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Editorial Contact Address:

Dr. Laura A. Cariola
University of Edinburgh
School of Health in Social Science
Teviot Place, Doorway 6
Old Medical School
Edinburgh EH8 9AG
United Kingdom
E-mail: laura.cariola@ed.ac.uk

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The journal of ***Language and Psychoanalysis*** is a fully peer reviewed online journal that publishes twice a year. It is the only interdisciplinary journal with a strong focus on the qualitative and quantitative analysis of language and psychoanalysis. The journal is also inclusive and not narrowly confined to the Freudian psychoanalytic theory.

We welcome a wide range of original contributions that further the understanding of the interaction between Linguistic Analysis and Theory & Psychoanalytic Theories and Techniques. Any relevant manuscripts with an emphasis on language and psychoanalysis will be considered, including papers on methodology, theory, philosophy, child development, psychopathology, psychotherapy, embodied cognition, cognitive science, applied dynamical system theory, consciousness studies, cross-cultural research, and case studies. The journal also publishes short research reports, book reviews, interviews, obituaries, and readers' comments.

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Content

Heidegger and Lacan: Language Beyond Communication

Dario Alparone[1] &Valentina Lucia La Rosa
University of Catania

Abstract

Lacanian psychoanalysis cannot disregard its debts to philosophy, especially continental philosophy. Lacan's conception of language is derived from multiple philosophical sources (i.e., Plato, Aristotle, Kant, Hegel, Kierkegaard) including Heidegger's philosophy of language and pride of place. Heidegger's view of language prepares the ground for reversing the relationship between language and human beings, overcoming common sense about language and the communicative model of language. Language is much more than a set of labels; it shapes the human world and structures social relations themselves. In addition, language acts as a social link. The function of language as a social link allows us to think of it in relation to the Law and the very function of this human subjectivity. In reference to the Other of the Law and language, the subject finds her recognition, and this implies that the language is not reducible to communication. The process of technical-scientific domination of Western institutions leads to a reduction of their functions to the formal aspects, which may lead to a reification of the human as well as a state of alienation.

Introduction

According to Heidegger (1959), philosophical reflection on language cannot fail to start from an initial and fundamental methodological distance from the different disciplines (from linguistics to psychology) that deal with language. While these disciplines tend to define language as a system of signs useful in conveying some meanings (the most widespread conception), philosophy deals with language itself. While recognizing the value of these disciplines, philosophical reflection must be able to ignore them—that is, it must be able to place brackets around the datum of common sense according to which one speaks to say something and transmit a message (Heidegger, 1959). The conception of language as communication considers it on a level of exteriority,[2] with respect to which philosophical reflection must therefore abstract, and considers words merely as labels of 'real' things.

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[1] Correspondence concerning this article should be addressed to Department of Political and Social Sciences, Palazzo Pedagaggi, Via Vittorio Emanuele II 49, 95131 Catania, e-mail darioalparone@gmail.com.

[2] "The Greek word that corresponds to our "language" is Υλῶσσα, "tongue". Language is φωνή σημαίντική, a vocalization which signifies something. This correct but externally contrived representation of language, as "expression", remains definitive from now on. It is still so today. Language is taken to be expression and vice versa. Every kind of expression is represented as a kind of language. [...] Once, however, in the beginning of Western thinking, the essence of language flashed in the light of Being—once, when Heraclitus thought the Λογος

In the Heideggerian philosophical perspective, language itself carries an intrinsic ontological connotation. Speaking, in fact, is not merely the expression of a message between two speaking beings but founds the very being of the things of which it speaks: The word is already a thing in and of itself (Heidegger, 1959). In this perspective, as something more than a mere tool endowed to human beings to share experiences, language (Λογος) is linked to the act of laying (λέγειν) (Heidegger, 1954). Language is linked to the presentation of things in a "gathering laying-before", and for this reason, it can be understood through a precise type of listening: Listening to the silence of language means going beyond the simple mechanical beating of sound on the eardrum.[3] Language, as Λογος, requires a listening that differs from hearing of everyday life:

> "Not to me", i.e., not to this one who is talking; you are not to heed the vocalization of his talk. You never hear properly so long as your ears hang upon the sound and flow of a human voice in order to snatch up for yourselves a manner of speaking. Heraclitus begins the saying with a rejection of hearing as nothing but the passion of the ears. But this rejection is founded on a reference to proper hearing (Heidegger, 1954, p. 67).

It is in this orientation of hearing how to listen that we can take in language as the reference to the things themselves and not as meanings or messages in which the represented is already provided in a prefiguration offered in common sense. There is something more in such a hearing: Language speaks and, as Λογος, places the being of things in themselves, "the being of the essent". Therefore, what would make a difference in the philosophical conception of language is its listening point, whence it follows that it is not so much man who speaks as the language (Heidegger, 1959).

Language and Speaking Being

Distinguishing between the conception of language as a speaker and as an instrument of communication is a fundamental operation that became a cardinal principle in the psychoanalytic theorization of Lacan (Di Ciaccia & Recalcati, 2000, p. 45; Richardson, 2003, p. 17; Meyer, 2007), which was translated into French '*Logos*' by Heidegger (Heidegger, 2013). Moreover, in *Being and Time* the ordinary use of

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as his guiding word, so as to think in this word the Being of beings" (Heidegger, 1954, pp. 77–78).

[3] Some authors have noticed a possible comparison between Heideggerian's listening of being and Freudian psychoanalytic listening in the patient's discourse. In this perspective, Lacan's 'return to Freud', placing language as a fundamental element, would account for the Heideggerian perspective on language (that is, a non-connotative model): through the *talking cure*, patient language becomes central to achieving truth (Richardson, 2003, pp. 19–20). A word is considered the signifier in itself regardless of the intentional meaning it carries.

language typical of everyday life was subjected to strong philosophical criticism and referred to as *idle talk*, a form of being inauthentic in one's own way of being in the world (Heidegger, 1953, pp. 156-159). From these philosophical coordinates, the psychoanalytic understanding of language assumes a different value than the purely psychological one. It is conceived not as a simple instrument of mediation between individuals but rather as a fabric that organizes and structures social relations (Gurgel, 2009). Language, in particular, mediates the relation between an individual and her subjective experience of the internal (emotions, sensations) and external (material things) world; it may shape experiences themselves (Cimatti, 2016a). This perspective is radically opposed to the empiricist conception of language, according to which there is an isomorphism between mind and reality, a mirroring relationship between subjective experience and external reality, in which language would only be a set of labels indicating the things of the world (Cimatti 2016b)[4]. In this sense, Lacan describes the relationship of the human being with language in terms of 'field'— that is, as a place within which the speaking being is inscribed before her biological birth (which is therefore subsequent to her symbolic birth). These reflections may lead psychoanalysts to say that the unconscious—what inhabits the human in the most in-depth and rooted way—is structured like a language[5].

It is clear that, in both the Heideggerian philosophical perspective and in the Lacanian psychoanalytic one, language goes far beyond the pure and simple communication between individuals,[6] as subjects exchange, in full consciousness and awareness, messages and meanings, almost as if they were goods.[7] In this sense, we can observe

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[4] In this regard, it seems appropriate to indicate that this also implies a criticism of those epistemological positions coincident with the logical positivism, which were overcome in the current epistemological debate (Franco, 2018).

[5] This conception of language as a field of relational structuring that precedes the birth of the subject herself allows it, at the symbolic level, to be exemplified by what Lacan has stated about the ignorance of criminal law: "No one is supposed to be ignorant of the law; this formulation, provided by the humor in our Code of Laws, nevertheless expresses the truth in which our experience is grounded, and which our experience confirms. No man is actually ignorant of it, because the law of man has been the law of language since the first words of recognition presided over the first gifts [...]" (Lacan, 1966a, p. 225). See again Gurgel (2009, pp. 167–168).

[6] "This conscious subject, master, makes the difference between linguistics and psychoanalysis. Their epistemological domains are distinct. Linguists and psychoanalysts listen to some words, but in a different way. The first try to describe languages, to build a scientific theory of their operation. Their concern is objectivity, the general, thus following the Aristotelian path. Thus, they pursue "every" subjectivity, while psychoanalysts claim it in associative listening and that their objective consists not in a theory of language but of the unconscious» (Houdebine, 2005, pp. 987–988, *our translation from French*).

[7] "[...] it is, on the other hand, more important to recall that this ideology of the conscious subject constituted the implicit philosophy of classical political economy and that Marx was criticizing its "economic" version in rejecting any idea of "homo economicus", in which man is defined as the conscious subject of

how Heidegger's perspective on language, wanting to overcome the perspective of a language as a means of communication and naming world objects, is proposed above all as a metaphysical perspective that wants to be an alternative to the model that is at the foundation of the liberal political vision (Woodson, 2020), a critical political perspective which is also consistent with Heidegger's political choices (Nelson, 2017). In our perspective, man is instead spoken by language and is traumatised, even in the body, by the signifier. In psychoanalysis, this relationship is often described with the pun *motérialité* (Lecoeur, 2016), as a synthesis of word and matter, to indicate the material effect that words have on the subject and on her body (the word is already a thing).

The extent to which man is marked by language is evident from the early stages of childhood development. From birth, man is thrown into a state of biological incompleteness and instinctual deficiency that makes one extremely dependent on one's environment. This obliges the *infans* to build tools to express one's own needs and address them to the Other on which one totally depends (Romano, 1989). In such a state of dependence, the wail, the cry, and the scream become primordial forms of invocation until the word is set up as a representation of something that is missing (symbol), as a question addressed to the Other concerning one's appetite, which, however, was already being under-communicated. The question so mediated by the word is satiated not by the object that it could receive as an answer but by the very gesture of the answer by the Other (that is, the signifier). Thus, language, from the beginning, possesses a person in her needs, from which she is always decentralized: Her questions do not ask for specific satisfaction in an object but convey a desire, which in turn is satisfied with its dissatisfaction, with that emptiness which corresponds to the very desire that is the Other's desire: "this subjectification consists simply in posing the mother as this primordial being who may be there or not. In the child's own desire this being is essential. What does the subject desire? It's not simply a matter of appetition for the mother's care, contact or even her presence, but of appetition for her desire" (Lacan, 1957-58, pp. 165–166). Thus, the fundamental dependence that requires care becomes, in the symbolic mediation of language, a request for recognition (Cimino, 2019). In this sense, language is much more than communication for man. It is the very figure of one's desire that is of one being subject and, therefore, of one being in the world.

Starting from this structure of the relationship between subject and language, it is noted that the latter acts as an operator of interpersonal relationships, ensuring third parties' role, mediation, and a symbolic guarantee of the relationship. The effect of the structuring of social relations takes on a specific consistency in the Law's institution as an organization of the subjectivity in relation to the social structure: "It is not the Law itself that bars the subject's access to jouissance—it simply makes a barred subject out of an almost natural barrier. For it is pleasure that sets limits to jouissance, pleasure as what binds incoherent life together, until another prohibition—this one being unchallengeable—arises from the regulation that Freud discovered as the primary process and relevant law of pleasure" (Lacan, 1966b, p. 696). Thus, in a language recognized as something more than communication, even the Law takes on further meaning with respect to the simple regulation of relationships between

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his needs and that subject of need is defined as the ultimate and constitutive element of every society" (Althusser, 1996, p. 115).

individuals, administration of the sovereign will of a narcissistic subject.[8] The Law is a symbolic place in which the subject finds an orientation in her life, thus organizing her action and desire within the horizon of the Third (the Other of Law and Language):

> The uppercase Third is the reference provided as a logical third to which every relationship of legality responds within the culture and the very idea of society. It indicates the horizon of law. The point from which it is possible to conceive of that law as a system of rules merely reflects the function of a third party […] (Legendre, 1989b, p. 57, our translation).

Language and Society

In this perspective, if the language is the structure that centres the human in the social relationship, making her arise as a subject in front of the Law, then the legal institutions of law are the "objectification" of social relationships (Honneth, 2014 p. 124). In the function of *référence* (that is, reference of the symbolic authority to another: "in-name-of"), the law formally establishes the function of the third party, guaranteeing the subject's recognition as the holder of rights and desires. According to Legendre (1989a), in this social organization, the subject is born within the social world, and this allows her to request self-recognition as a desiring, speaking being. However, this organization is increasingly in crisis in contemporary society because the law has been reduced to a mere administrative instrument, which has eroded its genealogical status (that is, its symbolic foundation in the form of "in-name-of"). The technical-scientific vision of the Law reduces the organization of the symbolic structure to mere technical functionality, useful for regulating only individual relationships within a context of trade emptied of the horizon of meaning (Romano, 2002): "It is true that the rise of scientific rationality led to the preclusion ('foreclosure') of another form of reason, one that preceded today's form yet – especially in view of legal practice – has therefore not disappeared" (Michels, 2013). It is a process of degradation of the Law from the guarantor of the recognition to the mere functional administration of the relations of autonomous market subjects, which already leads to a pre-philosophical (pre-Heideggerian) vision of language as a mere communication tool and message vehicle. Therefore, we could say that the reduction of the Law to its strictly functional (technical-administrative) aspects, typical of bureaucracy, refers to a use of the typical language of everyday life—that is, of that inauthentic being which, as stated above, Heidegger called *idle talk*. It is not by

[8] See, in this regard, the distinction made by Lacan between the symbolic relationship regulated by the Law and the imaginary function that is held on the narcissistic structure: "We must distinguish, therefore, between the principle of sacrifice, which is symbolic, and the imaginary function which is devoted to it, but which veils the principle at the same time that it gives it its instrument. The imaginary function is the one Freud formulated as governing object cathexis as narcissistic" (Lacan, 1966b, p. 696).

chance, with regard to the function of the Law, that Heidegger distinguished the law of natural sciences from normative law: "A law of nature is a principle of explanation, a norm is a principle of evaluation [*Beurteilung*]" (Heidegger, 1987, p. 28). In this sense, the reduction of the principle of reason immanent in the Law to technical rationality implies the exclusion of the poietic function ('creative' by a constructionist view) of the Law itself. This process, in our opinion, coincides with the adoption of a certain type of language understood as mere communication—that is, only as its technical aspects.

Thus, the Law, in its degradation from a symbolic order to an abstract operation, comes with degradation to the social level of the language itself. In the dimension of the global market, social life increasingly tends to be administered according to an economic model, in which the widespread language is increasingly of a technical and evaluative nature (Romano, 2002). The technical knowledge that permeates and turned into a desert the symbolic universe, changes the language from evocative (with its reference to a sense horizon) to numerical, thus reducing itself to a vehicle of administrative and accounting provisions. From this perspective, it can be pointed out that the legal institutions of Western democratic societies are marked by the risk of producing a form of extraneousness among citizens, precisely through a disconnect between social relations and juridical regulation, which resembles an abstract formality and incomprehensibility that can lead to social pathologies of freedom (Honneth, 2014, pp. 86–88). From a psychoanalytic point of view, this process can be interpreted as being due to a lack of possibility of subjecting the signifiers conveyed by the institutions: The language is not an expression of the social bond but is lived as a stranger to the life of the subject with alienation effects (Alparone, 2019). The number replaces the letter, so the language no longer organizes the subjective recognition but becomes a mere digit that communicates itself. In other words, it is a language and a law that is self-founded and self-justified in its functionality and not as a genealogy of the symbolic authority (using a Legendrian term) (Avitabile, 2004).

