

ARE DELUSIONS ADAPTIVE?

by

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SYNOPSIS

This thesis explores whether delusions are adaptive in the course of six papers. In Paper 1, I review the main philosophical and psychological literature on delusions, concluding that delusions are usually defined as beliefs characterized by high degrees of conviction, low levels of insight and that are not shared by same culture peers. In Paper 2, I review the main literature on the adaptiveness of delusions, delineating the promises and challenges of such literature. In Paper 3, I investigate whether one of the main theories of delusion formation and maintenance - the two-factor theory- is compatible with two contrasting claims: the first, that delusions are pathological, and the second, that delusions are adaptive. In Paper 4, I motivate the need for empirical research to ascertain whether delusions are adaptive. I do so by criticising Fineberg and Corlett's influential predictive coding model of biological adaptiveness of delusions. In Paper 5, I apply a novel empirical methodology to a sample of four people suffering from delusional beliefs and OCD, in the attempt to answer the question: can delusions be adaptive? Finally, in Paper 6, I explore the impact of egodystonicity on perceptions of free will and recovery from OCD.

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Introduction: On the lookout for the Pearl of the Sea

As the Italian writer Dino Buzzati tells in his short story *The Colomber* (Buzzati 1983), when he was 12 years old, Stefano Roi discovered that he was chased by the Colomber, a tremendous, mysterious shark that only the victim and his close relatives could see. The shark chose its victim and pursued him for years and years, until it eventually managed to devour him. However, as Stefano discovered - too late - at the end of his life, the Colomber did not mean to devour him; the King of the Sea charged the strange creature to deliver Stefano the Pearl of the Sea, a pearl which brought love, power and peace of mind to whoever possessed it.

I have always found that this story asks in a poetic way a question that lies in everyone's heart. Can something terrible and frightening – like, for example, a mental illness – hide a wondrous secret, waiting to be discovered if only we had the courage to take a closer look at it? It might have been the curiosity to find an answer to this question that prompted me to invest four years of my life in a PhD on the adaptiveness of delusions. I have always found extremely fascinating the idea that delusions – fixed, irrational beliefs that popular and not so popular culture have always labelled as the mark of madness – could hide a wondrous secret and, if not donating love and eternal peace like the Pearl of the Sea, at least allow people to momentarily survive to the adversities of life, as those who define delusions as adaptive claim. But the adaptiveness of delusions is a topic which is of interest not only to the sailors of introspection. It also has important consequences for at least three other categories of people: psychologists, mental health researchers and philosophers. On the one hand, psychologists and mental health researchers should consider that if at least some delusions are adaptive – i.e., if they are an emergency mechanism designed by evolution to deliver benefits in the face of difficulty – then an eradication of delusions could also eradicate the benefits that delusions are designed to bring about, causing even more suffering to already vulnerable people. This has important consequences for the treatment of delusions, inviting a medical approach which is customized to the symptoms and needs of each patient - as precision medicine already suggests (National Research Council 2011) - rather than focused on standardised diagnoses and treatments. On the other hand, establishing whether delusions are adaptive is also of utmost interest to philosophers working in the fields of epistemology, philosophy of psychology and biology. Understanding whether imperfect cognitions such as delusions are designed to deliver benefits means challenging the traditional philosophical view that the path to knowledge, self-knowledge and successful agency should necessarily meet the standards of truth and rationality (Bortolotti 2020). Also, investigating whether delusions deliver benefits could help reduce the perceived gap between normal and pathological cognitions, showing that not only true and rational beliefs but also irrational beliefs like delusions can sustain agency and contribute to the development of a meaningful self-narrative, as continuum models of psychosis already argue (Bortolotti 2009). Finally, researching the adaptiveness of delusions could also have an impact on the debate whether delusions are a transdiagnostic category which presents similar features across all disorders, or even on the related, metaphysical debate on whether delusions are natural kinds. Could the fact that delusions are part of an adaptive mechanism be the unifying causal mechanism required by natural kinds (Boyd 1989; Samuels 2009)?

While a part of this thesis focuses on the adaptiveness of delusions in general, another big part focuses on the adaptiveness of delusions in obsessive-compulsive disorder (OCD). This choice has been dictated by the fact that the study of delusions in general and of the adaptiveness of delusions in particular has not received the same amount of attention outside schizophrenia spectrum disorders than it has received in neurological conditions or inside schizophrenia spectrum disorders, despite a recognition that delusions are also present outside these disorders (Lancellotta and Bortolotti 2019). My thesis aims to fill part of this gap by focusing on a disorder, OCD, where the presence of delusions has been widely recognised but not so widely researched (Matsunaga *et al.* 2002; Lelliot *et al.* 1998). I will try to show that a study on the benefits of delusions outside schizophrenia spectrum disorders can greatly inform research on the benefits of delusions inside schizophrenia spectrum disorders, as well as contributing to a richer understanding of what delusions are.

If I think that delusions are a small Pearl of the Sea, or a mirage of it, this will be revealed in the conclusive section at the end of this thesis. For the time being, I would like the readers to make up their own mind, offering them a solid scaffolding to help them do so. In what follows, I will guide them to the discovery of the parts of this scaffolding, so that they can feel safer in the navigation that will bring them to the answer.

In what follows, I will present the key terms and issues of my thesis, which are investigated in the course of six papers.

1. What are delusions? Paper 1

To establish whether delusions are adaptive, one should firstly define what delusions are. In Paper 1, I try to do so by reviewing the philosophical and psychological literature on the topic across different disorders. I argue that delusions can be understood across different disorders according to three fundamental dimensions: conviction, insight and cultural isolation. Conviction indicates the feeling of subjective certainty with which delusions are entertained most of the time. Insight is a multidimensional construct encompassing the two overlapping but distinct notions of clinical and cognitive insight. Clinical insight indicates the capacity to acknowledge the presence of some malfunction, reduce it to an underlying mental illness and be compliant with treatment. People with delusions show a varying degree of clinical insight, but usually towards the poor/absent end of the spectrum: even when some awareness of the pathology is present, this never reaches a full awareness. With its two dimensions of self-reflectiveness and self-certainty, cognitive insight captures the degree of openness to feedback and of resistance to counterevidence of delusional beliefs. Typically, delusions are characterized by low levels of cognitive insight. I argue that, though overlapping, clinical and cognitive insight capture different dimensions of delusionality, and that cognitive insight ultimately seems to be more fundamental than clinical insight into a definition of delusions, as full clinical insight can only supervene on cognitive insight. Finally, I illustrate that cultural isolation – the fact that delusional beliefs are not shared by same culture peers – is an important feature of delusions, and one which is turning to be a promising avenue for future research.

2. What do we mean when we say that delusions are adaptive? Paper 2

Once established what I mean by delusions, to establish whether they are adaptive, one needs to define what adaptiveness is. Paper 2 addresses this question. Co-authored with Lisa Bortolotti and published in the journal *WIREs Cognitive Science*¹, Paper 2 is an overview paper on the adaptiveness of delusions: its main goal is to highlight what various philosophical and psychological accounts have said up to now about the adaptiveness of delusions across different disorders, and what the main promises and challenges of these accounts are.

The paper introduces the concept of adaptiveness in its two main senses: psychological and biological. The primary notion of adaptiveness is a biological one. A trait, mechanism or mental state is biologically adaptive when it enhances the genetic fitness of an individual in a given environment. By analogy with biological adaptiveness, philosophers and psychologists often speak of psychological adaptiveness when a trait, mechanism or mental state promotes pleasure (on a hedonic view of wellbeing) or makes one's life meaningful and allows an individual to function socially (on an eudaimonic view of wellbeing). Although psychological and biological adaptiveness often go hand in hand, they can also come apart. For example, sexual intercourse is an activity which is both psychologically and biologically adaptive. However, having very low levels of anxiety is psychologically but not biologically adaptive, as it can make people less sensitive to danger and hence decrease their chances of survival.

We thus clarify the way in which delusions are considered to be either psychologically or biologically adaptive. In general, delusions are not considered to be adaptive *per se*, but insofar as they deliver psychological or biological benefits in the face of various difficulties, be them existential, physiological or psychological ones. From a psychological standpoint, some accounts consider delusions to be adaptive insofar as they put an end to uncertainty and give meaning to life (like delusions in schizophrenia), or as they help overcome trauma and fill memory gaps (like delusions in anosognosia and dementia). From a biological standpoint, other accounts – such as Fineberg and Corlett's - consider delusions in schizophrenia and in some neurological conditions such as Capgras to be adaptive because they help resume processes of automated learning and because they explain anomalous experiences. Resuming learning and explaining anomalous experiences is good for survival and reproduction: for this reason, schizophrenic and neurological delusions would be biologically adaptive. Fineberg and Corlett utilise the metaphor of the shear pin to describe the way in which delusions are adaptive. A shear pin is a metal pin installed in the drive engine of some machines. In situations of emergency, the shear pin breaks and allows the machine to keep functioning, although at an attenuated level. Similarly, schizophrenic and some neurological delusions would form in response to a crisis, and they would prevent the cognitive system from breaking down, allowing it to keep going at a sub-optimal level.

What emerges from our review is that *many delusions are in the long run psychologically harmful and biologically maladaptive, but their adoption can be understood in context as offering some short-term benefits, as a response to an emergency situation, although different authors characterize the nature of the emergency and the response to it in different terms* (Lancellotta and Bortolotti 2019, 12). The paper also starts delineating some problems for the claim that delusions are biologically adaptive, especially the fact that it is not substantiated by empirical evidence. These criticisms are better

¹ Percentage of student's contribution: 50%

developed in Paper 4. Before, in Paper 3, I try to further explore the claim that delusions are adaptive by contrasting it with the opposite – and much more widespread – claim that delusions are pathological. I investigate the relationship between the pathological and the adaptive side of delusions within the camp of an influential theory of delusion formation and maintenance: the two-factor theory.

3. Delusions in the two-factor theory: pathological or adaptive? Paper 3

Co-authored with Lisa Bortolotti and published in the *European Journal of Analytic Philosophy*², Paper 3 investigates whether one of the main theories of delusion formation and maintenance – the two-factor theory – is compatible with two contrasting claims: the first, that delusions are pathological, and the second, that delusions are adaptive.

The paper focuses on two of the most influential accounts in the two-factor theories camp: Coltheart *et al.* (2010) and McKay (2012). There are important similarities but also differences between the two accounts. Both accounts hold that two factors are involved in the adoption and maintenance of delusions. Moreover, the accounts also agree that Factor 1 coincides with a dysfunction which would manifest in an anomalous experience. However, there are also important differences between the two accounts. According to Coltheart, the delusion would be the best possible explanation of the anomalous experience brought about by Factor 1. Therefore, for Coltheart the adoption of the delusion would be Bayesian optimal given the presence of the anomalous experience. The maintenance of the delusion instead would be the result of a dysfunction, which would prevent the person from discarding the delusion when confronted with counterevidence. According to McKay instead, both the adoption and the maintenance of the delusion would be affected by a bias towards explanatory adequacy, which would make the person unduly overvalue the anomalous experience over the evidence against it. For McKay, delusions are never Bayesian optimal.

The goal of our paper is to see whether these two accounts are compatible with the claim that delusions are pathological as well as with the claim that they are adaptive. To achieve this goal, we first clarify what we mean by pathological and adaptive. Three different notions of pathological can be distinguished in the literature. The former is a normativist one, which claims that something is pathological if it causes harm. The second is a naturalist one, according to which something is pathological if it is the result of a dysfunction. The third is a blend of the other two: in order for something to count as pathological, it must be both harmful and the result of a dysfunction. In Coltheart's account, delusions seem to be pathological on a normativist, naturalist and harmful-dysfunction reading. In the former case, this is because delusions cause harm to the people entertaining them; in the second case, because they are the result of a dysfunction (specifically, Factor 2); in the third case, because they cause harm and they are the result of a dysfunction. On McKay's model, delusions are pathological on a normativist but not on a naturalist and harmful-dysfunction account, as they are the result of a bias rather than of a dysfunction.

As far as adaptiveness is concerned, we considered delusions to be adaptive in the shear pin sense, along the lines of Fineberg and Corlett. In other words, we consider delusions to be adaptive iff they

² Percentage of student's contribution: 50%.

meet the two following criteria: (1) they emerge in the context of a crisis and (2) they rescue the cognitive system from collapsing. On Coltheart's model, the maintenance of delusions in the face of counterevidence meets both criteria. However, this is incompatible with the belief being the result of a dysfunction. On McKay's model, the adoption of delusions meets both criteria. Moreover, this is also compatible with delusions being the result of a bias. An interesting upshot of our investigation is that delusions can be pathological and adaptive, though not at the same time. This is what happens in McKay's model: delusions have the potential to prevent the person's cognitive system from breaking down when adopted (and thus they are adaptive) *but* they are pathological on a normativist reading, because they disrupt the person's psychological functioning in the long-term, when they are maintained.

In the next paper, I analyse the claim that delusions are adaptive within another very popular theory of delusion formation and maintenance: predictive coding. In particular, I will examine Fineberg and Corlett's predictive coding model of biological adaptiveness of delusions. In doing this, I will also establish the necessity for 'an empirical turn' of my thesis.

4. Is the biological adaptiveness of delusions doomed? Why an empirical turn is necessary: Paper 4

Published in the *Review of Philosophy and Psychology*, this paper motivates the need for empirical research to ascertain whether delusions are adaptive. It does so by criticising Fineberg and Corlett's (2016) influential predictive coding model of biological adaptiveness of delusions. According to the model, delusions would be akin to a shear pin mechanism, whose principles I have already illustrated in section 2.

My paper highlights two problems with Fineberg and Corlett's model of biological adaptiveness. The first is that a more traditional, maladaptive view of delusion formation and maintenance is simpler than Fineberg and Corlett's shear pin model. This means that in principle the maladaptive view should be preferred over Fineberg and Corlett's model in virtue of its superior simplicity, unless Fineberg and Corlett's model can prove that there is something that the maladaptive view is missing, i.e., that delusions are adaptive. However, the claim that delusions are adaptive should be substantiated by empirical evidence that the model does not present: this is the second criticism that I raise against the model.

To rescue Fineberg and Corlett's model, I propose a methodology to establish whether delusions are adaptive, and that I apply in my next, empirical paper. I advocate the need for empirical studies that compare either people who undergo certain difficulties (like psychological or physiological problems) and have delusions with people who present the same difficulties but no delusions or a single person undergoing some difficulties before and after developing a delusion. If delusions really are an adaptive response to difficulties, people undergoing the same difficulties as people with delusions but who present no delusions should be less biologically adapted than people presenting both the difficulties and the delusions. Similarly, a single person facing a crisis should be less biologically adapted before rather than after adopting a delusional belief.

I have applied this methodology in the following paper on delusions in OCD.

5. Are delusions adaptive? Paper 5

Under review at *Consciousness and Cognition*, in this paper I apply the above methodology to a sample of four people suffering from delusional beliefs and OCD, in the attempt to answer the question: can delusions be adaptive?

We have seen that delusions can be adaptive in a psychological or biological sense. In the paper, I employ both notions but with a special focus on biological adaptiveness, because this is the primary notion of adaptiveness and the one which has more interesting philosophical and clinical implications. In line with Fineberg and Corlett's model, for delusions in my sample to count as biologically adaptive, they had to meet the following criteria: 1. arise in a context of crisis; 2. favour a better engagement with the environment. In other words, people should be more engaged with their environment with than without delusions given the context of crisis. I have also taken into account that a better engagement with the environment could be achieved with or without the mediation of psychological benefits, as Bortolotti and Fineberg and Corlett respectively hold. To ascertain whether delusions in my sample met 1 and 2, I have relied on participants' self-reports, asking them to compare their level of engagement with the environment with and without delusions. Findings suggest that delusions in my sample bear complex and heterogeneous relationships with psychological benefits and engagement with the environment. While some delusions support both, thus meeting the standards of biological adaptiveness, others seem to hinder both or deliver only psychological benefits.

Given the limited size of the sample, it would be hasty to draw general conclusions about which kinds of delusions, if any, are adaptive. However, the present study aims to work as a template for future research on the adaptiveness of delusions, suggesting it should focus on comparisons between the psychological wellbeing and the level of engagement with the environment of people with and without delusions, as the present study does.

Having established that more empirical work is required to determine whether delusions are adaptive, the next paper focuses on the nature of obsessions in OCD rather than on that of delusions. However, I will show that this study can also have important repercussions on delusions.

6. The role of egodystonicity in perceptions of free will and recovery in OCD: Paper 6

Paper 6 aims to explore the impact of egodystonicity on perceptions of free will and recovery from OCD. Obsessions in OCD are usually described as egodystonic. Egodystonicity describes a thought that is not consistent with one's sense of self. The notion is used in the clinical discourse to indicate when one does not incorporate the symptoms of one's illness - such as obsessions and compulsions in the case of OCD - into one's sense of self. Egodystonicity plays an important role in discourses on perceptions of free will and recovery from OCD. While it is not clear whether egodystonicity favours recovery from OCD, it seems that it makes a positive contribution to perceptions of free will in this illness.

In the paper, I argue that egodystonicity *per se* is neither good nor bad for recovery and perceptions of free will in OCD: this essentially depends on which values of the ego egodystonicity refers to. The ego is a complex construct, made of different and sometimes contrasting values and beliefs. Some

thoughts and beliefs, such as obsessive ones, can thus be in harmony with some values of the ego but clash with others. For example, obsessing over the thought that if one does not wash his hands 100 times per day, he is going to contaminate other people, can be consistent with one's sense of morality, as it confirms that one is a loving and caring person, but in contrast with one's sense of rationality, if the person acknowledges that the thought is exaggerated and irrational. On the basis of the self-reports of my participants, I argue that egodystonicity supports recovery and perceptions of free will in OCD when the reference value is rationality, i.e., when obsessions and compulsions are perceived to be alien to one's sense of rationality. I also argue that cognitive insight is a sub-set of egodystonicity, as perceiving a thought to be in contrast with one's sense of rationality equals to having a good cognitive insight. However, contrary to what some accounts hold, perceiving one's obsessions and compulsions in line with other values of the self beyond rationality does not seem to pose a problem for recovery and perceptions of free will in OCD.

This study can also have repercussions on delusions. Perceiving one's obsessions in line with one's sense of rationality equals to having a poor cognitive insight, which is also what characterizes delusions. Future avenues of research should further explore the relationship between obsessions and delusions.

References

Bortolotti, L. (2020). *The Epistemic Innocence of Irrational Beliefs*. Oxford: OUP.

Bortolotti, L. (2009). *Delusions and Other Irrational Beliefs*. Oxford: OUP.

Boyd, R. (1989). What Realism Implies and What it Does Not. *Dialectica*, 43 (1/2), pp. 5-29

Buzzati, D. (1966/1983). *Restless nights: selected stories of Dino Buzzati*. Translated by Lawrence Venuti. San Francisco: North Point Press.

Coltheart, M., P. Menzies, and J. Sutton. 2010. Abductive inference and delusional belief. *Cognitive Neuropsychiatry* 15(1-3), pp. 261-287.

Fineberg, S. and Corlett, P. (2016). The doxastic shear pin: delusions as errors of learning and memory. *Cognitive Neuropsychiatry*, 21(1), pp.73-89.

Lancellotta, E. (2021). Is the biological adaptiveness of delusions doomed? *Review of Philosophy and Psychology*, <https://doi.org/10.1007/s13164-021-00545-6>

Lancellotta, E. and Bortolotti, L. (2020). DELUSIONS IN THE TWO-FACTOR THEORY: PATHOLOGICAL OR ADAPTIVE? *European Journal of Analytic Philosophy*, 17(1), <https://doi.org/10.31820/ejap.16.2.2>

Lancellotta, E. and Bortolotti, L. (2019). Are clinical delusions adaptive? *WIREs Cognitive Science*, 10: e1502, <https://doi.org/10.1002/wcs.1502>

Lelliot P.T, Noshirvani H.F, Basoglu M, Marks I.M, Monteiro W.O (1988). Obsessive-compulsive beliefs and treatment outcome. *Psychological Medicine*, 18, pp.697–702.

Matsunaga, H., Kiriike, N., Matsui, *et al.* (2002). Obsessive-compulsive disorder with poor insight. *Comprehensive Psychiatry*, 43, pp.150–157.

McKay, R. 2012. Delusional inference. *Mind & Language* 27(3), pp. 330-355.

National Research Council. (2011). *Toward Precision Medicine: Building a Knowledge Network for Biomedical Research and a New Taxonomy of Disease*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/13284>.

Samuels, R. (2009). Delusion as a natural kind. In Broome, M. and Bortolotti, L. *Psychiatry as Cognitive Neuroscience: Philosophical perspectives*. OUP, 10.1093/med/9780199238033.001.0001

What are delusions?

Abstract: Despite a great deal of research on the topic, a univocal definition of delusions is still missing in the philosophical and psychiatric literature. In what follows, I will try to gain an understanding of the basic surface features of delusions by exploring the way delusions present across several disorders. From my analysis, it emerges that the main features of delusions are conviction, insight and cultural isolation. I discuss the promises and the limits of each of these features, with a special focus on insight.

1. Introduction

Delusions are easier to recognise than to define. The 4th and 5th editions of the Diagnostic and Statistical Manual of Mental Disorders (DSM 5 and DSM 4) define delusions as *fixed beliefs that are not amenable to change in light of conflicting evidence* (APA 2013, 87) and as *a fixed belief based on incorrect inference about external reality that is firmly sustained despite what almost everyone else believes and despite what constitutes incontrovertible and obvious proof or evidence to the contrary. The belief is not ordinarily accepted by other members of the person's culture or subculture* (APA 2000, 765). However, the nature of delusions is much more complex than the above definitions can reveal, as the presentation of delusions varies greatly from one disorder to the other.

In the present chapter, I describe delusions across different diagnostic categories, in the attempt to formulate a unitary definition of the phenomenon, at least with regard to its surface features. It is controversial that delusions should be defined only according to surface and not by other features, such as aetiological ones. However, the causes of delusions are far from being completely understood, and it is not easy to adjudicate among rival theories of delusion formation and maintenance. Are the causes of delusions to be identified with aberrant perceptions, an anomaly in the generation of predictive errors, some form of reasoning impairment or a combination of all these elements? While waiting for science and philosophy to shed further light on the roots of delusions, their multifarious appearance is all we are left with to make sense of this puzzling phenomenon. This is why, in the same way as the DSM and many authors who have written on the topic, I will also base my own understanding and interpretation of delusions on their surface features.

However, even limiting one's enterprise to surface features is still not enough to provide a straightforward answer to what delusions are. As anyone acquainted with the study of this phenomenon knows, delusions can be so elusive and heterogeneous that it is not only difficult to establish with certainty what all their core surface features are, but also to say how these features distinguish delusions from similar psychic phenomena. For example, the features of conviction and resistance to counterevidence, which are among the definitional criteria of delusions, are also shared by other phenomena such as superstitions, overvalued ideas, self-enhancing and alien abduction beliefs (Berrios 1991; Bortolotti, Gunn and Sullivan-Bissett 2016). In the philosophical, psychological

and empirical literature that I have analysed – most of which dates back to the last century – delusions can be understood according to the following fundamental dimensions.

- *Beliefs*. Since the 19th century, the received view in psychiatry, philosophy and psychology has conceived of delusions in doxastic terms, with the work of Karl Jaspers (1963) greatly contributing to the affirmation of the doxastic view. Non-doxastic views of delusions, including the phenomenological tradition, see delusions as not reducible or not entirely reducible to beliefs (see e.g., Dub 2017; Gerrans 2014; Currie 2000; Egan 2009).
- *Conviction*. Conviction is the feeling of subjective certainty with which delusions are entertained. Delusions are unanimously characterised by high conviction in all the diagnostic categories taken into account. Although levels of conviction in delusional beliefs can fluctuate depending on factors such as the stage of the illness or the levels of distress (Maher & Ross 1984), delusions are entertained with high degrees of conviction most of the time.
- *Resistance to counterevidence*. Although many delusions are not completely irresponsive to counterevidence (see Flores 2021), most of them are nonetheless very resistant to it. Resistance to counterevidence is a dimension which is also captured by cognitive insight: this is why, throughout the paper, I will consider it as a subcategory of cognitive insight.
- *Insight*. The literature presents two variants of insight – cognitive and clinical – which, though overlapping, capture different manifestations of delusionality. The absence or scarcity of *cognitive insight* is usually used to diagnose the presence of delusional beliefs outside schizophrenia spectrum disorders (Beck *et al.* 2004). Cognitive insight is tracked by the two parameters of self-reflectiveness and self-certainty. While the former registers the openness and responsiveness of an individual to feedback, the latter mirrors the degree of certainty with which a belief is held, as well as its resistance to counterevidence. Poor levels of self-reflectiveness and a high degree of self-certainty are distinctive of poor cognitive insight and hence of beliefs that are indeed delusional. *Clinical insight* would represent one's capacity to acknowledge the presence of some malfunction, attribute it to an underlying mental illness and be compliant with treatment (David 1990). In this sense, even people with delusions can present a partial insight: as we shall see, patients across different disorders can sometimes be aware that some malfunction is present, although they deny that it is the outcome of a mental illness. Deluded individuals can display awareness of some symptoms without necessarily being able to attribute them to an underlying pathological cause. I argue that full clinical insight (i.e., recognition of symptoms and correct attribution to a mental illness) can only supervene on cognitive insight and that ultimately lack of cognitive insight seems to be one of the core traits of delusional ideation.
- *Cultural isolation*. One of the features that distinguishes delusional beliefs from other forms of more common, irrational beliefs is the fact that delusions are not shared by same culture peers. As I will illustrate, this criterion has recently gained central stage in the debate on the nature of delusions, with an increasing number of authors arguing that delusions should not

only be explained in terms of cognitive or experiential deficits but also by failures in the incorporation of testimony (Miyazono and Salice 2020; Bell, Raihani and Wilkinson 2021)

- *Distress*. Alongside with the previous criteria, delusions can also be characterised by the presence of distress. However, distress is a more controversial dimension than the previous ones. As some studies (Peters *et al* 1999; Garety and Hemsely 1987) and the present analysis show, distress is not a constitutive trait of all delusions: many delusions are in fact distressing (e.g., in BDD), but many others are not (e.g., in HD). This is why it is doubtful that distress should be enumerated among the definitional criteria of delusions.

In what follows, I will illustrate how these features emerge in the presentation of delusions across the different diagnostic categories taken into consideration: schizophrenia (2), bipolar disorder (3), depression (4), anorexia nervosa (5), Body Dysmorphic Disorder or BDD (6), obsessive-compulsive disorder or OCD (7), Hoarding Disorder or HD (8), and neurological disorders (9). I thus conclude that the fundamental dimensions of delusions seem to be conviction, insight and cultural isolation (10).

2. Delusions in schizophrenia

“A 32-year-old first-class private, Karl B., reports that “everything begins” one morning as his unit breaks to leave camp. When the sergeant asks him for the key to his quarters, it is suddenly clear to him that it is a ploy to “test” him [...] “It is clear that they are all receiving their instructions” about him. The patient is unable to explain how he sees this. He simply “sees it.” [...] Later he thinks, “There must be some kind of peculiar effect emanating from me. Other people are under my influence as if under a spell.” [...] When he reaches Conrad’s military hospital, the delusions have progressed from external space to the inner space of his body. The patient reports that a “wave apparatus” controls his movements from some distance through electric current” (Mishara 2009, 9-10)

Together with hallucinations, delusions are one of the main positive symptoms of schizophrenia. As the above report illustrates, they present as fixed beliefs which do not conform to the opinions of those close to the patient. Paradigmatic examples of schizophrenic delusions include grandiose, persecutory, erotomaniac delusions and delusions of reference (see APA 2013, 91-92 for a classification of subtypes of schizophrenic delusions). Although a high level of conviction is held to be a characteristic trait of delusional beliefs in schizophrenia, this can fluctuate over time, with a decrease especially in the phases of recovery and onset (Maher and Ross, 1984). Bizarreness of content is no longer considered a hallmark of schizophrenic delusions (see the transition from DSM 4 to DSM 5). While many delusions in schizophrenia are in fact bizarre (see example above), many others are not (e.g., persecutory delusions or delusions of jealousy).

A popular theory about the formation of delusions in schizophrenia holds that delusions in schizophrenia are explanations of aberrant perceptions, and they are maintained in so far as the perceptions they are attached to persist. Differently from delusional beliefs in other disorders, delusions in schizophrenia tend to be elaborated and systematised, i.e., they involve several themes, and they offer all-encompassing narratives aimed at making sense of the variety of the perceptions in

question (Mishara and Corlett 2009; APA 2000, 275; Bortolotti 2016). In other words, delusions in schizophrenia represent the privileged interpretation of a world characterised by hypersalient and aberrant perceptions. At the onset, delusions concern a limited number of experiences to later spread to the entire experiential field of the affected person. The German psychiatrist Klaus Conrad (Mishara 2009) exemplifies delusional ideation in schizophrenia in two stages:

- A. Prodromal delusional mood (Trema): This is the stage of hypersalient perceptions. In this phase, probably due to neurochemical changes in the brain, the patient's *attention is drawn toward irrelevant stimuli, thoughts, and associative connections, which are distressing and unpredictable* (Mishara 2009, 10). Irrelevant clues and events in the environment are imbued of a strong emotional connotation, seeming to demand for an explanation. The patient ascribes the changes in the perception of the environment to external rather than internal factors, looking for an explanation which could terminate his sense of non-finality and expectation.
- B. Revelation (aha-Erlebnis or apophany): the delusion appears as a revelation which explains the aberrant perceptions of the Trema, offering insight relief. Conrad depicts this moment as *a reflexive turning back on the self in which the universe is experienced as "revolving" around the self as middle point* (Mishara, 10). The individual is unable to shift frame of reference to consider the experience from another point of view of that offered by the content of the delusion. Hence the delusion becomes the privileged interpretation of an otherwise hypersalient and unexplained world.

According to Brendan Maher's popular one-factor theory of delusion formation, the adoption and maintenance of schizophrenic delusions would be *rational, given the intensity of the experiences that they are developed to explain* (Maher 1974, 105). Therefore, schizophrenic delusions would not be dysfunctional in themselves, but they would be a response to a dysfunction in perception (Factor 1). This position has been heavily criticised by two-factor theorists, as there seems to be people who present the same anomalous experiences of people with schizophrenic delusions but who do not develop delusions. This is why, according to two-factor theorists, Maher's Factor 1 is necessary but not sufficient to explain the appearance of delusions: a deficit or a bias in reasoning (Factor 2) is also needed (Coltheart *et. al.* 2011; Coltheart 2007; Davies and Egan 2013; Garety and Freeman 1999). However, it is controversial that people with schizophrenia and delusions suffer from cognitive deficits (Fine *et. al.*, 2007; Owen, Cutting, and David 2007; Selesnick and Owen 2012). In more recent times, it has been proposed that delusions in schizophrenia would be due to abnormalities in the way testimonial evidence is processed (Bell, Raihani and Wilkinson 2021; Miyazono and Salice 2020) rather than to abnormalities in reasoning. Finally, predictive coding argues that schizophrenic delusions would be generated by anomalous predictive errors, and they would be either a consequence or an adaptive response to them (Corlett *et al.* 2010; Fletcher and Frith 2009).

In many cases, delusions in schizophrenia guide action and may be a danger to the wellbeing of the patient or of those surrounding him. However, it has been pointed out that in other cases delusions in

schizophrenia are not acted upon. The inconsistency between delusional attitudes and behaviour – known as double bookkeeping - has been explained by recurring to a lack of motivation or to an inability to sustain action often observed in people diagnosed with schizophrenia (Bortolotti and Broome 2012).

Although lack of insight is not officially included into the diagnostic criteria for schizophrenia, it plays a major role in its prognosis and treatment (Cuesta and Peralta 1994). Insight in schizophrenia has been cashed out both in terms of clinical and cognitive insight. Cognitive insight in schizophrenia is usually low or absent, and this has been correlated especially to the presence of delusions rather than to other symptoms such as hallucinations. People with hallucinations and no delusions seem in fact to show high levels of self-reflectiveness as well as low levels of self-certainty, which indicates a good overall level of cognitive insight. On the contrary, people with delusions show very poor levels of cognitive insight, independently from the presence of hallucinations (Engh *et al.* 2009). This seems to suggest that lack of cognitive insight is a core feature of schizophrenic delusions. As far as clinical insight is concerned, it has been estimated that 50-80% of schizophrenics are unaware of suffering from a mental illness. Clinical insight seems to stand in a small negative correlation with symptom's severity, especially positive ones during the acute phases of the illness, as well as in a small positive correlation with depression (Mintz, Dobson and Romney 2003)

The levels of distress and malfunction generated by delusions in schizophrenia can vary. Garety and Hemsley (1987, 297-298) found that people with delusions usually score high on levels of distress. According to Fineberg and Corlett (2016, 76), by offering an explanation to otherwise unexplained perceptions, delusions offer psychological relief, which at the biological level would be signalled by a drop in the stress-related hormone cortisol once the delusion is formed. In this sense, delusions would seem to reduce the levels of distress brought about by aberrant perceptions. However, the content and the maintenance of delusions would generate distress (with a rise in cortisol) when confronted with counterevidence and the testimony of others. Hence, for Fineberg and Corlett delusions would have a positive impact on distress in the short but not in the long term.

Delusions of grandeur, jealousy and persecution, as well as erotomanic and somatic delusions, can also present on their own, without being accompanied by other schizophrenic symptoms or without a clear neurological cause. In this case, a diagnosis of delusional disorder is usually assigned (APA 2013, 90).

3. Delusions in bipolar disorder

At this time, my mania led me to believe that I was immortal and the sister of Jesus [...] I experienced further manic episodes in 2004, 2005, 2006 (during one of these I believed that I would be the next Queen - Elizabeth III). (Liz's story: Living with bipolar, 2021)

Bipolar disorder is thought to represent a bridge between schizophrenia spectrum disorders and depression, as it shares common features with each of these conditions. Bipolar disorder is the modern equivalent to the 19th century manic-depressive disorder or affective psychosis. It is subdivided in two types: Bipolar I and Bipolar II disorder. Bipolar I disorder is characterized by manic episodes, which are

usually followed by hypomanic or major depressive episodes. Bipolar II disorder is characterized by less intense mood swings than Bipolar I (APA 2013, 123-139).

Delusions can appear during either a manic or a depressive episode. They can either be mood-congruent or mood-incongruent, and they encompass a variety of themes, from grandiosity, invulnerability, suspiciousness to paranoia and guilt. It is estimated that 68% of people suffering from bipolar disorder experienced delusions at a certain point of their illness (Van Bergen *et al.* 2019). The presence of psychotic symptoms would be associated with an earlier disease onset and more frequent hospitalizations, as well as with a limited recovery during early remission from mood disturbance (Levy *et al.* 2013).

Beyond delusions of guilt, grandiose delusions would also be largely present in bipolar disorder, more than in all the other disorders (Knowles *et al.* 2011). It is thought that a number of different and often contrasting factors could contribute to the formation of grandiose delusions: from defences against negative life experiences, to positive life experiences, cognitive biases and internalising attributional styles.