In the loss of the symbolic recognition value of language, we could consider the contemporary Western society as a "communication society"[9]—that is, a society in which language is reduced to an advertising vehicle, an instrument to communicate and execute commercial transactions, a numerical digit to indicate the price of a product, the balance to be paid (Romano, 2002). In this world, the individual rediscovers her absolute *private* freedom, also *de-prived* of the field of recognition that would ensure its effective realization (Honneth, 2014). The desire of the individual, left free from the constraints that social and symbolic constraints operate, is not fulfilled in a claim of normative character but precipitates in the condition of appetite, of a need satisfied by the object of consumption (Romano, 2002). In the society of communication, we must deal with free individuals without authentic autonomy (Perniola, 2004). They are merely reduced to 'Ego', atomic subjects devoid of symbolic mediations. For this reason, psychoanalysis' task also assumes a different connotation compared to what it may have assumed previously: It "does not consist in

[9] In this regard, see Luhmann's text on Mass Media (1996) that reads the Western social reality as based on the communication process, which affects production not only of the reality (through the news) but also of the individuality of the spectator (pp. 71–75).

adapting people to the social and communicative *status quo*, but rather in re-establishing their relationship with the symbolic order" (Perniola, 2004, p. 52).

In the symbolic degradation of language, the communication society, as a society of economically oriented exchanges, achieves the maximum technical potential, the same that Heidegger (1954) highlighted as a 'threat' to man: It diverts one from recollection and prevents one from listening, in the silence of language, to the being of things.

Conclusion

Psychoanalysis employs a conception of language quite different from that typical of common sense or psychology. Both Heidegger and Lacanian psychoanalysis disregard the linguistic model as a set of functional labels to indicate 'things'. Language conceived of only as communication is a reduction from a psychoanalytic point of view, which also considers it something that provides shape to the world, something that shapes social relations and structures them. In this sense, Lacan takes up the Heideggerian conception that it is not the man who speaks but language. Lacan further radicalized this thesis by saying that man is spoken by language. Therefore, language is not a device, a function in the service of the speaking being, but it precedes and surpasses them. Man is shaped by language, and the world assumes infinite possibilities of meanings in language to the point that we could say the world is built linguistically.

What Heidegger noted regarding language as something related to being is also found in works by Lacan and has a fundamental role in the clinic. Through the word, the analyzing can give shape to the suffering that inhabits the symptom, he can put, in words, the symptomatic *jouissance* that freezes the existence of the subject in the circle of repetition. Therefore, through the talking cure, it is possible to touch that real, that being, in Heideggerian terms, which is at the heart of subjective suffering, thus opening the subject to new possibilities that break the logic of the repetition of the ghost.

Falling back into the logic of language as communication has radical effects. One of the most evident is undoubtedly in the institutional context, in which the function of the Law is no longer the expression of a common feeling, of the social bond, and authority appears to the subject in all its abstract arbitrariness. The effect of a technical-bureaucratic language, which therefore does not refer to a logic of reference and does not convey any recognition of the subject, is to make the individual perceive a sort of separation and estrangement from the institution, which no longer represents her because it does not convey any recognition of rights-desires. This is what has been observed in our Western societies increasingly marked by populism—that is, by large masses that no longer recognize themselves in the political power and the established laws. In the decay of language from the authentic expression of the social bond and the symbolic order to a technical-communicative function, a deterioration of the Law is also produced. Indeed, if in the first model of language the principle of *ignorantia legis non excusat* applies from the time when the Law was the very expression of the social bond, in language-communication, the institution is recognised as alien and the Law is potentially lived as persecutory (Alparone, 2018). In this way the contemporary function of the Law is reduced to the Super Ego (Marret, 2012).

In this sense, it seems essential to rediscover the philosophical roots of the Lacanian psychoanalytic conception of language. Heidegger is one of the teachers from whom we can draw fundamental lessons for thinking about our psychoanalytic experiences, both clinical and social.

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From Bion to Delany: Samuel R. Delany's "Modular Calculus" as an Example of Bionian Transformation*

Riccardo Gramantieri[1]
Ravenna, Italy

Abstract

Literature furnishes a particular vertex to see reality through narrative fiction. In particular, science fiction literature, which creates a fantastic situation starting from realistic data (history, science, cultures), may be considered a kind of creative process. It uses heterogeneous things and "integrates" them into a homogeneous, new and comprehensible product. Science fiction writing allows the objects of the real to be reprocessed in terms which are thinkable at the current moment. Using the terminology established in psychoanalysis by Wilfred Bion this reprocessing work is a transformation. According to Bion we can hypothesise that the writer of the science fiction literary work serves as a "container" and the science fiction novel, considered a different way to represent reality and not just a simple editorial product, serves as a alpha-function to make concepts that were not previously thinkable or understandable. Between the 70s and the 80s the writer Samuel Delany theorized and put into practice the use of a literary model called "modular calculus". This model allows the literary work of making something unthinkable into thinkable. The purpose of this paper is to highlight how modular calculus is a particular type of Bionian transformation, and how the science fiction novel can play the role of alpha-function, transforming unthinkable concepts into thinkable ones.

Introduction

Literature and science express human thinking, and they are both manifestations of creativity. Harry Slochower wrote that "Science looks for causes and reasons, aiming to get at uniform laws. The function of art is to reveal forms which are mobile and manifold"(Slochower 1965, p. 117). They both seek to reveal an order of things established by nature. Whereas science seeks a conceptual order (a formula that describes nature's behaviour in a standard way), the order provided by literature (which is a form of art) is sensuous (it comes from the senses), and manifests itself in tangible forms that can be seen and heard. Relating this hypothesis to literature, we can say that, just like science speaks the language of abstraction, literature speaks the language of symbolism. Science deals with signs that have a specific and fixed denotation, whilst literature uses mobile symbols.

Science fiction literature can be found where science (or popularization of it) and literature meet.[2] Getting back to Slochower's definition, we can say that science

* This topic was presented as "poster" at the 18th World Congress of the World Association for Dynamic Psychiatry (WADP 2017) in Florence.

1 Correspondence concerning this article should be addressed to Riccardo Gramantieri; email: grama@racine.ra.it

fiction grants dynamism to the specificity and secureness of science. Tom Idema points out that "what can materialize in SF is a dynamic understanding of science in which the latter, rather than being represented as an authoritarian monolith, is taken as a highly differentiated set of fields, people, institutions, practices, ideas, attitudes, emotions, and so" (Idema, 2015, p. 45). The great heterogeneousness of the contents of science fiction literature was also underscored by Paul Graham Raven: "there are a lot of futures out there, and I think it's important that we learn how to read them. Science fiction and futures often function as engines of techno-scientific desire, but there is also a way in which narratives of futurity perform a function akin to collective cultural dreaming" (Raven, 2016, p. 51).

Science fiction writing allows the objects of the real to be reprocessed in terms which are thinkable at the current moment. This process is more complex than the simple relocation of a current plot to a faraway planet, as it happened with the space opera of the 1930s. In those stories, entertaining yet naïve, the theme of the frontier and the fight against American Indians described in popular western novels was simply adapted in order to develop a plot to be set on faraway alien planets. In a different manner, science fiction in its most mature form does not merely change the costumes and scenarios of the western romance, but rather re-thinks reality.

Using the terminology established in psychoanalysis by Wilfred Bion, the space opera of the 1930s can be an exemplification of what is known as transformation in rigid movements. The more mature science fiction is instead an example of a more complex transformation: the task of science fiction is not to think about what has already been thought, but to be able to think of that which has yet to be thought. Samuel R. Delany, a writer who often analysed the science fiction genre as a linguistic means, stated that in science fiction the future is a convention that allows the writer to indulge in a distortion of the present "that sets up a rich and complex dialogue with the reader's here and now. The "future" is the most common writerly convention science fiction uses to accomplish this, but it is not the only one. Another is the "parallel world" convention, wherein the SF writer supposes that some event in history had turned out differently and uses the resultant alternative present for the story setting" (Delany, 1984/2012, p. 165). This characteristic of distorting the present using the means of creativity makes science fiction not merely a type of writing, but also "a way of reading" (Delany, 1994, p. 276). A transformation of all aspects of the representation of the real. By saying this, the reference to Bionian transformations is even more fitting: the transformations operate both on the reader and on the writer, just as they operate both on the analyst and on the analysand.

One of the examples often used by Delany in several critiques, concerns the way in which science fiction solves the problem of imagining the future starting from real elements of the present. The solution consists in *transforming* that which already exists into something different, by means of a particular type of *function* (psychic

[2] Several science fiction authors are scientists (e.g. Gregory Benford, David Brin, Peter Watts, etc.) and their science fiction books are actually a literary embodiment of the application of a scientific theory or a technological process. Most science fiction authors, on the other hand, do not construct their books starting from the primary source (the scientific theory), but from the secondary source, namely a popular dissemination of it.

during the analytic therapy, literary in writing/reading): "when Heinlein placed the clause "the door dilated" casually in one of the sentences of his 1942 novel, *Beyond This Horizon*, it was a way to portray clearly, forcefully, and with tremendous verbal economy that the world of his story contained a society in which the technology for constructing iris-aperture doorways was available" (Delany, 1994, p. 34).

The psychoanalyst Wilfred Bion is the one who, more than anybody else, explored the mechanisms of thinkability. If one should wish to resort to Bionian terminology, and refer to the example used by Delany of the diaphragm door, we could say that when Heinlein invented it in his novel, he made the "dilating" door understandable or thinkable. In this way, the science fiction writer is the one who takes the door-element and *transforms* it through the science fiction-function, starting from a pre-existing idea (preconception) of the diaphragm opening of the iris or of a camera shutter. From that moment on, the dilating door is understandable for the reader, too.

Bionian Transformations

Wilfred Bion "was a potent and original contributor to psychoanalysis" (Mawson, 2011, p. 3).[3] One of his major theoretical innovations was that of the concept of transformation. The transformations are a series of mental processes such as to transform incomprehensible information (emotional states and sensuous input) into mentalizable thoughts. The term is taken from mathematics, according to which the transformation is a change of shape.

Bion exemplifies the concept of transformation by comparing it to the series of operations intervening between the view of a field of poppies a painter sees in front of him and what the painter draws the canvas. The artist performs a transformation of what he sees in order to represent what his senses perceive in the form of a painting. Some of the elements of the painting are the result of the painter's interpretation, whereas other elements remain unaffected. The latter are those that allow us to recognize the real scene in the painting, that is, the vision of the field (for example, poppies, if they are drawn exactly as they are). Bion calls these elements invariants. The psychoanalytic interpretation, which takes place during the analyst-analysand

[3] Although the grandeur and originality of Wilfred Bion is widely acknowledged, he would have countered such popularity. Here is what he wrote about his American stay in Cogitations: "It took a long time to get used once again to the fact that nobody had ever heard of me, except one or two people who seemed to feel for some reason that they wanted further assistance. At the same time there were attributed to me qualities or abilities that seemed to be very wide of the mark; if I had had the qualifications or the addiction, I could have found myself thrust into the role of a sort of messiah or deity. All this ran parallel with its being made crystal clear to me that I was a mere human being, that psycho-analysis was, after all, only a form of verbal communication, and that there were limits to what could be done by it--especially as one was dependent on having somebody who would listen to what one had to say. So, what with having to say something, and also having to have somebody there who would listen to what I said, it was clear that the position that was being thrust upon me, or that I was being invited to take, was one not at all within my compass or capacity" (Bion, 1992/2005, pp. 376-377).

relationship, according to Bion, "can be seen to belong to this same group of transformations" (Bion, 1965/1977, p. 4). Following this theory, the invariants of psychoanalytic transformation are the theoretical pillars on which the theory rests (e.g., the Oedipus complex).[4]

During the psychoanalysis, the analyst transforms that which is brought (unsymbolised and sensuous things) into thinkable symbols by the patient into thinkable material. Bion distinguished transformations in rigid movements, projective transformations and transformations in hallucinosis. In therapeutic practice, the transformation in rigid movements coincides with the transfer phenomenon, with which the patient actualises his own unconscious desires within the therapy; in the projective one, the patient's communication takes place, as he remodels his own account of reality according to his own desires; the one in hallucinosis is characterised by a complete distortion of the real through acting-out, deliriums and hallucinations.

In order to describe the mental processes of thought formation (which is a first step towards artistic creation), Bion used the term alpha-function to describe a mental process through which thoughts and feelings impossible to understand by the person being analysed (beta-elements,) become understandable and thinkable (alpha-elements) thanks to the analyst's work. It is a simple form of transformation which provides meaning and coherence to the patient's speech. Therefore, growth of the thought is tied to a continuous and complex transformation process; it is a shift from scattered and shapeless ideas to forms which are alive and understandable. But in order to be "taming wild thoughts", thoughts must first be "housed", they must find a home that welcomes them (Monti, 2014). When these elementary components become thoughts (or concepts), they are stored in the unconscious so as to not occupy needlessly the conscience and be available. Hence, thought development depends on the interaction between the non-thing (the object for which one has no experience) and its realisation. This makes it possible to solve problems in the absence of the object (Bion, 1965/1977). In *Learning from experience* Bion introduced a concise form of these processes referring to them in strictly analytical-mathematical terms. The great Bionian revolution at the textual level consists precisely in a widespread use of a terminology taken from mathematics. Bion "found a mathematical form for this in what has come to be called 'Model Theory', invented in the 1950's by Alfred Tarski. Model Theory draws freely on the intuitions that we all use in representing new experiences in terms of old. A standard example of the use of a model can be found in the early attempts to explain the strange world of the atom and its

[4] Bion points out that it would be improper to speak of invariants in psychoanalysis, since psychoanalysis, as a discipline, keeps developing over time: "Since psycho-analysis will continue to develop we cannot speak of invariants under psycho-analysis as if psycho-analysis were a static condition. In practice it is undesirable to discard established theories because they seem to be inadequate to particular contingencies; such a procedure would exacerbate a tendency to the facile elaboration of ad hoc theories at times when it were better to adhere to established discipline. It is therefore advisable to preserve a conservative attitude to widely accepted theories even when it has become clear that some adjustment needs to be made" (Bion, 1965/1977, p. 4). If, however, a certain conservative attitude is maintained, it might be correct to speak of invariants even in psychoanalysis.

complicated mathematics. Some intuitive person hit on the image of a solar system, such as our own local universe supplies, to make things clear" (Skelton, 1995, p. 392).

The most elementary Bionian transformation is the emotional experience *x*-*K*-*y*. It must not be understood as *x* that owns something of *y*, but rather as *x* that is trying to get to know *y*. K (knowledge) is the domain in which transformations take place. For Bion, thought and emotional experience coincide. This is the reason why the proposition *x*-*K*-*y* can also express the alpha-function, stating that the beta-elements prefigure the alpha-element (Bion, 1962/1967). The beta-element must be digested (according to the classical Bionian metaphor) in order to become thought, and this occurs only if there is an apparatus for thinking. Bion defines the latter with the expression "container-content": it is a psychic organisation that emerges during the two moments of the earliest infancy, which are the paranoid-schizoid (PS) position and the depressive (D) position. The container-content expression comes from the fact that the child (or the analysand) in D-position, uses the object as if it were a container that metabolises the projective identifications (beta-elements), transforming them into alpha-elements, in other words element of symbolic thought. The presence of the container is necessary in order to collect the psychic fragments of experience and to give them coherence. The transformation process entails a shift from beta-elements to alpha-elements, from oneiric thoughts, dreams and myths to pre-conceptions, from conceptions to concepts, and lastly to the scientific-deductive system. They are all stages of the creation, with each one being the transformation of the previous stage. By following this theory, we can say that the narrative work carries out the function of "container", since it collects inside hypotheses and ideas that need to be reprocessed and transformed according to the writer's skill.

Samuel R. Delany's "Modular Calculus" as an Example of Bionian TransformationIntroduction

Hanna Segal, who dedicated part of her work to creativity, was a fan of science fiction. She considered it an excellent reprocessing means, especially if the story answered the question "what if…" (Bell, 2016, p.64). To Segal, literature was a means of reflection on reality and, at the same time, it furnishes another vertex to see reality through the narrative fiction. Literary writing does not only describe situations, it also exemplifies some psychic processes underway in the writer and in the community. Melanie Klein wrote about "reparation" meaning that mental process through which the distressed person tries to "repair", in other words to remedy, their own destructive fantasies towards the beloved object. This "reparation" action of the mental representation of reality is very similar to the action carried out by literature. By creating fictitious realities, the work of fiction has the task of forming "possible" images of the world, and therefore to contribute to forming new elements of thought, conceived for the first time in that form. The psychologist Carol Fleisher Feldman wrote that the various types of non-scientific interpretation, those that may be considered as fiction genres, constitute various ways of thinking, integral explanation models that are evoked by the stories and are attributed to the stories themselves (1994/1997). According to Bion, every time that, during the therapeutic process, the analyst provides an interpretation of beta-elements transforming them in alpha-elements, he performs a narrative transformation. The term narrative in psychoanalysis means "as the interventions in which, say, the analyst undertakes an

extension into the world of 'myth' [...] when he recounts something meaningful from a position on Row C of the Grid" (Ferro, 1999/2009, p. 1).

By making a parallelism between what happens during the analysis and the science fiction literary invention, we can say that by writing science fiction stories, a transformation of elementary scientific theories is carried out in order to make them "thinkable". This thinkability is then also transposed by the reader who, through the science-fictional text, he acquires a new image of what it has become possible to think. Furthermore, we can say that science fiction is the mythological literature of the contemporary era.

Following the Bionian model, science fiction is the equivalent of a "container", capable of elaborating theories that would otherwise be abstract and "not digestible". The writer is the one who is able to retain knowledge and past experiences (in other words existing scientific theories) in order to use them in the literary invention. Since the work of fiction is a "container", it allows a theoretical concept to realise itself through a speculative and literary formulation that can be enjoyed by the reader. In science fiction, the literary "container" is constructed through the use of writing techniques, or through the creation of fantastic images: actions that presuppose an additional step in the complexity of the thought.

It was Bion himself who realised that science fiction was a privileged expression of creativity. In *The Dawn of oblivion* (1979), the third volume of the Trilogy *A memoir of the future,* he makes one of the leading characters Roland, who speaks with the P.A. (psychoanalyst), say that a metaphor is science fiction.[5] Science fiction makes it possible to increase the ability to tolerate the speculative image, given that the science approach only would be understood by people centuries later (Harris-Williams, 1983/2011). In this way, narrative fiction acquires a character of truth more than the unknowable (unthinkable) event, which in instead made up of the abstract scientific concept[6].

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[5] The first volume of the Bionian trilogy also contains a reference to science fiction. In one scene, Rosemary, one of the leading characters, speaks to some spectral figures while she is half-fainted (hence it is the passage from the PS position, dreamless, to D position). The ghosts reveal to Rosemary: "We are Science Fiction. Who are you? / I am the Artist who made the ram caught in a thicket beautiful in gold. I am the hunter who caught the ram in a thicket. I am the thicket in which the ram was caught. Who are you?" / "I am Science Fiction. I am S. F. I am the Fiction which became Science Fact. I am the tomb robber. I am the drug that stole your sense away. I am the tomb, ugly and frightening. I am the thief that made you bury, in the golden ram and its golden, golden thicket, the work of Art. I made you bury in the death pit of Ur. I robbed the death pit of its terrors. I am the S. F. who, disguised as the holy fool, appears as the Silly Fool. I am S.F" (Bion 1975-79, p. 36).

[6] The American author Philip K. Dick, writing about the role of the science fiction writer, made a statement that is very close to the Bionian theorization, in other words that "the SF writer senses that story, or many stories from the clues of tangible reality around him, and does the rest; he talks for the objects, the clues. He is driven to. He knows there is more, and he knows that he will not live long enough to see all the scientific data actually brought forth. . .they may never be.

Bion introduced mathematical abstraction in psychoanalysis when he theorized the three types of transformations (in rigid movements, projective, in hallucinosis). In this way, he performed a modelling of psychic processes. This theorization has certain points in common with the metaliterary abstraction introduced by the Afro-American writer Samuel R. Delany in some of his works between the end of the 1970s and the early 1980s. He suggested a particular form of narrative, and called it "modular calculus". "The term "modular" derives from the mathematical term "modulus", which refers to changing numbers from one base to another, and *Triton* concerns precisely this kind of "calculus"" (Miller, 2012, p. 57). The transition (transformation) from a real narrative to a science fiction one is analogous to the change from a numerical base to another one.[7]

The considerations on this writing method are contained in the group of texts consisting of the novel *Triton* (1976) and its appendix "Ashima Slade and the Harbin-Y Lectures", followed by the appendix to *Tales of Nevèrÿon* "Appendix: Some Informal Remarks Toward the Modular Calculus, Part Three by S. L. Kermit" (1979); of the novel *Neveryóna, or the tale of signs and cities* (1983), and lastly of "Appendix A: The Tale of Plagues and Carnivals" contained in *Flight from Nevèrÿon* (1985). Delany suggests that, by means of specifically developed models (literary, mathematical, linguistic), it is possible to translate reality. One of these is metalogic, a "mathematical superstructure" (Delany, 1990/2011, p. 318), a mental and scientific process designed by the leading characters of *Triton*. This book can be considered both a story of space science fiction (it is set on a satellite of Neptune) and an application of the modular calculus technique invented by Delany. This congruence between literary form and narrated story, between container and content, is possible because "the science in SF is mostly doubletalk anyway—like the "metalogics" and the "modular calculus" I spoke of before" (p. 332). *Triton* can be defined a meta-text: it narrates a science fiction story and, at the same time, it discusses science fiction itself.[8] This technique increases the co-penetration between the writer's real world

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The writer, then, begins to sing about those battles and those deeds. He places them in the future only for convenience; it is the placing of the story mostly in an imaginary world, but bound by small actual clues to this world, that drives him into expression" (Dick, 1974/1995, p. 73).

[7] The idea of associating mathematics with language might come from Delany's youthful readings. The writer said that he was given *The black star passes* by J. W. Campbell to read as a young man, a book whose plot he could not remember, but. "[...] I do recall that someone in it had invented a Very Powerful Mathematical Tool called "the multiple calculus" (Delany, 1974-75/78b, p. 107).

[8] In *Triton*, some of the leading characters' dialogues are parts of essays about science fiction that Delany had previously written. Even the appendix to the novel contains parts of literary critique articles which the writer had already published (1974-75/1978) or already written (1976/1978c). Therefore, the novel can be considered an example of recursive science fiction, that is "*science fiction about science fiction*" (Resnick, p. vii). Delany pretends that the appendix to the novel *Triton* is a commentary on the lecture on modular calculus given by Ashima Slade (a character in the novel) and published under the title "Shadow" in the *Foundation* magazine by Lux University of Titano (Delany, 1976/1992, p. 346). Actually, "Shadow" was an essay by Delany that appeared on the *Foundation* magazine of the Liverpool University.

(the one of the publishing world that produces science fiction) and the fictitious world of the Triton satellite. The slightly pretentious name of "modular calculus" actually conceals the idea that a literary content may be associated with different contexts.

In the theoretical text entitled "Shadow" (1974-75) Delany had imagined the need for a representational system that operates by models: "For A to be recognized as a model of B, first a set of internal relations, as A relates to itself, must be read from A, then processed in some way probably similar to a mathematical integration, then *another* set of internal relations must be read from B (some of the relations *may* be similar to these read from A; but they not be) and then integrated (by similar process; or by a very different one) and the two results compared; if I find the *results* congruent, then I recognized A as a model of B in the context of the joint integrative process that produced the congruent results"(Delany, 1974-75/78b, p. 52). Delany conceives literary (science fiction) modelling to be similar to mathematical integration, i.e., the operation that allows one to obtain the calculation of the (surface) area starting from a curve (a line). In the simplest possible terms, it could be defined as a type of operation that "adds" or "increases" the initial data (the curve) providing a more complex result (surface) than the initial one. Just like a mathematical formula is able, in its abstractness and uniqueness, to describe phenomena that are very different one from the other;[9] in the same way a text based on modular calculus must be able to represent realities which also are very different one from the other, such as the U.S. between the 1970s and the 1980s, and the heterotopy of the Neptune satellite or the prehistoric world of Nevèrÿon novels. Delany wrote that "the Modular Calculus is basically a set of equations that will take any description of an event, however partial, and elaborate it into a reasonable, accurate, and complete explanation of that event" (Delany, 1990/2011, p. 344).

The writer's intention is to create a literary form the content of which is specific and accurate in its expression, but at the same time capable of being used in different contexts for the purpose of allowing knowledge. In short, this is a definition of modular calculus. It was initially exemplified in the novel *Triton*, it can be defined as an initial attempt to apply the method and for this reason, it being a meta science-fictional reflection, can prove to be obscure to non-scholars of science fiction. Conversely, "Appendix A: The Tale of Plagues and Carnivals", inserted in *Flight from Nevèrÿon*, is more fitting and immediate: "The modular calculus is an algorithm or set of algorithms (a set of fixed operations) that can be applied to any fitting grammar to adjust it into a guiding grammar" (Delany, 1985, p. 376).[10] In an

[9] "Mathematical formulation is not yet available to the psycho-analyst though there are suggestive possibilities" (Bion, 1962/1967, p. 51).

[10] Fitting and guiding grammar are definitions that Delany takes from the work of Willard Van Orman Quine: "In more informal terms, there can be perfectly accurate descriptions of systems, of situations, or even of machines, which, while they tell us what these systems, situations, and machines look like, how they move, how they function (that is, tell us how they *might* work) nevertheless do not indicate how they *do* work. Similarly, there are explanations that tell us, accurately and precisely, how something actually does work, so that we can both recognize and (potentially) construct an object that works in the same way—though often those explanations will not let us recognize the initial object from which the grammar was derived (it doesn't necessarily tell us whether it was a

interview he kept using the same mathematical metaphor by explaining that "Modular Calculus is basically a set of equations that will take any *description* of an event, however partial, and elaborate it into a reasonable, accurate, and complete *explanation* of that event" (Delany, 1990/2011, p. 343).

These definitions are not always entirely clear: the mathematical model proposed by Delany is more of a science fiction metaphor than anything else. To make his point clearer, the author wrote "Appendix A: The tale of plagues and carnivals" as part of the *Nevèrÿon* fantasy series. There Delany states "Clearly the Neveryon series is a model of late twentieth-century (mostly urban) America" (p. 377). The story, written in 1984, clearly shows the two characteristic elements of modular calculus: the fantastic part is set in *Nevèrÿon* whereas the realistic one is set in New York. It is a clear application of what Delany had already written ten years earlier in "Shadow2, namely that "Everything in a science-fiction novel should be mentioned at least twice (in at least two different contexts)"(Delany, 1974-75/78b, p. 341) . In this case, in the prehistoric city of Nevèrÿon and in the New York of the eighties. One story stands as the model, the other is its transformation. The first fiction it is about an epidemic that starts to strike men (and, to a lesser extent, women) in *Nevèrÿon*. Pheron, one of the first to fall ill is thus described: "He's so thin—he must weigh only half of what he did when we saw him! His joints and his neck are all swollen. There're terrible sores on his leg and his side! His eyes are red and runny. And he's… sick! He can't even put his arms down. Underneath hurts too much" (Delany. 1985, p. 181). Those who are affected by the epidemic is hopeless. The place of origin is the Bridge of Lost Desire, the site that hosts the city's brothels. The second story tells about the way AIDS spreads and becomes a subject of concern for the population of contemporary New York and of Delany himself. The transformative action of modular calculus is evident in two respects: a meta-narrative and a narrative one.

The meta-narrative one is represented by the appendix, where it appears that the fantastic story is but the story based on an ancient (fictitious) text found by Afro-American archaeologist K. L. Steiner, who comes as "a black woman—and your friend for a good many years too. Also I'm a thirty-six-year-old, substantially overweight black woman, with an awful overbite" (p. 328). Steiner is the pseudonym under which Delany wrote several critical pieces on modular calculus even outside the fiction of the series *Nevèrÿon*. Delany entrust to it the fictitious finding of writings dating back to 9000 years ago, which constitute the fantasy narration of *Nevèrÿon*.[11] The narrative part is the one that can properly be defined as a Bionian transformation. It starts from a realistic situation but difficult to understand at that time (the spread of AIDS in the United States), and transforms it into a story of epidemic which, by

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green one or a red one, if its being green or red is not part of its workings) should we stumble over it in life. The first is, more or less, a Fitting grammar. The second is, more or less, a guiding grammar" (Delany, 1985, p. 376). The writer concludes: "In short, the problem of the modular calculus is: How do we know when we have a model of a situation; and how do we tell what kind of model it is?" (p. 377).

[11] This game of mirrors between narrative text and critique of the (fictitious) text as if it were real, can only be a reference to the literary fiction of Nabokov in *Pale Fire* (1962), where the romance consists of a critique of a poem written by a fictitious author.

resembling plague stories from the past but with the characteristics of syphilis, the reader can understand better.

The story of the spread of AIDS is sadly well known. Contagion started in 1979, when a few unexplainable deaths were reported (Gilman). However, it was not until 1981 that people started talking about a new disease, when, between October 1980 and May 1981, five young, previously healthy homosexual men were treated in Los Angeles for Pneumocystis carinii pneumonia. It is a type of pneumonia that usually affects people with severely weakened immune systems. In June 1981, the Center for Disease Control and Prevention (CDC) published an article in their weekly newsletter about the five men and their cases, and soon, information about the new disease spread quickly in the medical community. Owing to the predominance of homosexual patients, the term GRID (gay-related immune deficiency) was used, then, from 1982 onwards, the term AIDS started being used.

In 1984, when Delany was writing "The Tale of Plagues and Carnivals" the disease was still relatively unknown to most of the population, and therefore also to science fiction readers. Its dangerous is not yet "understandable". Therefore, Delany takes an unthinkable topic (an epidemic of AIDS) and makes it thinkable by turning it into an epidemic that is similar to the plague or syphilis but with the characteristics of AIDS, that strikes the prehistoric land of Neveryóna. At the beginning of the 80s very little is known about AIDS; so, it is still something unthinkable. If one wants to make it thinkable, that is understandable, one needs to turn this reality into an unrealistic fantasy story. The fantasy genre is a narrative that is well known to the readers, even if it does not describe real situations. Even the main topic of "The Tale of Plagues and Carnivals" (a sexually transmitted disease standing between the plague and syphilis) is however known to the reader through other works of fiction (the Plague can be found in many classical texts, and syphilis, too). So, fantasy and plague are thoughts that have already been conceived. The fantasy narrative of AIDS in "The Tale of Plagues and Carnivals", which in Delany's intention is an example of modular calculus, is a Bionian transformation, since it makes it possible to make the AIDS-thought understandable by transforming the plague-thought through the fantasy/science-fiction genre.

If we use the formula of Bionian transformation, *x K y*, then we can say that Delany operates in the text according to the transformation *x – Science Fiction/Fantasy - y*. Its "boundaries between languages become permeable; a new 'dialect' is created in order to approach the expression of truth" (Priel, 2013, pp. 1117-1118).

In this way Delany starts from certain predefined situations (emotions related to a deadly plague and syphilis epidemic) and integrates them in the fictional narrative transforming them (the sexual plague in Nevèrÿon), he produces a meta-fiction that is entirely similar to the interpretation made by the analyst during the session. The transformation of text is similar to a transformation in K, and if this personally implicates the writer and the reader, then it is similar to a transformation in O. The performance of this transformation in the creative-literary process itself is similar to the transformation process of the analysis inherent in psychoanalysis. Just like the analyst knows the rules of analysis (transformation in K) and during the analysis he also changes himself, in the same manner the writer knows the rules of writing science fiction, and applies them to rethink his own role. Starting from a literary

model such as science fiction, the writer changes both the literary genre and his own function within the genre itself. Delany's modular calculus is nothing but "another term for the "significant distortions" that science fiction produces—both creates and works in tandem with another effect that the genre generates, the representation of ways in which the reader's world could be different" (Tucker, 2010, p. 255).