4. Delusions in depression

A 53-year-old woman, without any depressive or manic episode, had cared for her disabled mother for about 20 years. After her mother died, she started living alone and gradually began to feel sad, lonely, and remorseful for insufficiency of her caring for mother. About 5 months later, she developed mood-incongruent delusions of persecution and reference. Her delusions persisted for 2 months, and she was thereafter referred to our hospital. At that time, she was very suspicious and also presented depressive symptoms, including depressed mood, diminished pleasure, appetite loss, severe insomnia, agitation, fatigue, and diminished ability to concentrate (Mizoguchi and Monji, 2014).

Depression is a condition characterised by low, empty or irritable mood, accompanied by somatic symptoms like insomnia and lack of appetite (APA 2013, 155) guilt and a sense of worthlessness around the self, the world and the future (see Ratcliffe 2015 for a phenomenological account of depression).

Depressive delusions are usually mood-congruent, ill-grounded beliefs which revolve around themes of guilt, meaninglessness and self-blame despite a substantial evidence to the contrary. However, delusions in depression can also be mood-incongruent and involve ideas of persecution and reference (see example above). Delusions in depression have been accounted for as a disruption of cognitive processes involving the acquisition of new, positive information regarding the self. According to Beck (1967), in early childhood we develop schemata about reality and ourselves which help us process incoming information throughout our whole adult life. Schemata are networks of beliefs and mental representations which aim to classify and explain experiences. When an object of experience cannot be classified according to the known schemata, however, cognitive dissonance is generated by the conflict between the subject's pre-existing schemata and the new experience triggered by the object. The conflict in question must be resolved either by assimilating the new experience to a known one (assimilation) or by creating a new schema which explains the new experience (accommodation). In

people with depression, the process of accommodation with regard to self-value would be compromised, so that the subject is unable to create new schemata to account for positive experiences about the self. Hence a process of cognitive compensation would take place, with assimilation replacing accommodation, and the subject would erroneously distort new, positive experiences about the self to make them fit with his existing negative self-schemata, acquired during childhood. More specifically, depressive subjects would distort new, positive inputs about the self by transforming them into negative and guilt laden ones, making them fit with their pre-existing negative self-conceptions.

According to Antrobus and Bortolotti (2016), in the short-term depressive delusions would confer both an epistemic and a psychological advantage, by helping the subject preserve a negative but consistent self-image and by reducing the distress caused by the cognitive dissonance between negative self-schemata and new, positive evidence about the self.

A characterization of delusions in major depression also comes from Stanghellini and Raballo (2015), who highlight the phenomenological differences between delusions in major depression and delusions in schizophrenia. According to the authors, delusional features can be grouped into intrinsic and extrinsic features. Among the intrinsic features, it is possible to find the form and the content of delusions. While in schizophrenia the form of delusions manifests in a revelation, in major depression it manifests in a confirmation of pre-existing, incorrigible and guilt-laden beliefs about the self. Delusions of guilt in major depressive episodes can even take the extreme form of Cotard syndrome, the delusion that one is dead (Fuchs 2014). As far as the content is concerned, major depressive delusions would *express our ontic, everyday concerns* with worldly affairs. This is different from delusions in schizophrenia, which usually exhibit ontological or metaphysical concerns. Moving on to the extrinsic features of delusions, these include preparatory field of experiences, background feelings, ontological framework of experience and existential orientation. In major depressive delusions, the preparatory field of experiences – i.e., the feelings that precede the onset of delusions – is characterized by the questioning of one's place in the ethical world, which paves the way to feelings of inability to experience emotions at all (Nicht-traurig-sein-Koennen' or not-to-be-able-to-be-sad, according to Schulte 1961). The ontological framework – i.e., one's experience of time, space and self – is marked by a feeling of emotional disconnection, with attached feelings of timelessness (the past endlessly repeats itself), constriction and depersonalization, where the self is defined on the basis of a finite and unchosen array of characteristics, with which the person tends to overidentify. Finally, the existential orientation of people suffering from major depressive delusions is defined by a hyper-connection to common sense and an overidentification with social norms.

5. Delusions in Anorexia Nervosa

Zoe: I'll always have breakfast, lunch and dinner, but it will be a big breakfast, 15 km run, a few carrots for lunch and maybe some protein for dinner. *Interviewer: Ok and so that's right for—*For my body yes, not for, I would never say that to like my little cousin who was running 15 km, I would be like “you need to eat all this food.”

Mia: So if the doctors share with you evidence of being malnourished and just saying your bloods, your blood tests have shown abnormalities, you always make the excuse and think well, you know, my white blood cell count's low but it might just be because I'm sick, or you know, my liver enzymes are raised but it could just be because of the medication I'm on, or you know my hair's falling out but it could just be because it's too long at the moment and it's dropping out and my skin's dry and my nails are brittle and it's just because, I don't know, you just make up an excuse and you think nothing applies to me, it's not to do with my eating disorder, it's just coming from another you know, source. (O'Connell *et al.* 2018, 321)

Anorexia Nervosa is an eating disorder characterised by a refusal to maintain a normal body weight, an intense fear of gaining weight and a disturbance in the perception of one's body shape and weight. It is currently subdivided in restricting and binge-eating/purging types: whereas in the former type, weight loss is achieved by fasting, dieting and excessive exercise, in the latter purging behaviours follow episodes of binge-eating (APA 2000, 539-541). Although not officially incorporated in diagnostic manuals, the delusional variant of Anorexia Nervosa represents a well attested subcategory of the illness (Konstantakopoulos 2012, Mountjoy 2014, Hartmann 2013), apparently associated with its restricting type (Konstantakopoulos 2012).

Consistently with the nature of the disease, delusions in Anorexia Nervosa are incorrigible beliefs revolving around ideas of body weight and shape. According to Espeset *et al.* (2011, 187), delusionality in Anorexia Nervosa refers to *being convinced that one's subjective body image is undistorted and shared by others*. According to O'Connell *et al.* (2018), delusions in Anorexia involve two main themes. The first comprises the exceptionality of the body of the Anorexia sufferer and the consequent need to act in a disordered way. Patients are convinced that their body escapes the normal laws of biology and physiology, although these laws are correctly recognised to apply to other people. As a consequence, a disordered behaviour is thought to be a logical response to a situation of physical exceptionality. The second delusional theme concerns the way individuals justify their beliefs of exceptionality and their need to act in a disordered manner. This includes the preference of feeling or subjective experience over logic and objectivity and contradictory insight, which manifests in the simultaneous agreement and disagreement with medical opinion as well as in the acknowledgement of holding irrational beliefs, which are nonetheless entertained with conviction (O'Connell *et al.* 2018). According to Espeset *et al.* (2011), delusionality in AN would coincide with a failure of integration between objective and subjective reality. According to Gadsby (2020) instead, delusions in AN would be the result of motivated biases that would prompt patients to selectively attend to oversized experiences, which in turn would give rise to delusions.

Both dimensions of cognitive and clinical insight are fundamental in shaping the definition of delusional beliefs in Anorexia Nervosa. As far as the former is concerned, delusional beliefs in Anorexia seem to be held with a high degree of self-certainty and inflexibility, which mirrors low levels of cognitive insight. Poor cognitive insight in Anorexia has been found to be a predictor of poor prognosis (Saccomani 1998). As for the latter, while the majority of patients in Anorexia Nervosa present some

level of clinical insight into their condition (Mountjoy 2014, Konstantakopoulos 2012), ranging from excellent to poor but with most of the cases attesting on poor levels, the minority represented by delusional patients shows no insight at all. Moreover, consistently with findings from David (1990) and Amador et al. (1991), insight in AN seems to be not a unidimensional but a multifaceted construct: some patients would in fact be able to relabel past but not current beliefs as pathological, while others would acknowledge the presence of disordered behaviours but not see them as a manifestation of mental illness (O'Connell et al. 2018).

Finally, it is not clear if delusions in AN alleviate or promote psychological distress. According to Mountjoy (2014, 511) on average Anorexia patients show higher level of distress and preoccupation than schizophrenics, and this would be due to their higher level of clinical insight into their condition. In other words, though it is an essential step towards recovery (Konstantakopoulos 2012, 486), the awareness of suffering from a mental illness would also cause considerable distress. If this is true, by obscuring patients' clinical insight, delusions in Anorexia should alleviate rather than enhance psychological distress. However, this conclusion should be considered as merely hypothetical, as the considered studies do not explicitly focus on the relationship between delusions and distress. Moreover, it might be the case that even if delusions reduce the distress linked with the awareness of suffering from a mental illness, nonetheless being deeply convinced that one is overweight might also cause considerable distress.

6. Delusions in BDD

A 37-year-old well-educated male from the middle socio-economic class was presented with a belief that his face was changing into one of an 'eunuch' with a perceived emphasis on his face, lips, ears and his voice in articulation and also people commenting him as eunuch (number nine)—nine is a social-cultural term given to an eunuch [...] He suddenly started feeling that his customers were referring and talking about him as an 'eunuch' by stressing on the words 'nine' boldly and repeatedly. As days passed, he was excessively preoccupied with his face changing into 'eunuch'-like appearance. Change of face into that of 'eunuch' was noticed by other people and his own family members—wife, mother and others—with an impact of mostly avoiding him. He felt that they noticed his 'eunuch' face with disgust and shame. He could not continue his job and resigned it as he was observed by each and every person around him pointing out purposefully to him with words nine and similar numbers. He felt shameful to leave his home, to mingle with others and to have social interaction. He felt uneasy and was preoccupied with his imagined eunuch facial appearance (Krishnam and Aravind 2006).

Body dysmorphic disorder is characterised by excessive preoccupation with imagined or slight bodily defects. It is usually accompanied by compulsive behaviours aimed at neutralising the distress generated by the perceived defects (APA 2013, 242-243).

Delusions in BDD mainly take the form of fixed beliefs about body shape and size, but they can also encompass control, reference and thought alienation themes (Rossell *et al.* 2020). It is held that the percentage of individuals reporting delusional beliefs in BDD oscillates between 27% and 50% (Labuschagne and Castle 2010, 707; Phillips and Hollander 2008, 14; Hartmann *et al.* 2013, 1132). Moreover, although beliefs in BDD spread along a continuum which ranges from very good to

delusional cognitive insight, they mainly attest on the poor insight end of the spectrum, contrary to OCD (Phillips *et al.* 2012)

Delusions in BDD seem to worsen the levels of distress experienced by patients. According to some studies, (Rossell *et al.* 2020; Labuschagne and Castle 2010), BDD patients would be more distressed and preoccupied by the presence of somatic delusions than healthy subjects and people with schizophrenia. Other studies have found that delusional in BDD seems to be associated with higher levels of perceived stress, functional impairment and poorer quality of mental health life (Phillips 2000, 173).

As far as the aetiology of delusions in BDD is concerned, it has been proposed that delusional beliefs in BDD may be explained by impaired semantic processing (Rossell *et al.* 2014).

Finally, it is worth noting that the classification of BDD under the umbrella of obsessive-compulsive disorders has recently been challenged (Toh, Castle *et al.* 2017), with delusional playing a major role into the discussion. Preoccupations in BDD would in fact seem to share more similarities with delusions in psychotic disorders than with obsessions in OCD and, according to the authors of the study, this would be sufficient to grant, if not a reconsideration of the current diagnostic classification of BDD, at least further investigation into the dimension of insight and delusional in OCD, BDD and psychotic disorders.

7. Delusions in OCD

At the age of 8, X had transient counting rituals associated with fear of harm coming to others. When she was 15, after a relative died, she feared that harm would befall her family and friends unless she completed specific tasks. She thought a supernatural 'power' inserted unpleasant thoughts into her mind, e.g., "if you read that book a relative will die". She believed unshakably that the power was supernatural but could not explain it. To appease the 'power' and the thoughts, she developed complex counting rituals pervading her daily activities. She also did ritualistic hand-washing and checking. She avoided specific numbers, colours and clothes and counted from 0 to 8 on her fingers and toes throughout the day. She repeated rhymes, avoided multiple numbers she associated with death or harm, and brushed her hair hundreds of times a day. She felt unable to resist the rituals, as her belief in negative consequences was absolute (O' Dwyer and Marks 2000, 282).

According to DSM 5 (APA 2013, 235), OCD is characterized by the presence of obsessions and/or compulsions. Obsessions are recurrent and persistent thoughts, urges, or images that are experienced as intrusive and unwanted, whereas compulsions are repetitive behaviours or mental acts that an individual feels driven to perform in response to an obsession or according to rules that must be applied rigidly. According to (Veale 2007, 271), Values which have become dominant, idealized and excessively identified with the self would be at the root of the whole OCD symptomatology.

The nature of delusional beliefs in OCD is strictly related to that of obsessions. Generally, OCD patients show a good level of cognitive and clinical insight into their obsessions, acknowledging their unreasonableness or exaggeration compared to the threat they really pose (e.g., Catapano *et al.* 2010).

However, there is a percentage of cases, spanning from 4% (APA 2013, 237; Eisen and Rasmussen 1993) to 58% according to one study upshot (Lelliot *et al.* 1988), where obsessive-compulsive beliefs display delusional features, by being held with a firm conviction in the plausibility of the obsessional content as well as in the necessity of ritualising to avoid catastrophic consequences. Recent studies have found that cognitive insight in OCD is negatively associated with delusional ideation (Hood *et al.* 2019).

It has been hypothesized that obsessions lie on a continuum with delusional beliefs and overvalued ideas. In other words, what would differentiate obsessions from overvalued ideas and delusions would be a higher degree of cognitive insight in the former, rather than a different quality of the obsessional beliefs (Kozak and Foa 1994, 347). This also seems to be hinted at by studies reporting that, in a similar way to *folies a deux* in psychosis, even OCD can be shared between two or more people (Benatti *et al.* 2019). A case report also shows how obsessions can transform into delusions - in the specific case, Cotard delusion (Fabrazzo *et al.* 2021). Moreover, some studies report that there are considerable transition rates from schizophrenia – where delusions are largely present - to OCD (Rasmussen *et al.* 2020; Meier *et al.* 2014; Kringlen 1965) and that schizophrenia and OCD share similar cognitive underpinnings (Lavalle' *et al.* 2020)³. The reasons why obsessions might transform into delusional beliefs are still rather obscure. On the one hand, Bortolon and Raffard (2015) have proposed that anxiety might be a moderator between obsessions and delusion-like beliefs in OCD. High levels of anxiety in the presence of obsessions would in fact reliably predict the formation of delusional beliefs. On the other hand, according to Fear, Sharp and Healy (2000), single themed obsessions, magical thinking and depression symptoms would be good indicators of delusional proneness in OCD.

It must be pointed out that, although psychological distress seems to have a role in the formation of delusional beliefs under the form of anxiety or depression, it is not clear if delusions in OCD have a positive or negative impact on it, i.e., if they alleviate or aggravate distress. On the one hand, Insel and Akiskal found that patients with OCD and delusions *may [...] show no evidence of anxiety*, (1986, 1529) suggesting that delusions might reduce the levels of anxiety which is usually associated with obsessions. On the other hand, Fear, Sharp and Healy (2000) state that people with OCD and delusions show more depressive symptoms than either OCD or purely deluded patients. Taken together, these data might imply that delusional beliefs in OCD improve levels of anxiety but worsen or leave untouched those of depression.

8. Delusions in HD

Even though she initially told him that she wanted to get rid of a lot of the things in her home, when she picks something up, it becomes the most valuable thing in the world and therefore can't be thrown away. She insists that she's going to read all of the newspapers in her home, which Neal knows would take months, perhaps years, to accomplish. Every time he points out that she hasn't used her art supplies in years (and indeed, many of the items have deteriorated beyond usefulness), she claims that she's about to start an important project any day

³ However, other studies suggest otherwise. See e.g., Jacobsen *et al.* (2012); Pelizza e Pupo (2013)

now. Her sense of responsibility is completely exaggerated, and she acts as if throwing a milk container away is somehow going to destroy the environment (Frost *et al.* 2010, 407-408).

According to DSM 5 (APA 2013, 236), *hoarding disorder is characterized by persistent difficulty discarding or parting with possessions, regardless of their actual value, as a result of a strong perceived need to save the items and to distress associated with discarding them.* In DSM 5, hoarding disorder is classified under the umbrella of obsessive-compulsive spectrum disorders. However, given its yet obscure aetiology, its belonging to the OCDS mirrors more a pragmatic choice rather than a deep affinity with other disorders of the spectrum (Mataix-Cols *et al.* 2010). Differently from obsessions in OCD and preoccupations in BDD, the act of hoarding *per se* is not perceived as distressful and in tension with the person's values and beliefs. Rather, distress in hoarding arises from the impairments generated by the accumulation of excessive clutter.

Delusionality in HD manifests in unshakeable beliefs about the importance of retaining certain objects and in the consequent absence of cognitive and clinical insight into these beliefs. In other words, the patient does not see his beliefs and behaviours as epistemically and clinically problematic. According to Matsunaga *et al.* (2002), on average HD patients present a lower insight into their symptoms than OCD with hoarding symptoms and pure OCD sufferers (the rates for poor insight being respectively 95%, 42% and 27%).

According to Frost *et al.* (2010), insight in HD can be conceived of in three different ways, i.e., anosognosia, OVI and defensiveness. Anosognosia covers the scope of both clinical and cognitive insight, being defined as the denial of one's illness in the face of strong evidence to the contrary or the difficulty to reducing severe impairments in functioning to an underlying illness. Anosognosia in HD takes the form of the denial of the apparent malfunctioning generated by hoarding behaviours as well as of low levels of distress associated with such malfunctioning. Insight can also be framed in terms of OVI. OVI are fixed and rigid beliefs surrounding the importance of the hoarded items, which are not sensitive to change when confronted with rational arguments to the contrary. The importance attributed to the items can be of various nature, ranging from emotional attachment, to fear of wastefulness or need of control over one's possessions. OVI is hence equivalent to cognitive insight. Finally, poor insight in HD can coincide with mechanisms of defensiveness. It has been noticed that HD patients are more prone to acknowledge the consequences of excessive hoarding when placed in a supportive and non-judgmental environment rather than in confrontational situations where there is a pressure to discard items. In such cases, HD sufferers are likely to feel their freedom of choice and autonomy threatened and react defending or even reinforcing their behaviour or beliefs concerning hoarding. According to Frost *et al.* (2014), although these different conceptions of insight might overlap, it does not necessarily have to be so, showing that insight in HD should be better understood as a multidimensional construct. For example, it might be the case that an individual presents high levels of insight along the anosognosic construct, acknowledging that her behaviour causes

malfunction, but at the same time she is convinced that the items in question are of high emotional importance, presenting low insight along the OVI dimension (see the case study above).

It has been noted that poorer insight – both clinical and cognitive - is associated with lower levels of distress about the hoarding (Tolin, Fitch *et al.* 2008). It thus seems that delusionality in HD has a favourable impact on distress: a lack of awareness of dysfunctions and a high degree of certainty in the veracity of one's delusional beliefs seems to positively alleviate the distress associated with higher degrees of insight.

9. Delusions with a neurological origin

On request, she admitted without hesitation that her left shoulder was part of her body and *inferentially* came to the same conclusion as regards her left arm and elbow, given, as she remarked, the evident continuity of those members. She was elusive about the forearm but insisted on denying ownership of the left hand, even when it had been passively placed on the right side of her trunk. She could not explain why her rings happened to be worn on the fingers of the alien hand (Bisiach and Geminiani 1991, 32–33).

In this section, I am going to briefly review delusions that present a clear neurological origin. This is the case of delusions in dementia, sometimes of monothematic delusions such as Capgras and most likely Fregoli, Cotard and mirrored self-misidentification, as well as of delusions in hemiplegia.

Dementia is characterized by a progressive decline in brain functioning. Delusional beliefs in this condition are generally triggered by memory loss, which is one of the distinctive features of dementia: they usually take the form of persecutory or paranoid delusions, that the person does not relinquish in the face of reasoned argument (About dementia, 2021). It has been argued that delusions in dementia could deliver psychological benefits insofar as they fill memory gaps, offering handy explanations for events which the person has no recollection of (Bortolotti and Sullivan-Bissett 2018; Lancellotta and Bortolotti 2019).

As far as monothematic delusions are concerned, Capgras delusion is the belief that a loved one has been replaced by an identically looking imposter. The syndrome was firstly identified by Capgras in 1923 (Capgras and Reboul-Lachaux 1923), and it has been an ongoing object of philosophical interest ever since. In a famous study, Ellis and Young (1990) identified the neurological factor which would be at the origin of the Capgras delusion, i.e., a disruption in the autonomic system of face recognition which would cause the person to physiognomically but not emotionally recognise the loved one. Other monothematic delusions that most likely have a neurological origin are Fregoli delusion – the belief that one is followed by known people in disguise, probably elicited by an unduly affective response to unfamiliar people (Davies *et al.* 2001); Cotard delusion – the belief that one is dead, which might be due to a generalised lack of affective response (Young *et al.* 1994; Young *et al.* 1992); mirrored self-misidentification – the belief that the person in the mirror is somebody else, probably due to a lost ability to interact with mirrors or to an inability to recognise oneself in the mirror (Davies *et al.* 2005). Some - like one-factor and predictive coding theorists - hold that the neurological factor, which in turn gives rise to experiential anomalies, is necessary and sufficient for the formation and maintenance of

monothematic delusion (Noordhof and Sullivan-Bissett 2021; Sullivan-Bissett 2020; Fineberg and Corlett 2016; Corlett *et al.* 2010; Maher 1974). However, others - such as two-factor theorists of delusions (Coltheart, Menzies and Sutton 2010; Davies *et al.* 2001) - argue that the neurological factor is necessary but not sufficient for the adoption and the maintenance of such bizarre delusions, as there are people who present the same neurological problem as people with delusions but who do not endorse delusional beliefs (see e.g., Tranel and Damasio 1995 for Capgras delusion). This is why, according to two-factor theorists, additional pathological factors need to be postulated to explain the genesis of monothematic (and other) delusions.

Finally, delusions can also manifest under different forms in conditions such as hemiplegia, where the patient is paralysed on one side of the body. Some of such forms are misoplegia, when the patient perceives the affected limb to be alien and intrusive; somatoparaphrenia, when the patient attributes the paralysed part of the body to another person; anosognosia, when the patient denies that he has a paralysis at all. In the past, such delusions were ascribed to the operations of unconscious defence mechanisms, whose goal was to protect the patient from negative emotions coming from an acknowledgment of their condition (Weinstein & Kahn 1950). However, after a poignant critique put forward by Bisiach and Geminiani (1991), pure unconscious defence accounts of hemiplegia have fallen out of favour and replaced by cognitive deficit theories (Fotopoulou 2013; Davies *et al.* 2005) or mixed accounts (Sims 2017).

10. On the difficulty of defining delusions

From the above discussion, it emerges that delusions can manifest in heterogeneous ways. Sometimes they represent new knowledge or a form of revelation (schizophrenic delusions), sometimes they reinforce pre-existing beliefs (depressive delusions); some of them present bizarre content (schizophrenic and obsessive-compulsive delusions), while others are more mundane (anorectic, body dysmorphic, hoarding, depressive delusions).

Despite all these variations, however, delusions also seem to exhibit some fundamental traits which are common to all the diagnostic categories taken into consideration. More specifically, these traits are *conviction*, *lack of insight* and *cultural isolation*.

- *Conviction* is the first trait according to which delusions are unanimously defined in all the diagnostic categories taken into account. It appears that delusions are above all conceived as strongly held beliefs, which are entertained with a high level of subjective conviction. Although levels of conviction can sometimes fluctuate, delusions are characterised by high conviction most of the time.
- *Insight* is the second dimension according to which delusions are framed in all the disorders under review. A lack of insight is in fact considered to be one of the hallmarks of delusionality. However, as delusions, insight is not a simple but a multidimensional construct, which escapes a straightforward definition. Part of the difficulty in pinning down a precise definition of insight resides in the fact that in the literature the two constructs of clinical and cognitive insight are

not always carefully distinguished. On the one hand, clinical insight would be the capacity to acknowledge the presence of some malfunction, reduce it to an underlying mental illness and be compliant with treatment. Individuals suffering from a mental illness distribute themselves along a continuum which ranges from full insight, where the patients display all the three dimensions of insight, to no insight, where none of the dimensions is displayed. Deluded individuals show poor or absent clinical insight: even when some awareness of the pathology is present, this never reaches full insight, displaying the three dimensions which are constitutive of it. For example, some patients can describe past but not current beliefs as pathological, others can acknowledge the presence of malfunctions but ascribe them to other things than to a mental illness, others still can recognise delusional reasoning in other people but not in themselves (see case study for Anorexia Nervosa). On the other hand, with its dimension of self-certainty, cognitive insight captures the notion of *resistance to counterevidence*, and couples it with the dimension of self-reflectiveness, i.e., the degree of openness to feedback. Typically, delusions are characterised by low levels of cognitive insight, as the analysis of the above disorders shows. Although clinical and cognitive insight are overlapping constructs, they nonetheless represent different aspects of delusionality. Consider the following three cases: a) *poor clinical insight with absent cognitive insight*. It is possible to show a certain level of clinical insight, acknowledging the presence of some malfunction, without necessarily showing cognitive insight, i.e., without being open to questioning the veracity of one's delusional belief. This dichotomy is apparent in cases of anorectic delusions, in which some patients can acknowledge the presence of bodily malfunctions (e.g., brittle nails) but they are still profoundly convinced that they look fat. Similarly, someone suffering from hoarding delusions can acknowledge the impairment brought about by excessive clutter but still strenuously defend the importance of the hoarded items; b) *good clinical insight with good cognitive insight*. When subjects acknowledge the presence of malfunctions and are able to ascribe them to an underlying mental illness, they are also open to questioning the veracity of their delusional beliefs. This is mostly evident in cases of remission from schizophrenia; c) *good cognitive insight with poor/absent clinical insight*. Once a patient starts questioning the veracity of his/her delusional beliefs, it does not automatically follow that she sees it as the manifestation of a mental illness. In other words, one can acknowledge that one's belief might be wrong without also acknowledging that it is also pathological. What these three cases show is that clinical and cognitive insight are two independent constructs which track distinct dimensions of delusionality. It is in fact possible to recognise the presence of some malfunction without also acknowledging the irrationality of one's delusions or, on the contrary, to question the veracity of one's beliefs without seeing them as an expression of mental illness. However, on further scrutiny of the three cases, while partial clinical insight (recognition of malfunction) can be independent from good cognitive insight, it seems that full clinical insight can only supervene on good cognitive insight, suggesting that ultimately absence of cognitive insight is what characterizes delusions at the

core. Put in other terms, in order to reach b (good clinical and cognitive insight), it seems logical that patients should first of all achieve a good level of cognitive insight (case c), becoming aware that their delusional beliefs might not be true. Differently, as case a) shows, becoming aware of the presence of some malfunction – hence showing a certain degree of clinical insight - seems not to be sufficient to grant that a patient is able to see that those malfunctions are generated by a mental illness. It is reasonable to hypothesise that the missing step from partial to full clinical insight is cognitive insight, i.e., the recognition that one's delusional beliefs might not be true. For example, if someone with anorectic delusions acknowledges that her nails are brittle (partial clinical insight), in order to reach full clinical insight, she must correctly ascribe this symptom to the presence of Anorexia Nervosa. However, in order to do that, it seems that first she has to acknowledge that her belief that she is exceptionally fat might not be true, hence first she must gain a good cognitive insight. Finally, drawing from the literature on hoarding disorder, *defensiveness* appears to be another important way in which insight can manifest. However, rather than adding to a definition of insight, defensiveness seems to provide indications about the context in which insight is more likely to manifest, specifically in non-confrontational situations where the patient can quietly reflect on the plausibility of his beliefs.

- *Isolation* from the beliefs of same culture peers is also a criterion that delusions across the different disorders taken into consideration seem to share. This might indicate that delusions are characterized by some failure in the processing of testimonial evidence, as supported by some recent theories of delusions: this could be a promising path for future research.
- It is more controversial that *distress* is a core feature of delusionality. Evidence from the present analysis does not point towards a clear answer. In some of the diagnostic categories under examination, delusions seem to offer some short-term psychological relief. In some forms of schizophrenia, they would explain unexplained perceptions, while in depression they would reduce cognitive dissonance and preserve a unified self-narrative. However, these are short rather than long-term benefits. In the long run, delusions in both schizophrenia and depression are likely to cause psychological harm by both clashing against counterevidence (in schizophrenia and depression) and by reinforcing a negative sense of self (in the case of depression). In AN and OCD evidence is more ambiguous and open to both negative and positive interpretations; in HD, delusions seem to reduce the distress brought about by hoarding behaviours, while in BDD delusions seem to have a negative impact on the psychological wellbeing of the subject. The factors for which delusions can result distressing or psychologically beneficial are far from clear and await further investigation.

Bibliography

Amador, X.F and David, A. (2004). *Insight and psychosis*, Oxford University Press

- Amador, X. F., Strauss, D., Yale, S. *et al.* (1991). Awareness of illness in schizophrenia. *Schizophrenia Bulletin*, 17(1), pp. 113-132
- American Psychiatric Association (2013). *DSM-V: Diagnostic and statistical manual of mental disorders*. (5th Rev. Ed). Washington, DC: American Psychiatric Press.
- American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., Text Revision). Washington, DC: American Psychiatric Press.
- Antrobus, M. and Bortolotti, L. (2016). Depressive delusions. *Filosofia Unisinos*, 17(2).
- Beck, A.T. (1967). *Depression: Causes and Treatment*. Philadelphia, University of Pennsylvania Press
- Beck, A. T., Baruch, E., Balter, *et al.* (2004). A new instrument for measuring insight: The Beck Cognitive Insight Scale. *Schizophrenia Research*, 68, pp. 319–329.
- Bell V, Raihani N, Wilkinson S. (2021). Derationalizing Delusions. *Clinical Psychological Science*, 9(1), 24-37
- Benatti, B., Arici, C., Altamura, A.C., Dell'Osso, B. (2019). Shared obsessive-compulsive disorder: An Italian case report. *Journal of Nervous and Mental Disease*, 207(4), pp. 311-313
- Berrios. G. E. (1991). Delusions as "Wrong Beliefs": A Conceptual History. *British Journal of Psychiatry*, 159 (14), pp. 6-13
- Bisiach, E. and Geminiani, G. (1991). Anosognosia related to Hemiplegia and Hemianopia. In Prigatano G. and Schacter D. (eds). *Awareness of Deficit after Brain Injury*. Oxford, OUP, pp. 17-39.
- Bortolon, C. and Raffard, S. (2015). Self-reported psychotic-like experiences in individuals with obsessive-compulsive disorder versus schizophrenia patients: Characteristics and moderation role of trait anxiety. *Comprehensive Psychiatry*, 57, pp.97-105.
- Bortolotti, L. (2016). Epistemic Benefits of Elaborated and Systematized Delusions in Schizophrenia. *British Journal of Philosophy of Science*, 67, pp. 879–900
- Bortolotti, L. (2015). The epistemic innocence of motivated delusions. *Consciousness and Cognition*, 33, pp.490-499.
- Bortolotti, L. and Broome, M. (2012). Affective Dimensions of the Phenomenon of Double Bookkeeping in Delusions. *Emotion Review*, 4(2), pp.187-191.
- Bortolotti, L., Gunn, R., and Sullivan-Bissett, E. (2016). What Makes a Belief Delusional? In Mac Carthy, I., Sellevold, K., and Smith, O. (eds.) *Cognitive Confusions*. Legenda, pp. 37–51.
- Bortolotti L, Sullivan-Bissett E. (2018). The epistemic innocence of clinical memory distortions. *Mind & Language*, 33, pp. 263–279.

- Capgras, J, Reboul-Lachaux, J. (1923). L'illusion des sosies' dans un delire systematise chronique. *Bulletin de la Societe Clinique de Medecine Mentale*, 2, pp. 6-16.
- Catapano, F., Perris, F., Fabrazzo, M., Cioffi V., Giacco D., De Santis V. *et al.* (2010). Obsessive–compulsive disorder with poor insight: A three-year prospective study. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 34, 323-330.
- Coltheart, M., Langdon, R. and McKay, R. (2011). Delusional belief. *Annual Review of Psychology*, 62(1), pp. 271-298
- Coltheart, M., Menzies, P. and Sutton, J., (2010). Abductive inference and delusional belief. *Cognitive Neuropsychiatry*, 15 (1), pp. 261–287.
- Coltheart, M. (2007). The 33rd Sir Frederick Bartlett Lecture Cognitive neuropsychiatry and delusional belief. *The Quarterly Journal of Experimental Psychology*, 60(8), pp. 1041-1062
- Corlett, P., Taylor J., Wang X., Fletcher P., Krystal J., (2010). Toward a neurobiology of delusion, *Progress in Neurobiology*, 92, pp. 345–369.
- Cuesta, M and Peralta, V. (1994). Lack of Insight in Schizophrenia. *Schizophrenia Bulletin*, 20(2), pp. 359=366.
- Currie, G. (2000). Imagination, delusion and hallucinations. *Mind and Language*, 15(1), pp. 168–183.
- David, A. S. (1990). Insight and psychosis. *The British Journal of Psychiatry*, 156(6), 798–808.
- Davies, M. and Egan, A. (2013). Delusion: Cognitive Approaches - Bayesian Inference and Compartmentalization. In Gipps, R. (ed). *The Oxford Handbook of Philosophy and Psychiatry*. Oxford, OUP, pp. 689-727.
- Davies, M., Davies, A. A., & Coltheart, M. (2005). Anosognosia and the Two-factor Theory of Delusions. *Mind & Language*, 20(2), pp. 209–236.
- Davies, M., Coltheart, M., Langdon, R. and Breen, N., (2001). Monothematic delusions: Towards a two-factor account. *Philosophy, Psychiatry and Psychology*, 8 (2/3), pp. 133–158.
- Dub, R. (2017). Delusions, acceptances, and Cognitive feelings. *Philosophy and Phenomenological Research*, 94(1), pp. 27–60.
- Egan, A. (2009). Imagination, delusion, and self-deception. In T. Bayne & J. Fernández (Eds.), *Delusion and Self-Deception*. Psychology Press, pp. 263–280.
- Eisen JL, Rasmussen SA (1993). Obsessive-compulsive disorder with psychotic features. *Journal of Clinical Psychiatry*, 54, pp. 373–379.
- Ellis, H. and Young, A. (1990). Accounting for Delusional Misidentifications. *British Journal of Psychiatry*, 157, pp. 239-248

- Eng, J., Friis, S., Birkenaes, A., *et al.* (2009). Delusions Are Associated with Poor Cognitive Insight in Schizophrenia. *Schizophrenia Bulletin*, 36 (4), pp. 830–835.
- Espeset, E., Nordbø, R. H., Gulliksen, K. S., *et al.* (2011). The Concept of Body Image Disturbance in Anorexia Nervosa: An Empirical Inquiry Utilizing Patients' Subjective Experiences. *Eating disorders: The Journal of Treatment & Prevention*, 19:2, pp. 175-193.
- Fabrazzo M., Giannelli L., Riolo S., *et al.* (2021). A hypothesis on Cotard's syndrome as an evolution of obsessive-compulsive disorder. *International Review of Psychiatry*, 33 (1-2), pp. 23 - 28
- Fear, C. and Healy, D. (1997). Probabilistic reasoning in obsessive–compulsive and delusional disorders. *Psychological Medicine*, 27(1), pp.199-208.
- Fear, C., Sharp, H. and Healy, D. (2000). Obsessive-Compulsive Disorder with Delusions. *Psychopathology*, 33(2), pp.55-61.
- Fine C, Gardner M, Craigie J, Gold I. (2007). Hopping, skipping or jumping to conclusions? Clarifying the role of the JTC bias in delusions. *Cognitive Neuropsychiatry*, 12(1), pp. 46-77.
- Fineberg, S. and Corlett, P. (2016). The doxastic shear pin: delusions as errors of learning and memory. *Cognitive Neuropsychiatry*, 21(1), pp.73-89.
- Fletcher, P. C. and C. D. Frith, (2009). Perceiving is believing: a Bayesian approach to explaining the positive symptoms of schizophrenia, *Nature Reviews Neuroscience* 10 (1), pp. 48–58.
- Flores, C. (2021). Delusional evidence-responsiveness. *Synthese*. [https:// doi. org/ 10. 1007/s11229-021- 03070-2](https://doi.org/10.1007/s11229-021-03070-2)
- Fotopoulou, A. (2013). Time to get rid of the ‘Modular’ in neuropsychology: A unified theory of anosognosia as aberrant predictive coding. *Journal of Neuropsychology*, 8, pp. 1–19
- Frost, R., Steketee, G. and Nathan, P. (2014). *The Oxford handbook of hoarding and acquiring*, Oxford University Press
- Frost, R., Tolin, D. and Maltby, N. (2010). Insight-Related Challenges in the Treatment of Hoarding. *Cognitive and Behavioral Practice*, 17(4), pp.404-413.
- Fuchs, T. (2014). Psychopathology of depression and mania: symptoms, phenomena and syndromes. *Journal of Psychopathology*, 20(4), pp. 404-413.
- Gadsby, S. (2020). Self-deception and the second factor: How desire causes delusion in anorexia nervosa. *Erkenntnis*. 85(3), pp. 609-626.
- Garety, P. A. and Freeman, D., (1999). Cognitive approaches to delusions: A critical review of theories and evidence, *British Journal of Clinical Psychology*, 38, pp. 113–154.