The Modular Calculus as Bionian Transformation: A Conclusion

According to the psychoanalyst Wilfred Bion, thoughts and dreams are closely related things. Alpha-elements are the outcome of work done by alpha-function on sense impressions; alpha-function is the interior process "by which sense impressions are transformed into elements capable of storage for use i n dream and other thoughts" (Bion, 1963/1989, p. 4). Thought and dream are two aspects of the same inner process, so much so that "Failure of alpha-function means the patient cannot dream and therefore cannot sleep" (Bion, 1962/1967, p. 7).

As regards the artistic product, we can say that creativity is the mirror image of the dream. The dream is the preferential way to the unconscious and some literary forms are particularly suitable to represent such way. Poetry is one of them. Science fiction is also one of these art forms. Delany maintains that science fiction is closer to poetry than mainstream literature: "By much the same process that poetry expanded beyond its beginnings in ritualistic chant and incantation to become a way to paint all that is human and etch much that is divine, so s-f became able to reflect, focus, and diffract the relations between man and his universe, as it included other men, as it included all that man could create, all he could conceive" (Delany, 1970-71/1978a, p. 127).

The ability that some particular literary forms have to reach deeper meanings (the Bionian O) than others has also been underlined by Francesca Bion. She recalls that her husband thought that poets "seem to me to say something in a way which is beyond my powers and yet to be in a way which I myself would choose if I had the capacity. The unconscious-for want of a better word seems to me to show the way 'down to descend', its realms have an awe- inspiring quality" (Bion, 1985/1991, p. 241). Delany also identifies this ability that poets and psychoanalysts have in science fiction writers. Psychoanalysis succeeds in making conscious what is unconscious; to Delany "science fiction is a way of casting a language shadow over coherent areas of imaginative space that would otherwise be largely inaccessible" (Delany,1974-75, pp. 117-118). Science fiction, among the literary genres, is the one best suited to exemplify a Bionian transformation; Bion himself used it to write his narrative trilogy, precisely because it is capable of making transformation processes readable. The problem of the adaptation of representational forms to different types of reality is a problem that Bion had sensed with regards to the epistemology of psychoanalysis. His equation, *x-K-y*, is conceptually taken from mathematics. With this equation, he attempted to write a strict formula to describe in a concise way a process through which something becomes understandable, and therefore known, via a knowledge task starting from other elements of departure that are not thinkable in that new context. Alpha-function is a very limited functioning of the mind, restricted to intra-session experiences. In the hypothesis that has been made here, it is advised to extend the operation of this function (transformation) to a more complicated process such as the composition of a science fiction story, that is Samuel Delany's modular calculus.

In the 1970s, Delany wrote a series of texts that refer to a model of linguistic representation, invented by the writer himself, called modular calculus. The system vaguely refers to systems science and cybernetics. Through this system, Delany attempts to create stories equipped with a sense of the real world in which the writer operates, and in the fictitious world populated by his characters. Science fiction itself, with its characteristic malleability and allegoricalness, is an example of modular calculus. Delany makes the example of the dilating door described in Heinlein's novel: through that novel the dilating door, which was earlier an unknown image, has become understandable via the transformation of concepts already conceived of doors and camera shutter, into the now understandable dilating door. Delany mainly writes within models of this literary genre that can be itself considered an example of modular calculus. Science fiction, which usually describes future societies rewriting present ones, is "essentially a modelling" (McHugh, 2003, p. 20). Modular calculus, in the writer's intentions, is a general theory of modelling and representation (Freedman 2006). It coincides with science fiction when this constitutes "truly the bridge between science and literature, a notional gadget for postulating the hidden works of a black box which might hide the fundamental physical laws of the universe, or the obscure heart of a suffering human being" (Broderick, 2005, p. 130).

In psychoanalytical theory, the formulation or adherence to a model makes it possible for the analyst to give meaning to the form of the patient's story. Bion uses mathematics because it is a symbolism that makes it possible to work in the absence of the object being dealt with greater "precision and universality" (Bion, 1965/1977, p. 41). A modelling offers an interpretation of an unfamiliar state of affairs in terms of a familiar one, in order to reduce the anxiety of uncertainty. The "earliest experiences of modelling provide the functions that will process later experiences. If the earlier experiences have formed a bizarre or lopsided view of the world, later experiences will be cast in this mould. For example, a baby who had a psychotic mother (who would in the middle of the night wake up the baby to be dressed and then put it back to sleep again, only to feed it when it was not hungry) is laying down a foundation process for very bizarre models of the world, in which authority figures can act in utterly unexpected ways" (Skelton, 1995, p. 394).

When Samuel Delany offers the reader a representation of an unknown state in familiar terms, he behaves just like the analyst when the latter offers the patient, with his interpretation, a thought that would otherwise be difficult to formulate for the person being analysed. In the creative process "a symbol is inherently healing to the psychic system, restoring ties to the object and resolving unconscious relational conflict" (Waska, 2005, p. 95); analogously with science fiction writing new symbolisations, and new thoughts, are created. Here comes to mind the concept of "open work" defined by Umberto Eco. The open work "suggests", i.e., it is "performed with the full emotional and imaginative resources of the interpreter. Whenever we read poetry there is a process by which we try to adapt our personal world to the emotional world proposed by the text. This is all the more true of poetic works that are deliberately based on suggestiveness, since the text sets out to stimulate the private world of the addressee so that he can draw from inside himself some deeper response that mirrors the subtler resonances underlying the text" (Eco, 1962/1989, p. 9). Umberto Eco, a few pages later, goes on stating that open works are "works which, though organically completed, are "open" to a continuous generation of internal relations which the addresses must uncover and select in his act of

perceiving the totality of incoming stimuli" (p. 21). "Appendix A: The Tale of Plagues and Carnivals" is a sort of open work, obtaining by transforming the emotional stimuli produced by the spread of AIDS into a fantasy tale. Thus, it is also an example of modular calculus[12] and, therefore, following our hypothesis, of Bionian transformation. He writes the story, set in pre-historic and mediaevalesque Nevèrÿon, and there places an epidemic that looks like the plague but which is sexually transmitted like syphilis, and whose symptoms are those of a new disease about which there is growing discussion in New York. Delany's novel about AIDS is "an allegory of feeling in the absence of history" (Bradway, 2017, p. 66). Modular calculus allows to express this absence, like a Bionian transformation allows to realize the no-thing.

What Delany calls modular calculus is similar to the process of making something unthinkable (AIDS, unknown before that time) into thinkable (AIDS as a sexually transmitted epidemic), a process that is similar to a Bionian transformation. The science-fiction writer uses the literary medium (operating in the K domain) to turn something that was not understandable to the reader into something that now is such. In the story, the Bionian transformation, which coincides with the application of modular calculus, is performed typographically and literarily by alternating the descriptive paragraphs of Nevèrÿon with New York, the epidemic with Aids, the Bridge of Lost Desire with Brooklyn. In the arts a transformation can be exemplified by using the Bionian example of the painter who paints a field of poppies and the picture that represents it. The transition from the sight of the real scene to the painting is a transformation. The invariants are the elements that make it possible to recognize the real scene in the picture (for example, the poppies).

When science fiction is considered a transformative function, the invariants are the elements that make it possible to label the literary work as science fiction. Generally, they are literary *topoi* such as space adventure, the presence of aliens, etc. In the specific case of Delany's modular calculus, the invariants are Martian and Neptunian colonies. In his treatise on transformations Bion writes that "the artist is not the only person involved in looking at a picture" (Bion, 1965/1977, p. 1). That is to say, the transformation takes place in both directions. As in psychoanalysis both the analyst and the analysand undergo transformation, in modular calculus both the writer and the reader are involved. It is no coincidence that Delany often repeated that science fiction is "a way of reading" (Delany, 1994, p. 276). That is, there is no one way to read a text, there are several; and the greater the reader's knowledge of the means of science fiction, the greater his or her ability to interpret the science fiction story will be.

Using the Bionian expression x-K-y, which describes the transformation in elementary and minimum terms, the following expression can be written: (thought-plague-syphilis)-(SCIENCE FICTION)-(AIDS), which means that the understandable and known picture of the disease, through the use of science fiction function, makes

[12] However, the modular calculus remains an abstract operation. Umberto Eco additionally writes: "the mathematical concept of information cannot be applied to the poetic message, or to any other message" (Eco, 1962/1989, p. 66). Indeed, literature "expands the general notion of information; but the important thing here is less the analogy between two different situations than the fact that they share the same procedural structure" (p. 66).

the concept of AIDS, at that time unknown and unthinkable, understandable. Using one last time Bion's words, we know that "the theory of transformations is intended to illuminate a chain of phenomena in which the understanding of one link, or aspect of it, helps in the understanding of others" (Bion, 1965/1977, p. 34). Similarly, modular calculus enabled Delany to make clear (illuminate) a particular moment in our recent history through the use of particular literary genres, such as science fiction and fantasy.

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"Inside or Outside": The Container Schema of High and Low Barrier Personalities. And Remarks on Covid-19

Laura A. Cariola[1]
University of Edinburgh

Abstract

By relating the exterior-interior model of body boundary awareness to Lakoff & Johnson's (1999) in-out orientation of container-schematic conceptualisations, this study aims to explore the use of container-schematic imagery in the autobiographical memories of High and Low Barrier Personalities. The results of this study are based on a corpus of everyday autobiographical memories (N=488) and dream memories (N=450). The results demonstrated that, in both memory types, High Barrier personalities used more semantic fields representing concrete and metaphorical container-schematic imagery (Johnson, 1987), suggesting that the container schema is similar to the Barrier personality construct. The results are also discussed in reference to the Covid-19 pandemic.

Introduction

"Just wear the damned mask" (Bloomberg, 2020)

"McDonald's slammed for separating Golden Arches to promote social distancing" (New York Post, 2020)

The negotiation, erection and fall of national and cultural borders is prevalent in political discourses. Barriers separate people, whereas opening barriers unifies people and regions. There are many examples of regions that have aimed to redefine geographical or cultural identities by the reinforcement or creation of barriers. Recent examples include U.S. president Donald Trump's suggestion of expanding the Mexico–United States barrier, the Catalan declaration of independence from Spain, the withdrawal of the United Kingdom (UK) from the European Union (EU), and the Scottish referendum. Other examples include the closing of national borders and the implementation of social distancing to prevent the spread of the Coronavirus, to mention a few.

Typically, boundaries have been explored in political discourses in reference to right-wing political influences and ideologies, such as hate crime and racist-related discourses (e.g., Baker, Gabrielatos, & McEnery, 2013; Wodak, 2009; Wodak &

[1] Correspondence concerning this article should be addressed to Dr. Laura A. Cariola, Department of Clinical Psychology, School of Health in Social Science, The University of Edinburgh/, Medical School (Doorway 6), Teviot Place, EH8 9AG. Email: Laura.Cariola@ed.ac.uk

Richardson, 2012) and discourses of political boundaries and border politics (Chilton, 1996). In particular, the link between cultural and bodily boundaries is a common metaphorical blend in Nazi and War propaganda using the BODY AS A CONTAINER or BODY AS A STATE metaphorical schema. In these metaphorical blends, the containment functions as a protective device to keep the 'good' self safe on the inside by warding off the danger of the "other" that resides beyond the containing boundaries (Chilton, 2005). Whereas linguistics focuses on the metaphorical concepts of the BODY AS A CONTAINER, psychological research has focussed on exploring how individuals vary in the way they experience the containing function of their body image, or schema. Fisher and Cleveland's (1956, 1958) body boundary scoring provides a content analysis measure to explore lexical items associated with boundaries and their penetrability. Fisher and Cleveland's (1956, 1958) body image boundary concept originated from their observation that individuals varied in their appraisals of their own body images. A series of exploratory studies provided empirical evidence that a distinction could be made between individuals who perceive their body boundaries as being clearly bounded and differentiated from the environment, and individuals whose bodies lack such firm body boundaries. Based on these preliminary results, Fisher and Cleveland developed a reliable and valid body boundary scoring measure, which determines the perceived definiteness and permeability of one's body.

Barrier imagery measures the definiteness of body boundaries by emphasising the protective, enclosing, decorative, or concealing features of the boundaries of a definite structure, substance, or surface; for example, barrier responses include *'a striped zebra'*, *'a woman wearing a high-necked dress'* and *'a tower with stone walls'*. Penetration imagery, in contrast, relates to the fragility, permeability, openness, and destruction of definite boundaries. For example, penetration responses include *'a man climbing through a window'*, *'an amputated arm'* and *'a bleeding leg'*. Based on this scoring, high frequencies of boundary imagery indicate a High Barrier personality, whereas low frequencies of barrier imagery relate to a Low Barrier personality. Barrier and penetration imagery represent personality states that are context dependent (Cariola, 2014a).

Psychological research has extensively explored the body boundary concept (Fisher & Cleveland 1958; see also Fisher, 1970, 1986). In particular, it has been identified that High Barrier personalities are more independent, goal-oriented, persistence-and achievement-oriented, emotionally expressive, and spontaneous, less suggestible and less likely to be disturbed in stressful and frustrating situations. High Barrier personalities are also more likely to support group goals and to strive to achieve group cohesion, as well as indicating a greater interest in socialising and communicating with others. It has also been shown that High Barrier personalities reflect increased skin sensitivity and reduced heart rate associated with greater openness and receptivity to externally derived stimuli, compared to individuals with Low Barrier personalities, who indicate the reverse pattern. In contrast, Low Barrier personalities express heightened concern for the safety and security of places, as a means of reinforcing their weak boundaries. Low Barrier personalities further reflect a greater need to engage in solitary activities that reduce social contact (see Fisher, 1970).

Empirical research has also identified a relationship between body boundary awareness and primordial thought, by measuring body boundary imagery and

regressive language in personal memories (Cariola, 2014a,b; see also Martindale, 1975). The findings provided some supporting evidence for the Freudian theory that assumes that the body, unconscious thought and language represent interrelated concepts. Primordial thought relates to the Freudian (1900) theory which differentiates between two types of mental functioning: primary process (primordial thought); and secondary process (conceptual thought). According to Freudian psychodynamic theory (1900), the primary process is concrete, irrational, free-associative, autistic, unrelated to logic and spatio-temporal constraints, and free from social and moral conventions. Primary process thought is the principal awareness that young children have, and it has also been associated with the cognitive functioning of altered states of consciousness, including dream, meditative, mystical and drug-induced hallucinatory states (see also Martindale, 1979). The primary process is assumed to function in relation to the Freudian principles of displacement and condensation. In contrast, secondary process relates to abstract principles of grammar and logic, time and space, social conventions and general knowledge of typical everyday situations in older children and adults.

Similarly, Robbins (2011, pp. 53-54) stated that primordial mental activity represents a distinctive form of mental activity that interacts with thought processes. In this view, primordial mental activity is assumed to be psychosomatic and motivated by bodily sensations and sensory perceptions, as well as by unprocessed raw emotions and an inability to accept reality. Experiences are holistic, fragments are combined into isomorphic entities, and personal narratives are fragmented and only relate vaguely to time, logic and causality. Communication is concrete and lacks self-reflective functioning in relation to a self that is perceived as undifferentiated relative to others and the environment. In contrast, conceptual thought is reflective and is motivated to identify emotions and to adapt to reality. Experiences are self-referential, and personal narratives are coherent, as well as reflective of integrated thought and emotions that obey time and causality. Communication is self-reflective and symbolic, and the self is perceived as separated and individuated relative to others. Importantly, psychological research has provided consistent evidence of the existence of the Freudian primary and secondary process in human cognitive functioning (Brakel & Shevrin, 2005; Brakel, Shevrin, & Villa, 2002). Neurological research has also established a biological basis for the primary and secondary process (Carhart-Harris & Friston, 2010).

The Exterior-Interior Model of Body Boundary Awareness

Fisher and Cleveland's body boundary concept of personality has identified the psycho-physiological and autonomic features associated with the degree of body boundary finiteness. The body boundary concept of personality originates from Fisher and Cleveland's (1958) qualitative observation that patients with rheumatic arthritis had marked concerns, expressed as fantasies and wishes, related to their bodies. This observation was also evidenced by their unusual number of unique Rorschach responses emphasising the containing, protective and surface-related features of the presented inkblot pictures — for example *"cave with rocky walls"*, *"flower pot"*, or *"turtle with a shell"*. These observations and initial findings were first confirmed in their empirical study that showed individuals who presented with chronic illnesses of their exterior body parts (i.e., rheumatoid arthritis, neurodermatitis and conversion symptoms) had higher barrier scores compared to individuals with disorders of their interior body parts (i.e., stomach disturbances and ulcerative colitis).

Such an exterior-interior model of body boundary awareness has been explored further by empirical research studies. For example, individuals with definite body boundaries have been shown to have a high reactivity in their muscles and skin but a low reactivity in their interior bodily sites (i.e., heart rate) compared to individuals with less definite body boundaries. Another study showed that individuals with exterior bodily symptoms (i.e., arthritis) had a higher Galvanic Skin Response and showed less of an increase in heart rate in response to stressful exposures than individuals with interior bodily symptoms (i.e., duodenal ulcers; Fisher & Cleveland, 1960). Children with rheumatoid arthritis also had higher barrier scores than children with asthma (Cleveland, Reitman, & Brewer, 1965), and a study comparing individuals with hypochondriac complaints related to their external bodies (e.g., skin itchy, joint aches) had higher barrier scores than individuals with interior complaints (e.g., heart throbs, stomach aches). Based on these results, Fisher (1970) concluded that individuals with definite body boundaries have a propensity to develop psychosomatic disorders in the exterior parts of the body, whereas individuals with indefinite body boundaries tend to develop psychosomatic disorders related to the interior body parts.

In addition, an extensive study by Fisher and Fisher (1964) demonstrated a consistent relationship between high barrier scores and an external orientation of bodily experiences. For example, verbal reports of bodily sensations related to exterior sites of the body (e.g., skin, muscle) were positively correlated with barrier scores, more so than interior body sensations (e.g., heart, stomach). In another experiment, barrier scores were positively correlated with recall of word clusters related to exterior bodily sensations (e.g., *"skin cold"*) compared with interior bodily sensations (e.g., *"heartbeat"*). A study by Cassell (1966) confirmed these results, demonstrating that individuals using more barrier imagery recognised pictures of exterior bodily parts (e.g., finger, forehead) more quickly than pictures of interior bodily regions (e.g., heart, stomach). Fisher & Renike (1966) also demonstrated that individuals who were asked to focus their awareness on their exterior body sensation showed an increase in the use of barrier imagery during projective responses compared to a control group. Some studies, however, were unable to replicate the exterior-interior model explained by Fisher (1970) in relation to possible methodological problems, such as erroneous participant recruitment, irregularities of the body boundary imagery scoring and inaccuracies of the symptoms' exterior-interior classification (e.g., Sherick, 1964; Eigenbrode & Shipman, 1960; Barendregt, 1961).

The Body and the Container in Embodied Cognition

Formal models of human cognition and consciousness consider the human brain to be a referential system that coordinates sense impressions (e.g., our visual and auditory attention and kinaesthetic senses) sourced from the external environment and internal motivations; recurrent, temporary and reflexive behaviours, including verbal behaviours, which represent the responses corresponding to the referential system (Wang et al., 2013). This view is consistent and complementary with Johnson's (1987) cognitive linguistics theory. The latter suggests that image schemas are continuous and analogous structures that organise our mental representations, cognitive processes and generalised knowledge, enabling us to understand our physical world. These image schemas are embodied to the extent that they are realised in our ability to visually observe our environment, to move our bodies through space and to manipulate objects. Johnson (1987) conceptualises image schemas as pre-

conceptual and dynamical structuring processes of general sensory perceptions, bodily experiences and activities. For example, image schemas can be used to structure and organise various elements of non-spatial situations and events through the use of spatial prepositions (e.g., *"The light is out"*).

One of the most basic image schemas that embodies our bodily experience is the container schema, which is related to the spatial and temporal structure of physical containment and boundedness, expressed for example by the English preposition 'in' (e.g., *"The cat is in the house"*) (see Figure 1). The gestalt structure of the container schema is made up of an inside, an outside and a boundary (Lakoff & Johnson, 1999). According to Johnson (1987; see also Lakoff & Johnson, 1980), human beings are predisposed to experience their bodies as being physically contained and bounded by an enveloping skin boundary. This in-out orientation of our bodily experience is apparent in our cognitive perception of the environment as a three-dimensional container. In fact, Lakoff and Johnson (1980) argue that the container schema is the most pervasive cognitive schema because of the human instinct for marking off territories by defining clear boundaries, such as walls and fences. Territorial behaviours enable humans to quantify their properties based on the spatial size contained within a bounded space. Common conceptualisations of the container schemas are multi-modal and therefore occur in relation to various contexts and event states (Lakoff & Johnson, 1980, 1999). For example, visual attention is defined as a bounded visual field (e.g., *"Peter has him in sight"*), whereas ontological metaphors relate to actions and activities (e.g., *"Mary ran out of energy"*), as well as emotional states (e.g., *"Peter fell in love"*) that are conceptualised as definite and bounded spaces.

As noted by Johnson (1987), the in-out orientation of the containment schema adheres to five structural entailments: i) containments involve protection from or resistance to external forces, ii) containment limits forces within the container, iii) the contained object is fixed to a location, iv) the fixed object is visible or invisible to an observer, and v) containment is transitive to the extent that if B is in A, and if C is in B, C is also in A.

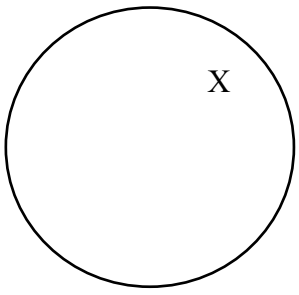

Figure 1. Container schema.

Cognitive Metaphor Theory (CMT)

Conceptual Metaphor Theory (CMT) states that embodied image schemas represent the basis of conceptual metaphorical expressions (Lakoff & Johnson, 1980). The Oxford English Dictionary (2012) defines a metaphor as "a figure of speech in which a name or descriptive word or phrase is transferred to an object or action different from, but analogous to, that to which it is literally applicable". The idea of something signifying something else captures the essence of the "A is B" schema of conceptual metaphor, which "consists of two conceptual domains, in which one domain is understood in terms of the other" (Kövecses, 2010, p. 4). For example, the metaphorical expression *"beaming with joy"* organises the experience of a highly positive emotional state (conceptual domain A) in terms of a ray or shaft of light (conceptual domain B). In this sense, the conceptual domain (A) represents the source domain (in this case HAPPINESS), which is then mapped onto the conceptual domain (B), the target domain, (in this case LIGHT), giving rise to the conceptual mnemonic of the mapping as HAPPINESS IS LIGHT (Kövecses, 2010, p. 97). Whereas the "A is B schema" of conceptual metaphor connects unrelated domains, metonymy, however, relies on a different mental mapping (Gibbs & Colston, 2012).

CMT also suggests that the correspondence between source and target domains in the construction of the conventional metaphors that occur in everyday English expressions are not random occurrences or poetic instances. Instead, CMT holds that embodied image schemas are active in the systematic regulation of the mapping mechanisms between source and target domains (Lakoff & Johnson, 1980, 1999). It is therefore assumed that the schematic mappings of conceptual metaphors reveal our thought patterns, providing insight into the cognitive processes that structure our bodily experiences and general knowledge. Lakoff and Johnson (1980, 1999) argue that many conventional metaphors are based on schematic concepts that are relevant to our sensorimotor experiences (Lakoff & Johnson, 1980, 1999). These image schemas often constitute related concepts. For example, the concepts CONTAINER, SUBSTANCE and OBJECT are related because human beings are predisposed to experience their bodies as a container, with an inside and outside, that is made up of bodily substances, such as bones and blood. For example, the metaphor *"Mary fell in love"* conceptualises the person (in this case Mary) as a substance that enters the container (in this case love), reflecting the BODY AS A CONTAINER FOR EMOTIONS schema. Other concepts that are grounded in sensorimotor experiences are related to metaphorical schemas that follow spatial orientations (e.g., MORE IS UP, LESS IS DOWN) and motion (e.g., TIME IS MOTION).

Criticism of CMT

CMT has received a range of criticism. One problem consistently noted is that the identification of metaphors is largely unsystematic and depends on the researchers' intuition (Kövecses, 2008; Pragglejaz, 2007). Some metaphorical expressions remain unnoticed, meaning that the target domains that underpin these metaphorical expressions also remain unidentified (Kövecses, 2008). Researchers also differ in their theoretical orientations and criteria for metaphor identification, influencing their decision-making in classifying conventional expressions as instances of metaphorical or non-metaphorical expressions (Pragglejaz Group, 2007). The lack of agreed-upon criteria also prevents the establishment of a scientific framework for quantitatively assessing and comparing the occurrence of metaphorical schemas in spoken and

written discourses (Kövecses, 2008; Pragglejaz Group, 2007). Most importantly, the lack of a systematic approach to metaphor analysis tends to produce cyclic arguments, rendering CMT unfalsifiable and, thereby, unscientific (Haser, 2005; Kertész & Rákosi, 2009; Pragglejaz, 2007).

Another point of criticism is that conceptual metaphors differ in their levels of schematicity. Indeed, Kövecses (2008, p. 174) posits that the conceptual metaphor schema THEORIES ARE BUILDINGS can be mapped onto "The theory has a solid foundation" but that the level of schematicity of this schema cannot be generalised to "The theory has a corridor". In this sense, Kövecses (2008, p. 175) argues that it is necessary to establish an appropriate level of schematicity in order to identify those elements of the source domain that map realistically onto the target domain. Lakoff and Johnson's (1980) CMT has been also widely criticised because it presents the relationship of embodiment and image schemas as universal experiences without acknowledging the cultural differences that influence the mind-body connection. Therefore, CMT has been perceived as reductionistic due to its lack of accountability for the cross-cultural variations of conceptualised bodily experiences (Rakova, 2003). In fact, cognitive linguists have provided great insight into the cultural differences that mediate the relationship between the body and cognitive processes, and into the ways in which these cultural variations are expressed in the use of metaphors (e.g., Maalej & Yu, 2011).

Pertaining to the psychodynamic theory underpinning the body boundary concept, scholars have also pointed out that cognitive science has incorporated fundamental psychoanalytic concepts without acknowledging their source (Bucci, 2000; Holland, 1998; Fónagy, 2001). Holland (1998) argues that cognitive linguistics and metaphor theory's central idea of a cognitive science of conceptual metaphor shows strong similarities to the writings of Ella Freeman Sharpe (1937, 1940). For example, Lakoff's (1996) analysis of US political parties by differentiating between the conservative as representing the strict father image and the liberal representing a nurturing mother image resembles psychoanalytic conceptualisations. Similarly, Lakoff's (1993) analysis of dreams through the use of metaphoric mappings and image schemas to explore the dreamer's anxieties makes use of psychoanalytic symbolism, such as WORLDLY POWER IS SEXUAL POWER. Also, CMT's assumption that metaphors are grounded in bodily experiences echoes the Freudian psychoanalytic notion, which positions the body as a central concept for describing and explaining the functional and dysfunctional development of the self in human beings (Freud, 1905; 1923). From this context, Holland proposes that CMT aligns with the psychoanalytic idea that unconscious and conscious thinking are interwoven processes and thus diffuse the idea of an "objective reality" and "literal truth". Despite the fact that CMT does not differentiate between two levels of consciousness (i.e., the conscious and unconscious), Fónagy (2001, p. 357) points out that Johnson (1987) compared the system of metaphorical thought to a net of channels, which implies the existence of different levels of consciousness that canalise the mapping processes of metaphorical image schemas.

Aims of this Study

By drawing on Lakoff & Johnson's (1980) container schema, this study aims to explore the use of semantic fields related to container-schematic imagery in the narratives of everyday memories and of dream memories in High and Low Barrier

personalities. Taking into consideration Fisher and Cleveland's exterior-interior model of body boundary awareness and Lakoff & Johnson's (1999) in-out orientation of container-schematic conceptualisations, it can be stated that if an increased use of the semantic fields that represent concrete and metaphorical container-schematic imagery were to be found in the narratives of High Barrier personalities compared to Low Barrier personalities, this result would support the proposition that the referential system which coordinates sense impressions and organises our mental representations differs between the barrier personality types. Such an increased frequency of semantic fields representing concrete and metaphorical container-schematic conceptualisations of objects and entities indicates an individual basis that underpins the tendency in humans to conceptualise and quantify the properties of their surroundings through the use of container-schematic perceptions. As heightened levels of primordial mental activity have been associated with an increase in use of metaphorical language (Freud, 1900), this study also aims to explore how High and Low Barrier personalities use metaphorical expressions differently in narratives of everyday memories and of dream memories. In particular, previous literature has identified that Low Barrier personalities showed more frequent instances of expressing their thoughts and emotions directly, whereas High Barrier personalities communicated their emotions and thoughts less often (Cariola, 2015). From this context, it is possible to infer that High Barrier personalities communicate their thoughts and emotions through the use of metaphorical expressions more frequently than Low Barrier personalities.

Hypotheses

Given that the barrier imagery related to semantic content describes the shielding and protective features of objects, the first hypothesis (H1) predicts that the narratives in the autobiographical memories of High Barrier personalities will use more semantic fields related to concrete container-like objects, such as *'Vehicles and transport on land'*, *'Architecture and buildings'* and references related to *'Clothes and personal belongings'*.

The second hypothesis (H2) further predicts that High Barrier personalities will use more semantic fields that indicate a container-schematic conceptualisation of entities that are not characterised by a visual external boundary or surface.

The third hypothesis (H3) predicts that the narratives of High Barrier personalities will use higher frequencies of semantic fields related to primordial mental activity, such as perceptual process (e.g., *'Sensory sight'*), spatial references and relativity (e.g., *'Shape'*) and bodily processes (e.g., *'Anatomy and physiology'*).

In contrast, the fourth hypothesis (H4) predicts that Low Barrier personalities will use higher frequencies of the semantic fields related to conceptual thought, such as cognitive processes (e.g., *'Thought and belief'*) and affective processes (e.g., *'General Emotions'*, *'Happy'* and *'Sad'*).

The fifth hypothesis (H5) suggests that High Barrier personalities will have an increased tendency to communicate emotions indirectly through the use of metaphorical expressions, compared to Low Barrier personalities.

Method

Participants and Data

The data were based on responses of 330 female and 158 male participants with a mean age of 25.59 years old (SD=10.65) with a range of 18-63 years. The data obtained for this study were based on a corpus of everyday memories (N=488) and dream memories (N=450). The narratives for everyday memories (N=488) had a text length of 71,831 words with a mean of 147.19 words per response (SD=97.27). The narratives of dream memories (N=450) had a text length of 62,005 words with a mean of 137.79 words per response (SD =125.16).

Procedure

An online survey was produced and distributed to undergraduate and graduate students. The study's online questionnaire included an initial briefing that outlined the purpose of the research project. Once the participants decided to take part in the experiment, they disclosed their demographic information, including gender, age, and native language. Then, the participants were asked to write a narrative about a recent everyday experience —*"Please think about a recent personal event. Write about this past event, in the box below, as you would describe it to a person or a good friend in a real-life situation"* — and a recent nocturnal dream — *"Please think about a recent nocturnal dream. Write about this dream, in the box below, as you would describe it to a person or a good friend in a real-life situation".* At the end of the experiment, the participants were thanked and were provided with a debriefing that explained the purpose of the study. The study received full ethical approval from the Ethics Committee at Lancaster University in Lancashire, UK. All verbal responses were manually checked for correct spelling and were spell-checked using the Microsoft Word Spelling and Grammar tool. Due to the technical restrictions of the PROTAN content analysis software (Hogenraad, Daubies, Bestgen, & Mahau, 2003), brackets, hyphens, and dashes were deleted from the corpus texts. Apostrophes used in contractions (i.e., negations and personal pronouns with auxiliary verbs) were substituted with the original grammatical forms, whereas apostrophes that marked the possessive case were deleted.