- Garety, P. and Hemsley, D. (1987). Characteristics of delusional experience. *European Archives of Psychiatry and Neurological Sciences*, 236(5), pp.294-298.
- Gerrans, P. (2014). *The Measure of Madness*, Cambridge, MA: MIT Press.
- Hartmann, A., Greenberg, J. and Wilhelm, S. (2013). The relationship between anorexia nervosa and body dysmorphic disorder. *Clinical Psychology Review*, 33(5), pp.675-685.
- Hood, H. K., Wilson, G.A., Koerner, N. (2019). Poor insight in obsessive-compulsive disorder: Examining the role of cognitive and metacognitive variables. *Journal of Obsessive-Compulsive and Related Disorders*, 23, 100447
- Insel, T. R., & Akiskal, H. S. (1986). Obsessive-compulsive disorder with psychotic features: A phenomenologic analysis. *The American Journal of Psychiatry*, 143(12), pp. 1527–1533.
- Jacobsen, P., Freeman, D. and Salkovskis, P. (2012). Reasoning bias and belief conviction in obsessive-compulsive disorder and delusions: Jumping to conclusions across disorders? *British Journal of Clinical Psychology*, 51(1), pp. 84-99.
- Konstantakopoulos, G., Varsou, E., Dikeos, *et al.* (2012). Delusional of body image beliefs in eating disorders. *Psychiatry Research*, 200(2-3), pp.482-488.
- Kozak, M. and Foa, E. (1994). Obsessions, overvalued ideas, and delusions in obsessive-compulsive disorder. *Behaviour Research and Therapy*, 32(3), pp.343-353.
- Knowles, R., McCarthy-Jones, S., Rowse, G. (2011). Grandiose delusions: A review and theoretical integration of cognitive and affective perspectives. *Clinical Psychology Review*, 31(4), pp. 684-696
- Kringlen, E. (1965). Obsessional neurotics: a long-term follow-up. *British Journal of Psychiatry*, 111, pp. 709–722
- Krishnam, V. and Aravind, V. (2006). Body dysmorphic disorder, dysmorphophobia or delusional disorder-somatic subtype? *Indian Journal of Psychiatry*, 48(4), p.260.
- Jaspers, K. (1963) *General Psychopathology* (transl. by J. Hoenig and M. Hamilton). Manchester: Manchester University Press.
- Labuschagne, I. and Castle, D. (2010). An Examination of Delusional Thinking and Cognitive Styles in Body Dysmorphic Disorder. *Australian & New Zealand Journal of Psychiatry*, 44(8), pp.706-712.
- Lancellotta E, Bortolotti L. (2019). Are clinical delusions adaptive? *WIREs Cognitive Science*, 10: e1502
- Langdon, R. and Coltheart, M., (2000). The cognitive neuropsychology of delusions, in M. Coltheart and M. Davies (eds.) *Pathologies of Belief*, Oxford: Blackwell, pp. 183–216.

- Lavallé, L., Bation, R., Dondé, C. (2020). Dissociable source-monitoring impairments in obsessive-compulsive disorder and schizophrenia. *European Psychiatry*, 14;63(1), e54.
- Lelliot PT, Noshirvani HF, Basoglu M, Marks IM, Monteiro WO (1988). Obsessive-compulsive beliefs and treatment outcome. *Psychological Medicine*, 18, pp.697–702.
- Levy, B., Medina, A.M., Weiss, R.D. (2013). Cognitive and psychosocial functioning in bipolar disorder with and without psychosis during early remission from an acute mood episode: A comparative longitudinal study. *Comprehensive Psychiatry*, 54(6), pp. 618-626
- Maher, B.A., (1974). Delusional thinking and perceptual disorder, *Journal of Individual Psychology*, 30: pp. 98–113.
- Maher, B., and Ross, J.S. (1984). Delusions. In: Adams, H.E., and Sutker, P.B., (eds.) *Comprehensive Handbook of Psychopathology*. New York: Plenum Press, pp. 383-410.
- Mataix-Cols, D., Frost, R., Pertusa, A. (2012). HOARDING DISORDER: A NEW DIAGNOSIS FOR DSM-V? *Depression and Anxiety*, 27, pp. 556–572
- Matsunaga, H., Kiriike, N., Matsui, T., Oya, K., Iwasaki, Y., Koshimune, K., . . . Stein, D. J. (2002). Obsessive-compulsive disorder with poor insight. *Comprehensive Psychiatry*, 43 ,150–157.
- McKay, R., Langdon, R. and Colheart, M., (2005). Sleights of mind: Delusions, defences, and self-deception, *Cognitive Neuropsychology*, 10, pp. 305–326.
- Meier SM, Petersen L, Pedersen MG, Arendt MC, Nielsen PR, Mattheisen M, Mors O, Mortensen PB (2014). Obsessive-compulsive disorder as a risk factor for schizophrenia: a nationwide study. *JAMA Psychiatry*, 71, 1215–1221.
- Mental Health Foundation (2021). *Liz's story: Living with bipolar*. [online] Available at: <<https://www.mentalhealth.org.uk/stories/lizs-story-living-bipolar>> [Accessed 29 July 2021].
- Mintz, A., Dobson, K., Romney, D. (2003). Insight in schizophrenia: a meta-analysis. *Schizophrenia Research*, 61, pp. 75– 88
- Mishara, A. (2009). Klaus Conrad (1905-1961): Delusional Mood, Psychosis, and Beginning Schizophrenia. *Schizophrenia Bulletin*, 36(1), pp.9-13.
- Mishara, A.L and Corlett, P. (2009). Are delusions biologically adaptive? Salvaging the doxastic shear pin. *Behavioral and Brain Sciences*, 32(6), pp. 530-531
- Miyazono, K., Salice, A. (2020). Social epistemological conception of delusion. *Synthese*. <https://doi.org/10.1007/s11229-020-02863-1>

Mizoguchi, Y, and Monji, A. (2014). A Case of Psychotic Depression Successfully Treated with Sertraline as Monotherapy. *Journal of Neuropsychiatry and Clinical Neuroscience*, 26:1. <https://neuro.psychiatryonline.org/doi/pdf/10.1176/appi.neuropsych.12120409>

Mountjoy, R., F. Farhall, J. and L. Rossell, S. (2014). A phenomenological investigation of overvalued ideas and delusions in clinical and subclinical anorexia nervosa. *Psychiatry Research*, 220(1-2), pp.507-512.

Nhs.uk. (2021) About dementia. [online] Available at: <<https://www.nhs.uk/conditions/dementia/about/>> [Accessed 30 July 2021].

Noordhof, P. and Sullivan-Bissett, E. (forthcoming). The Clinical Significance of Anomalous Experience in the Explanation of Monothematic Delusions. *Synthese*.

O'Connell, J., Bendall, S., Morley, E., Huang, C. and Krug, I. (2018). Delusion-like beliefs in anorexia nervosa: An interpretative phenomenological analysis. *Clinical Psychologist*, 22, pp. 317-326.

O'Dwyer, A. and Marks, I. (2000). Obsessive-compulsive disorder and delusions revisited. *British Journal of Psychiatry*, 176(03), pp.281-284.

Owen, G., Cutting, J. & David, A. S. (2007). Are people with schizophrenia more logical than healthy volunteers? *British Journal of Psychiatry* 191, pp. 453-454

Pelizza, L., e Pupo, S. (2013) Disturbo ossessivo-compulsivo con fenomenica psicotica: aspetti psicopatologici e di personalità. *Rivista di Psichiatria*. 48(3), 224-233.

Peters, E., Day, S., Mckenna, J. and Orbach, G. (1999). Delusional ideation in religious and psychotic populations. *British Journal of Clinical Psychology*, 38(1), pp.83-96.

Phillips, K., Pinto, A., Ashely, S. *et al.* (2012). A Comparison of Insight in Body Dysmorphic Disorder and Obsessive-Compulsive Disorder. *Journal of Psychiatric Research*, 46(10), pp. 1293–1299.

Phillips, K. and Hollander, E. (2008). Treating body dysmorphic disorder with medication: Evidence, misconceptions, and a suggested approach. *Body Image*, 5(1), pp.13-27.

Rasmussen, A., Nordgaard J., Parnas, J. (2020). Schizophrenia-spectrum psychopathology in obsessive-compulsive disorder: an empirical study. *European Archive of Psychiatry and Clinical Neuroscience*, 270(8), pp. 993-1002.

Ratcliffe, M. (2015). *Experiences of Depression*. Oxford: OUP.

Rossell, S., Labuschagne, I., and Castle, D. (2020). Delusional themes in Body Dysmorphic Disorder (BDD): Comparisons with psychotic disorders and non-clinical Controls. *Psychiatry Research*, 284, 112694

- Saccomani, L. et al. (1998). LONG-TERM OUTCOME OF CHILDREN AND ADOLESCENTS WITH ANOREXIA NERVOSA: STUDY OF COMORBIDITY. *Journal of Psychosomatic Research*, 44, pp. 565–571
- Schulte, W. (1961). Nichttraurigseinkoennen im Kern melancholischen Erlebens. *Nervenarzt*, 32, pp. 314-320.
- Selesnick, S. A. & Owen, G. S. (2012). Quantum-like logics and schizophrenia. *Journal of Applied Logic*, 10, pp. 115-126.
- Sims, A. C. (2017). Can anosognosia for hemiplegia be explained as motivated self-deception? *Review of Philosophy and Psychology*, 8(2), pp. 337–353.
- Stanghellini, G. and Raballo, A. (2015). Differential typology of delusions in major depression and schizophrenia. A critique to the unitary concept of ‘psychosis’. *Journal of Affective Disorders*, 171, pp. 171-178
- Sullivan-Bissett, E. (2020). Unimpaired Abduction to Alien Abduction: Lessons on Delusion Formation. *Philosophical Psychology*, 33 (5), pp. 679–704.
- Toh, W, Castle, D. J. et al. (2017). Insight in body dysmorphic disorder (BDD) relative to obsessive-compulsive disorder (OCD) and psychotic disorders: Revisiting this issue in light of DSM-5. *Comprehensive Psychiatry* 77, pp. 100–108
- Tolin, D., Fitch, K.E., et al. (2008). Family Informants’ Perceptions of Insight in Compulsive Hoarding. *Cogn Ther Res*, 34, pp. 69–81.
- Tranel, D., Damasio, H. and Damasio A.R. (1995). Double dissociation between overt and covert recognition. *Journal of Cognitive Neuroscience*, 7, pp. 425–432.
- Van Bergen, A.H., Verkooijen, S., Vreeker, A. et al. (2019). The characteristics of psychotic features in bipolar disorder. *Psychological Medicine*, 49(12), pp. 2036-2048
- Veale, D. (2007). Treating Obsessive-Compulsive Disorder in People with Poor Insight and Overvalued Ideation. In M. M. Antony, C. Purdon, & L. J. Summerfeldt (Eds.), *Psychological treatment of obsessive-compulsive disorder: Fundamentals and beyond*. American Psychological Association, pp. 267–280.
- Veale, D., Matsunaga, H. (2014). Body dysmorphic disorder and olfactory reference disorder: proposals for ICD-11. *Revista Brasileira de Psiquiatria*, 36(1), pp.14–20.
- Weinstein E.A, Kahn RL. (1950). The Syndrome of Anosognosia. *Archives of Neurology and Psychiatry*. 64(6), pp. 772–791.
- Young, A. W., Leafhead, K. M., & Szulecka, T. K. (1994). The Capgras and Cotard delusions. *Psychopathology*, 27, pp. 226–231.

Young, A. W., Robertson, I. H., Hellowell, D. J., de Pauw, K. W., & Pentland, B. (1992). Cotard delusion after brain injury. *Psychological Medicine*, 22, pp. 799–804.



OVERVIEW



WILEY

Are clinical delusions adaptive?

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Abstract

Delusions are symptoms of psychiatric disorders such as schizophrenia and dementia. By and large, delusions are characterized by their behavioral manifestations and defined as irrational beliefs that compromise good functioning. In this overview paper, we ask whether delusions can be adaptive notwithstanding their negative features. Can they be a response to a crisis rather than the source of the crisis? Can they be the beginning of a solution rather than the problem? Some of the psychological, psychiatric, and philosophical literature has recently suggested that they can. We consider different types of delusions and different ways in which they can be considered as adaptive: psychologically (e.g., by increasing wellbeing, purpose in life, intrapsychic coherence, or good functioning) and biologically (e.g., by enhancing genetic fitness). Although further research is needed to map the costs and benefits of adopting and maintaining delusional beliefs, a more nuanced picture of the role of delusions in people's lives has started to emerge.

This article is categorized under:

Philosophy > Representation

1 | INTRODUCTION

In this paper we offer a brief overview of clinical delusions as they are discussed in the psychiatric, psychological, and philosophical literature, asking whether they can at the same time be symptoms of psychiatric

disorders and have adaptive features. Delusions emerge in a variety of disorders, including schizophrenia, amnesia, dementia, delusional disorders, depression, and obsessive–compulsive disorders. They are typically unusual beliefs reported with conviction and held in the face of counterevidence. They can have varied content: people with delusions of persecution say that others want to harm them; people with delusions of mirrored-self misidentification treat the reflection of their own face in the mirror as the face of a stranger, even though they preserve the general capacity to recognize images in the mirror as reflections. Can delusions be adaptive? We take a trait or a mechanism to be adaptive if it contributes to the genetic fitness of the organism, cashed out in terms of increased chances for survival and reproduction. Physical and mental illness have been accounted for in terms of dysfunction (Wakefield, 1992) and adaptiveness (Murphy, 2005). One view is that illness arises

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either from the breakdown of a mechanism which no longer performs its function or from a change in the environment—some behavior that increased genetic fitness in the old environment no longer matches the needs of the organism in the new environment. Delusions are usually categorized as beliefs resulting from the breakdown of some adaptive mechanism (e.g., a deficit in the belief formation process) or as manifestations of behavior that contributed to genetic fitness in a different environment but no longer contributes to genetic fitness in the current environment (e.g., paranoia may have been adaptive in an environment where trusting others was especially risky). The notion of adaptiveness has been developed within evolutionary biology and in relation to genetic fitness, but by extension it has been used to characterize aspects of behavior that have significant benefits and whose value is not limited to an increase in an organism's chances of survival and reproduction. For instance, we can describe delusions as *psychologically* adaptive if they lead to increased wellbeing (McKay & Dennett, 2009) or have other psychological benefits such as promoting good functioning, enhancing meaningfulness, or restoring intrapsychic coherence.

First, we describe what delusions are (Section 2). Then, we consider how the notion of adaptiveness has been applied to

them, and what the relationship may be between psychological and biological adaptiveness (Section 3). Further, we review arguments to the effect that some delusions have psychologically adaptive features (Section 4), and arguments to the effect that some delusions have biologically adaptive features (Section 5). Next, we introduce the case of delusions in obsessive–compulsive disorder (OCD) and in major depressive disorders (MDD), where recent evidence suggests that delusional beliefs can be biologically and psychologically maladaptive in the long term but psychologically adaptive in the short term (Section 6). In the end, we identify some areas for future research where new evidence may enable us to reach a more satisfactory conclusion about the adaptiveness of some delusions, while remaining skeptical about the possibility to establish whether delusions *in general* are adaptive (Section 7).

This skepticism is justified by the fact that “delusion” is used as a family-resemblance term and that different conclusions

about the adaptiveness of a delusion may be drawn depending not only on structural features that are shared by most delusions, but also on the content of the delusional beliefs, which is subject to great variation. The possibility that delusions are adaptive deserves further considerations notwithstanding the challenges we highlight, because it has significant implications for our conception of delusions as a symptom of psychiatric disorders and for our interactions with people reporting delusional beliefs.

2 | WHAT ARE DELUSIONS?

There are some controversies about the best way to define delusions and there are also some debates about whether delusion overlaps with phenomena like self-deception and confabulation. In this section we briefly address these issues.

Here are some definitions of delusions:

A false belief based on incorrect inference about external reality that is firmly held despite what almost everyone else believes and despite what constitutes incontrovertible and obvious proof or evidence to the contrary. The belief is not ordinarily accepted by other members of the person's culture or subculture (i.e. it is not an article of religious faith). When a false belief involves a value judgment, it is regarded as a delusion only when the judgment is so extreme as to defy credibility. (APA, 2013, DSM-5, p. 819)

A person is deluded when they have come to hold a particular belief with a degree of firmness that is both utterly unwarranted by the evidence at hand, and that jeopardises their day-to-day functioning. (McKay, Langdon, & Coltheart, 2005, p. 315)

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Delusions are generally accepted to be beliefs which (a) are held with great conviction; (b) defy rational counter-argument; and (c) would be dismissed as false or bizarre by members of the same socio-cultural group. (Gilleen & David, 2005, pp. 5–6)

The definitions above characterize delusions on the basis of their *surface features*, and in particular their negative epistemic features, where “epistemic” denotes something that has to do with knowledge and belief. Delusions are defined as beliefs that are *unwarranted, fixed, resistant to counterargument, and implausible*. Some definitions also include negative psychological features, adding that delusions typically compromise wellbeing or good functioning. Most definitions make no reference to the mechanisms responsible for the formation of delusional beliefs. This is not surprising as delusions emerge in a variety of contexts and thus researchers have not come to a consensus on the best etiological account of delusions.

Delusions used to be divided into *functional* and *organic*: a delusion was called *organic* if its presence was explained by brain damage (such as injuries affecting the right cerebral hemisphere), and *functional* if its presence was explained by psychodynamic or motivational factors. Today, it is acknowledged that there are biological and psychological factors contributing

to most types of delusions, although there may be still some work to do in order to identify such factors with precision and map the interaction between them.

Consider the two delusions we introduced earlier, persecution and mirrored-self misidentification. Persecution is usually a *polythematic* and *elaborated* delusion, that is, it extends to more than one theme where the themes can be interrelated, and it is well integrated in the person's belief system, often driving action that is consistent with the person believing the content of the delusion. For instance, a young woman who believes that she is surrounded by alien forces that control her own actions and are slowly taking over people's bodies might decide to run away to protect her loved ones from danger (Payne, 2013).

Mirrored-self misidentification is usually *monothematic* and *circumscribed*. That means that, apart from the content of the delusion itself, the person may not make any other implausible claim and the delusion may not be supported by, or support, the person's other beliefs. Suppose an elderly man experiencing mirrored-self misidentification is asked whether “the stranger in the mirror” resembles him. The man might acknowledge that the stranger looks like him, which makes his delusional belief

that the person in the mirror is a stranger even less plausible (Breen, Caine, Coltheart, Hendy, & Roberts, 2000). Other examples of monothematic delusions are Capgras and Cotard. In Capgras the person claims that a dear one (a close relative or the spouse) has been replaced by an impostor. In Cotard the person reports being disembodied or dead. In most cases such beliefs are not interacting with the person's other beliefs, although they may be defended with reasons when challenged. So, the person with Capgras may not go looking for the loved one who is believed to be missing (although some people with Capgras are hostile and even violent towards the alleged impostor) and the person with Cotard may not act dead (although some people with Cotard may stop routine behavior such as bathing).

One might wonder what the difference is between delusion and other false or irrational behaviors we find in the clinical and nonclinical population. Most definitions of delusions fail to provide a set of necessary and sufficient conditions for the phenomenon and leave it open that delusions may overlap with, for instance, cases of self-deception and confabulation.

Self-deception is much more common than delusion and does not seem to have the same disruptive consequences on functioning. In some instances, the phenomena cannot be easily distinguished, as they both involve some belief that is not well-grounded and that people nonetheless report with conviction and are often prepared to act upon. The distinction between delusion and self-deception is often characterized by the role of *motivational factors*. In self-deception, motivational factors

are central. If we are self-deceived, we end up believing what we *want to* be the case (“My partner is faithful to me,” “I failed

the exam because I was too tired after a night out,” etc.). In delusion, motivational factors may have a role, but need not. The content of delusional beliefs is not always something we find desirable. In some delusions, we might conjure a positive image of ourselves, for instance, as people who were chosen by God to accomplish an important mission in delusions of reference; as the only people able to understand a complex conspiracy in delusions of grandeur; or as attractive sexual partners pursued by famous people in erotomania.

In other delusions, though, we see ourselves as overwhelmed by guilt (delusions of guilt), or manipulated by external forces who can control our actions or even insert thoughts in our heads (delusions of passivity and thought insertion). That said, even thoroughly unpleasant delusions, such as delusions of persecution, might have a defensive role to play, protecting our self-esteem. Bad events in our lives are explained by the evil intentions of the persecutors and not by our own failings.

Typically, “delusion” refers to a clinical phenomenon and “self-deception” to a nonclinical one, however, there is no sharp

distinction between delusion and self-deception. In this article we shall consider some delusions that are described as “motivated” in that they represent the person's reality as more pleasant than it is. In those cases, the line between delusion and self-deception cannot be clearly drawn as motivational factors are likely to play a role in both phenomena.

Another distinction that is not made consistently in the literature is between delusion and confabulation. Confabulation, just like delusion, is primarily characterized by negative epistemic features—it is described as an ill-grounded belief or a false narrative (e.g., Hirstein, 2005). It is key to confabulation that the belief or narrative is genuinely endorsed and presented with no intention to deceive. So, there is a substantial overlap with delusion. The main difference between delusion and confabulation is that, as a clinical phenomenon (*narrow confabulation*), confabulation concerns the distortion or fabrication of a memory, and thus it most often emerges in psychiatric disorders that feature serious memory impairments such as amnesia and dementia. Delusion does not need to involve memory distortions or fabrications.

As a nonclinical phenomenon (*broad confabulation*), confabulation is just an explanation that is ill-grounded (e.g., Hirstein, 2005; Nisbett & Wilson, 1977), and thus it does not need to involve any memory impairment. That said, some differences can be found also between delusion and broad confabulation. Whereas a delusion is usually an implausible belief that can be further elaborated but does not need to, a confabulation can be very plausible and often takes the shape of an explanation or a narrative, thus exhibiting a high level of elaboration and integration with the person's other beliefs. An influential answer to the question about the differences between delusion and self-deception, or delusion and broad confabulation, is that the former is a pathological phenomenon that characterizes a clinical population, whereas the latter is a widespread phenomenon in the nonclinical population that does not need to impair functioning and does not count as a symptom of mental distress. However, we should be cautious and avoid relying too heavily on the distinction between *pathological* and *nonpathological* belief or between *clinical* and *nonclinical* populations, because it is not clear what makes a belief pathological and beliefs with the same epistemic features as delusions are to be found in people who do not experience mental distress and do not attract a psychiatric diagnosis (Bortolotti, Gunn, & Sullivan-Bissett, 2017).

3 | ADAPTIVENESS

The adaptiveness of delusions has been briefly explored in the recent literature, and we shall review some of the identified costs and benefits of adopting or maintaining delusional beliefs in Sections 4, 5, and 6. Here we explain why we distinguish such costs and benefits in biological and psychological, and consider some hypotheses about what the relationship between the two categories may be.

“Adaptiveness” is first and foremost a biological notion. The goal of adaptive traits is to support the reproductive success

and survival of the biological organism they belong to. Crucially, adaptiveness is not a timeless process but rather a historical one, and an adaptive trait is closely connected to the environment in which it develops. Thus, some traits can be adaptive in one environment without being adaptive in other environments, or they can lose their adaptiveness as a consequence of environmental changes. By analogy with biological adaptiveness, some authors speak of *psychological* adaptiveness when a belief, state of mind, or mechanism delivers important psychological benefits to an organism, such as enhancing its psychological wellbeing.

It is not clear how biological and psychological adaptiveness relate to each other. As Ryan McKay and Daniel Dennett eloquently write, behaviors that are psychologically adaptive may not be biologically so, and behaviors that are biologically adaptive may not be psychologically so:

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Here we must be careful to honour a distinction, often complacently ignored, between human happiness and genetic fitness. If the most promising path, on average, to having more surviving grand offspring is one that involves pain and hardship, natural selection will not be deterred in the least from pursuing it (it is well to remind ourselves of the insect species in which the males are beheaded in the normal course of copulation, or – somewhat closer to home – the ruthless siblingcide practiced by many bird species). (McKay & Dennett, 2009, p. 502)

As Randolph Nesse (1998, p. 401) also says: “natural selection shaped the regulation mechanisms for maximal reproductive success, not for peace and happiness.” In some cases, nature seems to have designed us to derive pleasure from those behaviors which foster reproductive success and survival, such as sexual intercourse (e.g., Fleischman, 2016). However, in other cases, biological and psychological adaptiveness come apart. For instance, enjoying very low levels of anxiety can be psychologically beneficial, but poses a threat to reproductive fitness. This is because, if we underestimate danger, then we drastically decrease our chances of survival and reproduction (e.g., Lee, Wadsworth, & Hotopf, 2006). In the case of beliefs more specifically, as McKay and Dennett (2009) argued, a belief leading to psychological wellbeing may or may not be biologically adaptive. We will review cases of delusions which seems to be both psychologically and biologically beneficial in the short term, such as motivated delusions, and cases of delusions where psychological benefits come with an increase of the severity of symptoms, such as delusions in MDD and OCD.

3.1 | The doxastic shear-pin

What would it mean for delusions to be adaptive? As delusions are commonly defined on the basis of their negative features and are symptoms of a number of severe disorders, the possibility that they are adaptive in any sense is often quickly dismissed. However, it has been suggested that delusions are an instance of misbelief that is potentially adaptive. McKay and Dennett introduce the metaphor of the *doxastic shear pin* to ask whether delusions are the outcome of a mechanism that is designed to malfunction in some circumstances in order to prevent a more serious malfunctioning from occurring.

A shear pin is a metal pin installed in, say, the drive train of a marine engine. The shear pin locks the propeller to the propeller shaft and is intended to “shear” should the propeller hit a log or other hard object. (McKay & Dennett, 2009, p. 497)

Shear pins are designed to break under extreme conditions, allowing a system to keep functioning, although in an imperfect manner. Delusions might act as shear pins, allowing the doxastic system to keep working in times of extreme distress. In this picture, delusions emerge as a response to a breakdown threatening a person's epistemic and emotional engagement with reality.

We envision doxastic shear pins as components of belief evaluation machinery that are “designed” to break in situations of extreme psychological stress (analogous to the mechanical overload that breaks a shear pin or the power surge that blows a fuse). Perhaps the normal function (both normatively and statistically construed) of such components would be to constrain the influence of motivational processes on belief formation. Breakage of such components, therefore, might permit the formation and maintenance of comforting misbeliefs – beliefs that would ordinarily be rejected as ungrounded, but that would facilitate the negotiation of overwhelming circumstances [...] and that would thus be adaptive in such extraordinary

circumstances (McKay & Dennett, 2009, p. 501)

McKay and Dennett consider the possibility that some delusions may be biologically adaptive as doxastic shear pins, and in the end they reject this hypothesis. However, this has not stopped other scholars using the doxastic shear pin metaphor to argue for the potential adaptiveness of delusions. For instance, Lisa Bortolotti argued that motivated delusions, as well as delusions in schizophrenia, can have both *psychological* and, indirectly, *epistemic* benefits (Bortolotti, 2015, 2016). By enabling the doxastic system to continue working (albeit imperfectly) when the person is at risk of being overwhelmed by negative emotions or by the uncertainty caused by anomalous experience, delusions support the person's capacity to pursue and achieve some of her epistemic goals. Without the psychological relief that the delusion offers, the person's capacity to pursue and achieve her epistemic goals would be compromised by a disrupted or absent interaction with her surrounding environment.

Philip Corlett and colleagues argue against McKay and Dennett that the doxastic shear-pin hypothesis leads to the claim that all delusions are *biologically*—not just psychologically—adaptive (see Fineberg & Corlett, 2016; Mishara & Corlett, 2009). This is because on their account delusions arise as a response to aberrant prediction error signals and permit “ongoing function in the face of paralyzing difficulty” (Fineberg & Corlett, 2016, p. 73). Fineberg and Corlett argue that the function of delusions is to keep a person in contact with her environment in situations of emergency and view this as a contribution to survival: “our model indicates how delusions may be adaptive as a shear pin function by enabling the patient to remain in vital connection with his/her environment” and “patients continue to respond reflexively to the environmental cues incumbent upon them, necessary for continued survival” (Mishara & Corlett, 2009, p. 531). On this account, the emergency is described differently from how it is described by McKay and Dennett. For McKay and Dennett, the risk is that negative emotions may over-

whelm the person and cause a complete absence of interaction with the environment via severe depression, which may occur when the shear pin does not break. For Mishara and Corlett, instead, the risk is that the learning system crashes due to the persistent prediction-error signals it receives and is disabled, leaving the person unable to gather information about aspects of her environment that are crucial to her survival. So, the averted danger is presented not just as a psychological benefit, but as a biological one.

We will come back to this account in the next section, where we consider the hypothesis that delusional beliefs are biologically adaptive.

4 | BIOLOGICAL ADAPTIVENESS OF DELUSIONS

In this section, we review the reasons for considering delusions maladaptive and then turn to one influential argument for the biological adaptiveness of delusions, suggesting that they are instrumental to learning being restored after the effect of disrupting prediction error signals. There is evidence suggesting that delusions are biologically maladaptive. The presence of delusions is a predictor of poor long-term outcome in people with paranoid psychosis (Jørgensen, Aagaard, Jespersen, & Mortensen, 1987) and people with schizophrenia who often experience hallucinations and delusions marry and reproduce less than controls (Nanko & Moridaira, 1993), suggesting that psychiatric disorders characterized by psychotic symptoms compromise a person's chances to mate and reproduce. Although there is still disagreement about how delusions are formed and

maintained, the plausible candidate theories present delusions as the outcome of a malfunctioning mechanism, though the nature of the mechanism involved varies from one account to the next. One-factor theories (Maher, 1974) and predictive processing models (Corlett, Taylor, Wang, Fletcher, & Krystal, 2010; Fletcher & Frith, 2008) argue that abnormal perceptions or aberrant predictive error signals are necessary and sufficient for delusional beliefs. Instead, two-factor accounts (Coltheart, Menzies, & Sutton, 2010; Davies, Coltheart, Langdon, & Breen, 2001; Stone & Young, 1997) hold that abnormal data are necessary but not sufficient to account for the adoption of delusions, introducing a second factor. This is to be identified with some form of reasoning bias or deficit. Error management theorists argue that delusions are the outcome of extreme, pathological versions of evolutionary biases (Miyazono, 2015; McKay & Dennett, 2009, p. 502). What theory of delusion formation we adopt matters to whether we believe that delusions can be adaptive. Delusions are biologically adaptive if, as a response to a crisis of some sort (anomalous perception or overwhelming distress), they enhance a person's chances of reproductive success and survival by conferring systematic biological benefits. The view that delusions have biological benefits has been defended by some predictive coding theorists and we now turn to their account.

4.1 | Making sense of anomalous experience

Predictive coding assumes that the brain is a predictive machine governed by a simple principle: to minimize uncertainty and to build an internal model of the world which reduces to a minimum the discrepancy between what is expected and what is experienced (Hohwy, 2014). It proves difficult to reduce predictive coding to either a one-factor or a two-factor account (Miyazono, Bortolotti & Broome, 2015). Contrarily to both one and two-factor theories, prediction error theories do not draw a sharp distinction between perception and belief (Fletcher & Frith, 2008; Williams, 2018). This is because in predictive coding perception and belief are two temporal phases of the same process of hierarchical Bayesian inference. While perceptions take place lower down in the hierarchy, at a faster and more limited spatiotemporal scale, beliefs (delusions included) are generated at a higher level of the same hierarchy, at a larger and more abstract spatiotemporal level. Another important distinction between prediction-error theories and either the one-factor or the two-factor account is that, instead of perceptions unidirectionally influencing beliefs, in predictive processing perceptions and beliefs dynamically sculpt one another, so that we do not just believe what we see but we also see what we believe (McKay, 2012).

According to prediction error theories, delusions are reached via a single impairment in the hierarchy of inference (Bortolotti & Miyazono, 2015). The impairment in question would be represented by aberrant prediction-error signals, which cause the subject to depart from ideal Bayesian norms of rationality. Normally, prediction errors signal a discrepancy between what the person expects and what she actually experiences, so that the experience either is discarded because it conflicts with the person's existing beliefs, or it is taken to imply that something was amiss in the person's expectations and new beliefs need to be adopted. The criteria according to which an experience either is discarded or causes prior beliefs to be updated depend on the estimation of the precision of the prediction error. If a prediction error is estimated to be precise, it results into an updating of the existing beliefs; if it is not estimated to be precise, the experience is discarded.

In people with delusions, prediction errors are elicited when they should not, by events that appear significant and salient but are unsurprising, or they are mistakenly weighted as highly precise.