Classification of Barrier Personalities

The Body Type Dictionary (BTD) (Wilson, 2006) was applied to the narratives of everyday memories (N=488) and to the narratives of dream memories (N=450). The BTD is a content analysis dictionary that, in conjunction with a content analysis software program, identifies and calculates the frequency of lexical items that are classified as barrier imagery and penetration imagery. The BTD is conceptually based on Fisher and Cleveland's (1958) manual scoring system of High and Low Barrier personalities. The BTD contains 551 entries for barrier imagery, 231 entries for penetration imagery, and 70 exception words that prevent the erroneous matching of ambiguous word stems, all of which are assigned to 12 semantic categories (Wilson, 2006).

For the computerised content analysis, the BTD was applied to the narratives using the PROTAN content analysis software program, which measures occurrences of category-based lexical content in texts (Hogenraad et al., 2003). A lemmatisation process was then applied to reduce inflected words to their base forms. For example,

"agrees, agreed, agreeing" were all reduced to *"agree"*. Subsequently, the lexical content of the segmented and reduced texts was matched against the BTD categories. The frequency rate used in this study for both linguistic and grammatical variables was based on the following formula:

$$Frequency\ rate = \sqrt{\frac{frequency\ count}{no.\ of\ tokens\ in\ segment}} x1000$$

The median range for the barrier imagery frequency in each memory type was used to divide the narratives of everyday and dream memories into two equivalent parts. Barrier scores less than the median values were categorised as 'Low Barrier personalities', whereas Barrier scores greater than the median values were categorised as 'High Barrier personalities.'

Descriptive statistics revealed that the narratives for everyday memories had a frequency rate mean of 2.20 and a frequency rate median of 2.43 (SD=2.18), whereas those for dream memories had a frequency rate mean of 3.29 and a frequency rate median of 3.75 (SD=2.45). The BTD has been shown to have high inter-rater and inter-method reliability in relation to Fisher and Cleveland's (1956, 1958) manual scoring system, and correlation validity with primordial thought language (Cariola, 2014, a,b).

After the data were divided into two equal parts, the Low Barrier personalities (N=244) had a frequency rate mean of .34 (SD=.75) and the High Barrier personalities (N=244) had a mean of 4.10 (SD=1.31) for the Barrier frequencies in the narratives of everyday memories. The Low Barrier personalities (N=225) had a mean of 1.30 (SD=1.55) and the High Barrier personalities (N=225) had a mean of 5.29 (SD=1.24) for the Barrier frequencies in the narratives of dream memories (see Tables 22 and 23).

Semantic Field Annotation

The USAS tagger (UCREL[2] Semantic Annotation Tool) (Rayson et al., 2004) of the web-based semantic annotation software WMatrix (Rayson, 2008) was applied to the narratives of everyday memories and of dream memories to match the words and multi-word expressions with pre-defined semantic field tags. The USAS's tag set comprises 21 major discourse fields that are divided into 332 categories, based on approximately 37,000 words and 16,000 multi-word units (Archer, Wilson, & Rayson, 2002; Piao, Rayson, Murdaya, Wilson, & Garside, 2006). The USAS semantic tagger is assumed to have a categorisation accuracy of 91 to 92 per cent (Rayson et al., 2004). In relation to this study, a log-likelihood statistic at a 0.001 significance level with a LL cut-off value of 6.63 was applied to indicate the over- or under-use of 65 USAS tags. Due to the relatively large number of over- and under-used key semantic fields in the comparison of the autobiographical memories between

[2] UCREL is the acronym for the University Centre for Computer Corpus Research on Language.

the High and Low Barrier personalities, the analysis was limited to the twenty most frequently occurring semantic fields.

Corpus-Based Metaphor Analysis

To answer the fifth hypothesis, the USAS tagger was applied to analyse the figurative language used, including metaphor and metonymy. The application of the USAS tool to the identification of significantly over- and under- used semantic fields after comparing the two texts (i.e., the research and reference corpus) has been proposed as an automatic course for the analysis of figurative language (Koller, Hardie, Rayson, & Semino, 2008). By referring to a conceptual metaphorical framework (Lakoff & Johnson, 1980; Lakoff, 1987), the 'source' and 'target' domains of the conceptual metaphors have been suggested to correspond approximately to the pre-defined semantic fields of the USAS tagger. This identification of 'semantic' fields then enables potential metaphorical language usage (Semino et al., 2005). The USAS tagger also produces lists that show the frequencies of the semantic tags based on word and multi-word expressions in each semantic field for both data sets (i.e., the research and reference text). A closer exploration of these words and multi-word expressions enables the identification of any potential 'source' domains in greater detail, while providing further information about whether the words and multi-word expressions that inform semantic fields in one dataset are high or low keyness compared to another. Subsequently, concordance analysis enables the classification of words and multi-word expressions classified within a set of semantic fields conceptualised for the dataset, providing insight into the metaphorical use of extracted potential 'source' domains. As stated by Koller and colleagues (2008, p. 142), this metaphorical analysis has been largely criticised for lacking a coherent empirical framework (e.g., Steen, 1999; Cameron, 2003; Deignan, 2005). The development of an automated annotation procedure for metaphorical analysis represents a promising empirical procedure for the identification of 'source' and 'target' domains compared to manual metaphor annotation.

Identification of Metaphors and Figurative Expression

The identification of figurative language use was based on the Metaphor Identification Procedure (MIP) as proposed by the Pragglejaz Group (2007). The MIP represents a systematic procedure for identifying metaphors. Based on the MIP, a lexical unit is classified as a metaphorical expression when its contextual meaning is incongruent with the basic meaning associated with the same lexical unit. The basic meaning of a lexical unit is sourced from a dictionary, such as the OED, which can be then compared with the contextual meaning of the lexical unit as it occurs in the phrase. To assess the reliability of the MIP, six independent coders using the MIP to identify metaphors in two data sets (i.e., conversations and newspaper text) demonstrated an overall modest reliability in identifying metaphors using the MIP. The MIP outlines the following procedural steps for identifying metaphors and figurative expressions (p. 3)

> 1. Read the entire text–discourse to establish a general understanding of the meaning.
> 2. Determine the lexical units in the text–discourse.
> 3. (a) For each lexical unit in the text, establish its meaning in context, that is, how it applies to an entity, relation, or attribute in the situation evoked by the

text (contextual meaning). Take into account what comes before and after the lexical unit.
(b) For each lexical unit, determine if it has a more basic contemporary meaning in other contexts than the one in the given context. For our purposes, basic meanings tend to be:

- More concrete; what they evoke is easier to imagine, see, hear, feel, smell, and taste.
- Related to bodily action.
- More precise (as opposed to vague)
- Historically older.

Basic meanings are not necessarily the most frequent meanings of the lexical unit.
(c) If the lexical unit has a more basic current–contemporary meaning in other contexts than the given context, decide whether the contextual meaning contrasts with the basic meaning but can be understood in comparison with it.
4. If yes, mark the lexical unit as metaphorical.

The Oxford English Dictionary (OED, 2014) (http://www.oed.com) was used to identify the basic meaning of words. The OED is a standard dictionary of the English language that provides the meaning and pronunciation of over 600,000 words. The OED also provides the historical meanings of words, and is regularly updated and revised according to contemporary developments in the English language.

Further Statistical Analysis

A Z-test of proportions for independent populations was used to assess significant differences in use of figurative expressions between High and Low Barrier personalities in the narratives of everyday and dream memories.

Results

The over- and under- used semantic discourse fields in the narratives of everyday memories and of dream memories in Low and High Barrier personalities can be seen in Tables 1, 2, 3 and 4.

H1. Consistent with the first hypothesis (H1), High Barrier personalities had a high keyness of semantic fields that were perceptually grounded to the container schema with enclosed or partially enclosed objects and a material boundary that separated the interior from the exterior (Johnson, 1987). The semantic fields that were relevant to the container schema in narratives of everyday memories and of dream memories included: *'Vehicles and transport on land'* (e.g., *car*, *train*, *cars*), *'Clothes and personal belongings'* (e.g., *bag*, *shoe*, *pocket*), *'Architecture, house and buildings'* (e.g., *house*, *flat*, *building*). Related narratives of everyday memories also included the semantic field: *'Residence'* (e.g., *hotel*, *house*), *'Sailing, swimming, etc.'* (e.g., *boat*, *boats*, *ship*), and *'Parts of buildings'* (e.g., *room*, *roof*).

High Barrier personalities' narratives of the dream memories, compared to those of Low Barrier personalities, had a high keyness of the semantic fields *'Furniture and household fittings'* (e.g., *bed*, *sofa*, *table*) and *'The Media: Books'* (e.g., *library*, *book*, *books*). These terms comprise container schematic lexical items that can also be

classified as barrier imagery, such as *'carpet'*, as well as, in relation to the latter, *'library'* and *'book'*. High Barrier personalities' narratives of dream memories also had a high keyness of the semantic field *'Geographical terms',* which comprises lexical items grounded in container schematic concepts with clearly defined boundaries, such as *'sea'*, *'river'*, and *'cave'*.

Given the increased perceptual focus on surfaces in High Barrier personalities' narratives of everyday memories, the high keyness of the semantic field *'Living creatures: animals, birds, etc.'* contained, if also infrequently, lexical items that denoted animals, which are classified as barrier imagery due to the animals' "distinctive or unusual skin" (Fisher & Cleveland, 1958, p. 59). These include stripes and structured surfaces (e.g., *sheep*). An increased focus on surfaces in High Barrier personalities was also evident in the high keyness of the semantic fields *'Colour and colour patterns'* and *'Substances and materials: Liquid'*, which are often, but not exclusively, related to the description of the solid and textured surface materials (e.g., *wood*, *glass*, *iron*) of container objects (e.g., *"The cardboard box"*).

H2. Consistent with the second hypothesis (H2), the results also showed High Barrier personalities' perceptual focus on the metaphorical boundaries and containing qualities of entities. For example, High Barrier personalities' narratives of everyday memories had a high keyness of the semantic field *'Geographical names'*, which comprises lexical items that denote the place names of cities (e.g., *London*, *Norwich*, *Aberdeen*), countries (e.g., *Italy*, *Uganda*, *New Zealand*) and adjectives with cultural references (e.g., *British*, *Irish*, *Arabian*). These place names and cultural attributes are often conceptualised within a container schema in relation to geographically negotiated and bounded territories. For example, the boundaries of a country are often designated through a coloured line drawn on a map. High Barrier personalities' narratives of everyday memories also had an increased frequency of the semantic field *'Time: Beginning'* (e.g., *started*, *start*, *began*), which conceptualises time in the form of a definite temporal boundary of an action or entity (e.g., *"The funeral started with a Catholic mass"*). The conceptualisation of time as a bounded entity corresponds to symbolic perception of container boundaries of non-material entities, compared to material entities that are defined by a physical boundary.

In narratives of dream memories, High Barrier personalities had a higher keyness of the semantic fields *'Personal names'* and *'Kin'* compared to Low Barrier personalities. *'Personal names'* typically denotes the identity of a person (or animal), and implies unique qualities due to their personality and the unique visual appearance and recognisability of their bodily exterior (e.g., *"I met Albert Einstein"*). The semantic field *'kin'* (e.g., *mum*, *family*, *father*) contains those lexical items that communicate an associated degree of kinship of family members (e.g., *"My mum was stood"*). Kinship represents a group entity that is defined by its emotional attachments and shared genetics; thus, this entity is differentiated from other social groups and relationships. In this context, the high frequency of references to kinship echoes the High Barriers' tendency to emphasise group membership (Cariola, 2015). Kinship has also been anthropologically associated with nurturing and protection against individuals who are not kin (Murphy, 2008). In contrast, Low Barrier personalities' narratives of everyday memories had a high keyness of the semantic field related to general social interactions, including 'Personal relationship: general' (e.g., friends, friend, met), 'Participating' (e.g., met up, meeting, attended) and 'Giving' (e.g., gave,

give, given), rather than family relationships. Notably, Low Barrier personalities made significantly more references to 'friend/s' (117) compared to High Barrier personalities (95), $Z = 2.01$, $p < .05$. This preference of Low Barrier personalities for mentioning friends in their narratives of everyday memories might be indicative of the supportive role friendships play in their lives as a possible substitute for a less supportive family environment, compared to High Barrier personalities, who are typically characterised by a supportive family (Fisher & Cleveland, 1958). Within this line of thought, the narratives of dream memories of Low Barrier personalities also had a high keyness for the semantic field 'Relationship: Intimacy and sex' (e.g., boyfriend, girlfriend, sexually), emphasising intimate personal relationships and experiences.

Security related concerns are also expressed in the high keyness of the semantic field *'Law and order'* (e.g., *security*, *police*, *prisoner*) in High Barrier personalities' narratives of dream memories, which comprise those lexical items that characterise security-related concepts and the confinement and restriction of movement (e.g., *"they arrested Beth"*), along with the increased use of inhibition words, as identified in Study 2 (6.2).

H3. The results identified that the narratives of High Barrier personalities involving everyday memories had a high keyness of semantic fields reflecting primordial mental activity, such as sensory perception, spatial and motion references, thus confirming the third hypothesis (H3). For example, memories of everyday memories had a high keyness of semantic fields relevant to sensory perceptions, such as *'Sensory: Sight'* (e.g., *see*, *saw*, *seen*), *'Light'* (e.g., *light*, *lightening*, *lights*) and *'Seen'* (e.g., *noticed*, *notice*, *looked out*), which in narratives of dream memories referred to the processes of observation, for example *"I suddenly noticed a girl running across the tracks"*). There was also a high keyness of semantic fields associated with spatial and motion references, including *'Location and direction'* (e.g., *there*, *this*, *where*), *'Moving, coming and going'* (e.g., *went*, *go left*) and *'Putting, pulling, pushing, transporting'* (e.g., *put*, *moved*, *picked up*). The inflation of spatial and motion references was also evident in High Barrier personalities' narratives of dream memories, (i.e., *'Location and direction'*); however, the results suggest that the spatial and motion references in dream narratives are primarily conceptualised through the ascertainment of size, amount and degree, as indicated by the semantic fields *'Measurement: Size'* (e.g., *size*, *fit*, *sized*), *'Measurement: Length & height'* (e.g., *in*, *heights*, *level*) and *'Speed: Fast'* (e.g., *faster*, *quicker*).

H4. Mainly consistent with the fourth hypothesis (H4), Low Barrier personalities' narratives of everyday and dream memories had a higher keyness of semantic fields related to conceptual thoughts, compared to the narratives of High Barrier personalities.

Given the assumption of the inflation of cognitive processes with conceptual thought (Robbins, 2011), the results showed an inflation of semantic fields associated with cognitive processes, such as *'Knowledgeable'* (e.g., *know*, *knew*, *remember*), and *'Learning'* (e.g., *found out*, *find out*, *learnt*) in Low Barrier personalities' narratives of everyday memories. In particular, the semantic field *'Negative'* (e.g., *not*, *no*, *nothing*) indicated the presence of discriminating thoughts. Although their cognitive processes of everyday memories emphasised knowledge, cognitive insights and discriminative

thought, Low Barrier personalities' narratives of dream memories further reflected a high keyness of those semantic fields that comprise lexical items specific to the recall of dream events, such as *'Inattentive'* (e.g., *in dream*, *ignored*, *disregarding*), *'Mental actions and processes'* (e.g., *dreamt*, *dream*, *dreaming*), and *'Mental object: Conceptual object'* (e.g., *dream*, *dreams*, *nightmare*). These lexical items indicate that the recalled event was a dream and its consequences would represent "no physical real-life effect on the real 'I', other than an emotional impact, since dreams indicate creative imaginary acts" (Cariola, 2008, p. 20).

Low Barrier personalities also used more semantic fields related to the evaluation of event states in both narrative types. For example, the narratives of everyday memories had an inflated keyness of the semantic fields *'Evaluation: True'* (e.g., *fact*, *in fact*, *be the case*) *'Existing'* (e.g., *was*, *is*, *be*) and *'Exceed; waste'* (e.g., *too*, *too much*, *over*), whereas the narratives of dream memories had an increased use of *'Evaluation: Good'* (e.g., *best*, *absolute*, *perfect*) and *'Evaluation: Inaccurate'* (e.g., *wrong*, *missing*, *missed*). Evaluations typically indicate the remembering subject's personal involvement and attitude towards the narrative event by emphasising the importance of certain narrative aspects (e.g., *"he was too clingy anyway"*) and via commentary on the accuracy of the recalled details (e.g., *"And I know for a fact that it was not due"*). Such an increased focus on the evaluation and truthfulness of memory events is consistent with semantic usage, relating to Pennebaker and King's (1999) factor level of *'making distinctions'*. It suggests that the production of autobiographical memories by Low Barrier personalities might be perceived as more factually reliable than the narratives of High Barrier personalities, which reflect a more creative and socially engaging narrative style (Cariola, 2015).

The narratives of both everyday and dream memories of Low Barrier personalities also had an increased keyness of the semantic field *'Thought, belief'* (e.g., *think*, *felt*, *feel*), which included the expression of their thought processes (e.g., *"I do not think Craig told anyone"*) and feeling states (e.g., *"I felt bad that I had so enjoyed the evening"*). Although the narratives of everyday memories did not show a high keyness of semantic fields related to emotions, narratives of dream memories showed an inflated keyness of the semantic fields associated with the expression of various emotional states, such as *'Sad'* (e.g., *upset*, *crying*, *sad*), *'Happy'* (e.g., *happy*, *funny*, laughed) and *'Like'* (e.g., *like*, *loved*, *fancied*).

Taking into consideration that dream states typically have a higher level of primordial mental activity compared to everyday consciousness (Freud, 1900), Low Barrier personalities' narratives of dream memories also featured a high keyness of semantic fields associated with relativity, such as spatiality and physiological references, which is typically representative of primordial mental activity (Robbins, 2011). For example, the spatial semantic field *'Distance: Near'* (e.g., *closer*) is related to the expression of an observed motion situated in the dream memory (e.g., "*the wolf was getting closer and closer"*). There was also a high keyness of the semantic fields *'Time: Present: simultaneous'* (e.g., *now*, *at this point*, *yet*) and *'Distance: Near'* (e.g., *closer*), both of which emphasise the relationship between the recalled dream events and the person's real life (e.g., *"the guy I am currently seeing was cheating on me"*) and also express a sense of the immediate vividness of a dream event (e.g., *"I was now on the other side"*). In this sense, Low Barrier personalities used temporal references literally, whereas, as shown above in relation to the semantic field, *'Time: beginning'*, High

Barrier personalities used temporal references as a container-schematic bounded entity.

H5. The results identified that High Barrier personalities used slightly more but also different embodied expressions of human emotions than Low Barrier personalities, thus partly confirming the fifth hypothesis (H5). Cognitive linguistics has consistently demonstrated that internal and external bodily parts are often used metaphorically as a means to conceptualise human cognition, spanning emotions, personality traits, cultural values and mental faculties (Gibbs, 2006; Ziemke, Zlatev, & Frank, 2007). For example, the human heart is typically perceived as representing the centre of human emotions and feelings, compared to the head, which is seen as the centre of thoughts and the mind in the British-English speaking culture (Sharifian, Dirven, Yu, & Niedermeier, 2008).

In this context, the results identified that the semantic item *'heart'* in the semantic field *'Anatomy and physiology'*[3] was used eight times as a source domain to figuratively express the emotions in High Barrier personalities' narratives of everyday and dream memories. For example, the emotion of sadness was expressed via conventional idioms (i.e., *"It was heart breaking"*) and a vertical metaphor DOWN IS BAD schema (e.g., *"My heart sinks"*). However, the emotion of fear was communicated in the form of a local displacement of the heart (e.g., *"I could feel my heart in my mouth"*). The *'heart'* was also conceptualised as PART FOR WHOLE metonymy by attributing to the human heart the anthropomorphic quality HEART IS A HUMAN BEING, such as *"my heart cries"*. In contrast, among Low Barrier personalities, the *'heart'* was used figuratively in only one instance as a means to express the affectionate personality of another individual (i.e., *"caring heart"*). According to Fisher (1970, p. 481), an increased awareness of the heart has been shown to relate to sociability and friendly interactions with others, echoing the social and outgoing nature of the High Barrier personality. Low Barrier personalities showed an increased use of source domains related to the idiomatic expressions of 'face' to convey emotions in narratives of everyday memories, whereas High Barrier personalities did not use 'face' in figurative expressions. For example, Low Barrier personalities referred to the 'face' to express the emotion of courage, or lack of fear, by combining the metonymic FACE IS SEEING schema with the metaphorical schema SEEING IS CONFRONTING, such as *"to face all the aspects of my personality"* and *"she could not face it alone"*, and the idiomatic expression *"to keep a brave face"*.

Emotions were also indirectly expressed by High Barrier personalities in relation to the semantic field *'Architecture, houses and buildings'*. High Barrier personalities'

[3] In the semantic field *'Anatomy and physiology'*, the semantic item *'back'* was the most frequently used word; however, its denotative meaning was related predominantly to the concept of "coming back, returning" (e.g., *"when I am living back in halls next year"*) or "situated behind or in the rear, or away from the front" (e.g., *"and my back window is also leaking"*) rather than relating to "the hinder surface of the body, that which is opposite to the front or face, and which is turned upon those who are left behind" (OED, 2014). This example demonstrates the lack of context-dependent sensitivity of computerised semantic tagging to disambiguate homonymous and homographs.

narratives of everyday memories used the word stem *'build'* to express emotions and physical states (e.g., *"the excitement was building"*) and to describe the development of human relationships through the use of EMOTIONS, PHYSICAL HEALTH and RELATIONSHIPS ARE STRUCTURES schema (e.g., *"we had really built up some kind of rapport"*). In narratives of dream memories, these word stems were not used figuratively; however, the architectural imagery related to the semantic field *'Parts of buildings'* was depicted as damaged and destroyed in High Barrier personalities' narratives of dream memories (e.g., *"bits of the roof were missing"*). In High Barriers' narratives of everyday memories, however, they did not mention the condition of the parts of buildings (e.g., *"The views from the roof were amazing"*). High Barrier personalities also had a high keyness of the semantic field *'Damaging and destroying'* (e.g., *crashing*, *crash*, *broken*) in relation with architectural features (e.g., *"a few of us living in this ruin of a castle"*) and anatomical bodily parts (e.g., *"I had broken my foot again"*) in their recall of dream memories.

Although these expressions were used predominantly literally, the complete or partial destruction of objects and bodily parts also evoke feelings of loss or physical pain in the hearer, thus communicating negative emotions (Bowlby, 1980). Given High Barrier personalities' increased group focus, the use of imagery that expresses negative emotions through the use of destructive imagery further enabled them to elicit empathic and supportive responses from the environment. In particular, the ability to simulate the experiences, events, feelings, and emotions of others represents the foundation of social identification and the notion of a social 'we-ness' (Gallese, 2009). Out of this context, the sharing of destructive imagery in the narratives of dream memories, as an indirect expression of negative emotions, might be related to the High Barrier's increased ability to simulate other internal states while grounding their communicative content on embodied simulation designed to elicit socially empathic responses and social identification. These simulations rely on "implicit and prelinguistic mechanisms of the embodied simulation-driven mirroring mechanisms" (Gallese, 2009, p. 519). This strategy is consistent with the High Barriers' socially orientated personalities. Conversely, High Barrier personalities also use references related to the destruction or damage of objects in order to infuse their dream narrative with drama. In this way, they call on the listener's ability to embody simulation as a means of increasing the attentive and affective involvement of the listener (e.g., *"the sound of the wild waves crashing in my ears"*). High Barrier personalities had a higher keyness of the semantic field *'Judgment of appearance: Beautiful'* (e.g., *nice*, *lovely*, *amazing*) in the narratives of everyday memories, which also contained lexical items describing favourable perception of objects, individuals and events (e.g., *amazing*, *nice*, *lovely*), such as *"the views from the roof were amazing"* or *"it was lovely to pretend"*. These semantic tags are associated with a positive affective tone that produces positive emotions in the communicative recipient (Bradley & Lang, 1999; Stevenson, Mikels, & James, 2007; Warriner, Kuperman, & Brysbaert, 2013).

Table 1. Frequencies (O) and log-likelihood values (LL) of over-used semantic fields in narratives of everyday memories of High Barrier personalities compared to Low Barrier personalities.

	High Barrier		Low Barrier		
Semantic Field	**O1**	**%**	**O2**	**%**	**LL**
Vehicles and transport on land	234	0.68	39	0.12	141.93
Clothes and personal belongings	129	0.37	8	0.02	121.09
Moving, coming and going	801	2.32	480	1.48	61.46
Architecture, house and buildings	89	0.26	16	0.05	51.21
Parts of buildings	114	0.33	33	0.10	42.02
Anatomy and physiology	356	1.03	195	0.60	37.68
Living creatures: animals, birds, etc.	120	0.35	40	0.12	36.74
Residence	130	0.38	51	0.16	30.64
Plants	57	0.16	13	0.04	27.01
Putting, pulling, pushing, transporting	231	0.67	124	0.38	26.06
Colour and colour patterns	71	0.21	23	0.07	22.63
Judgement of appearance: Beautiful	129	0.37	59	0.18	22.27
Geographical names	154	0.45	76	0.24	22.07
Substances and materials: Liquid	33	0.10	6	0.02	18.83
Sensory: Sight	220	0.64	129	0.40	18.36
Sailing, swimming, etc.	37	0.11	9	0.03	16.49
Grammatical bin	9,893	28.63	8,728	26.99	16.21
Location and direction	520	1.51	377	1.17	14.41
Time: Beginning	107	0.31	55	0.17	13.73
Substances and materials: Solid	43	0.12	14	0.08	13.61

Table 2. Frequencies (O) and log-likelihood values (LL) of over-used semantic fields in narratives of dream memories of High Barrier personalities compared to Low Barrier personalities.

	High Barrier		Low Barrier		
Semantic Fields	**O1**	**%**	**O2**	**%**	**LL**
Parts of buildings	384	1.18	103	0.40	115.19
Architecture, houses and buildings	243	0.75	42	0.16	114.89
Vehicles and transport on land	194	0.60	72	0.28	33.88
Clothes and personal belongings	150	0.46	53	0.20	28.93
Location and direction	698	2.15	400	1.54	28.46
Personal names	165	0.51	65	0.25	25.26
Moving, coming and going	802	2.47	497	1.92	19.83
Grammatical bin	9,962	30.66	7,487	28.90	14.98
Kin	225	0.69	118	0.46	14.10
Geographical terms	127	0.39	57	0.22	13.81
Light	37	0.11	9	0.03	12.54
Law and order	34	0.10	8	0.03	11.97
Measurement: Size	15	0.05	1	0.00	11.73
The Media: Books	31	0.10	7	0.03	11.42
Seen	33	0.10	8	0.03	11.23
Measurement: Length & height	17	0.05	2	0.01	10.40
Damaging and destroying	65	0.20	26	0.10	9.60
Furniture and household fittings	102	0.31	48	0.19	9.57
Speed: Fast	8	0.02	0	0.00	9.38
Sailing, swimming, etc.	56	0.17	22	0.08	8.63

Table 3. Frequencies (O) and log-likelihood values (LL) of under-used semantic fields in narratives of everyday memories of High Barrier personalities compared to Low Barrier personalities.

	High Barrier		Low Barrier		
Semantic Field	**O1**	**%**	**O2**	**%**	**LL**
Pronouns	5,852	16.94	6,135	18.97	38.55
Negative	478	1.38	623	1.93	29.96
Thought, belief	265	0.77	377	1.17	27.76
Speech: Communication	286	0.83	389	1.20	23.34
Knowledgeable	162	0.47	226	0.70	15.27
Existing	1,223	3.54	1,334	4.13	14.97
Evaluation: True	9	0.03	30	0.09	13.36
Speech acts	196	0.57	258	0.80	13.10
Wanted	128	0.37	181	0.56	12.98
Personal relationship: general	153	0.44	204	0.63	11.08
The Media: Newspapers etc	3	0.01	16	0.05	10.65
Learning	10	0.03	28	0.09	10.11
Participating	21	0.06	40	0.12	7.34
Giving	57	0.16	83	0.26	6.73
Exceed; waste	32	0.09	53	0.16	6.73

Table 4. Frequencies (O) and log-likelihood values (LL) of under-used semantic fields in narratives of dream memories of High Barrier personalities compared to Low Barrier personalities.

	High Barrier		Low Barrier		
Semantic Field	**O1**	**%**	**O2**	**%**	**LL**
Pronouns	5,370	16.53	4,902	18.92	46.78
Relationship: Intimacy and sex	56	0.17	106	0.41	29.08
Mental object: Conceptual object	180	0.55	234	0.90	24.59
Thought, belief	178	0.55	219	0.85	18.61
Anatomy and physiology	342	1.05	362	1.40	14.11
Sad	32	0.10	57	0.22	13.92
Degree: Boosters	239	0.74	265	1.02	13.68
Negative	432	1.33	440	1.70	13.04
Happy	42	0.13	67	0.26	12.84
Time: Present: simultaneous	51	0.16	74	0.29	11.07
Inattentive	33	0.10	54	0.21	10.99
Like	39	0.12	59	0.23	9.89
Evaluation: Good	6	0.02	18	0.07	9.30
Work and employment: Generally	38	0.12	55	0.21	8.17
Evaluation: Inaccurate	16	0.05	30	0.12	8.09
Distance: Near	2	0.01	10	0.04	7.79
Mental actions and processes	76	0.23	92	0.36	7.30

Discussion

By relating the body boundary concept to the cognitive linguistic assumption that humans would be predisposed to view their environment in a visual in-out orientation due to their conscious experience of perceiving themselves as being contained by a skin boundary (Lakoff & Johnson, 1980), this study explored the identification of the semantic fields related to concrete and metaphorical container-schematic imagery and

the use of embodied figurative expressions of emotional states in the narratives of everyday and dream memories of individuals classified as High and Low Barrier personalities.

The results demonstrated that, in both memory types, High Barrier personalities used more semantic fields representing concrete and metaphorical container-schematic imagery (Johnson, 1987), thus indicating that container metaphors might be similar to the Barrier personality construct. High Barrier personalities' autobiographical memories also used higher frequencies of semantic fields related to primordial mental activity, such as bodily, sensory, motion and spatial references. Finally, High Barrier personalities used more semantic fields associated with space and time relations, and also demonstrated an increased surface awareness.

These results indicate an increased tendency to structure concepts and knowledge as bounded and contained entities, which is consistent with Fisher and Cleveland's (1958) claim that High Barrier personalities direct their visual attention to the boundaries and enclosing features in their environment. For example, High Barrier personalities' narratives of everyday and dream memories contained more semantic fields related to concrete and metaphorical container schematic entities than the narratives of Low Barrier personalities. These narratives were also classified as barrier imagery, according to Fisher and Cleveland's manual scoring system, such as *'Vehicles and transport on land'*, *'Clothes and personal belongings'*, and *'Architecture, house and buildings'*. High Barrier personalities used a metaphorical container schema to conceptualise geographical locations as geographically bounded territories and temporal references as definite temporal boundaries. In this sense, the results provided further evidence that the visual cognition of High Barrier personalities emphasised the surface and containing features of their natural environment and memory traces of dream memories to the extent that the concrete and metaphorical container schema represent a theoretical equivalence to the Barrier personality construct.