[P]rediction error theories of delusional formation suggest that under the influence of inappropriate prediction error signal, possibly as a consequence of dopamine dysregulation, events that are insignificant and merely coincident seem to demand attention, feel important and relate to each other in meaningful ways. Delusions ultimately arise as a means of explaining these odd experiences.” (Corlett et al., 2010, p.

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Due to the high precision erroneously assigned to the prediction error, its rejection is not a viable option. Hence a revision of priors takes place, and a delusional belief is adopted as a new prior making sense of the anomalous experience. At a later stage, further aberrant perceptions are explained in the light of the delusional prior, giving way to a process of reinforcement which strengthens the endorsement of the delusion (Fineberg & Corlett, 2016, p. 79).

42 | Resuming automated learning

Within a predictive coding framework, advocates of delusional adaptiveness argue that the main biological benefit of delusions consists in enabling the learning system to resume its normal function in the face of aberrant perceptions and prediction-error signals (Fineberg & Corlett, 2016, pp. 73–76; Mishara & Corlett, 2009, p. 530). By explaining anomalous perceptions and prediction errors, delusions not only provide some short-term relief from uncertainty, but they also salvage the learning capabilities of the person by protecting her from the danger of having frequent, unexplained and highly precise aberrant prediction error signals. These are thought to disrupt the normal process of learning and, as far as they persist, to severely impair the contact of the person with the world. The view is that, by explaining aberrant prediction errors, delusions prevent a complete loss of contact with reality. This is regarded to be biologically adaptive, because being in contact with reality in an impaired manner affords a person better chances of survival than being in no contact with reality at all.

Although on this view delusions “rescue” the learning system, when adopted and maintained, they disable its most flexible and cognitively expensive part. There are in fact two distinct parts of the learning system which compete to control behavior, one goal-directed, the other habitual. While the former “involves learning flexible relationships between actions and outcomes” (Mishara & Corlett, 2009, p. 530), the latter mirrors a more stereotyped relationship between stimuli and responses, such that a particular stimulus always triggers a particular response, independently from the outcome. When delusions are adopted, the flexibility of the former system is disabled to permit ongoing learning, while the latter system takes over in controlling the person's delusional beliefs (Fineberg & Corlett, 2016, p. 76). On the account, this explains the fixity and inflexibility of delusional states, features that make them more similar to habits than to actions that are sensitive to rewards. Although the goal-directed system still functions in the formation and assessment of other beliefs, it is disabled with regard to the delusional beliefs: it would be cognitively too costly to keep it working in the face of anomalous perceptions and predictive errors. Here is an example. The belief that her spouse has been replaced by an identically looking imposter provides an explanation for the anomalous feeling of unfamiliarity the person looks at experiences when she sees her spouse's face (*delusional formation*). The delusional belief (“My spouse has been replaced by an impostor”) is then reinforced by the persistency of the aberrant feelings of unfamiliarity and ends up being adopted as a new prior which explains the perceptions in question (*delusional maintenance*). There are several advantages to entertaining such a bizarre belief: the discrepancy between perceptions and expectations is reduced, the anxiety induced by the unexplained experiences is relieved, and learning is resumed as soon as the prediction errors are got rid of. Now the person can focus her attention on other things rather than spending all her resources trying to make sense of a persistent feeling of unfamiliarity when looking at her spouse. Life can go on, but at a price.

The sensitivity of the new belief to counterevidence has been disabled. From a cognitive point of view, it would in fact be too expensive to maintain belief flexibility in the presence of the mental distress brought about by the aberrant prediction-error signals which accompany the delusional perception (Fineberg & Corlett, 2016, p. 76; Gold et al., 2013). Hence, delusions restore the contact of the person with reality—in the sense that they allow the person to focus her attention and mental energy on something different from her aberrant perceptions—but at the cost of the responsiveness of her newly formed beliefs to evidence.

43 | Problems with the adaptiveness claim

How plausible is it that delusions contribute to keep a person in contact with reality? The idea is that delusions provide an explanation to previously unexplained aberrant perceptions that would otherwise monopolize the person's cognitive resources. By doing so, delusions would allow the person to focus on aspects of the world other than those that are the object of her aberrant perceptions. In this picture, the adoption of a delusion restores the process of learning which is momentarily blocked by the presence of salient, unexplained perceptions.

This account is controversial. Many delusions are thought to absorb and hijack cognitive resources instead of freeing them up. As we saw earlier, people with delusions of persecution may be preoccupied that ill-intentioned aliens wish them harm and that thought might dominate their mental life. They often take action like moving cities and avoiding contact with people to keep themselves and others safe. It is apparent that in such cases delusions are time and energy consuming rather than cognitively liberating. However, a supporter of the adaptiveness of delusions might not need to deny that maintaining the delusions in the long run can cause severe disruption to a person's life. Rather, the claim is that, when the delusion is adopted, the person may be better off by believing that alien forces are persecuting her than being bombarded by inexplicable and dis-comforting perceptions. The veracity of such a claim is an empirical issue, as it implies ascertaining whether people with abnormal perceptions and no delusions are worse off than people having both abnormal perceptions and delusions. One consideration is that the phase of abnormal perceptions usually preceding the formation of delusions (e.g., the so-called "prodromal phase" in schizophrenic delusions) might last days, months, even years (Mishara & Corlett, 2009). If someone experiences aberrant perceptions for years, it is implausible to imagine that she is in a state of emergency for such a long time.

Again, a supporter of the adaptiveness of delusions might reply that the shear pin breaks only when aberrant perceptions have reached a certain threshold of intensity, and this might well take years to happen.

5 | PSYCHOLOGICAL ADAPTIVENESS OF DELUSIONS

In this section we consider the rather obvious psychological costs of adopting delusional beliefs and the less obvious (often short-term) benefits that adopting delusions can bestow on agents who are already experiencing what can be described as a crisis (McKay & Dennett, 2009). Many delusions have detrimental psychological effects, causing unhappiness and worry to the people who experience them (see, e.g., Garety & Hemsley, 1987). All delusions can be disruptive in the sense that they alter the person's sense of reality and compromise socialization by causing the person with the delusions to become overly preoccupied with the content of the delusion and isolated. Moreover, some psychological harm can stem directly from the content of the delusion. We saw earlier that in some cases of persecutory delusions, the person lives in fear, worried that the threats she experiences are going to cause her or her loved ones pain or death.

Some other delusions, however, are not held with distress. On the contrary, depending on their content, some delusions can confer a sense of purpose and boost self-esteem (see, e.g., McCreery & Claridge, 2002; Peters, Day, Mckenna, & Orbach, 1999; Roberts, 1991). For instance, delusions of reference and delusions of grandeur can make the person feel important and worthy of admiration. Whether the delusions with desirable content have positive or negative psychological effects depends on the preferred notion of wellbeing, as has been argued before (for instance, see Miyazono, 2015). Delusions of reference and grandeur have psychological benefits on a *hedonic* view of wellbeing, intended as a subjective feeling about how well one's life is going. On a *eudaimonic* view of wellbeing, however, where the authenticity and meaningfulness of a person's life, her agency, and her capacity to function socially are also taken into account, even delusions with positive content can have negative effects. Believing that one is Napoleon is empowering, but the clash between the belief and the reality of the person's surroundings means that there is a loss of contact with the physical and social environment, and alienation ensues. That said, there are accounts where delusions are described as responses to a critical situation, maybe the beginning of a solution, rather than the source of the problem. It is not clear to what extent this view can be generalized to all types of delusions, but some adaptive features can be identified in different types of delusions. Some delusions in schizophrenia provide temporary anxiety relief by offering explanations for unusual experiences. Some elaborated delusions can increase a sense of meaningfulness and purpose. Some “motivated” delusions make a harsh reality temporarily less distressing. And some delusions in dementia fill gaps in a person's failing understanding of the world.

5.1 | Putting an end to uncertainty

In some influential accounts of the formation of delusions in the context of schizophrenia (such as the ones provided by Kapur, 2003), the adoption of a delusional belief is said to offer the person some relief from anxiety:

First, endogenous psychosis evolves slowly (not overnight). For many patients it evolves through a series of stages: a stage of heightened awareness and emotionality combined with a sense of anxiety and impasse, a drive to ‘make sense’ of the situation, and then usually relief and a ‘new awareness’ as the delusion crystallizes and hallucinations emerge. (Kapur, 2003, p. 15)

The idea is that in the first stage of psychosis the person has experiences that appear to her as inexplicably salient and this causes anxiety and negative emotions that can become overwhelming, with adverse effects for well-being.

The sense is that some- thing important is about to happen, but there is no indication of what that something might be. As in the classic literature on delusions by Jaspers (1963) and Conrad Mishara (2010), the delusion emerges as an explanation or a revelation, taking away the sense of uncertainty. Although the adoption of the delusion can be seen as a temporary relief from anxiety, the delusion itself can become a source of anxiety in the long run. Especially when delusions have distressing content, they can affect negatively a person's life. That is why anxiety relief is likely to be temporary, an effect of the *adoption* but not of the *prolonged maintenance* of the delusion.

People may no longer feel anxious about their hypersalient experience (for example, “how should I interpret this?”), but they can feel anxious and distressed about how the world is according to the delusion (for example, “how can I escape from the alien forces persecuting me?”). (Bortolotti, 2016, pp. 890–891)

52 | Finding life meaningful

In an interesting study aimed at exploring the potential adaptiveness of delusions (Roberts, 1991), people with elaborated and systematized delusions were found to score higher than people in remission, rehabilitation nurses, and Anglican ordinands in the “purpose in life” test and the “life regard” index, which measure respectively a person's experience of meaning and purpose in life and a person's regard for her own life. The conclusion of the study is that “for some there may be satisfaction in psychosis and that [delusion formation] is adaptive” (Roberts, 1991, p. 19). The psychological adaptiveness of the delusion is ascribed to two factors: the delusion serves as an explanation for an experience that was distressing or perplexing for the person, bringing relief from uncertainty; and the delusional reality may be preferable to the actual reality the person finds herself in, playing a defensive function. More recently, it has been found that people in acute delusional state may have a greater “sense of coherence” than people with no psychiatric diagnosis (Bergstein, Weizman, & Solomon, 2008). The sense of coherence encompasses the feeling that there are projects that are both worth engaging and challenging, and that the person has the resources to pursue them. The sense of coherence is positively correlated with wellbeing.

53 | Overcoming trauma

In Section 3, we saw that one of the main reasons put forward in the literature for the psychological adaptiveness of delusions—McKay and Dennett's original doxastic shear pin account—is that some delusions (especially so-called *motivated* delusions) play a defensive function, representing the world as the person would like it to be. One example is anosognosia, which most commonly involves the denial that a limb is paralyzed (“I am moving my arm,” when the arm cannot move; or “I can climb stairs but I am a little slow,” when legs are paralyzed). People with anosognosia often deny obvious evidence of their impairment (Berti, Spinazzola, Pia, & Rabuffetti, 1993, p. 164). The delusion has negative effects, compromising the shared reality between the person and her closest ones. Further problems are likely to emerge if the person refuses to acknowledge the implications of her impairment and fails to engage in rehabilitation. However, when people need to live with the consequences of trauma, denying the impairment can be adaptive in the short term (Fotopoulou, 2008; Ramachandran, 1996) as people do not have to accept that they are severely disabled and that their lives have dramatically changed. Overwhelming negative emotions would compromise the person's capacity to interact with her physical and social environment because severe depression would not be conducive to the pursuit of her goals. Indeed, people who experience anosognosia are found to have fewer negative emotions and reduced anxiety with respect to people who acknowledge their impairment.

54 | Filling gaps

Delusional beliefs may emerge in people with middle- to late-stage dementia, usually beliefs involving suspicions or paranoia (e.g., the belief that someone is stealing things). Although the memory impairment can be a trigger for the suspicion or the accusation (e.g., the person cannot remember where she placed her possessions), such delusional beliefs are not distorted memory reports but firmly held beliefs that the person does not typically abandon as a result of a reasoned argument.

Such delusional beliefs are extremely distressing for caregivers who are often the object of suspicions and accusations, and who need to manage the person's delusions-driven behavior. However, in the circumstances in which the person finds herself, it is not difficult to see how the delusional beliefs play the role of (implausible but) handy explanations for unexpected events (“I cannot find my wallet”), thereby offering some short-term relief to them as they are trying to make sense of a physical and social world that is increasingly hard to navigate.

6 | DELUSIONS IN OCD AND MDD

Here we turn to delusional beliefs emerging in disorders that traditionally do not involve psychotic symptoms, such as OCD and MDD. Although the question whether delusions are adaptive in these contexts may be premature, the literature suggests that there may be some short-term psychological benefits for the people with OCD or MDD who develop delusional beliefs congruent with their habits or moods.

6.1 | Delusions in OCD

According to the *Diagnostic and Statistical Manual of Mental Disorders*,

OCD is characterized by the presence of obsessions and/or compulsions. Obsessions are recurrent and persistent thoughts, urges, or images that are experienced as intrusive and unwanted, whereas compulsions are repetitive behaviours or mental acts that an individual feels driven to perform in response to an obsession or according to rules that must be applied rigidly. (APA, 2013, DSM-5, p. 235)

Most people with OCD display good insight into their illness, regarding their obsessive–compulsive behaviors as unwarranted and exaggerated. However, in a minority of cases (around 4% according to DSM-5, p. 238) people hold their obsessive–compulsive thoughts with delusional conviction, fearing that not ritualising will bring about dreaded consequences.

[X] thought a supernatural ‘power’ inserted unpleasant thoughts into her mind, e.g. “if you read that book a relative will die” [...] To appease the ‘power’ and the thoughts, she developed complex counting rituals pervading her daily activities. She also did ritualistic hand-washing and checking. She avoided specific numbers, colours and clothes and counted from 0 to 8 on her fingers and toes throughout the day [...] She felt unable to resist the rituals, as her belief in negative consequences was absolute. (O’Dwyer & Marks, 2000, p. 282)

The reasons why obsessions might develop into delusion-like beliefs are far from being fully understood; however, some proposals have been advanced. It has been hypothesized that high levels of anxiety, combined with obsessions, predict the formation of delusional beliefs (Bortolon & Raffard, 2015). Single-themed

obsessions, magical thinking, and depressive symptoms are all factors that contribute to delusional ideation in OCD on some accounts (Fear, Sharp, & Healy, 2000). Further studies are required to explore if delusional experiences in OCD might play an adaptive role. Is delusional ideation in OCD an adaptive response or just a worsening of the distress which characterizes obsessive–compulsive thoughts and behaviors?

While the latter hypothesis has garnered most of the attention from research—with studies showing that delusional forms of OCD are associated with “a graver clinical picture” than nondelusional forms (Poyurovsky, 2013, p. 173)—so far the former has not received much consideration. However, an adaptive role, whether biological or psychological, for delusional

forms of obsessions should not be prematurely ruled out. Delusional beliefs in OCD might in fact help the person preserve a sense of rational agency. An agent is deemed to be rational when her actions are consistent with her desires and beliefs. For example, the act of Jamie's drinking a glass of water is rational if it results from his desire to extinguish his thirst and the belief that drinking a glass of water will effectively do so.

In OCD desires are expressed by obsessions. For example, Bonnie might strongly want her house not to burn down (*obsession/desire*) and, in order to prevent that, she might think that she has to check the stove 30 times per day (*belief*). As a consequence of her desires and beliefs, Bonnie will feel driven to perform the action of checking the stove 30 times per day (*action/compulsion*). Even if people with OCD do not assume that the link among their obsessions, beliefs, and actions is a rational one, they still feel the drive to perform the relevant actions. In other words, Bonnie might not be convinced that checking the stove 30 times per day is necessary to prevent her house from burning down, yet she performs that action anyway. This generates problems for Bonnie's sense of rational agency: people with OCD cannot often make sense of their own actions, feel out of control, and are conflicted due to the discrepancy between their beliefs and actions. If an obsession reaches delusional intensity, however, the discrepancy between what is believed and what is acted upon significantly diminishes. If Bonnie is (delusionally) convinced that checking the stove 30 times per day will prevent her house from burning down, then her action—checking the stove—will seem more rationally justified to her than if she lacked that conviction. Arguably, the preservation of one's sense of rational agency confers a sense of control on one's actions and a feeling that one's actions effectively bring about the satisfaction of one's desires. Hence, it might be the case that, even if biologically maladaptive, delusions in OCD confer psychological benefits that come from restoring the intrapsychic coherence necessary for preserving one's sense of rational agency.

62 | Delusions in MDD

Delusions in MDD do not appear to be adaptive in a biological sense, as people with depression who also have delusions show a higher suicide rate than their nondelusional counterparts (Roose, 1983), suggesting that the presence of delusions can impact negatively on survival. However, a similar argument as for delusions in OCD can apply to delusions in MDD. The presence of delusions can reduce the perceived conflict between the agent's mood and the agent's beliefs, which can be psychologically draining.

So-called *psychotic depression* or *depressive psychosis* is a major depressive episode that can be accompanied by delusions and hallucinations (Gerretsen et al., 2015; Hales & Yudofsky, 2003) as well as very low mood, lack of interest in everyday matters, problems with sleeping, feelings of guilt, and obsessive self-accusations. Most delusions in severe depression are *mood-congruent*, which means that their content matches the person's mood experienced (Hales & Yudofsky, 2003). According to the *Diagnostic and Statistical Manual of Mental Disorders* (APA, 2013, DSM-5), common themes of depressive delusions are persecution, guilt, punishment, personal inadequacy, or disease.

It is controversial whether depression with delusions is a form of unipolar depression or a form of psychosis (e.g., Frances, Brown, Kocsis, & Mann, 1981; Parker, Roy, Hadzi-Pavlovic, & Pedic, 1992). Those who argue that depression with delusions is a form of depressive disorder (e.g., Stanghellini & Raballo, 2015) point to a

significant difference between delusions in schizophrenia and delusions in depression: whereas delusions in schizophrenia are a revelation and disclose some *new and surprising* content, the content of delusions in depression contains information that is *already known and familiar*. For instance, delusions of guilt in MDD may validate a feeling of guilt and confirm the person's conviction that she has done something wrong.

Following from this observation and drawing on an influential theory of depression (see Beck, 1967), it has been argued that delusions in depression can be viewed as adaptive from a psychological point of view (see, e.g., Antrobus & Bortolotti, 2016). People with MDD have feelings that are often not confirmed by the evidence available to them; typically, they feel guilty and inadequate. Delusions that contain negative self-related information help them preserve coherence in their self-appraisals. This is a significant effect, because we already know that people have a general tendency to restore coherence between moods and beliefs, or between conflicting beliefs, when coherence is compromised (see for instance, Heider, 1946; Festinger, 1957). It is possible that mood-congruent delusions in MDD offer validation for the guilt, shame, and hopelessness the person experiences, and contribute to avoiding fragmentation in one's self-concept, enhancing intrapsychic coherence. At the same time, they may cause depressive symptoms to become more severe, thus compromising biological adaptiveness overall.

1 | HOW DO WE ESTABLISH AND MEASURE ADAPTIVENESS?

It is controversial whether delusions can be biologically adaptive, but it is possible to describe delusions as psychologically adaptive, in some cases and in the short term. The psychological benefits of delusional beliefs vary depending on the type of beliefs, their content, and the context in which they are adopted. This means that different measures of psychological adaptiveness will apply to different delusions. The notions of subjective wellbeing and psychological wellbeing capture key aspects of the philosophical accounts of wellbeing known respectively as *hedonism* and *eudemonism*. Hedonism holds that wellbeing is a subjective feeling of pleasure and pain. Instead, according to eudemonism, wellbeing also depends on a positive assessment of one's functioning and on the meaningfulness of one's life. Both parameters are relevant to the psychological adaptiveness of delusions.

To sum up, we saw that some delusional beliefs are thought to relieve anxiety and stress; the effects of delusions that are elaborated may include enhancing the sense that one's life is important and meaningful; motivated delusions can be described as a temporary coping mechanism in response to trauma or adversities; delusional beliefs in dementia can help fill explanatory gaps that would be otherwise difficult to live with, enabling one to build a coherent self-image encompassing beliefs, emotions, and behaviors; and finally, delusions can sustain the sense of one's rational agency, restoring intrapsychic coherence. In most of our examples, delusions are thought to make a positive contribution to the hedonic form of wellbeing, which can be measured relying on self-reports or behavior (e.g., by asking people how their lives are going) or on physiological indicators (e.g., by tracking the oscillations in the levels of stress-related hormones such as cortisol as in Fineberg & Corlett, 2016).

It is more difficult to ascertain if delusions also make a positive contribution with regard to eudaimonic wellbeing, although we did see that in some studies elaborated delusions have been shown to increase people's sense of coherence, which suggests that they feel their lives have a purpose. In other cases, it is not clear what contributions delusions make. Do delusions in schizophrenia and OCD ameliorate people's functioning? Answering such a question requires weighing one effect against the other. Relief from anxiety and the restoration of intrapsychic coherence support good functioning, but delusions are very often all-absorbing, a feature which seems to speak in favor of the common belief that delusions interfere with good functioning.

One way to establish if and to what extent delusions are conducive to good functioning in the critical circumstances in which they emerge would be to compare indicators of good functioning in people who

experience mental health issues and

have delusions with people who experience similar mental health issues but have no delusions. Given that both groups, with and without delusions, are vulnerable to the similar psychological difficulties, evidence for the psychological adaptiveness of delusions would lie in whether people with delusions function better than their people without. What we know about delusions at this stage suggests that the prospects for delusions to enhance good functioning are not promising.

2 | CONCLUSION

In this paper, we reviewed some of the arguments in favor of clinical delusions having psychologically adaptive or biologically adaptive features. Whereas the costs of delusions are well-known—and many of the definitions of delusions are indeed based on their negative features—the potential benefits of delusions have not been studied thoroughly yet. We highlighted both interesting contributions and significant gaps where plausible claims need to be investigated further. It is safe to conclude

at this stage that many delusions are in the long run psychologically harmful and biologically maladaptive, but that their adoption can be understood in context as offering some short-term benefits, as a response to an emergency situation, although different authors characterize the nature of the emergency and the response to it in different terms. For instance, some motivated delusions can be seen as a coping mechanism to avoid major depression and suicide in case of overwhelming negative emotions caused by trauma; delusions formed in response to anomalous experiences can be seen as a means of relieving anxiety and restoring habitual processes of learning which were disrupted by aberrant prediction-error signals; and delusions in OCD and MDD can be seen as reducing the conflict caused by a clash in the person's emotions, beliefs, and behaviors and as restoring some levels of intrapsychic coherence (see Table 1).

There are several questions that the empirical and philosophical literature has as yet failed to answer satisfactorily, and these are relevant to the adaptiveness of delusions. One is whether it makes sense to talk about delusions (and other beliefs regarded as symptoms of psychiatric disorders) as *pathological* in themselves, or whether their role should be evaluated only as part of a more comprehensive analysis of a person's behavioral patterns. If delusions are pathological, what makes them so? Is it simply the fact that they are the outcome of a malfunction, or is the fact that they have detrimental effects on people's agency and survival? Answering such a question sounds daunting, but it is important to consider the implications that claims about the adaptiveness of delusions have for clinical practice, science, and society at large. A change of perspective in the way delusions are defined and assessed would also bring new levels of complexity to both symptom management in psychiatry

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and cognitive models in cognitive neuroscience research. Further, and most importantly, viewing delusions as responses to a crisis and as imperfect solutions to serious problems may be instrumental to challenging the pervasive stigma still associated with psychotic symptoms. An appreciation of the role that the adoption of a delusional belief may play should inform interactions between people who experience delusions and people who do not, hopefully enhancing understanding and cooperation.

CONFLICT OF INTEREST

The authors have declared no conflicts of interest for this article.

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FURTHER READING

Bentall, R., Kinderman, P., & Kaney, S. (1994). The self, attributional processes and abnormal beliefs: Towards a model of persecutory delusions.

Behaviour Research and Therapy, 32(3), 331–341.

Bortolotti, L. (2009). *Delusions and other irrational beliefs*. Oxford, England: Oxford University Press.

Bortolotti, L. (2018). Delusion. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy*. Retrieved from <https://plato.stanford.edu/archives/spr2018/entries/delusion>

Bortolotti, L., & Broome, M. (2008). Delusional beliefs and reason giving. *Philosophical Psychology*, 21(6), 821–841.

Bortolotti, L., & Gunn, R. (2017). Delusion. In *Routledge encyclopedia of philosophy*. Taylor and Francis. Retrieved from <https://www.rep.routledge.com/articles/thematic/delusion/v-1>

Bortolotti, L. (Ed.). (2018). *Delusions in context*. London, England: Palgrave

Macmillan. Corlett, P. (2009). Why do delusions persist? *Frontiers in Human*

Neuroscience, 3, 1–9. Gerrans, P. (2014). *The measure of madness*. Cambridge,

MA: MIT Press.

Gold, I., & Hohwy, J. (2000). Rationality and schizophrenic delusion. *Mind & Language*, 15(1), 146–167.

Gunn, R., & Bortolotti, L. (2018). Can delusions play a protective role? *Phenomenology and the Cognitive Sciences*,

17(4), 813–833. Hohwy, J. (2013). *The predictive mind*. New York, NY: Oxford University Press.

Insel, T. R., & Akiskal, H. S. (1986). Obsessive-compulsive disorder with psychotic features: A phenomenologic analysis. *American Journal of Psychiatry*, 143(12), 1527–1533.

McKenna, P. (2017). *Delusions: Understanding the un-understandable*. Cambridge, England: Cambridge University

Press. Miyazono, K. (2018). *Delusions as beliefs: A philosophical inquiry*. Abingdon, England: Routledge.

Radden, J. (2010). *On delusion*. Abingdon, England: Routledge.

Raveendranathan, D., Sharma, E., Rao, M., Gangadhar, B., Shiva, L., Venkatasubramanian, G., & Varambally, S. (2012). Obsessive compulsive disorder masquerading as psychosis. *Indian Journal of Psychological Medicine*, 34(2), 179–180.

The imperfect cognitions blog. Retrieved from <http://www.imperfectcognitions.com>

Van Ameringen, M., Patterson, B., & Simpson, W. (2014). DSM-5 obsessive-compulsive and related disorders: Clinical implications of new criteria.

Depression and Anxiety, 31(6), 487–493.

REFERENCES

- American Psychiatric Association. (2013). *DSM-V: Diagnostic and statistical manual of mental disorders* (5th Rev ed.). Washington, DC: APA.
- Antrobus, M., & Bortolotti, L. (2016). Depressive delusions. *Filosofia Unisinos*, 17(2), 192–201.
- Beck, A. T. (1967). *Depression: Causes and treatment*. Philadelphia: University of Pennsylvania Press.
- Bergstein, M., Weizman, A., & Solomon, Z. (2008). Sense of coherence among delusional patients: Prediction of remission and risk of relapse. *Comprehensive Psychiatry*, 49, 288–296.
- Berti, A., Spinazzola, L., Pia, L., & Rabuffetti, M. (1993). Motor awareness and motor intention in anosognosia for hemiplegia. In P. Haggard,
- Y. Rossetti, & M. Kawato (Eds.), *Sensorimotor foundations of higher cognition* (pp. 163–181). Oxford: Oxford University Press.
- Bortolon, C., & Raffard, S. (2015). Self-reported psychotic-like experiences in individuals with obsessive-compulsive disorder versus schizophrenia patients: Characteristics and moderation role of trait anxiety. *Comprehensive Psychiatry*, 57, 97–105.
- Bortolotti, L. (2015). The epistemic innocence of motivated delusions. *Consciousness and Cognition*, 33, 490–499.
- Bortolotti, L. (2016). The epistemic benefits of elaborated and systematised delusions in schizophrenia. *British Journal for the Philosophy of Science*, 67(3), 879–900.
- Bortolotti, L., Gunn, R., & Sullivan-Bissett, E. (2017). Chapter 3: What makes a belief delusional? In I. Mac Carthy, K. Sellevold, & O. Smith (Eds.), *Cognitive confusions: Dreams, delusions and illusions in early modern culture*. Cambridge: Legenda.
- Bortolotti, L., & Miyazono, K. (2015). Recent work on the nature and development of delusions. *Philosophy Compass*, 10(9), 636–645.
- Breen, N., Caine, D., Coltheart, M., Hendy, J., & Roberts, C. (2000). Delusional misidentification. *Mind & Language*, 15, 74–110.
- Coltheart, M., Menzies, P., & Sutton, J. (2010). Abductive inference and delusional belief. *Cognitive Neuropsychiatry*, 15(1), 261–287.
- Corlett, P., Taylor, J., Wang, X., Fletcher, P., & Krystal, J. (2010). Toward a neurobiology of delusions. *Progress in Neurobiology*, 92(3), 345–369.
- Davies, M., Coltheart, M., Langdon, R. and Breen, N., (2001). Monothematic delusions: Towards a two-factor account. *Philosophy, Psychiatry, and Psychology* 8 (2/3), 133–158.
- Fear, C., Sharp, H., & Healy, D. (2000). Obsessive-compulsive disorder with delusions. *Psychopathology*, 33(2), 55–61.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, England: Stanford University Press.
- Fineberg, S., & Corlett, P. (2016). The doxastic shear pin: Delusions as errors of learning and memory. *Cognitive Neuropsychiatry*, 21(1), 73–89.
- Fleischman, D. S. (2016). An evolutionary behaviorist perspective on orgasm. *Socioaffective Neuroscience & Psychology*, 6, 32130. <https://doi.org/10.3402/snp.v6.32130>
- Fletcher, P., & Frith, C. (2008). Perceiving is believing: A Bayesian approach to explaining the positive symptoms of schizophrenia. *Nature Reviews Neuroscience*, 10(1), 48–58.
- Fotopoulou, A. (2008). False selves in neuropsychological rehabilitation: The challenge of confabulation. *Neuropsychological Rehabilitation: An International Journal*, 18(5–6), 541–565.
- Frances, A., Brown, R. P., Kocsis, J. H., & Mann, J. J. (1981). Psychotic depression: A separate entity. *American Journal of Psychiatry*, 138(6), 831–833.
- Garety, P., & Hemsley, D. (1987). Characteristics of delusional experience. *European Archives of Psychiatry and Neurological Sciences*, 236(5), 294–298.
- Gerretsen, P., Flint, A. J., Whyte, E. M., Rothschild, A. J., Meyers, B. S., & Mulsant, B. H. (2015). Impaired insight into delusions predicts treatment outcome during a randomized controlled trial for psychotic depression (STOP-PD study). *Journal of Clinical Psychiatry*, 76(4), 427–433.
- Gilleen, J., & David, A. S. (2005). The cognitive neuropsychiatry of delusions: From psychopathology to neuropsychology and back again. *Psycho-logical Medicine*, 35, 5–12.
- Gold, J. M., Strauss, G. P., Waltz, J. A., Robinson, B. M., Brown, J. K., & Frank, M. J. (2013). Negative symptoms of schizophrenia are associated with abnormal effort-cost computations. *Biological Psychiatry*, 74(2), 130–136.
- Hales, R. E., & Yudofsky, S. C. (Eds.). (2003). *Textbook of clinical psychiatry*. Washington, DC: American Psychiatric Publishing.
- Heider, F. (1946). Attitudes and cognitive organization. *Journal of Psychology*, 21(1), 107–112.

- Hirstein, W. (2005). *Brain fiction: Self-deception and the riddle of confabulation*. Cambridge, MA: MIT Press.
- Hohwy, J. (2014). *The predictive mind*. Oxford, England: Oxford University Press.
- Jaspers, K. (1963). *General psychopathology*. Manchester, England: Manchester University Press.
- Jørgensen, P., Aagaard, J., Jespersen, J. H. & Mortensen, L. (1987). Nonspecific psychological distress, psychosocial stressors and delusional psychosis. *Acta Psychiatrica Scandinavica*, 75(2), 190–194.
- Kapur, S. (2003). Psychosis as a state of aberrant salience: A framework linking biology, phenomenology, and pharmacology in schizophrenia. *American Journal of Psychiatry*, 160, 13–23.
- Lee, W., Wadsworth, M., & Hotopf, M. (2006). The protective role of trait anxiety: A longitudinal cohort study. *Psychological Medicine*, 36(3), 345–351. <https://doi.org/10.1017/S0033291705006847>
- Maher, B. A. (1974). Delusional thinking and perceptual disorder. *Journal of Individual Psychology*, 30, 98–113.
- McCreery, C., & Claridge, G. (2002). Healthy schizotypy. *Personality and Individual Differences*, 32(1), 141–154.
- McKay, R. (2012). Delusional inference. *Mind & Language*, 27(3), 330–355.
- McKay, R., & Dennett, D. (2009). The evolution of misbelief. *Behavioral and Brain Sciences*, 32(06), 493–561.
- McKay, R., Langdon, R., & Coltheart, M. (2005). “Sleights of mind”: Delusions, defences, and self-deception. *Cognitive Neuropsychiatry*, 10, 305–326.
- Mishara, A. L. (2010). Klaus Conrad (1905-1961): Delusional mood, psychosis, and beginning schizophrenia. *Schizophrenia Bulletin*, 36, 9–13.
- Mishara, A. L., & Corlett, P. (2009). Are delusions biologically adaptive? Salvaging the doxastic shear pin. *Behavioral and Brain Sciences*, 32(6), 530.
- Miyazono, K. (2015). Delusions as harmful malfunctioning beliefs. *Consciousness and Cognition*, 33, 561–573.
- Miyazono, K., Bortolotti, L., & Broome, M. R. (2015). Prediction-error and two-factor theories of delusion formation: Competitors or allies? In N. Galbraith (Ed.), *Aberrant beliefs and reasoning* (pp. 34–54). Hove, England: Psychology Press.
- Murphy, D. (2005). Can evolution explain insanity. *Biology and Philosophy*, 20(4), 745–766.
- Nanko, S., & Moridaira, J. (1993). Reproductive rates in schizophrenic outpatients. *Acta Psychiatrica Scandinavica*, 87(6), 400–404.
- Nesse, R. M. (1998). Emotional disorders in evolutionary perspective. *British Journal of Medical Psychology*, 71(4), 397–415.
- Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, 84, 231–259.

- O'Dwyer, A., & Marks, I. (2000). Obsessive-compulsive disorder and delusions revisited. *British Journal of Psychiatry*, *176*(03), 281–284.
- Parker, G., Roy, K., Hadzi-Pavlovic, D., & Pedic, F. (1992). Psychotic (delusional) depression: A meta-analysis of physical treatments. *Journal of Affective Disorders*, *24*(1), 17–24.
- Payne, R. (2013). *Speaking to my madness*. Scotts Valley, CA: Createspace Independent.
- Peters, E., Day, S., Mckenna, J., & Orbach, G. (1999). Delusional ideation in religious and psychotic populations. *British Journal of Clinical Psychology*, *38*(1), 83–96.
- Poyurovsky, M. (2013). *Schizo-obsessive disorder*. New York, NY: Cambridge University Press.
- Ramachandran, V. S. (1996). The evolutionary biology of self-deception, laughter, dreaming and depression: Some clues from anosognosia. *Medical Hypotheses*, *47*(5), 347–362.
- Roberts, G. (1991). Delusional belief systems and meaning in life: A preferred reality? *The British Journal of Psychiatry*, *159*, S19–S28.
- Roose, S. (1983). Depression, delusions, and suicide. *American Journal of Psychiatry*, *140*(9), 1159–1162.
- Stanghellini, G., & Raballo, A. (2015). Differential typology of delusions in major depression and schizophrenia. A critique to the unitary concept of ‘psychosis’. *Journal of Affective Disorders*, *171*, 171–178.
- Stone, T., & Young, A. W. (1997). Delusions and brain injury: The philosophy and psychology of belief. *Mind & Language*, *12*, 327–364.
- Wakefield, J. (1992). The concept of mental disorder: On the boundary between biological facts and social values. *American Psychologist*, *47*(3), 373–388.
- Williams, D. (2018). Hierarchical Bayesian models of delusion. *Consciousness and Cognition*, *61*, 129–147.