Given the association between body boundary awareness and primordial mental activity, High Barrier personalities also used more semantic fields reflecting primordial mental activity in both autobiographical memory types compared to Low Barrier personalities, including references to somatosensory processes (*'Anatomy and physiology'*, *'Sensory: Sight'*, *'Light'*) and spatial and motion references (e.g., *'Location and direction'*, *'Moving, coming and going'* and *'Putting, pulling, pushing, transporting'*). In contrast, Low Barrier personalities used more semantic fields associated with conceptual thought, including references related to cognitive processes (e.g., *'Knowledgeable'*, *'Learning'*, *'Negative'*), emotional states (e.g., *'Sad'*, *'Happy'*, *'Like'*) and references indicating an increased emphasis on the evaluation of accuracy and truthfulness of the recalled narrative details (e.g., *'Evaluation: True'*, *'Exceed; waste'*, *'Evaluation: Inaccurate'*). The results further confirm that Low Barrier personalities show an increased tendency to recall narratives they perceive to be factually reliable compared to the narratives of High Barrier personalities, which reflect a creative and socially engaging narrative style to evoke social responses. An indirect expression of positive and negative emotions enables the speakers to minimise the threat of negative social evaluations while constituting a politeness strategy used to gain social acceptance.

Although the results indicated that Low Barrier personalities tended to express their emotions more directly, some examples were identified where High Barrier personalities employed embodied figurative expressions to communicate their emotional states. For example, the heart was used in relation to feelings of sadness and discontent; this act is associated with the increased socially-orientated nature of High Barrier personalities. In contrast, Low Barrier personalities used more references related to the face as a means to express feelings of courage. In narratives of dream memories, High Barrier personalities appeared to use imagery to evoke negative emotion states, such as the destruction of buildings and the injury of body parts; in so doing, they enabled listeners to simulate similar experiences in their own lives, as marked by notions of loss and physical pain that could elicit empathic and supportive responses.

Apart from the capacity of cognitive functioning to simulate internal states, indirect expressions of negative emotion states may represent a politeness strategy as a means of avoiding disapproving and judgmental responses by the listener (Brown & Levinson, 1987). Given that High Barrier personalities are typically characterised as socially orientated, threats would represent an unfavourable outcome, with the potential to negotiate or jeopardise their acceptance within a social in-group. The indirect expression of emotions also represents an indirect speech act in the form of a pre-sequence on the part of the listener, who, in a conversational context, responds to the embedded emotive content by providing a supportive and empathic response consistent with sustained social involvement and conversational interest (Levinson, 1983). In this sense, High Barrier personalities attempt to gain the approval of their social surroundings in a manner that mirrors their own early experiences in their family environment; that is, they as children adapted to their parents' social expectations and conditional values of what constitutes acceptable and love-worthy behaviour (Fisher & Cleveland, 1958; Rogers, 1951, 1961).

Based on the results of this study, it is possible to assert that the use of linguistic expressions that represent container schematic objects are conceptually equivalent to the symbolic container metaphor. However, the generalisability of the results is limited to the extent that it has not been established whether the use of concrete container imagery would also relate to the spatial conceptualisations of container metaphor (e.g., *"Mary fell in love"*). At this point, it should also be noted that the analysis is limited to some extent by its narrow focus on the frequencies of over- and under-used semantic fields. This is because it does not explore the similar patterns in the semantic fields of a dataset, which would provide a more complete understanding of the data.

This study may provide insight into human behaviours associated with the Covid-19 pandemic to the extent that the closing of borders, social distancing and lockdowns increased people's immediate visual and cognitive awareness of the barrier structures in their immediate environment. Here the body boundary functions as a contact membrane that categorises the self and other individuals into social groups. Social categorisation and social comparison typically accentuate the perception of similarities and differences among group members (Tajfel, 1959; Tajfel & Wilkes, 1963). Here the exposure to barriers would lead to human behaviour associated with the High Barrier Personality. For example, it is not inconceivable that the imposed confinement during lockdown inflated awareness of one's immediate social

relationships. The conceptualisation of social groups as barrier entities was communicated by the UK Government using barrier imagery, including 'social bubbles', 'childcare bubble' and 'support bubble'.

To increase and facilitate social cohesion within a 'bubble', individuals would adjust to the needs that are common and shared by the social group, leading to a reduced awareness and expression of individualistic needs. As such, subjective experiences would be expressed indirectly, rather than directly, with the aim of ensuring social support and reducing the notion of threat towards the existing shared group norms and values. Here the alignment to social norms and reduction of threat would minimise rejection and most importantly arousal of social anger within the social group. This thought is consistent with Bachelard's (1994) outside-inside distinction: "*Beyond what is expressed in their formal opposition lie alienation and hostility between the two. And so, simple geometrical opposition becomes tinged with aggressivity. Formal opposition is incapable of remaining calm*" (p. 212). Here the social group assumes an absolutist character, with its anger brewing underneath its supportive surface but easily erupting to punish undesirable social responses in its environment, whilst remaining well concealed and inhibited when it successfully suppresses individual expressions. It begs the question: Where is it better and safer to live, inside or outside? Future research should explore behaviour of High and Low Barrier personalities in relation to the Covid-19 pandemic, such as attitudes towards mask wearing and the maintenance of social distance.

The use of the body boundary to define the existence of the "other" by categorically differentiating the self from the non-self has been also shown in political discourses. For example, an analysis of barrier imagery in political manifestos showed High Barrier political parties reflected a tendency to construct blame discourses through the use of polarisation between a "good" self and a culpable "bad" other social group, whereas Lower Barrier political parties employ solution-focused discourses that recognise conflicting interests between social groups (Cariola, 2013). Based on these findings, it would be interesting to explore changes of group perceptions relevant to the Covid-19 pandemic, or other events that enforce a strong focus on barriers and boundaries.

There are also other limitations to this study. For example, there is an overlap between the BTD and some USAS categories, indicating that it would to some extent be conceivable that High Barrier narratives would have higher frequencies of semantic fields associated with barrier imagery compared to narratives derived from Low Barrier personalities. Although there is a sense of using a data set for selection twice to assume a set of results, this study aimed to perform a fine-grain analysis of barrier imagery in relation to the container-schematic concept, by homing on the linguistic details that underlie the coarse-grain categorisation of the BTD frequency analysis. Given the technical limitations of existing lexical analysis software programmes to conduct a fine-grain analysis, the USAS tagger was a tool that allowed a frequency analysis by comparing semantic fields of two data sets as well as providing concordances to explore how lexical items are used in context at sentence level. As such, the results of this study partly confirm existing knowledge of the barrier imagery, and further extend the barrier imagery concept by relating it to the container-schema derived from CMT. Future research would be able to replicate this analysis using semantic software that allows comparison of the lexical sub-categories

of the BTD rather than using alternative software with a semantic field categorisation. Future research may also want to explore the relationship between the High and Low Barrier Personality and culture, including national, regional and perhaps even local characteristics pertaining to physical distance and touch.

In relation to the clinical context, the body boundary construct might represent an alternative model to psychodynamic attachment theories (e.g., Bowlby, 1969; Winnicott, 1971) as put forward by Roman (2014). The development of Fisher and Cleveland's (1958) body boundaries are influenced by exposure to the early familiar and social environment that contribute to the development of an individual's attachment pattern. For example, Low Barrier Personalities experienced more neglect and lack of social and psychological support structures in their early familial and social environment compared to High Barrier personalities, thus increasing the possibility of the development of an insecure attachment pattern. Such early experiences of neglect in the Low Barrier personality may be associated with problematic attachment. For example, disorganised attachment relates to the complete absence or the collapse of functional attachment strategies, which is then associated with the development of dissociative disorders, including psychosis (Main & Hesse, 1990; Liotti, 1992). The development of disorganised attachment relates to early interactions in which children are exposed to the caregivers' inconsistent and erratic behaviour, which might mean they are frightening on some occasions, and at other times are available and caring.

The pathological manifestations of the Low Barrier personality might also share some similarities with reactive attachment disorder. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM 5, American Psychiatric Association, 2013), reactive attachment disorder is caused by parental and social neglect, such as the absence of adequate caregiving during childhood. It can be expressed as an inhibited or disinhibited type. The former type is characterised by a consistent pattern of autistic-like emotional withdrawn behaviour, with a reluctance to accept comfort and affect even from a familiar adult. The latter type is characterised by indiscriminate attempts to receive comfort from any available adult, including total strangers, which puts children at an increased risk of abuse (Love, Minnis, & O'Connor, 2015; Verwoort, Bosmans, Doumen, Minnis, & Verschueren, 2014).

In this sense, body boundary awareness and reactive attachment behaviour represent dynamic models that regulate the maintenance and transgression of interpersonal and psychosocial boundaries. For example, as shown in previous research, the occurrence of reduced body boundary awareness and identity structure has been associated with sexual and violent offenders as well as those on the receiving end of sexual abuse (Leifer et al. 1991; Tardif & Van Gijseghem 2001; Weinberg et al. 2003). From a theoretical perspective, future research should outline in detail to what extent extreme manifestations that characterise the High and Low Barrier personalities relate to the various developmental psychopathological concepts.

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Book Review

Review of *Fanon, Education, Action: Child as Method* By Erica Burman Abingdon, UK: Routledge, 244 pages, $35.96 paperback. ISBN 9781138089952

Reviewed by María-Constanza Garrido Sierralta[1]
University of New Mexico

As more of Frantz Fanon's works emerge and become available in English, new ways of engaging with his writing bourgeons in fields such as education and critical psychology. Fanon left an undeniable imprint and a pulsating critical voice in philosophy, psychoanalysis, and revolutionary political praxis. His radical and politically engaged perspectives withstood the test of time and continue to resonate and be applicable for most of us in the academic radical Left vis-à-vis the deterioration of our socio-political climate. Erica Burman (2018) invites Fanon to become a key player in critiquing her own field, clinical developmental psychology, and help develop an analytical approach that reads socio-political practices through the positioning accorded to child/hood and children.

'Child as method,' as Burman (2018) states, is "concerned with the (structural and subjectively occupied) positions produced for and about children, and how children engage with these positions" (p. 187). Her book *Fanon, Education, Action – Child as Method* is a sustained analysis of Fanon's work and an engagement with the various forms of child/ren that appear throughout his published works. Burman (2018) aptly describes the analysis as a "deep and critical evaluation of Fanon" that is also "critical with Fanon" (p. 7). Burman (2018) is not shy to bring in a radical feminist perspectives along with a Foucauldian lens, both of which have been critical of Fanon's work in the past (see p. 121 onwards). Instead of solely being critical, Burman (2018) draws connections between these various positions, in one instance she explains, "Fanon was explicitly and actively committed to a project of political transformation" (p. 120). This project of political transformation is fundamentally personal, something feminists of all types would agree with. The personal and the political converge much like the feminist rallying slogan "the personal is political." An added layer to this analysis appears in Burman's (2018) chapter on the "extemic child," which draws from Jacques Lacan's notion of 'extémité' to ascribe to the subject what is both interior and exterior since the individual and the social are infinitely intertwined. The extemic child is simultaneously included and excluded within societal practices. However, what Burman (2018) would like us to keep in mind is that children in the Fanonian sense are "not the prototypical children of normalized, globalized models but rather children who are at the margins, marginalized by (in his descriptions) racialisation, political allegiance, class, and gender" (p. 151). The child becomes a political subject who acts and reacts, who internalizes and becomes, and instantiates a project of transformation that is both personally and politically meaningful.

[1] Correspondence concerning this article should be addressed to María-Constanza Garrido Sierralta, conygarridosierralta@unm.edu

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This thorough exploration is a systemic analysis of the psycho-affective and cultural meanings set forth by Fanon with regards to the centrality of child/hood. These references made to the child are the starting point of Burman's (2018) analyses, which generate pluralistic and relevant discussions around four forms of child: The Idiotic child, the Traumatogenic child, the Therapeutic child, and the Extemic child (as mentioned above). I could argue that the 'method' is quadripartite in the sense that these various children are but facets of a uniting 'child.' These facets come to explain the construction of subjectivities by way of interactions (direct or indirect), which are, in Fanon's case, deeply affected and informed by racialization, colonial oppression, and the struggle for liberation. While Burman (2018) gives ample background of Fanon's personal history, the book also permits us to see what led Fanon to write, research, and critique. The medical and clandestine work he performed in Algeria, confronting racism in France, and supporting the struggle for Algerian independence showcase a different temporality than that of linear, logical, and historical succession. Instead, Burman (2018) echoes Fanon in that this personal-political project disrupts the developmental route and pays closer attention to narrative as a more adequate psycho-political and psychoeducational methodology.

As Burman (2018) explains, Fanon offers a 'sociodiagnostic,' which she similarly adapts to British society vis-à-vis Brexit. This is perhaps the most intriguing part of the book for it uniquely reads Fanon while exploring Burman's own concrete socio-political conditions. Parallels can be drawn between Fanon's and Burman's times. In the contemporary setting, we witness the rise of neo-fascism and the conservative Right, the parasitic stage of neoliberal capitalism, racism and xenophobia, the rampant inequality gap (intensifying under COVID-19), all of which must continually be brought into question. As readers, we are obliged to consider the current conditions of our time and see that movements such as Black Lives Matter are but new utterances of similar constant struggles. We ask, alongside Burman and Fanon, the question he posed at the end of *Wretched of the Earth*, "In reality, who am I?" (as cited in Burman, 2018, p. 126) because Black lives continue to be denied, dehumanized, and rendered dispensable in the US and elsewhere.

To decolonize and to dismantle systemic racial oppression forces all of us to continually ask this very question. Who am I and what am I doing about these persisting inequalities and injustices? Where do I stand and how am I to support others in the struggle for liberation? Let us, following Fanon and Burman, disrupt the developmental cycle and the linear succession, which undergirds it. As Burman (2018) points out, this question "is also a question about the claim on the world, on reality, and the demand for a different reality—a glimpse that this, current, reality is not all there is" (p. 126). For reality can be otherwise and it should be, we see history unfolding before our eyes, so what are we doing about it? In the chapter before last, Burman (2018) cites Fanon's call to the European colonizer, which in our day is a call addressed to every privileged white person in America and elsewhere, asking them to recognize their complicity (as cited in Burman, 2018, p. 154). We should say instead, white people "must first decide to wake up and shake themselves, use their brains, and stop playing the stupid game of Sleeping Beauty" (p. 154). Fanon and Burman shake the very ground of the reader and lay down the foundations for a path of personal and political transformation, for they question our complicity in today's most crucial issues.

Burman's book is thought provoking and extremely relevant today. It deserves more attention than it is currently being given and it is worthy of praise. I cannot do justice to the book with a short review, for it is a highly rich analysis that engages Fanon's work in a way that has not been done before. Other valuable angles of the book to explore are the various sections on 'pedagogy of failure' (p. 118 and earlier), the 'Brexit Street' readings (p. 62 onward), or Burman's (2018) interpretation of Fanon's cases in *Wretched of the Earth* (p. 126 onward). Burman's work remains an outstanding resource for scholars, activists, and practitioners engaging with, being critical of, or wishing to struggle alongside Fanon while considering the relevance of his ideas in today's socio-political climate. Burman handed us a powerful book, let us pay close attention to it.

Autobiographical Note

María-Constanza Garrido Sierralta is an M.A. student in the Department of Philosophy at the University of New Mexico. Her research interests are critical phenomenology, psychoanalysis from the Global South, and Marxist theory and practice. She is a published translator, her most recent work is featured in *The Weariness of Democracy: Leading Theorists Confront the Failure of Liberal Democracy* (Palgrave, 2020). She is also the co-founder of the Critical Praxis Cooperative.