DELUSIONS IN THE TWO-FACTOR THEORY: PATHOLOGICAL OR ADAPTIVE?

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ABSTRACT

In this paper we ask whether the two-factor theory of delusions is compatible with two claims, that delusions are pathological and that delusions are adaptive. We concentrate on two recent and influential models of the two-factor theory: the one proposed by Max Coltheart, Peter Menzies and John Sutton (2010) and the one developed by Ryan McKay (2012). The models converge on the nature of Factor 1 but diverge about the nature of Factor 2. The differences between the two models are reflected in different accounts of the pathological and adaptive nature of delusions. We will explore such differences, considering naturalist and normativist accounts of the pathological and focusing on judgements of adaptiveness that are informed by the shear-pin hypothesis (McKay and Dennett 2009). After reaching our conclusions about the two models, we draw more general implications for the status of delusions within two-factor theories. Are there good grounds to claim that delusions are pathological? Are delusions ever adaptive? Can delusions be at the same time pathological and adaptive?

Keywords: *Delusions; adaptiveness; pathology, two-factor theories;*

delusion formation

1. Introduction

Delusions are symptoms of mental disorders. Does that mean that they inherit from disorders their *pathological* status? Or should they be seen instead as emergency responses to a critical situation and thus described as *adaptive*? Could they be simultaneously pathological *and* adaptive? In this paper we are interested in the answers that the two-factor theory of delusions provides to such questions.

We are aware that delusions come in different forms and contents and that the two-factor theory has interesting things to say about all types of delusions—and other kinds of beliefs too. However, in this paper we shall refer to monothematic delusions and in particular the Capgras delusion as our standard example. This is for two reasons: (1) the two-factor theory was initially put forward to account for monothematic delusions,¹ even though its scope has been gradually extended to account for a wider range of phenomena;² (2) the Capgras delusion is the standard example in the papers proposing the two models of the two-factor theory we have chosen to focus on.

1.1. Delusions: The Pathological and the Adaptive

Delusions are unusual beliefs that are considered as symptomatic of a number of mental disorders, such as schizophrenia and delusional disorder. Monothematic delusions revolve around one theme and their content is often wildly implausible: someone with Capgras delusion believes that their spouse has been replaced by an impostor who looks just like the spouse; someone with Cotard delusion believes that they are disembodied or dead; someone with mirrored-self misidentification believes that they can see a stranger—and not their own image—in the mirror. The two-factor theory of delusion formation is a very influential theory proposing that monothematic delusions are caused by at

least two factors. Factor 1 is a neuropsychological deficit responsible for anomalous data that may also result in an anomalous experience. Factor 2 is a cognitive process (described as either dysfunctional or biased) explaining either the initial endorsement of the delusional belief or the prolonged maintenance of the delusional belief in the face of mounting counterevidence. Multiple versions of the two-factor theory have been put forward, where the main difference between them lies in the description of Factor 2 and its role in the process of delusion formation.

¹ Some authors suggest that the two-factor theory is best suited to account for monothematic delusions, and that has been built around the Capgras delusions (e.g., Corlett 2019).

² See for instance the discussion of self-deception in McKay et al. (2005).

According to the two-factor theory, are delusions pathological? Are they adaptive? Following the most popular ways to characterise what counts as a disorder in the philosophy of medicine in general and in psychiatry in particular, a belief counts as ‘pathological’ when it is either (1) the output of a dysfunctional process (*naturalism*); (2) harmful (*normativism*); or (3) the output of a dysfunctional process and harmful (*harmful-dysfunction account*) (Bortolotti 2020). Beliefs are sometimes regarded as pathological when they deviate from some norm to which they are expected to conform—but that use of the term ‘pathological’ is an extension and we shall not consider it here.

Beliefs are usually called ‘adaptive’ if they enhance a person’s wellbeing, purpose in life, or good functioning (*psychological adaptiveness*); or if they enhance an individual’s chances of survival and reproduction (*biological adaptiveness*). It has been shown that arguments for the biological adaptiveness of delusions are less common and overall less persuasive than claims about their psychological adaptiveness (McKay and Dennett 2009; Lancellotta and Bortolotti 2019) and when some delusions are presented as psychologically adaptive, their contribution to wellbeing or good functioning is often regarded as partial or temporary. We will spend more time on the psychological adaptiveness claim simply because the biological adaptiveness thesis has been defended (to our knowledge) only within the predictive-processing account of delusion formation (Fineberg and Corlett 2016) and not within the two-factor theory. To make our task more manageable, we shall confine our attention to forms of psychological adaptiveness that are explained by a shear-pin mechanism (McKay and Dennett 2009).

1.2. The Shear-pin Hypothesis

According to the “shear-pin” hypothesis (McKay and Dennett

2009), some false beliefs that prevent a cognitive system from being overwhelmed can count as adaptive (*adaptive misbeliefs*). This might happen for instance when people experience such a traumatic event that they would succumb to suicidal thoughts if their negative emotions were not managed. One example is anosognosia (“denial of illness”), where a person, who has lost the use of a limb as a result of physical trauma, denies paralysis or does not acknowledge the full extent of the ensuing impairment (Ramachandran and Blakeslee 1998; McKay et al. 2005). Someone’s delusion that they can clap their hands when their right arm is paralysed would act as a motivated belief which serves to reduce the harmful impact of their new disability on their wellbeing and sense of self. McKay and Dennett (2009) suggest in their paper that, in situations of extreme stress, motivational influences are allowed to intervene in the process of belief evaluation. As a result, people come to believe what they desire to be true (“My arm is not paralysed”; “I can clap!”) and not what they have evidence for (“My arm is not moving because it is paralysed”). This is designed to permit the cognitive system to continue operating.

According to the shear-pin hypothesis, the situation in which adaptive misbeliefs emerge is already seriously compromised.

What might count as a doxastic analogue of shear pin breakage? We envision doxastic shear pins as components of belief evaluation machinery that are “designed” to break in situations of extreme psychological stress (analogous to the mechanical overload that breaks a shear pin or the power surge that blows a fuse). Perhaps the normal function (both normatively and statistically construed) of such components would be to constrain the influence of motivational processes on belief formation. Breakage of such components, therefore, might permit the formation and maintenance of comforting misbeliefs – beliefs that would ordinarily be rejected as ungrounded, but that would facilitate the negotiation of overwhelming circumstances

(perhaps by enabling the management of powerful negative emotions) and that would thus be adaptive in such extraordinary circumstances. (McKay and Dennett 2009, 501)

The person is already experiencing high levels of stress and can come to more serious harm unless their negative emotions are managed. Thus, adaptive misbeliefs prevent the situation from worsening. McKay and Dennett talk about the “extraordinary circumstances” in which motivational influences on belief are not just tolerated but desirable. Such influences intervene not by accident but by design, and this is what makes the resulting beliefs adaptive despite their falsehood.

McKay and Dennett consider the possibility that some delusions count as biologically adaptive misbeliefs but argue that in the case of delusions the extent to which desires are allowed to influence belief formation is excessive. They leave it open whether some delusions can count as psychologically adaptive.

1.3. The Two-factor Theory

According to Max Coltheart (2007), who is the founder of the two-factor theory, a satisfactory theory of delusions should be able to answer two questions about the genesis and maintenance of delusional beliefs:

1. Where does the delusion come from?
2. Why is the delusion adopted and then maintained in the face of disconfirming evidence?

Two-factor models of delusions provide an answer to these questions by advocating two factors in the generation and maintenance of a delusional belief (Coltheart 2007).

Factor 1 answers the first question and results in anomalous data/experience. Consider for example the Capgras delusion where the person comes to believe that a loved one has been

replaced by an identical impostor. Factor 1 is an autonomic failure in the face recognition system, so when the person sees their spouse, the well-known face does not trigger the usual feelings of familiarity.³ This generates an anomalous experience of a face which is recognised but does not *feel* familiar. On the model, Factor 1 explains the content of the delusion. Factor 1 varies from delusion to delusion and may even vary across individual cases of the same delusion. Two-factor theories hold that Factor 1 is necessary but not sufficient to explain the phenomenon of delusions. This is mainly due to the fact that there seem to be people who have the deficit playing the Factor 1-role but do not report delusional beliefs. To differentiate these cases from delusional ones, another factor (Factor 2) is required to explain the transition from the data resulting in an anomalous experience to the delusional belief. The move from not feeling that a well-known face is familiar to believing something like: “The person I see in front of me is not my spouse but an impostor” is due to a process of either endorsement or explanation of the content of the anomalous experience.

Whilst Factor 1 differs from one delusion (or person) to the next, Factor 2, broadly described as a problem in belief evaluation, is supposed to be constant across all delusions. However, two-factor theorists disagree on the precise nature of Factor 2. Some proposals identify Factor 2 with a lesion to the right dorsolateral prefrontal cortex (Coltheart et al. 2018) but there is disagreement about whether this locus is specific to delusions or shared with other neuropsychological conditions (see Tranel and Damasio 1994; Corlett 2019). Another open question about two-factor theories is whether Factor 2 contributes to the *adoption* or to the *maintenance* of the delusional belief.

³ We are aware that the way of describing the conscious experience of people with Capgras when they look at their loved one is controversial, but we will not engage in questions about the nature of their experience as it is not relevant to our discussion. In this paper, we shall talk about their failing to experience a “feeling of familiarity”. Also, there is a debate about how to accurately characterise the content of the Capgras delusion. In this paper, we shall talk about people believing something like the following: “The person I see in front of me is not my beloved one but an impostor”.

Let us describe two competing models of the two-factor theory—the most influential and detailed—and map their differences.

1.4. The Coltheart Model

On what we shall refer to as *the Coltheart model* (Coltheart et al. 2010), Factor 1 is a neuropsychological deficit which results in anomalous data and can manifest at conscious level as an anomalous experience.

Factor 1 operates at the belief adoption stage. What happens at the belief adoption stage? The anomalous data are accounted for by a process of inference *to the best explanation* (abductive inference): given the very unusual nature of the data, the delusional explanation is the best possible explanation among a range of candidate hypotheses. Abductive inference is understood in Bayesian terms. Bayes' theorem stipulates the best way of choosing among candidate hypotheses to explain a given piece of evidence (O). A hypothesis (H) is more apt than another hypothesis (H') to explain O if its posterior probability is higher than the posterior probability of H'. The posterior probability of a hypothesis is the product of the hypothesis' prior probability (the probability of the hypothesis before O) and its likelihood (how likely it is to observe O if the hypothesis was true). On this account, given O, it is possible for H to be a better explanation than H' even if H has a low prior probability providing that the likelihood of H given O offsets its low prior probability.

Consider the Capgras delusion. In the Coltheart model, the impostor hypothesis (“That woman is not my wife but an impostor”) can be a better explanation than the spouse hypothesis (“That woman is my wife”) with regard to evidence O. Even if the impostor hypothesis has a lower prior probability than the spouse hypothesis, as impostors are not a frequent occurrence, its likelihood can be much greater than that of the spouse hypothesis, to the point of making its posterior probability higher than that of the spouse hypothesis. In this scenario, the impostor

hypothesis is the most rational explanation for the absence of a feeling of familiarity: people have intact reasoning capacities when adopting the delusional hypothesis. Their reasoning is compromised when evidence against the delusional belief start accumulating.

Factor 2 is a cognitive deficit inhibiting the rejection of an endorsed belief even in the presence of strong counterevidence—Factor 2 makes the belief virtually impossible to revise. On this model, Factor 2 operates at the belief maintenance stage. What happens then, at the belief maintenance stage? On the Coltheart model, there is a second dysfunction responsible for the delusion (Factor 2) which amounts to a *deficit* in belief evaluation. This allows the delusional belief to be preserved in the face of evidence to the contrary.

In the case of Capgras delusion, the person faces overwhelming evidence against the impostor belief but that is not sufficient reason for the person to abandon or revise that belief. Evidence may include the testimony from relatives and friends confirming that the person accused to be an impostor is in fact the spouse. The person who adopted the delusional belief is unable to step back from it and to consider alternative explanations even when the belief receives serious challenges.

1.5. The McKay Model

Ryan McKay puts forward several objections to the Coltheart model which are important to understand his own proposal (McKay 2012), what we shall call *the McKay model*. As the objections are also relevant to our assessment of the status of delusions, we shall consider some of them here, albeit briefly.

First, the novel contribution in the Coltheart model (Coltheart et al. 2010) is that adopting the delusional hypothesis (e.g., the impostor hypothesis in the Capgras delusion) is Bayesian-rational because the hypothesis is the best explanation for the

anomalous data. But for McKay the rationality of the endorsement of the delusional hypothesis is overestimated in the Coltheart model, because the model does not take into account how incredibly unlikely the state of affairs which makes up the content of the delusion is. As McKay says, it would be akin to a miracle if an impostor were to take the place of one's spouse and be also perfectly identical to the spouse. Thus, it is not plausible to suppose that there is nothing problematic in the reasoning step that leads from the anomalous data and the resulting experience to the delusional belief.

Second, how do we account for the experiences of ventromedial frontal patients who, similarly to Capgras patients, experience an autonomic failure to familiar faces but who, differently from Capgras patients, do not adopt the impostor belief? In the Coltheart model, the assumption is that ventromedial frontal patients initially adopt the impostor belief—as the best possible explanation of the anomalous data which sometimes results in an anomalous experience—but do not maintain it. When faced with disconfirming evidence, differently from Capgras patients, they abandon the impostor belief. This can be accounted for if ventromedial frontal patients share Factor 1 with Capgras patients but not Factor 2.

McKay's objection to this proposal is that it is implausible that ventromedial frontal patients first adopt the impostor belief and then reject it. It is implausible that the spouse hypothesis is dismissed at the stage of belief adoption but then embraced once the person receives evidence against the impostor belief. The conjunction of new evidence (i.e. testimony from relatives and friends which contradicts the impostor belief) and old evidence (i.e. the absence of a feeling of familiarity which confirms the impostor belief and protestations for the alleged impostors that they are not impostors) does not favour the spouse hypothesis over the impostor belief in the circumstances. Why would the spouse hypothesis explain the total evidence any better than the impostor belief? More precisely, it is not clear why the testimony of others should radically change the distribution of likelihoods

between the impostor belief and the spouse hypothesis, considering that, according to McKay, the spouse's testimony was presumably already dismissed at the stage of the adoption of the impostor belief.

A possible response in defence of the Coltheart model is that the testimony of the spouse does not count as evidence in favour of the spouse hypothesis: it is easy to see that a good impostor would still convincingly pretend to be someone's spouse even when explicitly confronted about it. The testimony of friends and family seems a more reliable source of evidence in favour of the spouse hypothesis. Hence, it might be the case that ventromedial frontal patients initially adopt the impostor belief because it is the one which best explains the evidence at hand—the absence of feelings of familiarity and the testimony of the spouse—but then correctly dismiss it in the face of the testimony of friends and family.

The third criticism of the Coltheart model is probably the most compelling. It concerns the *chronology* of Factor 1 and Factor 2. If people with Capgras delusion are unable to revise their impostor belief in the light of contradicting evidence because of Factor 2, this means that they cannot acquire Factor 2 prior or at the same time of Factor 1, otherwise they would be unlikely to abandon the spouse hypothesis and would dismiss the evidence for the impostor hypothesis (i.e., the absence of a feeling of familiarity). In other words, if people who develop the Capgras delusion are *conservative* with their existing beliefs at the maintenance stage, why should they be *revisionist* with their existing beliefs at the adoption stage? The Coltheart model seems to require that people with Capgras acquire Factor 2 *after* Factor 1, that is, after endorsing the impostor belief and before facing the testimony of family and friends which counts against it.

McKay overcomes this objection by putting forward his own model, according to which Factor 2 operates at the adoption stage, just like Factor

1: the impostor hypothesis is adopted because people suffer from a neuropsychological impairment responsible for the anomalous data and resulting in the anomalous experience (Factor 1), and because they have a bias towards *explanatory adequacy* (Factor 2) which leads them to accept hypotheses that seem to explain their experiences even when such hypotheses have low prior probability and conflict with their existing beliefs.

An individual with a bias towards explanatory adequacy will update beliefs as if ignoring the relevant prior probabilities of the candidate hypotheses. (McKay 2012, 345)

The McKay model builds on previous work by Stone and Young (1997), Aimola Davies and Davies (2009), and McKay himself. It largely agrees with the Coltheart model about the nature of Factor 1. Factor 1 is a neuropsychological deficit and in the case of Capgras delusion it causes the absence of a feeling of familiarity towards well-known faces.

However, the model offers a different account of Factor 2. In the McKay model, Factor 2 is activated in the transition from the anomalous experience to the belief. Due to the explanatory adequacy bias, salient perceptual experience is taken at face value, causing the person to adopt a hypothesis which explains the experience in question but does not fit with the person's previous beliefs (e.g., the impostor hypothesis in Capgras). Ventromedial frontal patients who may also fail to experience feelings of familiarity towards well-known faces (Factor 1) but who do not come up with the impostor belief may just lack the explanatory adequacy bias (Factor 2). In the model, Factor 2 is thus already present when the delusional belief is adopted whereas the Coltheart model is supposed to locate Factor 2 at the belief maintenance stage.

For McKay, given the extreme low prior probability of the impostor hypothesis, it is not rational to adopt it as an explanation of the anomalous experience, so some bias needs to be involved in the acceptance of the delusional belief. The delusion is adopted due to the fact that people discount the prior probabilities of the delusional hypothesis in favour of how well the hypothesis explains ('fits') the data. So, people who develop Capgras adopt the impostor belief despite its low prior probability because it matches the absence of a feeling of familiarity towards well-known faces better than the spouse hypothesis.

Here is a way of describing the difference between the McKay model and the Coltheart model: for McKay the delusion emerges when the impostor belief is adopted, as Factor 1 and Factor 2 have contributed by then to the person endorsing an unusual explanation for an unusual experience. For Coltheart and colleagues, the impostor belief is adopted as a result of Factor 1, but it becomes a delusion only when it grows resistant to counterevidence at the maintenance stage as a result of Factor 2.

1.6. Interim Summary and Plan

We have introduced two models of the two-factor theory, explaining how they differ (see table 1 for a summary). In section 2 we shall ask whether the models are compatible with delusions being pathological. In section 3 we shall ask whether they are compatible with delusions being adaptive.

	<i>Factor 1</i>	<i>Factor 2</i>
The Coltheart Model (Coltheart et al. 2010)	<i>A neuropsychological deficit manifesting in an unusual experience leads the person to adopt an unusual belief.</i>	<i>A cognitive deficit in belief evaluation leads the person to preserve the unusual belief in the face of counterevidence.</i>
	<i>Factor 1 explains belief adoption and Factor 2 the belief maintenance.</i>	

The McKay Model (McKay 2012)	A <i>neuropsychological deficit</i> manifesting in an unusual experience contributes to the person adopting an unusual belief.	An <i>explanatory adequacy bias</i> contributes to the person adopting a belief with low prior probability.
	<i>Factor 1 and Factor 2 together explain the adoption of the delusional belief.</i>	

Table 1: Differences in two influential versions of the two-factor theory of delusion formation

2. Are Delusions Pathological?

In this section we ask whether the claim that delusions are pathological beliefs is compatible with the two-factor models of delusions described in section 1, the Coltheart model and the McKay model. We structure the discussion around three ways in which we can understand what it means for delusions to be pathological, which map the notions of disorder defended in the philosophy of medicine: *naturalism* (the system is disordered if it is dysfunctional); *normativism* (the system is disordered if it causes harm); the *harmful-dysfunction* view (the system is disordered if it is dysfunctional and it causes harm).

2.1. The Naturalist View

For naturalists, the pathological nature of a delusional belief depends on whether the belief’s aetiology involves a dysfunction. More precisely, the claim is that for a belief to be pathological, there must be a dysfunction in the mechanisms responsible for how the belief is adopted or maintained.

In statements about the two-factor theory of delusion formation, the words ‘deficit’ and ‘dysfunction’ are indeed used and delusions are recognised as pathological: “[W]e advocate a deficit model of delusion formation, that is, delusions arise when the normal cognitive system which people use to generate, evaluate, and then adopt beliefs is damaged” (Langdon and

Coltheart 2000, 184). And again: “Essentially, we view delusion as a dysfunctional belief, a doxastic state of a particular pathological severity” (McKay et al. 2005, 315). We know by now that in the two-factor theory, the two factors are a neuropsychological deficit resulting in anomalous data/experience and, more relevant to assessing the pathology of a belief, a problem with reasoning. Factor 2 is described as a *cognitive bias* (e.g., Fine et al. 2007; Langdon et al. 2010; McKay 2012) or as a *cognitive deficit* (e.g., Coltheart 2007; Coltheart et al. 2010).⁴

In two-factor theories advocating cognitive biases, people reporting delusional beliefs are found to reason differently from people who do not, but the difference is not a disadvantage independent of the context in which the bias operates. This suggests that there is no deficit or dysfunction involved in forming the delusion given the anomalous nature of the experience. The presence of biases in the belief fixation process is not sufficient for the resulting belief to qualify as pathological, and indeed many non-pathological beliefs are the output of biased reasoning. The same bias can be beneficial in some contexts and detrimental in other contexts, and biased reasoning does not imply the presence of an underlying deficit. The McKay model is a good example of the bias approach: the problem identified in the inference from the experience to the belief (Factor 2) is an *explanatory adequacy* bias. People who have it tend to disregard a hypothesis’s low prior probability if the hypothesis seems to explain well the data salient to them. The opposite tendency, often called *doxastic conservatism*, consists in resisting a hypothesis that does not fit with previous beliefs even if the hypothesis seems to explain well the data. It is a form of inertia where the person’s existing model of the world is protected from change. Whether one bias or the other leads to

⁴ If the only problem with the delusion was the anomalous data it explains, then one might come to the conclusion that the delusional belief itself is not pathological as there is nothing dysfunctional in the way in which belief fixation mechanisms operate.

better outcomes (the adoption and maintenance of true and rational beliefs) depends on the context. Thus, on naturalist grounds alone, delusions are not pathological in the McKay model.

In two-factor theories explicitly advocating a cognitive deficit or a doxastic dysfunction, Factor 2 is to be identified with such a deficit or dysfunction: examples would be the failure for the belief fixation system to inhibit implausible hypotheses or the failure for the belief maintenance system to abandon or revise a belief that has received disconfirmation by further evidence after its adoption. This suggests that the role of Factor 2 in the formation of delusions is sufficient for the delusion to count as pathological on naturalist grounds. The Coltheart model fits such a description: impostor beliefs may not be pathological when they are adopted, as the impostor hypothesis is the best explanation for the person's anomalous data/experience. However, the belief becomes pathological at the stage in which it is maintained in the face of powerful counterevidence, because its maintenance is due to a dysfunction affecting belief evaluation.

2.2. The Normativist and the Harmful-dysfunction View

Normativists agree that the pathological nature of a belief depends on whether the belief causes harm or otherwise leads to undesirable consequences for the agent—as judged by the agent or by society, depending on the preferred version of the view. Harms and disadvantages may include impaired functioning, loss of agency, negative emotions, failure to fulfil one's goals, and so on. It is plausible to claim that delusions (differently from many non-delusional irrational beliefs) are generally disruptive and can negatively affect a person's wellbeing causing impaired functioning, social isolation and withdrawal.

However, for a belief to be pathological, we would expect *the belief itself* to be the cause of harms or other disadvantages. It is not clear in the case of delusion whether the belief is the cause of

the harm or disadvantage or is instead a response to a situation that is already critical for the person. The difficulty for normativism here is that what we know about so-called pathological beliefs does not usually enable us to determine whether the harm or disadvantage is caused by the beliefs themselves. Indeed, it may be caused by something else but ultimately explain why the beliefs are adopted or maintained; or it may just happen alongside the adoption and the maintenance of the belief.

For instance, on some accounts of delusions in schizophrenia, the delusion is seen as a response to the uncertainty in the prodromal phase of psychosis (e.g., Jaspers 1963; Mishara 2010). More relevant to monothematic delusions, in anosognosia the adoption of the belief that one's arm is not paralysed (say) can be seen as a reaction to the physical and psychological trauma the person experienced (e.g., Turnbull et al. 2014). In such a case, the delusion seems to be a response to a critical situation as opposed to the source of the harm or disadvantage (although the maintenance of the delusion may become a source of further harm or disadvantage). In the case of monothematic delusions like Capgras, it is not clear whether the delusion causes or is a response to harm or disadvantage: psychodynamic accounts of Capgras tended to see it as a motivated delusion, but more recent cognitive-deficit accounts do not make room for the delusion to be part of a defence mechanism (McKay et al. 2005).

There are cases in which unquestionable harm or disadvantage is associated with believing the delusional content (e.g. when the content is distressing, causing guilt, fear, or anxiety). There are also cases in which the harm or disadvantage is caused by the reaction of the surrounding social environment to the person reporting the belief: individuals whose beliefs have similar surface features may experience drastically different responses, ranging from being supported by their social circle to being vulnerable to exclusion and isolation. In sum, there is a significant link between delusions and harm or disadvantage even

when a person’s overall functioning is not impaired by the delusion (e.g., Jackson and Fulford 1997).

Where does this leave our two models? Are delusions pathological on normativist grounds for the two-factor theory? The most plausible answer is yes. McKay is explicit about delusions causing harm—functioning is disrupted by the extent of the mismatch between the content of the delusion and the reality as experienced by those who are non-delusional (McKay et al. 2005; McKay and Dennett 2009). Factor 1 and Factor 2 are both responsible for this mismatch, the data being anomalous and the delusional hypothesis being so implausible that it would be ‘miraculous’ for its content to turn out true. The Coltheart model does not explicitly discuss negative psychological consequences of the delusion but that delusions cause harm or disadvantage is often implied.

On views of the pathological nature of delusions according to which both a harmfulness condition and a dysfunction condition are combined (the so-called ‘harmful-dysfunction’ views inspired by the work of Jerome Wakefield), delusions still result as pathological on the Coltheart model but not on the McKay model unless Factor 2 is described as a cognitive dysfunction as opposed to a cognitive bias.

2.3. Summary of Section 2

The two-factor theory aims at providing an account of the pathological nature of delusions, so it is not surprising that the claim that delusions are pathological is compatible with both the Coltheart model and the McKay model (see table 2 for a summary).

	<i>Naturalism</i>	<i>Normativism</i>	<i>Harmful Dysfunction</i>
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<p>The Coltheart Model (Coltheart et al. 2010)</p>	<p>The delusion is pathological because its maintenance is due to a cognitive dysfunction.</p>	<p>The delusion is pathological because its maintenance disrupts psychological functioning.</p>	<p>The delusion is pathological because its maintenance is due to a cognitive dysfunction and disrupts psychological functioning.</p>
<p>The McKay Model (McKay 2012)</p>	<p>The delusion is not pathological because it is due to a cognitive <i>bias</i>, not a cognitive dysfunction.</p>	<p>The delusion is pathological because it disrupts psychological functioning.</p>	<p>The delusion is not pathological because it disrupts psychological functioning but is not due to a cognitive dysfunction.</p>

Table 2: Are delusions pathological?

3. Are Delusions Adaptive?

In this section, we ask whether the claim that delusions are adaptive is compatible with the Coltheart model and the McKay model. In the philosophical, psychological, and psychiatric literature there have been recent explorations of the idea that some delusions may be adaptive *in some sense* (Lancellotta and Bortolotti 2019), psychologically (McKay and Dennett 2009), biologically (Fineberg and Corlett 2016), even epistemically (Bortolotti 2015; 2016).

As anticipated, we shall focus on the shear-pin hypothesis as the best (most detailed) conceptualisation of adaptiveness as applied to delusional beliefs. The shear-pin metaphor illustrates one of the ways in which delusions could be considered as adaptive. By disabling some of its parts, shear pins allow a system which is about to collapse to continue operating, albeit in an imperfect manner. In shear-pin accounts, an adaptive misbelief is the

outcome of a process that is designed to prevent the collapse of the cognitive system. The misbelief is biologically adaptive if it enhances genetic fitness and psychologically adaptive if it contributes to wellbeing or good functioning. As we saw, after careful consideration, McKay and Dennett (2009) conclude that delusions are *not* biologically adaptive misbeliefs.⁵ However, they do not rule out that some delusions can be psychologically adaptive.

Based on our analysis in section 2, both the Coltheart and the McKay models identify a factor responsible for anomalous data. In the Coltheart model the adoption of the belief is Bayesian-rational but its maintenance is due to a cognitive deficit; in the McKay model, the adoption of the delusion is due to a cognitive bias. Do such accounts leave room for delusions to be described as an adaptive emergency response?

3.1. The Coltheart Model and the Shear-pin Hypothesis

In the Coltheart model as applied to monothematic delusions such as Capgras, does the *adoption* of the unusual belief (1) emerge in the context of a crisis and (2) rescue the cognitive system from collapsing? As we saw, the unusual belief is an explanation—the best possible one—of the anomalous data brought about by Factor 1. When people lack feelings of familiarity towards a familiar face, the cognitive system produces a belief (“The woman in front of me is not my wife but is an impostor”) which is false, but Bayesian-rational. The adoption of the unusual belief can hardly be interpreted as the response to a critical situation, and there seem to be no reason to believe that it would be rescuing the cognitive system from collapsing. This strongly suggests that the adoption of the unusual belief is not the outcome of a shear-pin mechanism.

Let’s move now to the Coltheart model of belief *maintenance*. Does preserving the unusual belief in the face of counterevidence (1) emerge in the context of a crisis and (2) rescue the cognitive

system from collapsing? In a delusion like Capgras and in the context of a deep tension between what one believes and what other people believe, remaining convinced that one's spouse has been replaced by an impostor could have some psychological benefits over believing that one has serious mental health

⁵ Revisiting McKay and Dennett's shear-pin hypothesis in the light of their predictive-coding approach, Sarah Fineberg and Phil Corlett (2016) argue that the breakage of the shear pin and the consequent formation of the delusion allow an individual's cognitive system to keep functioning in the face of anomalous data. Such data, if left unexplained, would lead to the paralysis of the processes by which an individual engages in automated learning, significantly damaging the cognitive system. By explaining the anomalous data, the delusion allows automated learning to resume and the cognitive system to keep functioning. However, the cost is that all anomalous data are likely to be interpreted through the lens of the delusional belief which become more entrenched as the default explanation.

issues. Continuing to believe that one has veridical experiences and is the victim of a malicious third party (i.e., the impostor) would help preserve one's positive self-image, whereas acknowledging that one's experience is unreliable and gave rise to an implausible belief would not. In the light of this, Factor 2 could be interpreted as the sign that the shear pin has broken. If the goal is to salvage the cognitive system at the cost of disabling some of its parts, Factor 2 could be understood as the cost—the disabling of the capacity for belief evaluation.

However, the compatibility of the Coltheart model with the shear-pin hypothesis is compromised by the model branding Factor 2 as a cognitive dysfunction. Factor 2 emerges as a deficit in belief evaluation—an inability to revise one's existing beliefs in the face of disconfirming evidence. Due to such a deficit, the belief becomes resistant to counterevidence and is preserved. Factor 2 cannot be a shear-pin mechanism because it is characterised not as a design feature, but as a dysfunction, and thus the delusional belief cannot be regarded as adaptive.

What we can say, then, is that the shear-pin hypothesis is incompatible with belief adoption in the Coltheart model, because belief adoption does not respond to a crisis, and could be compatible with belief maintenance in the Coltheart model if the delusion were not branded as the outcome of a dysfunction. The delusion would be a design feature which prevents the system from collapsing.

3.2. The McKay Model and the Shear-pin Hypothesis

We saw that McKay sees the delusion as irrationally formed, that is, as a non-optimal explanation of the anomalous data caused by Factor 1. The main difference with the Coltheart model is that Factor 2 gets activated at the belief adoption stage rather than at the maintenance stage. Thus, we need not distinguish between belief adoption stage and belief maintenance stage in the McKay model because both Factor 1 and Factor 2 operate at the belief

adoption stage and the unusual belief qualifies as a delusion then.

In the McKay model, then, do delusions (1) emerge in the context of a crisis and (2) rescue the cognitive system from collapsing? As with the Coltheart model, in the Capgras case the adoption of the delusion can hardly be interpreted as the response to a critical situation, and there seem to be no reason to believe that it would be rescuing the cognitive system from collapsing. Rather, the adoption of delusions is the outcome of a cognitive bias operating on anomalous data. When people with Capgras lack feelings of familiarity towards a familiar face, the cognitive system produces a belief (“The woman in front of me is not my wife but is an impostor”) which is false, but “fits” those feelings.

Can delusions more generally be seen as the output of a shear-pin mechanism in the McKay model? For the shear-pin hypothesis to apply, there needs to be a crisis the delusion is a response to (e.g., overwhelming negative emotions to manage) and this response prevents the cognitive system from collapsing. It is well known that unexplained anomalous experiences may generate uncertainty (Fineberg and Corlett 2016) and by providing an explanation of those experiences, delusions would contribute to relieve the ensuing anxiety. An example of a delusion that could be explained by the shear-pin hypothesis is the Reverse Othello syndrome (McKay et al. 2015). After recently becoming disabled, a man comes to believe that his previous partner is still in love with him and that they married, whereas his partner has moved on and is in another relationship. The realisation that his partner had left him on top of the many other changes caused by his new disability might have led the man to depression and even suicide, threatening the continued functioning of his cognitive system. In this case, it is easy to see how the shear-pin could intervene to avoid the collapse of the person’s cognitive system. The adoption of the delusion (e.g., “My partner and I still are in a happy relationship”) could be interpreted as a sign that the shear pin has broken: the man’s desires have been permitted to exercise a powerful influence on

his beliefs (see also Mele 2006). In the instance of Reverse Othello syndrome examined by McKay (Butler 2000), the man then gradually abandoned the conviction in the delusional belief that his former partner still loved him and had become his wife which suggests that the delusion did not have long-term negative consequences for the man's functioning. However, in an alternative hypothetical case in which the delusion persisted after the initial crisis had been managed, the delusion might have lost its adaptive role and become a serious hindrance.

Our conclusion is that the shear-pin hypothesis is compatible with the McKay model, because the adoption of the delusion is not due to a cognitive dysfunction, and the delusion can in some contexts be formed as a response to a crisis that prevents the cognitive system from collapsing. That said, the Capgras would not be a good example of a delusion that is the outcome of a shear-pin mechanism and even for other types of delusions for which the shear-pin hypothesis is more plausible, it is not clear that the psychological benefits of adopting the delusion outweigh the potential long-term costs of maintaining the delusion.

3.3. Summary of Section 3

The two models of the two-factor theory we are discussing do not explicitly address the question whether delusions are adaptive, although Ryan McKay has considered the question elsewhere (McKay and Dennett 2009). It is an interesting issue, though, whether the two-factor theory is compatible with the claim that delusions are adaptive at least in the short-term, a claim that is not implausible for at least some delusions in some contexts.

We argued that the McKay model can make room for a shear-pin explanation of the adaptive nature of some delusions, whereas for the Coltheart model things get trickier (see table 3). We also observed that the overall plausibility of claims about delusional beliefs being adaptive cannot be generalised and depends on the content of the delusional belief and the context in which it

emerges.

Delusions as adaptive outputs of a shear-pin breakage	
The Coltheart Model (Coltheart et al. 2010)	The maintenance of the delusion in the face of counterevidence could be a response to a crisis that prevents the cognitive system from collapsing so it could be due to a shear-pin breakage. However, this is not compatible with the belief being the outcome of a cognitive dysfunction.
The McKay Model (McKay 2012)	The adoption of some delusions is a response to a crisis that prevents the cognitive system from collapsing so it could be due to a shear-pin breakage. This is compatible with those delusions being the outcome of a cognitive bias.

Table 3: Are delusions adaptive?

4. Conclusions and Implications

We asked what two influential models of the two-factor theory of delusion formation have to say about the potential pathological nature and adaptiveness of delusions, with a special focus on monothematic delusions such as Capgras. Throughout, we made some observations which have implications for further investigations into the nature of delusions.

First, delusions can be pathological on a normativist reading of disorder, where delusions simply need to be harmful to count as pathological, although it is not clear that delusions are always the source of harm as opposed to a response to an existing crisis that causes harm (Bortolotti 2015). Some delusions may enable the person to cope with adversities and preserve their self-esteem (Gunn and Bortolotti 2018). In one case, Barbara started believing that God was communicating with her by telepathic messages because she was his child and she was good: “as God was talking to me he was making sure that I knew there was nothing wrong with me. And he’s always there, whether I’m right, whether I’m

wr... well, he, he says I'm never wrong, God says I'm never wrong". Barbara developed the delusion after hearing voices for some time and her delusional belief may be considered as an explanation for her unusual experiences. Furthermore, Barbara's belief that she was special and that God was supporting her followed a very difficult time in her life, when her unfaithful husband had left her permanently and she was feeling both vulnerable and guilty about earlier decisions she made in her life. In the short term, the delusion might have protected Barbara from negative feelings about herself and prevented a suicidal attempt which was on her mind.

It is even more dubious that we can base the pathological nature of delusions on a naturalist or harmful-dysfunction reading of disorder, where delusions need to be the outcome of a dysfunctional process to count as pathological. That is because we cannot easily show that the cognitive process responsible for delusion formation is a dysfunctional process in itself as opposed to a cognitive process that operates in non-ideal conditions (such as a process whose input is the outcome of a dysfunction, a process affected by biases or performance errors, etc.).

Second, whether delusions are the outcome of a shear-pin breakage is also very difficult to ascertain in general terms. It is possible that a shear-pin mechanism works to protect a person's cognitive functioning by relieving that person from the anxiety which comes with anomalous experiences, helping the person manage negative emotions, or salvaging the person's positive self-image. However, whether the alleged benefits ever outweigh, even temporarily, the costs of having the delusion is by no means obvious and needs further examination. Some progress could be made with the issue whether delusions are psychologically adaptive if it were possible to compare the psychological profile of people with delusions with the psychological profile of people who have the same experiences as people with delusions but develop no delusions. If delusions are an emergency response which is devised to help in the face of

a crisis, then people facing the same crisis as people with delusions but with no delusions should be psychologically worse off. This would help clarify if delusions are the problem or the imperfect solution to a problem (Lancellotta forthcoming).

Finally, one interesting upshot of our investigation is that in a version of the two-factor theory of delusions the same belief can be adaptive and pathological (though not at the same time). This marks an important difference between the Coltheart model and the McKay model. In the McKay model, some delusions can prevent the person's cognitive system from breaking down at the time of their adoption (and thus be adaptive as the outcome of a shear-pin breakage) *and* disrupt the person's psychological functioning in the long-term (and thus count as pathological on a normativist account). However, in the Coltheart model, delusions cannot be adaptive *and* pathological, because by being the outcome of a dysfunctional process and counting as pathological in a naturalist and harmful-dysfunction sense, the possibility that they are also the outcome of a shear-pin mechanism which breaks by design is ruled out.

REFERENCES

- Davies, A. M., and M. Davies. 2009. Explaining pathologies of belief. In *Psychiatry as Cognitive Neuroscience*, eds. M. Broome and L. Bortolotti, ch. 15. Oxford: Oxford University Press.
- Bortolotti, L. 2015. The epistemic innocence of motivated delusions. *Consciousness & Cognition* 33: 490-499.
- Bortolotti, L. 2016. The epistemic benefits of elaborated and systematised delusions in schizophrenia. *British Journal for the Philosophy of Science* 67(3): 879-900.
- Bortolotti, L. 2020. Doctors without disorders. *Aristotelian Society Supplementary* 94(1): 163–184.
- Butler, P. V. 2000. Reverse Othello syndrome subsequent to traumatic brain injury. *Psychiatry* 63(1): 85-92.
- Clutton, P., and S. Gadsby. 2018. Delusions, harmful

- dysfunctions, and treatable conditions. *Neuroethics* 11: 167–181.
- Coltheart, M., R. Cox, P. Sowman, H. Morgan, A. Barnier, R. Langdon, E. Connaughton, L. Teichmann, N. Williams, and V. Polito. 2018. Belief, delusion, hypnosis, and the right dorsolateral prefrontal cortex: A transcranial magnetic stimulation study. *Cortex* 101: 234-248
- Coltheart, M. 2007. Cognitive neuropsychiatry and delusional belief. *Quarterly Journal of Experimental Psychology* 60: 1041–1062.
- Coltheart, M., P. Menzies, and J. Sutton. 2010. Abductive inference and delusional belief. *Cognitive Neuropsychiatry* 15(1-3): 261-287.
- Corlett, P. R. 2019. Factor one, familiarity and frontal cortex: A challenge to the two-factor theory of delusions. *Cognitive Neuropsychiatry* 24(3): 165–177.
- Davies, M., M. Coltheart, R. Langdon, and N. Breen. 2001. Monothematic delusions: Towards a two-factor account. *Philosophy, Psychiatry and Psychology* 8(2/3): 133–158.
- Jackson, M., and K. W. Fulford. 1997. Spiritual experience and psychopathology. *Philosophy, Psychiatry, and Psychology* 4: 41-65.
- Lancellotta, E. forthcoming. Is the biological adaptiveness of delusions doomed? The case of predictive coding. *Review of Philosophy and Psychology*.
- Lancellotta, E., and L. Bortolotti. 2019. Are clinical delusions adaptive? *WIREs Cognitive Science* 10: e1502.
- Jaspers, K. 1963. *General Psychopathology*. Manchester: Manchester University Press.
- Gunn, R., and L. Bortolotti. 2018. Can delusions play a protective role? *Phenomenology and the Cognitive Sciences* 17, 813–833.
- McKay, R. 2012. Delusional inference. *Mind & Language* 27(3): 330-355.
- McKay, R., R. Langdon, and M. Coltheart. 2005. “Sleights of mind”: Delusions, defences, and self-deception. *Cognitive Neuropsychiatry* 10(4): 305-326.
- McKay R. T., and D. C. Dennett. 2009. The evolution of misbelief. *Behavioral and Brain Sciences* 32(6):493-561.

- Mele, A. 2006. Self-deception and delusions. *European Journal of Analytic Philosophy*, 2(1), 109-124. <https://hrcak.srce.hr/91611>
- Miyazono, K. 2015. Delusions as harmful malfunctioning beliefs. *Consciousness and cognition* 33: 561–573.
- Miyazono, K., and R. McKay. 2019. Explaining delusional beliefs: A hybrid model. *Cognitive Neuropsychiatry* 24(5): 335-346.
- Mishara, A. 2010. Klaus Conrad (1905-1961): Delusional mood, psychosis, and beginning schizophrenia. *Schizophrenia Bulletin* 36: 9-13.
- Ramachandran, V. S., and S. Blakeslee. 1998. *Phantoms in the Brain: Probing the Mysteries of the Human Mind*. New York: William Morrow.
- Sakakibara, E. 2016. Irrationality and pathology of beliefs. *Neuroethics* 9(2): 147–157.
- Turnbull, O., A. Fotopoulou, and M. Solms. 2014. Anosognosia as motivated unawareness: The ‘defence’ hypothesis revisited. *Cortex* 61: 18-29.



Is the biological adaptiveness of delusions doomed?

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Abstract

Delusions are usually considered as harmful and dysfunctional beliefs, one of the primary symptoms of a psychiatric illness and the mark of madness in popular culture. However, in recent times a much more positive role has been advocated for delusions. More specifically, it has been argued that delusions might be an (imperfect) answer to a problem rather than problems in themselves. By delivering psychological and epistemic benefits, delusions would allow people who face severe biological or psychological difficulties to survive in their environment - although this has obvious epistemic costs, as the delusion is fixed and irresponsive to compelling counterevidence. In other words, it has been argued that delusions are biologically adaptive. The adaptiveness of delusions has been compared by Ryan McKay and Daniel Dennett to a shear pin, a mechanism installed in the drive engine of some machines which is designed to shear whenever the machine is about to break down. By breaking, shear pins prevent the machine from collapsing and allow it to keep functioning, although in an impaired manner. Similarly, when delusions form, they would allow a cognitive or psychological system which is about to collapse to continue its functioning, although in an impaired manner. However, this optimistic picture of delusions risks being undermined by both theoretical and empirical considerations. Using Sarah Fineberg and Philip Corlett's recent predictive coding account as a paradigmatic model of the biological adaptiveness of delusions, I develop

two objections to it: (1) principles of parsimony and simplicity suggest that maladaptive models of delusions have an upper hand over adaptive models; and (2) the available empirical evidence suggests that at least some delusions stand good chances of being psychologically adaptive, but it is unlikely that they also qualify as biologically adaptive.

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1 Introduction

Delusions are characterized as fixed and irrational beliefs which are not amenable to change in the light of evidence to the contrary and are held despite what everyone else believes (APA 2013, 87). They can be found in a number of psychiatric illnesses, ranging from schizophrenia to delusional disorder, depression, OCD, Body Dysmorphia, and Anorexia Nervosa. They are also generally held to be the outcome of a dysfunction of some sort (Davies et al. 2001; Fletcher and Frith 2008; Ellis and Young 1990) and to cause harm and psychological distress to the person who experiences them (McKay et al. 2005; Garety and Hemsley 1987).

However, already in the last century a more positive role was advocated for delusions. Drawing on Freud's approach to psychosis (1924/1986), so called psycho-dynamic or psychoanalytic accounts claimed that delusions might play a psychologically protective or defensive function, relieving painful and difficult emotions (Bell 2003). For example, Capgras and Carette (1924) saw the delusion of a young woman who believed that her father was an imposter as the result of a defence mechanism, aimed at hiding to the patient's consciousness her incestuous desires towards her father. Notwithstanding some exceptions, (e.g. Bentall and Kaney 1996; Enoch and Trethowan 1991), psychodynamic accounts of delusions and psychoanalytic theory more in general are usually dismissed by contemporary mainstream psychiatry as a relic of folk psychology with no scientific basis (Ellis 2003; Stone and Young 1997). This is mirrored by the DSM definition of delusions, which is based on one of the nowadays most influential paradigm of delusion formation and maintenance, the neuropsychological paradigm: this paradigm sees delusions as the by-product of neurological or physiological deficits or dysfunctions (e.g. Miyazono 2015; Davies et al. 2001; Langdon and Coltheart 2000).

The old psychodynamic idea that delusions might be an (imperfect) answer to a problem rather than problems in themselves has been more recently revisited by other theories of delusion formation and maintenance. Even more daringly than their psychodynamic ancestors, such theories have argued that the benefits of delusions can extend further than the psychological realm. By delivering both psychological and epistemic benefits, delusions would allow people who face severe biological or psychological difficulties to be better off and to survive in their environment - although with some epistemic costs, as the delusion

is fixed and irresponsive to compelling counterevidence. In other words, such theories have argued that delusions are not only psychologically adaptive, in line with psychodynamic accounts, but also epistemically beneficial to some extent and biologically adaptive. In an influential paper, McKay and Dennett (2009) - who deny the biological adaptiveness of delusions but are open to their possible psychological adaptiveness - have compared the adaptiveness of delusions to a shear pin, a mechanism installed in the drive engine of some machines which is designed to shear whenever the machine is about to break down. By breaking, shear pins prevent the machine from collapsing and allow it to keep functioning, although in an impaired manner. Similarly, when delusions are formed and maintained, they would allow a cognitive or psychological system which is about to collapse to continue its functioning, although in an impaired manner. Despite McKay and Dennett ultimately arguing in their paper that delusions are not biologically adaptive, the shear pin metaphor has been particularly successful among supporters of the biological adaptiveness of delusions. Aaron Mishara and Philip Corlett et al. (2009) and, more recently, Sarah Fineberg and Corlett (2016, F&C from now on), have put forward the most developed model of the biological adaptiveness of delusions within a predictive coding framework, focusing on schizophrenic and neurological delusions such as Capgras.¹

In this paper, I argue that claims about the biological adaptiveness of delusions are partly undermined both by theoretical and empirical considerations, which seem to suggest that, while some delusions might be psychologically adaptive, at least in the short term, it is unlikely that they are biologically adaptive. Taking F&C's model as my target, I develop two objections to the claim that delusions are biologically adaptive: (1) principles of simplicity and parsimony suggest that the maladaptive view of delusions should be preferred over the adaptive/shear pin model proposed by F&C; and (2) though still scant and difficult to find, the available empirical evidence speaks in favour of the psychological adaptiveness of some delusions but against their biological adaptiveness. The paper is structured as follows. After briefly introducing the notion of adaptive-ness (2), I will illustrate how such a notion, as well as the related notion of epistemic innocence, have been applied to delusions (2.1). Then I will examine F&C's as the most developed existing model of the biological adaptiveness of delusions. After introducing the basics of predictive coding (3) - the account of delusion formation which F&C's model belongs to - I illustrate F&C's model (4) in detail and raise two objections to it. The first objection (5.1) is more theoretical in nature, stating that between a maladaptive and an adaptive model of delusion

formation, the former should be preferred, as it is simpler and makes fewer and less controversial assumptions than the latter. The second objection (5.2) is based on a review of some of the existing empirical evidence about the psychological and biological benefits of delusions. It maintains that, contra F&C's model, such evidence speaks against the biological adaptiveness of delusions. I also point to some additional empirical research that could be developed to test F&C's model. I thus conclude (6) that, before we accept the F&C's model, we need more empirical evidence in its support, even if obtaining it will be no easy task.

2 Adaptiveness

'Adaptiveness' is a key term in evolutionary biology and psychology. A trait or mechanism is considered to be biologically adaptive when it performs the function it was designed for by natural selection (Boorse 1975; Wakefield 1992). For example, a heart which pumps blood is an adaptive mechanism, as hearts were designed by natural selection to pump blood. The goal of adaptive traits and mechanisms is to support the reproductive success and survival of an organism in a given environment. An adaptive

¹ Although F&C's model has been developed with schizophrenic and Capgras delusions in mind, in principle there is no reason why the model should not be extended to delusions in other conditions, as predictive coding is an all-encompassing account of human cognition. In fact, beyond schizophrenia and Capgras, predictive coding models have also been developed for other disorders where delusions and delusion-like ideas are present, such as OCD (Levy 2018), depression (Badcock et al. 2017) and Anorexia Nervosa (Gadsby and Hohwy 2020).

trait is closely connected to the environment in which it developed. As a consequence, some traits can be adaptive in one environment but not in another or lose their adaptiveness as a consequence of an environmental change. By analogy with biological adaptiveness, philosophers and psychologists talking about beliefs and delusions often speak of psychological adaptiveness² when a trait, mechanism or mental state delivers psychological benefits, either by enhancing feelings of pleasure, or by conferring purpose and meaning to one's life (Bortolotti 2015; McKay and Kinsbourne 2010; McKay et al. 2005). Although biological and psychological adaptiveness often go hand in hand, they can also come apart. For example, activities which are biologically adaptive (such as sexual intercourse) can also be psychologically pleasant. However, conditions such as extremely low levels of anxiety - as pleasant as they might be - pose serious threats to genetic fitness, as they make individuals less sensitive to danger and hence decrease their chances of survival in a given environment (Lee et al. 2006). In other words, they are psychologically but not biologically adaptive.

The notion of adaptiveness or maladaptiveness has been applied to behaviours that are associated with mental illness, in the following three ways (Murphy 2005): (a) as a failure of some component of the mind/brain to fulfil its evolutionary function; (b) as a result of the mismatch between the ancestral and the present environment; (c) as the unpleasant social consequences of atypical traits which were and are still adaptive in the present environment—it is debated, however, if the label of mental illness still applies to such cases. While (a) seems quite straightforward in accounting for the rise and development of mental illnesses, (b) and (c) are more controversial, and require complex causal histories of the phenomena they aim to account for. According to option (b), traits or mechanisms which were adaptive in a past environment are no longer adaptive in a new environment and they thus fail to deliver the benefits they were originally designed for. According to option (c), atypical traits like the lack of prosocial emotions which characterize antisocial personalities are usually labelled as mental illnesses. However, this would be a mistake from an evolutionary standpoint. These traits would in fact allow the person to survive and successfully reproduce – even if at the expenses of others - and hence they might in fact be biologically adaptive despite their being socially despicable.

Delusions are usually conceived as a maladaptive phenomenon, a breakdown of some component in the brain/mind machinery—in accordance with view (a). From a merely biological standpoint, delusions would be maladaptive: for example, people with schizophrenia, where

delusions are largely present, tend to marry and reproduce less than controls (Nanko and Moridaira 1993). Also, paranoid ideation without psychosis in the general population is associated with depression, anxiety and suicide attempts, suggesting that delusional ideas have a negative impact on psychological wellbeing but also survival (Na et al. 2019). From a psychological standpoint, delusions are maladaptive as they hijack cognitive resources and, depending on the content, cause worry and unhappiness to the people experiencing them (e.g. Garety and Hemsley

² Here I use the notions of psychological adaptiveness and psychologically adaptive traits in the sense that the scholarly debate on delusions employs them, which should not be confused with the way in which evolutionary psychologists use the same terms. For evolutionary psychologists (see e.g. Schmitt and Pilcher 2004), psychologically adaptive traits (or psychological adaptations) are all those cognitive and behavioural traits that favour the fitness of an organism in a given environment. In this paper, psychologically adaptive traits are simply all those traits that provide some psychological benefit to the beholder.

1987) For example, people with persecutory delusions might be worried that people want to harm them and, as a consequence of that, live in fear and interrupt social contacts.

However, the proposal that delusions might be psychologically or even biologically adaptive has gained momentum. Expanding on the psychodynamic idea that delusions are the beginning of a solution rather than problems in themselves, delusions have been considered as part of ‘a shear pin mechanism’ which delivers biological or psychological benefits to organisms that find themselves in a situation of severe biological or psychological difficulty. In the next section, I am going to illustrate the metaphor and its application to delusions in more detail. I will also introduce the notion of epistemic innocence, that has been utilized by F&C’s model in support of the claim that delusions are biologically adaptive.

2.1 The Adaptiveness of Delusions: Psychological Adaptiveness, Epistemic Innocence and Biological Adaptiveness

According to the inventors of the metaphor, Ryan McKay and Daniel Dennett “A *shear pin* is a metal pin installed in, say, the drive train of a marine engine. The *shear pin* locks the propeller to the propeller shaft and is intended to “shear” should the propeller hit a log or other hard object” (McKay and Dennett 2009, 497). By breaking and disabling some of the parts of a system which is about to collapse, the function of the shear

pin would be to prevent the system's complete breakdown. In this way, the system keeps functioning in an impaired manner, but the breakdown is prevented.

McKay and Dennett consider that delusions might be akin to a shear pin mechanism, whose function would be to prevent the complete collapse of the cognitive system of an individual who finds himself in severe biological or psychological difficulties. However, they ultimately reject this idea, concluding that delusions are not the by-product of a shear pin mechanism. They acknowledge that some delusions could be psychologically adaptive, but also that this is not sufficient to make them biologically adaptive. Drawing on McKay and Dennett, Lisa Bortolotti argues that in virtue of their psychological adaptiveness, some delusions are also epistemically innocent. A belief is epistemically innocent if 1. It delivers a significant epistemic benefit, such as the acquisition and retention of true beliefs; 2. This benefit cannot be otherwise achieved, i.e. at a minor epistemic cost (Bortolotti 2020; Bortolotti 2015). Motivated delusions would prevent severe depression by protecting from overwhelmingly negative emotions caused by adverse events (Bortolotti 2015); depressive delusions would restore a coherent sense of self by resolving the clash between pre-existing negative schemata about the self and contradictory evidence (Antrobus and Bortolotti 2016); elaborated and systematized delusions in schizophrenia would resolve the uncertainty and relieve the anxiety brought about by anomalous experiences and predictive errors (Bortolotti 2016). In all these cases, delusions would relieve uncertainty, low mood, and enhance one's self-esteem: in other words, they would be psychologically adaptive. However, these psychological benefits would also translate into epistemic ones, as having anxiety relieved and mood enhanced would allow someone to be more engaged with the external environment, which in turn favours the acquisition and retention of true beliefs (condition 1 of epistemic innocence). Moreover, this epistemic benefit would not be otherwise achievable, i.e. by entertaining a non-delusional belief, because believers would not have access to alternative beliefs due to various dysfunctions, impairments or biases (condition 2 of epistemic innocence). It should be highlighted that the contact with the environment and the psychological relief that delusions provide is far from optimal, as delusions are irrational, irresponsive to rational arguments to the contrary, and often distressing depending on their content. However, this state of imperfect contact with reality and of precarious psychological equilibrium which delusions provide would still be better than one in which the difficulties that people undergo are not responded to by the delusions. For example, it is

undeniable that schizophrenic delusions cause a great deal of psychological distress and, by limiting the social life of an individual, also negatively affect his contact with the environment. However, the epistemic and psychological consequences of not having the delusion for someone who is undergoing anomalous experiences and predictive errors would be even worse than entertaining the delusion that, for example, one is persecuted by the CIA.

Revisiting the notion of epistemic innocence as well as a previous proposal by Mishara and Corlett (2009) - who, in response to McKay and Dennett, argued that delusions could be the by-product of a shear pin mechanism - F&C argue that delusions are biologically adaptive: this is because being more in contact with the environment, as posited by epistemic innocence, is also key to survival and reproduction.

In what follows, I will explain how F&C conceive of the biological adaptiveness of delusions. Before doing that, however, it is necessary to illustrate the basics of predictive coding, as their model firmly relies on the principles of this popular theory of human cognition.

3 Predictive Coding

Fineberg and Corlett's model belongs to predictive coding theories of delusion formation and maintenance. Predictive coding is an influential model of human cognition. Its basic assumption is that the brain is a predictive machine ruled by a simple principle: to minimize uncertainty by building an internal model of the world where the gap between the expected and actual sensory input is reduced to minimum (e.g. Hohwy 2014; Fletcher and Frith 2008).

The mismatch between actual and expected sensory inputs is signalled by prediction errors (PEs). According to predictive coding, the final goal of the brain would be to get rid of PEs in the long run in order to achieve a consistent model of the world where expected sensory inputs reliably predict actual inputs (Williams 2018). PEs can be eliminated in various ways: actual inputs which mismatch expected inputs can be used to update the person's prior beliefs, engendering new beliefs and hence promoting learning; inputs can be discarded and prior beliefs retained; finally, PEs can also be eliminated or reduced by actions whose aim is to avoid the generation of PEs in the first place. Take Alice, who believes herself to be extremely overweight, but who in reality is very thin. Whenever she looks at her image in the mirror, Alice will get a disconfirmation of her belief that she is fat. PEs which signal the mismatch between her beliefs and her

visual inputs are thus generated. To eliminate the PEs, Alice has three options: a. update her previous beliefs in light of her visual inputs and adopt the new belief that she is in fact thin; b. discard the visual inputs generated by the mirror image and continue to believe that she is fat; c. continue to believe that she is fat by stopping looking at the mirror altogether or by attending to specific body parts which she deems to be more fat or unattractive (as it happens in some cases of Anorexia Nervosa): in this way, as the source of the PEs is entirely avoided, PEs are also completely eliminated. The criteria according to which Alice might choose one way or the other to get rid of PEs depend on the estimation of the precision of the PEs about body size. Estimation of precision indicates the degree of confidence that one has towards the reliability of PEs. If PEs are estimated to be highly precise (or reliable), that means that the set of beliefs or predictions that one holds are deemed not reliable enough to explain a given state of affairs. As a consequence, an update of beliefs will take place. On the contrary, if PEs are estimated to be highly imprecise, previous beliefs will be retained, as the generation of the PEs will be ascribed to some noise in the environment rather than to the unreliability of the set of beliefs. In general, precision is fundamental in the revision or maintenance of one's model of the world, to the point that, according to predictive coding, psychopathologies are entirely explicable as errors in precision weighing or estimation (Hohwy 2017). Here it is important to highlight the following point. The final goal of the predictive brain is to get rid of PEs in the long term, achieving consistency between one's set of beliefs and perceptual inputs. However, this does not necessarily entail that the resulting model of the world will mirror how the world really is, as there is not a preferential way to reduce PEs. The way one chooses to minimize PEs in the long run might or might not lead to the formation of veridical beliefs about the world, as this is the result of complex processes concerning precision estimation. The predictive coding framework has also been characterized as a Bayesian inferential hierarchy. Bayes' theorem stipulates what the best way of updating beliefs under conditions of uncertainty is:

$$p(h/e) = p(e/h)p(h)/p(e)$$

More specifically, the probability of a hypothesis given the available evidence $p(h/e)$ is proportional to its likelihood $p(e/h)$ – how well the hypothesis predicts the sensory data
 - divided by its prior probability $p(h)$ – the probability of the hypothesis

prior to the sensory data. This would be the ideal way of updating beliefs under conditions of uncertainty. However, according to supporters of the Bayesian brain, the theorem would also bear a descriptive value, as many inferential processes in the brain would actually approximate Bayes' theorem (Knill and Pouget 2004).

Another important feature of predictive coding is that there is no clear-cut distinction between perceptions and beliefs (Corlett and Fletcher 2015; Fletcher and Frith 2008; Teufel and Fletcher 2016). Rather than being two discrete entities, perception and belief would represent two different levels of the same inferential hierarchy, organized according to spatiotemporal levels of increasing complexity. While perceptions would capture causal regularities at a more limited space and smaller duration of time, lower down in the hierarchy, beliefs would do it at the higher levels of the hierarchy, at a broader space and time length. However, although in everyday language we might choose to refer to the lower levels as perceptions and to the higher levels as beliefs, as Corlett and Fletcher put it, "*at another level of analysis – the one we think is more useful – no distinction is called for*" (Corlett and Fletcher 2015, 96–97). The disavowal of the distinction between perceptions and beliefs has a huge impact on the classification of psychotic symptoms: for example, hallucinations and delusions should not be considered as distinct entities but rather they can be explained "*in terms of a disturbed hierarchical Bayesian framework, without recourse to separate consideration of experience and belief*" (Fletcher and Frith 2008, 48). Finally, while in other theories of delusion formation perceptions can influence beliefs but not vice-versa, in predictive coding the influence between perceptions and beliefs is mutual and continuous, so that we do not only believe what we see but we also see what we believe (McKay 2012). This phenomenon is known as cognitive penetration.

It is interesting to see how predictive coding relates to the other most popular theories of delusion formation and maintenance, namely one- and two-factor accounts. One-factor accounts postulate that delusions are caused by a single neuropsychological impairment, which often takes the form of an anomalous perception: delusions would be a rational explanation of such perception (Maher 1974), as for one-factor theorists the cognitive capacities of people with delusions would be intact. On the other hand, two-factor accounts claim that people with delusions undergo a double dysfunction, the former being a neuropsychological impairment under the form of an aberrant perception and the latter being a reasoning bias or deficit (Coltheart et al. 2010; Davies et al. 2001; Stone and Young 1997). In this case, delusions would be the result of this double

impairment. Some assimilate predictive coding to a one-factor account (*"We posit a single factor, prediction error dysfunction for delusion formation and maintenance"*; Corlett et al. 2010, 361); others, however, argue that predictive coding is not incompatible with a two-factor account (Miyazono and McKay 2019; McKay 2012). In any case, it is clear that predictive coding cannot be easily reduced either to a one- or to a two-factor account. Contrary to both one and two factor accounts, in predictive coding perceptions and beliefs are not two water-shed entities but two levels of the same inferential hierarchy which mutually influence each other. In line with one-factor accounts, predictive coding posits that delusions are reached via a single impairment. The impairment in question would be represented by aberrant PEs, which cause the person to depart from ideal Bayesian norms of rationality. In patients with delusions, PEs would erroneously be estimated to be more or less precise than they should, or elicited when they should not, by normal and unsurprising events. When PEs are erroneously estimated to be highly precise, *"possibly as a consequence of dopamine dysregulation, events that are insignificant and merely coincident seem to demand attention, feel important and relate to each other in meaningful ways. Delusions ultimately arise as a means of explaining these odd experiences"* (Corlett et al. 2009, 1). In the light of such PEs, a revision of beliefs take place, and a delusional belief is adopted as a new belief which explains the anomalous PEs. At a later stage, aberrant PEs are explained in the light of the delusional belief, giving way to a process of reinforcement which strengthens the delusion even more (Hohwy 2013). However, PEs can also be mistakenly estimated to be less precise than they should: in this case, prior beliefs are wrongfully overvalued and perceptual evidence is prematurely discarded.

In what follows, I will illustrate how the adaptive model of F&C marries predictive coding and what contribution this interaction brings to the issue of the biological adaptiveness of delusions.

4 Fineberg and Corlett's Model

F&C's model sees delusions both as biologically adaptive and entirely explicable by a predictive coding framework.

On the model, delusions are the by-product of the shear pin, which is designed to break in times of what can be called a 'doxastic emergency'. More precisely, such an emergency would be triggered by the person undergoing aberrant PEs (often under the form of anomalous experiences). The biological adaptiveness of delusions would consist in the fact that, when explaining those anomalous experiences, delusions contribute to the elimination of PEs and hence to a person's survival, by allowing the learning system to resume its functioning; as a result, the person continues to stay engaged with reality. For example, in the Capgras syndrome, aberrant PEs are generated as the result of expecting feelings of familiarity when perceiving a familiar face but instead not having those feelings. As long as the experience remains unexplained, a big part of the cognitive resources of the person is absorbed into the process of making sense of it, and cannot be employed to actively engage with other aspects of the outside world. In other words, the learning system (or a big part of it) is momentarily blocked by the presence of the unexplained experience. When the delusion emerges as an explanation of the experience - leading to the adoption of the belief that the dear one has been replaced by an imposter - those cognitive resources become available again and can be employed to interact with and exploit the external world, increasing the chances of survival and reproduction of the individual.

However, arriving at an explanation in this way also has some costs. Although delusions free cognitive resources, they remove the delusional belief from the control of the most flexible (but cognitively expensive) part of a person's learning system, the goal-directed learning system. In this way, the delusional belief falls under the control of the habitual learning system. While the former "*involves learning flexible relationships between actions and outcomes*" (Mishara and Corlett 2009, 530), the latter involves a more fixed relationship between stimuli and responses, such that to a specific stimulus always corresponds a specific response. For F&C's model, when delusions are adopted, the goal-directed part of the learning system is disabled in order to avoid the complete breakdown of the system, while the more habitual part monopolizes the control of the person's delusional beliefs. This shift in control between the different parts of the learning system explains the inflexibility which typically marks delusional states. This is the unavoidable cost of the shear pin break: preserving the overall functionality of the learning system in spite of aberrant perceptions or PEs has the side effect that the system does not function in an optimal manner. The delusion would restore the overall functionality of the learning system but at the cost of the delusion being irresponsive to evidence and to reasonable argument to the contrary.

It is important to notice that, according to F&C's model, the biological adaptiveness of delusions is mediated by their epistemic benefits. In other words, delusions increase the chances of survival and reproduction of an individual by restoring the functionality of the learning system, although this implies some epistemic costs. Restoring learning is good for the individual, because it allows him to stay engaged with the environment and exploit it for purposes of survival and reproduction.

Delusions [...] enable patients to stay engaged with the environment and to exploit its regularities, though the patient may be inflexible and unresponsive to corrective feedback (Fineberg and Corlett 2016, 76)

Delusions form when the shear pin breaks, permitting continued engagement with an overwhelming world, and ongoing function in the face of paralysing difficulty (Fineberg and Corlett 2016, 73)

The restored functionality of the learning system also translates into psychological benefits, easing the sense of confusion and anxiety which characterizes the presence of unexplained and anomalous experiences or PEs. In turn, at a physiological level, relief from anxiety manifests in a dramatic fall of the stress-related hormone cortisol.

5 Objections

Here I am going to consider two objections to the F&C's model, emerging from theoretical and empirical considerations.

5.1 The Maladaptive View Is Simpler

As I have pointed out in 3, according to predictive coding, delusions are generated by a single dysfunction, affecting

both lower and upper levels of the Bayesian hierarchy (the equivalent of the folk-psychological notions of perceptions and beliefs); this dysfunction would cause the person to depart from Bayesian norms of rationality. How is it then possible for delusions to be dysfunctional and adaptive at the same time, as F&C argue? In other words, how can delusions be a response to a dysfunction if predictive coding generally holds that they are the result of a dysfunction?

In F&C's model, delusions are not dysfunctional: they are the by-product of a mechanism – the shear pin – which is functioning exactly as designed when it breaks and gives rise to delusions. Although the shear pin is activated by a dysfunction (under the form of anomalous PEs), its operation and the rise of delusions are not dysfunctional. This assumption seems to be somehow incompatible with the aetiology of delusions that predictive coding provides. In predictive coding, delusions are in fact dysfunctional, as they are the by-product of an abnormality – i.e. anomalous PEs - which disrupts inference at every level of the Bayesian hierarchy.

The unusual perceptual experiences and beliefs in psychosis can be explained by one core atypicality, namely a shift in the balance of Bayesian inference within a hierarchically - organised information processing system (Teufel and Fletcher 2016, 5)

These theorists [of predictive coding] disavow any strict conceptual separation between experience and belief. There is just one basic abnormality—aberrant prediction error signalling—that disrupts inference across the board. (McKay 2012, 349)

While in predictive coding PEs seem to directly generate delusions, by disrupting inference at every level of the Bayesian hierarchy, in F&C's model delusions are generated by the shear pin, which is triggered in response to the anomalous PEs. This seems to be an important point of conflict between predictive coding accounts of delusion formation and F&C's model. If, as predictive coding assumes, delusions are dysfunctional, this claim is incompatible with the claim that delusions are the by-product of an adaptive shear pin break. While in predictive coding delusions are something which goes against biological adaptiveness, in F&C's model delusions are part of the shear pin mechanism, which is designed by natural selection to support biological adaptiveness. F&C's model clearly deviates from the standard/maladaptive version of predictive coding accounts of delusion formation insofar as delusions are not generated by anomalous PEs but by the shear pin, which stops the anomalous PEs from propagating to the upper levels of the Bayesian hierarchy.

Delusion formation. In response to prodromal [i.e. when people present the anomalous PEs but not yet the delusion] confusion and stress, the “doxastic shear-pin” breaks. Delusions appear in an aha- moment, when explanatory insight occurs and flexible processing is disabled. (Fineberg and Corlett 2016, 76)

Nonetheless, there seems to be an important reason why standard/maladaptive predictive coding models of delusions should have the upper hand over their shear pin/ adaptive predictive coding counterparts in accounting for the rise and maintenance of delusions. Let's take Fred, who believes himself to be persecuted by the CIA. While a maladaptive model of delusions holds that the delusion of persecution is adopted because when undergoing certain anomalous PEs, Fred cannot help but adopt the delusional belief, the shear pin view argues that the delusion of persecution is adopted in response to anomalous PEs which have the potential to seriously impair Fred's learning and cognitive system: it is when the shear pin kicks in to tackle the PEs that delusions ensue. The maladaptive view holds that 1. people with delusions undergo anomalous PEs; 2. that the PEs are sufficient to cause delusions to arise. The conclusion is that delusions are the maladaptive result of anomalous PEs. Compared to the maladaptive view, the shear pin view holds two additional assumptions, i.e. 1. that, if not tackled, the PEs that people with delusions undergo have the potential to break down the overall functioning of their cognitive system and 2. that delusions are the by-product of a shear pin mechanism, which is supposed to tackle the anomalous PEs. It follows that, as having a functioning cognitive system is vital to surviving and reproducing, delusions are the adaptive by-product of a shear pin mechanism. In principle, between two or more models, the one that must be preferred for explaining a given phenomenon is the simplest, i.e. the one which makes the fewest assumptions. It is easy to see how, being the simplest model between the two, the maladaptive model of predictive coding should have the upper hand over the shear pin model endorsed by F&C, unless there are some aspects of delusions which the former cannot explain and hence motivate a recourse to the latter. It is thus fundamental for supporters of the shear pin version of predictive coding to specify those aspects of delusions that a maladaptive model would neglect and that a shear pin model would instead capture. F&C's model provides an answer to this issue, which

is contained in the additional assumptions made by the model: the aspects that maladaptive/standard predictive coding models of delusions overlook relate to the fact that delusions are biologically adaptive, i.e. that they favour survival and reproductive success thanks to their epistemic benefits, by keeping a person who is undergoing anomalous PEs in some form of contact with his environment rather than in no contact at all.

However, such a claim requires strong empirical evidence in its support; otherwise, all things being equal, the maladaptive version of predictive coding accounts should be preferred over its adaptive/shear pin counterpart in virtue of its superior simplicity. In what follows, however, I will illustrate that the available empirical evidence, though still scant, does not raise good prospects for the biological adaptiveness of delusions.

5.2 The Maladaptive View Is more Compatible with Available Evidence

Having established that the F&C's shear pin model should pass the test of empirical evidence in order to be reasonably preferred over maladaptive models of delusions, what kind of studies should one conduct to verify whether the model is accurate?

I envisage that the issue can only be settled through studies which compare people who undergo anomalous PEs and have delusions with people who present the same PEs but no delusions. If delusions really are an adaptive response to anomalous PEs of some sort, and it is an assumption of F&C that, if not eliminated, these PEs seriously undermine the contact of a person with reality and thus his chances of survival and reproduction, it follows that people undergoing the same PEs as people with delusions but who present no delusions should be less in contact with reality (and thus stand less chances of survival) than people presenting both the PEs and the delusions.

Studies of this type can take up two forms. The first applies to psychosis. It would consist in comparing people who have already developed a delusion with people who are still in its prodromal stages to see which group is more in contact with reality and hence potentially stands more chances of survival and reproduction. Comparative studies of this kind are difficult to run, as in psychosis it is hard to observe delusions in isolation from other confounding psychotic symptoms. Nonetheless, there exist some studies which have compared people with first-episode psychosis with people who are at high risk for psychosis on measures of quality of life and cognitive functioning, finding that people at high risk for psychosis display a lower mood but also a higher degree of cognitive functioning than people in their first episode (Fusar-Poli et al. 2012; Broome et al. 2009; Bechdolf et al. 2005).

The findings of these studies show that, while psychosis ameliorates the psychological wellbeing of people still in its prodromal stage, undergoing aberrant PEs, it worsens their cognitive functioning. This would seem to speak against F&C's model: what emerges from these studies is that psychosis seems to be psychologically adaptive, as it boosts the mood of the people in the prodromal phase, but it is not biologically adaptive as intended by F&C, as it negatively affects those cognitive capacities which in the model would be so important for keeping in contact with the external environment. However, one should be careful to jump to easy conclusions by extending these results to delusions. As psychosis is a broader construct than delusions, it cannot be ruled out that the psychological relief and the cognitive deterioration brought about by psychosis are ascribable to other phenomena than delusions. In other words, it could yet be proved that it is due to delusions that people in the full-blown psychotic phase are more detached from their environment than people experiencing only anomalous PEs in the prodromal phase. Although there is still room to refute the thesis that delusions are maladaptive, these studies seem to point in a different direction from F&C's model.

The second way in which the shear pin model might be tested extends beyond psychosis. It would consist in comparing people with delusions with people who present the same psychological or neurological dysfunctions of the deluded group but no delusions. Translated into the language of predictive coding, this would equal to comparing people who present anomalous PEs and delusions with people who present only the former. If the shear pin model is correct, the latter group should be less in contact with reality and less fit for survival than the deluded group, as in the non-delusional group the shear pin would not be operative. At first sight, this looks like a more viable way to test the shear pin hypothesis than the previous one. After all, there are plenty of conditions – such as Anorexia Nervosa, depression, OCD, BDD – which present both a delusional and non-delusional variant; it seems sensible to think that, despite the presence of delusions, the delusional and non-delusional forms of each condition share the same kind of dysfunctions, which in turn give rise to the anomalous PEs. This would make the shear pin hypothesis look quite easily testable, as it would be sufficient to take, say, some individuals with depression but no delusions and compare them to their delusional counterparts to see which ones are in fact more in contact with their environment.

However, recent debates have shown how difficult can be to prove that two groups of people undergo exactly the same kind of dysfunctions. A recent discussion about Capgras and ventromedial frontal patients, involving

Corlett and McKay, is a prime example in this sense (McKay 2019; Corlett 2019). Famously, Capgras and ventromedial frontal patients have been held to share the same kind of neurological impairment (i.e. a disruption in the autonomic response to familiar faces, which would cause the faces of beloved ones to be perceived as unfamiliar), with only the former presenting delusional ideation. However, Corlett has recently cast doubt on this assumption, highlighting that ventromedial frontal patients present vaster impairments of the ventromedial prefrontal cortex than Capgras patients. It would follow that ventromedial frontal patients and Capgras patients are not comparable groups, as their neurological impairments do not coincide. This debate shows how difficult it is in practice to establish if two individuals or groups of people suffer from a dysfunction which is exactly the same, and hence to prove that one group is biologically and epistemically better off than the other. Similarly, how is it possible to know if people with anorexia or depression suffer from the same kind of impairments of their delusional counterparts? Is a person with anorexia delusionally convinced of being extremely fat undergoing the same kind of neurological dysfunction or of anomalous PEs as a person with anorexia only thinking, feeling or fearing that she is fat, but in a less than delusional form?³

The F&C model could resist these objections by claiming that if people don't form the delusion, then that indicates that we are not talking about the same levels or kinds of PE. However, this reply is problematic. If the assumption is that people who do not form delusions are not undergoing the same kinds of PEs as people with delusions, this

³ In a pilot study on the adaptiveness of delusions in OCD, I have tried to address this issue by comparing the epistemic functioning not of different people but of the same person before and during delusional ideation. If delusions are the by-product of an adaptive mechanism, a person that undergoes a dysfunction Y at time t1 (before delusions arise) should be epistemically worse off than at time t2, when delusions develop in response to

must be shown to be true, otherwise the theory becomes unfalsifiable. Moreover, if it turned out to be very difficult to empirically ascertain that people with delusions undergo different kinds of PEs of people who are not deluded, then the simplest model should be preferred – and, as I have showed, this is not F&C's but its maladaptive counterpart. Although the above considerations suggest that the shear pin hypothesis might be in practice hard to prove - either because delusions are hard to observe in isolation from other psychotic symptoms or because it is hard to tell if two people or groups suffer from exactly the same dysfunctions - it is already possible to point out that the biological adaptiveness of delusions seems to be put into question by the fact that the cognitive capacities of people with psychosis – who almost always present delusional ideation – seem to be deteriorated if compared to the cognitive capacities of people in the prodromal phase of psychosis. As good cognitive capacities are essential to keep in touch with the outside environment and exploit it for purposes of survival and reproduction, psychosis seems to be detrimental to biological adaptiveness. Although it is still premature to extend these results to delusions, these findings do not raise good prospects for the biological adaptiveness of delusions. The shear pin hypothesis needs to be built on stronger empirical evidence, and obtaining it will be no easy task.

6 Conclusion

Delusions are a complex and multifaceted phenomenon, which offers itself to various interpretations. Much of psychiatry and philosophy of psychiatry still sees delusions as a maladaptive phenomenon, something which impedes the psychological and biological flourishing of an individual. However, there is also another, though not much told, story about delusions. For some accounts, rather than a problem or a dysfunction in themselves, delusions would be an imperfect answer to a situation which is already compromised from a biological or psychological standpoint. Among these accounts, the most daring is that of Fineberg and Corlett, which argues in favour of the biological adaptiveness of delusions within a predictive coding framework. While in standard predictive coding accounts delusions are generated by anomalous PEs, in the F&C's model, they are generated by the shear pin, which is activated in response to the anomalous PEs. Hence while in standard predictive coding accounts delusions are maladaptive, the by-product of a dysfunction, in F&C's model delusions are the outcome of an adaptive process of belief formation.

However, the maladaptive view of delusions offered by standard predictive coding is simpler compared to the shear pin/adaptive model put forward by F&C: principles of parsimony and simplicity would thus suggest that the maladaptive view should be preferred to the adaptive one, unless there are some aspects of delusions which cannot be explained without resorting to the latter. In F&C's model the aspects that the maladaptive view would not capture is that delusions provide epistemic benefits to their beholders, being the only way that individuals have to be in contact with the outside environment despite the biological and psychological difficulties that they

undergo. For this reason, delusions would be biologically adaptive. However, this issue cannot be settled by purely theoretical means: only empirical studies of a comparative kind can clarify whether delusions do present epistemic benefits of the kind envisaged by F&C's model and hence whether resorting to an adaptive rather than to a maladaptive view is justified. However, some studies run on people with psychosis and on people in the prodromal phase of psychosis seem to point towards a different direction: that psychosis ameliorates psychological wellbeing but has a negative impact on those cognitive capacities which are deemed to be so essential for the successful exploitation of the external environment by F&C's model. This would suggest that psychosis is psychologically but not biologically adaptive.

Although one should be careful to extend these results to delusions - as psychosis is a broader construct than delusions - it seems that these studies speak more in favour of a biologically maladaptive than of an adaptive view of delusions. Despite the fact that comparative studies of this kind are difficult to run, because it is difficult to separate delusions from other confounding factors and because it is hard to prove that two groups of people undergo the exact same kind of dysfunction, it is the only way for F&C's model to gain the upper hand over their maladaptive counterparts. The latter in fact rest on a theoretically more solid ground, as they resort to a simpler model to explain the rise and maintenance of delusions.

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References

- American Psychiatric Association. 2013. *DSM-V Diagnostic and statistical manual of mental disorders (5th Rev ed.)*. Washington, DC: APA.
- Antrobus, M., and L. Bortolotti. 2016. Depressive delusions. *Filosofia Unisinos* 17 (2): 192–201.
- Badcock, P.B., C.G. Davey, S. Whittle, N.B. Allen, and K.J. Friston. 2017. The depressed brain: An evolutionary systems theory. *Trends in Cognitive Sciences* 21 (3): 182–194.
- Bechdolf, A., R. Pukrop, D. Köhn, S. Tschinkel, V. Veith, F. Schultze-Lutter, S. Ruhrmann, C. Geyer, B. Pohlmann, and J. Klosterkötter. 2005. Subjective quality of life in subjects at risk for a first episode of psychosis: A comparison with first episode schizophrenia patients and healthy controls. *Schizophrenia Research* 79 (1): 137–143.
- Bell, D. 2003. *Paranoia*. Cambridge: Icon.
- Bentall, R., and S. Kaney. 1996. Abnormalities of self-representation and persecutory delusions: A test of a cognitive model of paranoia. *Psychological Medicine* 26 (6): 1231–1237.
- Boorse, C. 1975. On the distinction between disease and illness. *Philosophy and Public Affairs* 5: 49–68. Bortolotti, L. 2020. *The epistemic innocence of irrational beliefs*. Oxford: Oxford University Press.
- Bortolotti, L. 2015. The epistemic innocence of motivated delusions. *Consciousness and Cognition* 33: 490–499.
- Bortolotti, L. 2016. The epistemic benefits of elaborated and systematised delusions in schizophrenia. *British Journal for the Philosophy of Science* 67 (3): 879–900.
- Broome, M.R., P. Matthiasson, P. Fusar-Poli, J.B. Woolley, L.C. Johns, P. Tabraham, E. Bramon, L. Valmaggia, S.C.R. Williams, M.J. Brammer, X. Chitnis, and P.K. McGuire. 2009. Neural correlates of executive function and working memory in the 'at-risk mental state'. *The British Journal of Psychiatry* 194: 25–33.
- Capgras, J., and P. Carette. 1924. Illusion de sosie et complexe d'Oedipe. *Annales Medico-Psychologiques* 82: 48–68.
- Coltheart, M., P. Menzies, and J. Sutton. 2010. Abductive inference and delusional belief. *Cognitive Neuropsychiatry* 15 (1): 261–287.
- Corlett, P. 2019. Factor one, familiarity and frontal cortex: A challenge to the two-factor theory of delusions. *Cognitive Neuropsychiatry* 24 (3): 165–177.
- Corlett, P. (2018). Delusions and prediction error. In Bortolotti, L. (Ed). *Delusions in context*. Palgrave Macmillan.
- Corlett, P., and P. Fletcher. 2015. Delusions and prediction error: Clarifying the roles of behavioural and brain responses. *Cognitive Neuropsychiatry* 20 (2): 95–105.
- Corlett, P., J. Taylor, X. Wang, P. Fletcher, and J. Krystal. 2010. Toward a neurobiology of delusions. *Progress in Neurobiology* 92 (3): 345–369.
- Corlett, P., J. Krystal, J. Taylor, and P. Fletcher. 2009. Why do delusions persist? *Frontiers in Human Neuroscience* 3: 12.
- Davies, M., M. Coltheart, R. Langdon, and N. Breen. 2001. Monothematic delusions: Towards a two-factor account. *Philosophy, Psychiatry, and Psychology* 8 (2/3): 133–158.
- Ellis, H.D. 2003. Book review: Uncommon psychiatric syndromes. *Cognitive Neuropsychiatry* 8: 77–79. Ellis, H.D., and A.W. Young. 1990. Accounting for delusional misidentifications. *The British Journal of Psychiatry* 157 (2): 239–248.
- Enoch, M., and W. Trethowan. 1991. *Uncommon psychiatric syndromes*. 3rd ed. Oxford: Butterworth-Heinemann.
- Fineberg, S., and P. Corlett. 2016. The doxastic shear pin: Delusions as errors of learning and memory.

- Cognitive Neuropsychiatry* 21 (1): 73–89.
- Fletcher, P., and C. Frith. 2008. Perceiving is believing: A Bayesian approach to explaining the positive symptoms of schizophrenia. *Nature Reviews Neuroscience* 10 (1): 48–58.
- Freud, S. 1986. Neurosis and psychosis. (J. Strachey, trans). In *The essentials of psychoanalysis The definitive collection of Sigmund Freud's writing*, ed. A. Freud. London: Penguin.
- Fusar-Poli, P., G. Deste, R. Smieskova, S. Barlati, A.R. Yung, O. Howes, R.D. Stieglitz, A. Vita, P. McGuire, and S. Borgwardt. 2012. Cognitive functioning in prodromal psychosis: A meta-analysis. *Archives of General Psychiatry* 69 (6): 562–571.
- Gadsby, S. 2018. Self-deception and the second factor: How desire causes delusion in anorexia nervosa. *Erkenntnis* 85: 609–626.
- Gadsby, S., & Hohwy, J. (2020). Why use predictive processing to explain psychopathology? The case of anorexia nervosa. In *The Philosophy and Science of Predictive Processing* (Eds.) S. Gouveia, R. Mendonça, & M. Curado. Bloomsbury.
- Garety, P., and D. Hemsley. 1987. Characteristics of delusional experience. *European Archives of Psychiatry and Neurological Sciences* 236 (5): 294–298.
- Hohwy, J. 2017. Priors in perception: Top-down modulation, Bayesian perceptual learning rate, and prediction error minimization. *Consciousness and Cognition* 47: 75–85.
- Hohwy, J. 2014. *The predictive mind*. Oxford: Oxford University Press.
- Knill, D., and A. Pouget. 2004. The Bayesian brain: The role of uncertainty in neural coding and computation. *Trends in Neurosciences* 27 (12): 712–719.
- Langdon, R., and M. Coltheart. 2000. The cognitive neuropsychology of delusions. *Mind and Language* 15 (1): 184–218.
- Lee, W., M. Wadsworth, and M. Hotopf. 2006. The protective role of trait anxiety: A longitudinal cohort study. *Psychological Medicine* 36 (3): 345–351.
- Levy, N. 2018. Obsessive–compulsive disorder as a disorder of attention. *Mind & Language* 33: 3–16.
- Maher, B.A. 1974. Delusional thinking and perceptual disorder. *Journal of Individual Psychology* 30: 98–113.
- McKay, R. 2012. Delusional inference. *Mind & Language* 27 (3): 330–355.
- McKay, R. 2019. Measles, magic and misidentifications: a defence of the two-factor theory of delusions. *Cognitive Neuropsychiatry* 24: 183–190.
- McKay, R., and M. Kinsbourne. 2010. Confabulation, delusion, and anosognosia: Motivational factors and false claims. *Cognitive Neuropsychiatry* 15 (1–3): 288–318.
- McKay, R., and D. Dennett. 2009. The evolution of misbelief. *Behavioral and Brain Sciences* 32 (06): 493– 561.
- McKay, R., R. Langdon, and M. Coltheart. 2005. “Sleights of mind”: Delusions, defences, and self-deception. *Cognitive Neuropsychiatry* 10 (4): 305–326.
- Mishara, A.L., and P. Corlett. 2009. Are delusions biologically adaptive? Salvaging the doxastic shear pin. *Behavioral and Brain Sciences* 32 (6): 530–531.
- Miyazono, K. 2015. Delusions as harmful malfunctioning beliefs. *Consciousness and Cognition* 33: 561–573.
- Miyazono, K., and R. McKay. 2019. Explaining delusional beliefs: A hybrid model. *Cognitive Neuropsychiatry* 24 (5): 335–346.
- Murphy, D. 2005. Can evolution explain insanity. *Biology and Philosophy* 20 (4): 745–766.
- Na, E.J., K.W. Choi, and J.P. Hong. 2019. Paranoid ideation without psychosis is associated with depression, anxiety, and suicide attempts in general population. *The Journal of Nervous and Mental Disease* 207 (10): 826–831.
- Nanko, S., and J. Moridaira. 1993. Reproductive rates in schizophrenic outpatients. *Acta Psychiatrica Scandinavica* 87 (6): 400–404.
- Schmitt, D., and J. Pilcher. 2004. Evaluating evidence of psychological adaptation: How do we know one when we see one? *Psychological Science* 15 (10): 643–649.
- Stone, T., and A.W. Young. 1997. Delusions and brain injury: The philosophy and psychology of belief. *Mind & Language* 12: 327–364.
- Teufel, C., and P. Fletcher. 2016. The promises and pitfalls of applying computational models to neurological and psychiatric disorders. *Brain* 139 (10): 2600–2608.
- Wakefield, J. 1992. The concept of mental disorder: On the boundary between biological facts and social values. *American Psychologist* 47 (3): 373–388.
- Williams, D. 2018. Hierarchical Bayesian models of delusion. *Consciousness and Cognition* 61: 129–147.

Are delusions adaptive? A case study in OCD

Abstract: Delusions are usually characterized as harmful and dysfunctional beliefs, one of the primary symptoms of a psychiatric illness. However, in recent times a much more positive role has been advocated for delusions. More specifically, some accounts, like Bortolotti's, have argued that, thanks to their psychological benefits, delusions would foster engagement with the environment rather than no engagement at all in the face of psychological or even biological difficulties. Other accounts, such as Fineberg and Corlett's, have argued that, thanks to their fostering engagement with one's environment in response to a crisis, delusions would be biologically adaptive. However, I argue that whether delusions are adaptive or not is an empirical rather than a theoretical issue. This is why the present paper aims to investigate the adaptiveness of delusions empirically, by analyzing the responses to a semi-structured interview of four people suffering from delusions and OCD. Findings suggest that delusions in my sample bear complex and heterogeneous relationships with psychological benefits and engagement with the environment. While some delusions support both, thus meeting the standards of adaptiveness as envisaged by Fineberg and Corlett, others seem to hinder both or deliver only psychological benefits. The present study aims to work as a template for future research on the adaptiveness of delusions, suggesting it should focus on comparisons between the psychological wellbeing and the level of engagement of people with and without delusions, as the present study does. Studies on the adaptiveness of delusions have important implications for clinical practice and philosophy. For clinicians, they highlight that if delusions have benefits, the ways in which the delusion is challenged should be informed by that. For philosophers, they invite further reflection on notions such as adaptiveness and evolutionary mechanisms.

1. Introduction

Delusions are characterized as ill-grounded beliefs which are not amenable to change in the light of evidence to the contrary and persist in spite of what everyone else believes (APA 2013, 87). They can be found in various psychiatric illnesses, ranging from schizophrenia to delusional disorder, depression, obsessive-compulsive disorder (OCD), Body Dysmorphia, and Anorexia Nervosa. They are generally held to be the outcome of a dysfunction (Davies *et al* 2001; Fletcher and Frith 2009; Ellis and Young 1990) and to cause harm and psychological distress to the person who experiences them (McKay, Langdon and Coltheart 2005; Garety and Hemsley 1987).

However, already in the last century psychoanalysis advocated a more positive role for delusions, focusing on the psychological benefits that these seemed to deliver in the face of painful and difficult emotions (Bell 2003). Building on the old psychoanalytic intuition, more recent accounts of delusions argue that delusions provide both psychological and epistemic benefits in the face of difficulty. Even more daringly, other accounts claim that, thanks to these benefits, delusions are adaptive, an evolution-driven emergency mechanism devised to allow an individual to survive and reproduce in his environment in response to a crisis.

Bortolotti has extensively argued that some delusions are psychologically and epistemically beneficial in the face of difficulty (Bortolotti 2020). Elaborated and systematized delusions in schizophrenia would relieve anxiety and confer meaning to ineffable and anomalous experiences as well as help in dealing with predictive errors (Bortolotti 2016); motivated delusions would boost the mood of people who have undergone severe trauma

(Bortolotti 2015); depressive delusions would relieve the anxiety generated by cognitive dissonance and by a biased learning system (Antrobus and Bortolotti 2016). Thanks to these psychological benefits, such delusions would allow someone who is in a situation of biological or psychological difficulty to be more in contact with their environment than they would be without the delusion. As being more in contact with the environment favours the acquisition and retention of true beliefs, delusions would be epistemically beneficial.

Inspired by Bortolotti and by an earlier account by Mishara and Corlett (2009), Fineberg and Corlett (2016, F&C from now on) consider schizophrenic and neurological delusions such as Capgras to be biologically adaptive and compare them to a shear pin mechanism. A shear pin is an emergency mechanism located in the drive engine of some machines, designed to break whenever the machine is about to collapse because of a problem of some sort. By breaking, the shear pin allows the machine to continue functioning but in a sub-optimal manner, as it disrupts the functioning of some parts of the machine itself. Similarly, by responding to anomalous predictive errors that risk to paralyze the learning system, delusions are designed to allow the learning system to continue functioning but in a sub-optimal manner, by disrupting the function of some parts of the learning system itself. This is why delusions are ill-grounded and irresponsive to counterevidence. By keeping the learning system functioning, however, delusions allow the individual to re-engage with the external environment on a certain level. As maintaining some form of contact with the environment is key to surviving and reproducing, delusions would be biologically adaptive.

For both F&C and Bortolotti, delusions would allow people undergoing psychological or biological difficulties to maintain some engagement with their environment rather than worse or no engagement at all. However, while in Bortolotti's account this would happen thanks to the psychological benefits of delusions, in F&C's account engagement with the environment can also be achieved at the expense of psychological wellbeing: being convinced to be persecuted by the CIA feels bad but, given the situation of crisis, it is the only way to get rid of anomalous PEs, keep some contact with the environment and thus survive in it. Another important difference is that while Bortolotti is silent on whether the engagement with the environment that delusions provide increases one's chances of survival and reproduction, F&C argue that this is in fact the case: this is why on their model delusions are biologically adaptive.

In this paper, I explore whether such accounts are right in claiming that delusions deliver psychological and epistemic benefits by favouring psychological wellbeing and engagement with the environment in the face of difficulty. Drawing from Bortolotti, I will explore the possibility that psychological benefits can convert into epistemic ones by ameliorating one's engagement with the environment in the face of difficulty; together with F&C, I will assume that ameliorating engagement with the environment is sufficient to make delusions biologically adaptive. However, differently from F&C, in this paper I am neutral on whether delusions are the by-product of a shear pin mechanism which is designed to ameliorate one's engagement with the environment. This is because in F&C's account what matters in increasing one's chances of survival and reproduction in the face of difficulty is whether delusions do foster engagement with the environment: whether they are also designed to do so is an issue that goes beyond the scope of the present paper.

The reason for exploring the benefits of delusions is that, despite the optimistic picture of delusions that they provide, F&C's and Bortolotti's accounts suffer from two limitations that the present study aims to highlight and begin to address. The first is that the benefits of delusions – and indeed delusions more generally - have not received much attention outside schizophrenia, depression and neurological disorders such as Capgras or dementia, despite the fact that delusions are also present outside such disorders. The second limitation is that the claim that delusions are beneficial or adaptive is more the result of theoretical work rather than of empirical observation. After illustrating such limitations more in detail (2.1 and 2.2), the present study starts addressing them by resorting to a method which I better illustrate in 3. In 4, I present and discuss the results of four interviews conducted applying this method to the reports of people suffering from delusions and OCD. In 4.1, I illustrate how I detected the presence of delusions in my participants' reports; in 4.2, I present the context in which my interviewees formed delusions; in 4.3 and 4.4 respectively, I illustrate first the negative and then the positive impact that delusions seem to have on the psychological wellbeing and on the level of engagement with the environment of my interviewees; in 4.5, thus, I reflect on whether it is possible to reconcile the harmful and the beneficial sides of delusions, and how this bears on the broader issue of adaptiveness. The conclusion (5) is that delusions in my sample bear complex and heterogeneous relationships with psychological and epistemic benefits: some of them do not present either, thus not meeting the required standards for adaptiveness as envisaged by F&C; others present both; others still present only psychological benefits. Given the limited size of the sample, however, it would be hasty to draw conclusions about the adaptiveness of delusions in general. Rather, the present study aims to work as a template for future research on the adaptiveness of delusions, suggesting it should focus on comparisons between the psychological condition and the level of engagement with the environment of people with and without delusions, as the present study does.

The implications of these findings are important, clinically and philosophically. From a clinical standpoint, research into the benefits and adaptive features of delusions can greatly inform medical treatment. Philosophically, the present study invites further reflection on the features of phenomena such as adaptiveness and evolutionary mechanisms.

2. The limitations of the claim that delusions are adaptive

2.1 The benefits of delusions should be explored across many disorders

The first limitation of accounts that advocate a beneficial or adaptive role for delusions is that the benefits of delusions have not received much attention beyond schizophrenia, neurological delusions such as Capgras and depression. These disorders comprise only a small proportion of the disorders where delusions are present. My paper aims to fill part of this gap by focusing on the benefits of delusional beliefs in OCD. According to DSM 5 (APA 2013, 235), "OCD is characterized by the presence of obsessions and/or compulsions. Obsessions are recurrent and persistent thoughts, urges, or images that are experienced as intrusive and unwanted, whereas compulsions are repetitive behaviours or mental acts that an individual feels driven to perform in response to an obsession or according to rules that must be applied rigidly". Although people suffering from OCD usually have good insight into their illness, which

takes the form of an awareness of the unreasonableness of their obsessive-compulsive beliefs, around 4% of the total cases (APA 2013, 238) present obsessive-compulsive beliefs that display delusional features: these beliefs are held with a firm conviction in the plausibility of the obsessional content as well as in the necessity of ritualizing to avoid catastrophic consequences. For example, one might be firmly convinced that if he does not check the stove thirty times per day, his house will burn down. This paper aims to shed more light on the presentation of delusional beliefs in OCD in a sample of four participants, highlighting the similarities and differences with delusional beliefs in schizophrenia, depression and motivated delusions.

But why choose OCD out of all the disorders that present a delusional variant? There are some reasons to suppose that some delusional beliefs in OCD might arise as temporary coping solutions to precipitating stressful events, something which is in line with what is proposed by F&C's and Bortolotti's accounts. According to Poyurovsky (2013), delusions in OCD arise in two cases. The first is in the context of schizo-obsessive personalities, i.e. when individuals present both obsessive-compulsive disorder and schizotypal personality disorder, a condition which is loosely associated with schizophrenia. These individuals usually present more severe symptomatology, poorer prognosis and a longer duration of illness than their non-delusional counterparts. However, the most interesting case for the purposes of my investigation is when delusions in OCD arise in individuals who are otherwise indistinguishable from their non-delusional counterparts on clinical and demographic dimensions. According to Poyurovsky, in these cases the rise of delusions "is typically precipitated by a stressful event, it is circumscribed and reversible, and there is no subsequent evidence of schizophrenic disorder" (Poyurovsky 2013, 176). Poyurovsky identifies the appearance of delusions in these cases with "a transient understandable complication arising from a background of typical obsessive-compulsive symptoms" (Poyurovsky 2013, *ibidem*). However, the hypothesis that in these cases delusions arise as a short-term response to a stressful event rather than as a consequence of it should not be prematurely ruled out. According to F&C's and Bortolotti's accounts, this is what would happen in cases of schizophrenia, depression, Capgras and motivated delusions: an adaptive role for delusions in OCD thus deserves a more careful consideration. For example, could some delusions in OCD enhance a person's sense of control to allow her to better cope with a stressful event?

2.2 The claim that delusions are adaptive requires more empirical evidence

The second and most important limitation of the claim that delusions are adaptive is that there has been no evidence gathered for the purpose of supporting it. This is an issue that must be addressed: after all, we do not care whether delusions might be adaptive, but if, in fact, they are, and this can only be investigated empirically.

But how can the claim that delusions are adaptive be empirically tested? This is no easy task. One would need to resort to double dissociation, which is the golden standard in cognitive neuropsychiatry to infer that two processes are in fact independent from one another. For example, Patient A has difficulty performing cognitive tests for, say, auditory memory but has no problem with visual memory. Patient B has the opposite problem. Based on A and B, we would conclude that auditory memory and visual memory are doubly dissociable cognitive processes (Corlett 2019). Similarly, to prove that delusions ameliorate one's psychological

condition and engagement with the environment, one would need there to be Patient A, who presents impairment X but no delusions, and Patient B, who presents impairment X and delusions. If delusions are adaptive in the face of difficulty, then Patient B should be psychologically, epistemically and thus biologically better off than Patient A. However, there are two kinds of problems with this scenario.

The first is that in most cases it is difficult to observe impairment X unaccompanied by the delusion. Take schizophrenic delusions. Assuming that impairment X and the delusion which follows it are two distinct things, it is very hard to capture the former without the latter, as delusions usually are the first observable signs that something - impairment X - in the mental life of the patient is going wrong.

The second problem with the testability of claims about adaptiveness is that it is very hard in principle to establish if A and B suffer from the exact same kind of impairment – X - and, if this is so, then it is also hard to prove that delusions ameliorate one's psychological condition and engagement with the environment in the face of X. To highlight the difficulty in establishing if two individuals present exactly the same impairment and how this has an impact on whether delusions are adaptive, consider a depressed person with delusions (F1), suffering from impairment X, and a depressed person without delusions (F2), suffering from impairment Y. According to Leibniz's law of the identity of indiscernibles, for X and Y to be identical, X and Y should present identical properties. However, it is difficult to establish what these properties are and even more difficult to establish if X and Y are identical with regard to a specific property. Does F2 experience Y with the same intensity with which F1 experiences X? So long as the question remains unanswered, it is impossible to affirm with certainty that X and Y are identical and, as a consequence, to compare F1 with F2 to see if people with delusions are more adapted than people without.

My solution to this problem consists in collecting information about the psychological wellbeing and the level of engagement with the environment that not different people but the same person experiences during and before delusional ideation. If delusions deliver psychological and epistemic benefits in the face of difficulty or dysfunction, as F&C's and Bortolotti's accounts hold, a person that undergoes a dysfunction or difficulty Y at time t1 (before delusions arise) should be psychologically worse off and less engaged with her environment than at time t2, when delusions develop. The present paper applies this solution in four qualitative interviews: people who suffered from OCD with delusions at the moment of the interview or earlier were asked to describe and compare their level of psychological wellbeing and engagement with their social and physical environment with and without delusions. The envisaged solution tackles better than the others the worry that, even if suffering from the same disorder, different people could undergo slightly different dysfunctions and thus not be comparable in terms of adaptiveness.

However, I am aware that even the solution that I have adopted presents its own limitations. The most important is that even when delusions are perceived to worsen one's psychological wellbeing and engagement with the environment, one could still argue that without the delusion the person would have been even worse off. However, this argument is based on a counterfactual claim that risks to make the claim that delusions are adaptive unfalsifiable, something which should be avoided. If it is assumed that when one is

psychologically and epistemically better off, this is because of the delusion, and when one is psychologically and epistemically worse off, then it would have been even worse without the delusion, then it turns out to be impossible to falsify the claim that delusions are adaptive.

Another limitation of this solution concerns the methodology that I have adopted. One might wonder whether first-person reports about past experiences are the most reliable way to assess the psychological and epistemic condition of people with and without delusions. As far as the latter is concerned, although there certainly are other methods to assess whether someone is more or less engaged with one's own social or physical environment, that rely on third-person observations, I believe that first-person reports are still an invaluable source of information, one which moreover is easily accessible. As far as psychological benefits are concerned, first-person reports are probably the only source of information. It is only by speaking to people suffering from delusions that it is possible to find out whether delusions boost mood, relieve anxiety or have other psychological benefits.

3. Method

Participants

All the seven participants self-reported a formal diagnosis of OCD made by a psychiatrist. One participant reported comorbid bipolar disorder and another comorbid depression. The inclusion criteria, alongside diagnosis, were being native English speakers and having good cognitive capacities. We excluded those with a history of special educational provision or learning disability and those. Out of seven participants, only four met the criteria for delusional ideation, so they were included in the study. Their age ranged from 27 to 43 years old. They were 3 females and 1 male. Their YBOCS (Yale-Brown Obsessive-Compulsive Scale) final scores were the following: Shelley=24; Audrey=13; Diane=0; Fred= 30. The cut-off points for the final score are the same as those of the clinician-administered version of the YBOCS: 0–7 = subclinical; 8–15 = mild; 16–23 = moderate; 24–31 = severe; 32–40 = extreme (Federici *et al.* 2010)

Recruiting

Participants were recruited through Twitter: they responded to a call for volunteers advertised on my personal profile that was retweeted by institutions such as the University of Birmingham, the BDD Foundation and OCD Action or by people studying or working at the University of Birmingham. The call stated that *Researchers at the University of Birmingham are seeking participants who suffer from OCD and who would be willing to talk about their experiences of wellbeing and control.* At the moment of the interview participants were asked if they were officially diagnosed with OCD.

Ethical approval, consent and confidentiality

The project was reviewed by the University of Birmingham's Humanities and Social Sciences Ethical Review Committee and was granted full ethical approval on 4th May 2020 (ERN_19-1513).

All participants provided written consent prior to the interviews. Their names have been changed to ensure anonymity.

Interviews

The interviews took place on Skype. Interviews were designed to last for approximately an hour. They consisted of two stages: 1. Answering a self-report version of the YBOCS, a 10-item scale used in clinical practice to measure the severity of OCD symptoms. The self-report version of the YBOCS was provided to me by email by Gail Steketee and Randy Frost, who in turn took the questionnaire from Baer *et al.* (1993). Beyond the 10 items that are also present in the clinician-administered version, the self-report version of the YBOCS also includes two additional items that measure insight (item 11) and avoidance of important things (item 12). The scores resulting from answers to items 11 and 12, however, have not been added up to the final score of the questionnaire. 2. answering questions from a semi-structured interview on experiences of wellbeing, functioning, control and engagement with the environment. The questions were inspired to the Symptomatology and Perceived Free will 113 rating scale (SAPF), a 15-item scale contained in Van Oudheusden's *et al.* (2018) utilised to assess perceptions of free will in OCD. This was relevant to delusions because egosyntonicity, which is one of the parameters measured by the SAPF, is linked to delusional ideation by the authors of the study.

To detect the presence of delusional beliefs at the moment of the interview or in the past, I have relied on participants' reports. If participants' beliefs met the criteria of conviction and resistance to counterevidence, I considered them to be delusional. These criteria were drawn from DSM 5 and Langdon and Bayne's (2010) definition of delusions⁴. In addition to these criteria, the delusional beliefs of my participants also often met the criterion of cultural isolation, which features in DSM 4's definition of delusions (APA 2000, 765). In detecting the presence of delusional beliefs in participants' reports, I was assisted by Matthew Broome, who is a qualified psychiatrist.

Although semi-structured, interviews offered participants a choice regarding the topics they would like to discuss. Interviewees were also invited to talk about any other aspects of experience they felt it important to highlight to the researcher: this aimed to maintain an openness to participants' concerns throughout data collection. Responses to the interviews were analysed using thematic analysis (Braun and Clarke 2006). Coding drew out key themes, words and phrases. 'Deviant cases' were sought to challenge emerging interpretations. Overall reliability was established by probing the relationship between each individual transcript and the themes across the interviews as well as through discussions within the research supervisory team to forge shared interpretations.

4. Results and discussion

In this section, I will sketch a profile of four participants who either described delusional beliefs at the moment of the interview or who had had delusional beliefs in the past.

⁴ The DSM 5 (APA 2013, 87) defines delusions as *fixed beliefs that are not amenable to change in light of conflicting evidence*, while Langdon and Bayne (2010, 322) define delusion as *[A] belief which is implausible in light of general knowledge and/or the weight of evidence to hand (which ought normally to confer doubt), and which is adopted and maintained uncritically as true with unwarranted subjective conviction*.

- a. Fred. Fred suffered from severe OCD at the time of the interview, to the point where he could not leave the house. He was on amisulpride and escitalopram. He said he had what is known as pure OCD, i.e., he had to go over his thoughts again and again in his head to know that they are not true. He said that at the time of the interview, he believed his obsessions and compulsions to be completely unreasonable. Prior to 2011, however, when his OCD was less severe, he found his obsessions and compulsions to be reasonable.
- b. Shelley. Shelley suffered from OCD and comorbid bipolar disorder. In her family, there was a history of psychosis. Some years ago, she had psychotic depression: OCD skyrocketed exactly in that period. She managed to recover from the psychotic depression; however, the delusional belief that she was a living allergen and that she smelled badly persisted. She still had this belief at the time of the interview, but she was able to question it more than in the past. She was on a non-specified medication for her psychosis.
- c. Diane. Diane had suffered from OCD for a long time. It was only halfway through university, however, that her OCD became serious, taking the form of intrusive thoughts which revolved around slurs towards minority groups. Later on, when she started a relationship with her current partner, the intrusive thoughts concentrated on infidelity towards her partner. She is on escitalopram.
- d. Audrey. Audrey was diagnosed with OCD at the age of 15. Her obsessions revolved around themes of contamination and checking. She also suffered from depression, which she thought was a consequence of OCD. Her OCD got worse after big life events, for example when she moved to university, when her brother died and when her house was destroyed by a fire. She was on fluoxetine.

Many interesting themes have emerged from the four interviews. In what follows, I will summarize the main points in the attempt to answer the central question of my inquiry, viz. do delusions in my OCD sample present adaptive features? Before doing that, however, it is necessary to define what I intend with the term delusions.

4.1 Delusions

In this section, I am going to illustrate how I determined the presence of delusional beliefs in my participants' reports. Shelley's case was the most straightforward, as she reported that she was explicitly told by clinicians that she suffered from delusions. She said that *sometimes I worry that if people sneeze it's because of me, then this is why they [clinicians] said: "that's bizarre, Shelley, you are delusional"*. In Diane's, Fred's and Audrey's cases, despite the lack of an official diagnosis of delusions, I determined whether some of their beliefs were delusional if they met the criteria of conviction and resistance to counterevidence. Some of their beliefs met these criteria. For example, Audrey said that *when you are so convinced that something is reasonable or rational, you are stuck in the moment; it would be really distressing, sometimes to me it seemed reasonable, but I know that for someone else it would not look like that*. She also added that *when you are in stuck in the middle of it you cannot see, you are convinced that something is a real threat, no matter what other people tell you*. As it can be seen, Audrey's beliefs displayed all the characteristics of delusions: high level of conviction, resistance to counterevidence and

even isolation from other people's beliefs and opinions. Similar considerations apply to Diane. Diane said that *the thought that I was KKK racist... that was true in my head*. This shows that Diane entertained the belief with a high level of conviction. She also added that her beliefs were resistant to counterevidence: *in the moment, there wasn't any evidence that would be able to convince me otherwise*. Finally, to the question: *Would you feel relieved if you knew that your obsessions were unreasonable?* She answered: *Yes, but none would be able to tell me that*. This shows that her beliefs were resistant to counterevidence and to other people's opinions. Fred also shared the same belief patterns as Diane and Audrey. He stated that there were times in which he was completely convinced that his beliefs were reasonable: *I would find the obsessions reasonable as I believed they had an impact on the world, so I believed them completely*. He also stated that *It [having obsessions and compulsions] was my normal way of operating and I didn't see the world any differently*. This seems to suggest that Fred's beliefs were not sensitive to evidence to the contrary.

4.2 A difficult context

F&C's and Bortolotti's accounts highlight that delusions arise as a response to a context of crisis. This could take many forms: a traumatic event in one's life (motivated delusion), aberrant perceptions and hormonal dysregulations (schizophrenia), a neuropsychological impairment (Capgras) or cognitive biases and deficits (depression). Some of these difficulties also appear in the narrative of my participants and precede the onset of delusions. Here I am going to briefly present them.

- Traumatic or distressing events

Audrey. *I was in a long-distance relationship. It was difficult and the relation was not going very well. I was homesick and living with people I wasn't very happy with. I felt quite alone. That combined with stress of other things made it bad again. When it gets bad, it's usually after a big event. When I was younger, we had a housefire: that was quite a logical thing to worry about, and then I went to uni, and a few years ago my brother passed way, and that made it come back.*

Diane. *Even now when I am having a bit of a patch, I do, for example when I was getting into thoughts about prejudice and discrimination the thought that I was KKK racist... that was true in my head.*

- Influence of alcohol

Diane. *The day after that [i.e. drinking alcohol] I was pretty much guaranteed that I would have a difficult time, where I would be completely convinced that the thoughts are true*

- Influence of pre-existent mental illness

Shelley. Q: *Did the beliefs start developing when you were having psychotic depression?* A: *I was self-conscious before. But during that episode, it [the delusional belief] became a core belief and I hadn't gotten over it since.*

- No known distressing context

Fred. *It was my normal way of operating, and I didn't see the world any differently [...] Nowadays with my mental obsessions and other obsessions, I don't feel that way,*

perhaps because I am aware that they are not real and shouldn't be this way.

4.3 Delusions as negatively affecting psychological wellbeing and engagement with the environment

Let's now turn to the effect that delusions have on psychological wellbeing and on one's contact with the physical and social environment.

As far as the former is concerned, most of the participants perceive the presence of delusions as a source of distress, depression, anxiety and panic. This seems to be not in line with the picture of depressive, schizophrenic and motivated delusions provided by Bortolotti. In what follows, I am going to present the data in support of this view.

- Depression and anxiety, negative emotions, low mood caused by delusions

Shelley believed that it was OCD (and her belief that she was an allergen) which made her depressed and made her mood low: *I kept saying I am **depressed** because of OCD and I cannot leave the house.*

To the question: *Is there any part of these experiences that you would describe as good, valued or wanted? Do you find some positive in it?* She answered: *No.*

To the question: *Would you feel relieved if you were certain that these beliefs are not true?* She answered: *Yes. I would feel relieved if I knew that my belief was not true. [...] My whole thing now is, is it true or is it not? If it [the delusional belief] would be gone, I would not have that **anxiety** anymore.*

She also acknowledged that her delusional belief *is a part of me but not in a positive way*. These data, however, require a cautious interpretation: as Shelley also suffered from psychotic depression, it cannot be ruled out that the low mood was mainly due to depression rather than to the delusional belief itself. However, it is worth noting that Shelly ascribed her depression specifically to OCD and to the delusional belief that she is an allergen.

Delusions seem to have a considerable negative impact on Diane's psychological wellbeing. When asked whether she felt better in those moments in which she was more convinced that her obsessions were reasonable—i.e., when she presented delusional beliefs—she said: *No. I am too **traumatized** and I am in a state of **panic, alarm**, all the adrenaline going, **tearful** and **withdrawn**. My quality of life is very, very poor and I cannot think about anything that is good about that at all.* To the question whether she would feel relieved if in those moments she knew that her obsessions are unreasonable, she said: *Yes, but no one would be able to tell me that. The act of knowing that your obsessions are unreasonable is a huge part of recovery; the main factor of it is your belief whether your obsessions are reasonable or not, if you believe it, that is the thing that makes you unwell.*

In a similar vein, Audrey stated that: *When you are so convinced that something is*

reasonable or rational, you are **stuck in the moment**. It would be really **distressing**. Sometimes to me it seemed reasonable, but I know that for someone else it would not look like that. That caused me a lot of distress. I used to cry a lot and get angry. I would seek reassurance from other people... if it was, I am not sure either way, it was easier, but if I am convinced that something is reasonable, I would be a lot more distressed. In a similar way to Diane and Shelley, Audrey was highly distressed by her delusions, and she would also feel relieved if she knew that such beliefs were unreasonable.

➤ Alienation from one's environment

What about the contact with the environment that, according to F&C's and Bortolotti's accounts, delusions are supposed to foster? There is no evidence to say that delusions promote engagement with the environment. On the contrary, there are clues that delusions may contribute to alienate the person from her social and physical environment.

Shelley stated that she could not leave the house because of her OCD and because of the belief that she was an allergen and that she smelled badly; Diane used the word *withdrawn*; Audrey said that when she experienced delusions she was stuck in the moment, unable to focus on something else.

However, the negative impact that delusions seem to have on psychological wellbeing and on the contact that participants entertain with the outside environment is only a part of the story. There is an equally important one, which is constituted by some (and sometimes the same) participants conceiving of their delusions as a coping mechanism, which will be the object of the next section.

4.4 Delusions as a coping mechanism

Despite claims that delusions are distressing, anxiety-causing and alienating, it is interesting to see that some participants—often the same ones who ascribe negative effects to delusions—hypothesize that delusions could be part of a coping mechanism that presents some benefits, in line with F&C's and Bortolotti's accounts. In what follows, I will report the ways in which delusions as a coping mechanism are described by the interviewees to then analyze the specific benefits that they are held to bring about in more detail.

➤ Characteristics of the coping mechanism

Audrey explicitly said that her delusions could be part of a coping mechanism. *If I have got a lot of mental stress, it seems the way the stress comes out. After the initial shock of the event [...] I guess it's a kind of coping mechanism [...]* To the question: *Is the fact that you have OCD a coping mechanism?* She answered: *It's when things are stressful and there is stuff I cannot control, that's something I can control; it's an outlet for me. I have some control in my life by carrying out compulsions; in that sense it is a coping thing: my OCD brain sees it as doing a good thing because I am going to protect people.* To ascertain that by "getting worse" Audrey referred to the

appearance of delusions, I asked her whether she was describing the moments in which she was more convinced that her obsessions were reasonable, to which she answered positively.

Similarly, Shelley wondered whether *she used this* [i.e. the delusion of being an allergen] **as a thing to say the only reason why people would feel negative is that** [...]. *Any negativity I put it down to that rather than [for example] I should have not interrupted.* Shelley also stated that she was feeling less anxious when she was not questioning her delusional belief: *Now I am more anxious because I am more aware of that [...] When I was lost in it [i.e. in the delusional belief], I didn't have this back and forth, but it was here is your issue, try to solve it.* Her anxiety was due to the continuous back and forth between what she believed and the acknowledgement that other people told her that everything was in her head.

Finally, Fred only ascribed positive features to his delusional beliefs. These are his words. *It was my normal way of operating, and I didn't see the world any differently. I guess I found some value in them as I believed they gave me an ability to order the world around me and prevent things from happening.* Instead, for Fred, OCD getting worse meant he was aware that they [obsessions] are not real and shouldn't be this way as well as that they are more horrific and anxiety-causing. Anxiety and distress in Fred seemed to be linked to the content of the obsessive-compulsive beliefs, which he said were more *horrific* and *anxiety-causing* at the moment of the interview than in the past. Anxiety and distress also seemed to be linked to the awareness that his obsessions were not real and thus they should not have been there. His anxiety seemed not to be linked to the conviction with which obsessive-compulsive beliefs were held and hence to the presence of delusions.

In Shelley and Audrey's cases, the coping mechanism of which delusions would be the output would remain either hidden to consciousness—in the case of Shelley—or in any way out of conscious control, as an automatic process in the face of which the participant feels passive. Audrey stressed that she thought it was irrational the way her, as she called it, *OCD brain* saw the delusion as a way of being more in control. However, herself overall as a person she felt she was less in control: as a consequence of that, Audrey felt that when delusions arose, it was the OCD that had control and not her. This is very interesting, because we can see that Audrey posited herself as the spectator of an internal struggle between herself and her irrational or OCD brain, in which the latter fought to take control over the former because, as she said, the OCD brain saw it as a way to re-establish control in the face of adversities and uncertainty. This description fits with F&C's observation that when delusions appear, goal-directed learning is disabled and replaced by a more habitual form of learning. *Delusions may arise because goal-directed learning (at the highest levels of the hierarchy) is impaired (Gold et al., 2013, 2012; Gold, Waltz, Prentice, Morris, & Heerey, 2008). Simpler associative mechanisms (lower in the hierarchy) might drive ongoing but less flexible instrumental engagement (Fineberg and Corlett 2016, 76).* This means that delusions are out of the conscious control of the subject and of goal-

directed learning, and are, rather, the by-product of a more primitive and automatic system of learning—the habitual system—which takes control of the subject’s beliefs whenever there is the necessity to do so, i.e. in the face of intense distress and of precarious psychophysiological equilibrium. In other words, delusions are the default response to situations of psychological and biological struggle, an emergency mechanism devised by evolution to help us cope with that struggle. This impression also seems to be confirmed by Fred’s own account. Fred says that in the past he used to perceive his delusions as a good thing, as a way to order the world around him. However, he also stated that he did not feel that way anymore towards his obsessional beliefs, not only because his obsessions had a scarier content than in the past, but also because he knew that the things he obsessed about were not real, even if they felt so. In Fred’s conflict between knowing and feeling probably lurks the same dialectic between rational and irrational brain that can be seen in Audrey, a possible hint to the embodiment of the struggle between goal-directed and habitual belief learning systems envisaged by F&C.

It could be even hypothesized that it is exactly when the goal-directed learning system claims its authority over the habitual system that anxiety emerges, under the form of an awareness of the discrepancy between what the subject thinks and feels (Fred) or of a recognition that obsessions and compulsions would look unreasonable from the outside (Audrey and Shelley). On the contrary, when someone is lost in the delusions, it is the habitual learning system that has control: at that point, the conviction in the reasonableness of the obsessive-compulsive behaviours becomes unshakeable and anxiety disappears. Shelley claimed that when she was completely lost in her belief that she was an allergen, she was not feeling anxious, but rather she was thinking: *Here is your issue, try to solve it.* However, when she regained some insight into her belief, that gave life to a continuous back and forth in her head: again, maybe a representation of the conflict between a more primitive learning system, of which the delusional belief of being an allergen is the by-product, and the more goal-directed system, which claims back control over the subject’s beliefs. Fred and Audrey too felt anxious when they gained insight into the unreasonableness of their beliefs.

Having said how participants describe the coping mechanism of which delusions are the output, I will briefly illustrate the benefits that delusions are perceived to bring about.

- Sense of control and order

Fred believed that delusions gave him ***an ability to order the world around me and prevent things from happening.***

In a similar vein, Audrey said that *when things are stressful and there is stuff I cannot control, that’s something I can control. It’s an outlet for me. I have some control in my life by carrying out compulsions. In that sense it is a coping thing: my OCD brain sees it as doing a good thing because I am going to protect people.*

However, Fred and Audrey are not the only ones to acknowledge that delusions could be beneficial. Shelley also hypothesizes that delusions could bring about some benefits.

➤ Closure and explanation of worries

Shelley wonders whether she *used this* [i.e. the delusion of being an allergen] **as a thing to say the only reason why people would feel negative is that** [...]. *Any negativity I put it down to that rather than [for example] I should have not interrupted.* It is interesting to see that the delusion is interpreted as providing a simple answer to a very complex question: what are the reasons why people might not like me? The closure brought about by the delusion is confirmed by Shelly when she reported that, as a consequence of her belief of being an allergen and smelling badly, she ended up harming herself in the attempt not to cause allergies to people and smell better: *I found online that tonsil stones can cause bad breath, so I took a scoop. I would take a brush for dishes and scrape my skin off to shed skin. I was bleeding, it was not self-harm but a method to control that.*

The reports of the interviewees present us with a conundrum. On the one hand, delusions are held to be distressing, anxiety-causing, a source of depression and something which hijacks cognitive resources. This would seem to speak against the fact that delusions promote psychological wellbeing and more engagement with the environment and hence that they meet the standards of adaptiveness. On the other hand, however, three out of the four interviewees see delusions as psychologically beneficial or as part of a coping mechanism and, thus, as potentially adaptive. In the next section, I am going to investigate whether it is possible to reconcile the harmful and the adaptive side of delusions.

4.5 Are delusions in my OCD sample adaptive?

In this section, I will go through each case individually, trying to establish whether delusions are adaptive.

Diane. In Diane's case, delusions do not present any obvious psychological benefit. Unlike motivated delusions, they do not depict reality better than it is and they do not boost self-esteem or mood—quite the contrary. Diane's delusional beliefs display some similarities with the way both delusions in schizophrenia and in depression are formed. In a similar way to delusions in schizophrenia, delusional beliefs about racism and infidelity seem to provide a meaning and an explanation to an unsettling experience, which in Diane's case is represented by intrusive thoughts of a similar racist and unfaithful content. Having thoughts of a racist or unfaithful nature calls for an explanation, especially if it is something novel and at odds with the person's values and beliefs. Ending up believing or at least formulating the hypothesis that one is a racist or an unfaithful partner is a likely explanation for this unusual experience. However, formulating the hypothesis that one is a racist or an unfaithful partner is different from delusionally believing it. We know from Diane's account that such beliefs transform into full-blown delusions when she is going through a difficult time (*a rough patch*). In this sense, Diane's

delusional beliefs look similar to delusions which can be found in depression, as they represent a confirmation of previously formed negative beliefs about oneself. One could thus argue that Diane's delusions could be beneficial in the same way depressive delusions are, as proposed by Antrobus and Bortolotti: though psychologically painful, they compensate for a biased learning system, which prevents the person from incorporating any positive evidence into one's sense of self. The formation of negative, delusional beliefs about the self would keep the learning system going and help maintain some contact with the environment. Together with F&C, one could argue that this would make depressive delusions biologically adaptive. However, there are some problems with this claim. The first is that there is no evidence to say that Diane's delusions promote engagement with the environment. On the contrary, Diane claims to be more withdrawn and less engaged with her environment when experiencing delusions than when not experiencing them, and this seems to speak against them being adaptive. Secondly, it is also questionable that depressive delusions more in general promote a better engagement with the environment. The fact that people embrace delusional, negative beliefs about themselves could also be interpreted as the unfortunate consequence of the fact that they suffer from a learning bias that makes them unable to do otherwise, rather than as an adaptive response to such bias. For this reason, more empirical studies comparing the level of engagement that people with depressive delusions entertain with their physical and social environment before and during the delusional phase are required.

Fred. Delusions seem to play a positive role in Fred's mental life, making him feel that he can control and order the world. In fact, Fred's negative feelings are a result of the content of his obsessional beliefs as well as of the realization that his obsessions are unreasonable, and they should not be believed. In other words, Fred's troubles spring exactly from the acknowledgement that his delusional beliefs and related behaviours are senseless and that they are not especially effective in preventing things from happening. It thus seems clear that delusions are psychologically beneficial to Fred. It is more complex to establish whether delusions also allow him to better engage with his social and physical environment. There are clues that this might be so, especially when he states that in the past delusions were his normal way of operating and did not cause him much anxiety. *The worst [thing that could happen] is that someone would die, but I never stressed about this. Rather, I just followed my compulsions, and everything was fine.* Fred's delusional beliefs thus seem to meet the standards of adaptiveness as envisaged by F&C, cashed out in terms of an enhanced sense of control over the environment and a better engagement with it in the face of worry and anxiety.

Shelley and Audrey. As we have seen, Shelley and Audrey both state that they would feel relieved if they could get rid of their delusions and acknowledge that delusions have a negative impact on their levels of anxiety, depression and distress. However, they also explicitly hypothesize that delusional beliefs could be a kind of unconscious and automated coping mechanism. In Shelley's case, the delusion of being an allergen and of smelling badly is seen as a way to provide closure and find an explanation for any negative feeling that people might have towards her, while Audrey interprets her delusions as a way to re-establish control after big events that are in fact out of her control, such as the death of her brother. Should this mixed evidence be interpreted in favour of or against the fact that such delusions are adaptive? I will

consider both scenarios in what follows.

Scenario 1. Delusions are biologically adaptive in the short term

In this scenario, delusions allow Shelley and Diane to better engage with their physical and social environment, but only in the short term. This is the position usually endorsed by Bortolotti: in her view, the benefits of delusions would have an expiry date, in the sense that the adoption of delusions would be beneficial but not their maintenance. Assuming with F&C that delusions that promote engagement with the environment are adaptive, this means that Shelley's and Audrey's delusions would be adaptive in the short but not in the long term. In Audrey's case, by re-establishing a sense of control over her environment after a traumatic event, delusions prevent her from falling prey to depression and thus completely withdraw from the world. In Shelley's case, the delusion of being an allergen and of smelling badly would provide an answer to why people might feel negatively towards her, also sustaining action (i.e. hurting herself in the attempt to smell better) and thus promoting interaction with her environment. However, in the long-term Diane and Shelley's delusions would be detrimental to the engagement they entertain with their social and physical environment: this is in line with Audrey claiming to be stuck in the moment, absorbed in her compulsions, and Shelley affirming to be unable to leave her house for the fear of making other people sick or disgusted.

The strength of this hypothesis is that it acknowledges both the benefits and downsides of delusions by placing them on a precise temporal scale. Benefits would be found especially when delusions are adopted, while the downsides, both psychological and epistemic, are confined to the maintenance stage. One could argue that in this scenario delusions are adaptive in the same way compulsions are. Compulsions are in fact primarily meant to keep at bay the anxiety which ensues from obsessive thoughts and beliefs: however, engaging in compulsions in the long run is harmful and ends up being part of the mechanism that perpetuates anxiety and obsessions. In other words, if not controlled, compulsions can easily pass from being a part of the solution to being a part of the problem. Similarly, delusional beliefs in OCD reinforce the idea that compulsions are effective in achieving a desired outcome and in preventing a harm from occurring. Even if in the first place this idea can offer comfort and relief, in the long run it causes more harm than it prevents, making people disengage with reality and promoting dangerous behaviours.

However, some people might say that this hypothesis is unfalsifiable, as it assumes that the psychological wellbeing and engagement with the environment of people holding delusions would be even worse without delusions. If Audrey had not developed delusions in response to traumas in her life, she would have been overwhelmed by negative feelings and probably even more withdrawn from her environment; if Shelley could not come up with a delusional explanation of why people might not like her, she would have been stuck in a situation of uncertainty and anxiety that would have further compromised her engagement with the outside. However, the problem is that, as Audrey and Shelley never found themselves in such situations, it is difficult to prove whether they really would have been psychologically worse off and more alienated from their environment.

I will now compare this scenario with the following one, where Shelley and Audrey's

delusions are psychologically but not biologically adaptive.

Scenario 2. Delusions are psychologically but not biologically adaptive

In this scenario, Audrey's and Shelley's delusions provide psychological benefits, but this is not sufficient to foster engagement with the environment and thus make them biologically adaptive. The fact that delusions make Audrey feel more in control of her environment and that they provide Shelley with a simple explanation to her worries by no means is conducive to better adaptation and engagement with the environment. This hypothesis seems to find some support in Audrey's and Shelley's reports: Audrey was stuck in the moment and unable to focus on something else, while Shelley could not leave her house as a consequence of her delusional beliefs. This seems to indicate that Audrey and Shelley were less engaged with their environment when experiencing delusions than when not experiencing them.

Moreover, it can be argued that the fact that some delusions, such as Audrey's, allow one to avert depression by making her feel more in control does not necessarily lead to better adaptation to one's environment. Evolutionary psychology is increasingly recognising that depression can be adaptive in certain unpropitious circumstances. For example, when there is a loss of important goods in life, momentarily disengaging from one's environment can be key to adjusting to the new condition, and eventually better engage with a changed environment (Andrews and Thomson 2009; Horwitz and Wakefield 2007; Nesse 2000). If the content of a delusion represents the subject's circumstances as being better than they really are, then this adaptation could be lost. This could also apply to Audrey: the death of her brother certainly was an important loss in her life, and developing delusions that enhanced her sense of control helped her cope with trauma from a psychological standpoint, relieving depression. However, it could be the case that developing depression was the most appropriate and adaptive answer to bereavement. Acknowledging the lack of control and the negative emotions that everyone feels in the face of trauma can often lead to handle those emotions better than escaping them, as many psychotherapeutic approaches - such as mindfulness or acceptance and commitment therapy - also suggest (Hayes, Strosahl, & Wilson, 1999; Kabat-Zinn 1996).

In Shelley's case, it is also tempting to say that the delusion of being an allergen is not biologically adaptive, as it caused Shelley to withdraw from her social life and to put her life at risk. However, finding an easy explanation for why people might not like themselves is psychologically less draining than searching for the real answer, especially if this answer involves complex reasons and flaws of character that might be difficult to handle and modify. This is why Shelley's delusions might be psychologically beneficial. According to this interpretation, Shelley's delusions could be similar to Audrey's insofar as they avert depression by making the reasons for which one might not be liked by others look less scary and more easily manageable. Nonetheless, this would not coincide with the delusions providing better contact with the environment and thus with their being adaptive.

A second interpretation of Shelley's delusions, more favourable to the claim that delusions are adaptive, could be that they are more similar to schizophrenic delusions insofar as they are the best available explanation of deep worries and feelings. In other words, it could be likely that Shelley could not come up with a better, non-delusional explanation of why people

might not like her because this was not available to her, as Bortolotti argues is the case for some schizophrenic delusions. A belief or explanation is not available when the person suffers from cognitive biases or impairments that prevent him from adopting it. In this case, there would be some space left to argue that delusions are biologically adaptive, as having unexplained experiences and worries seems to paralyze the cognitive system and thus hinder rather than promote biological adaptiveness (Eysenck 2013). By explaining the experiences and worries in question, delusions would unblock the cognitive system and foster some engagement with the environment that would be absent without delusions. For these reasons, Shelley's delusions might be adaptive.

However, deciding whether delusions that avert depression or that explain experiences and worries when no other explanation is available are biologically adaptive is again an empirical rather than a theoretical matter. More comparative studies are called for in order to establish, for example, whether depression is a better strategy than denial or motivated delusions to face loss or bereavement. Similarly, it would be useful to better understand in which sense some people do not have access to better explanations for their experiences, worries and feelings. This might be more obvious in cases where a physiological impairment is present, such as in cases of dementia or anosognosia. However, it is still unclear whether and in which sense people with schizophrenia or psychotic depression do not have access to alternative explanations, as studies show that schizophrenic and depressed people do not present obvious reasoning impairments (Corlett 2012).

4.6. Limitations

The current study has a number of limitations. The first is that diagnoses of OCD are self-reported but not verified. Moreover, the limited sample size does not allow us to draw definitive conclusions on whether delusions in OCD are adaptive. However, the goal of the paper was not to establish whether delusions in OCD are adaptive, but a more modest one, i.e., to start gathering empirical evidence in support of (or against) Fineberg and Corlett's and Bortolotti's theories, as well as to offer a template for future studies in order to establish with more certainty whether delusions in OCD or other disorders are adaptive. In this sense then, the sample size is adequate given the purposes of the study. Another limitation concerns medication. Participants were on different medication regimes, and this might have been a potential confounder. A final concern regards the percentage of people in my sample displaying delusional beliefs. The DSM V estimates the presence of delusions in OCD at around 4%, while in my sample 4 out of 7 people (more or less the 50%) seem to present delusional beliefs. I believe that this difference is mainly linked to two factors. The first is that some of the studies on OCD on which the DSM's OCD section is based (Leckman *et al.* 2010; Eisen *et al.* 2004; Foa *et al.* 1995) utilize two scales of insight (the YBOCS and the BABS), while I have employed the YBOCS and the criteria of delusions listed by the DSM itself and by Langdon and Bayne (2010) to detect delusional beliefs in my sample. A difference in diagnostic measures might have contributed to a difference in the estimation of delusions. The second factor is that the YBOCS and the BABS (Brown Assessment for Beliefs Scale) consider a different time span than the one I took into consideration to assess the presence of delusional beliefs. While the YBOCS and the BABS cover only the delusional beliefs that are present at the moment of the interview or one week before the interview, in my

interviews I considered a longer time span, going back to a much more remote past. This might explain why the percentage of delusional beliefs in my sample was far higher than that recorded by the DSM. It might also be the case that the presence of delusional beliefs in OCD is underdiagnosed compared to that of delusional beliefs in other disorders due to the more volatile nature of these beliefs in OCD. As Poyurovsky points out, the rise of delusions in OCD *is typically precipitated by a stressful event, it is circumscribed and reversible, and there is no subsequent evidence of schizophrenic disorder* (Poyurovsky 2013, 176): it is rather *a transient understandable complication arising from a background of typical obsessive-compulsive symptoms* (ibidem). The fact that delusions in OCD are a circumscribed, reversible and transient phenomenon suggests that delusions in this disorder are more difficult to capture than in other disorders, because they tend to wax and wane more easily

5. Conclusions and implications

In this paper, I have argued that whether delusions are adaptive or not is ultimately an empirical question. Together with F&C, I have assumed that delusions are adaptive insofar as they foster some (or better) rather than no (or worse) engagement with the environment in the face of difficulty. They do that either by delivering psychological benefits, as Bortolotti holds, or independently from them, as F&C claim. However, the claim that delusions are adaptive has not been substantiated by much empirical evidence yet and this paper aims to provide some by analyzing the reports of four interviewees suffering from delusional forms of OCD.

Findings suggest that delusions in my sample entertain complex relationships with psychological wellbeing and engagement with the environment. In Diane's case, delusions do not promote either, hence they do not seem to meet the standards of adaptiveness as put forward by F&C. In Fred's case, the opposite holds true: as Fred seems to be more engaged with his surroundings as a consequence of his delusional ideation, it seems likely that delusions in his case provide a form of adaptation. In the last two cases, those of Shelley and Audrey, delusions seem to provide psychological benefits but also to hinder their contact with the environment. However, before deciding whether such delusions are psychologically beneficial but not biologically adaptive, further empirical studies are required.

Given the limited size of the sample, it would be hasty to draw general conclusions about which kinds of delusions, if any, are adaptive. However, this study aims to provide a template for future investigations on the nature of delusions and their alleged adaptiveness. More specifically, it highlights which directions such investigations should take. The first has to do with studies that, like the present one, compare the psychological wellbeing and the engagement with the environment of people with and without delusions, in order to establish whether delusions ameliorate wellbeing and engagement in the face of difficulty. Another way in which studies on the adaptiveness of delusions could develop concerns the assumption that delusions that help people avert depression, such as motivated ones, also help the subject better survive in his environment in response to trauma. This should be contrasted with research that seems to show that depression can be biologically adaptive exactly in response to trauma and difficulty. Finally, I anticipate that further studies on the adaptiveness of delusions could also focus on the lack of alternative explanations that some patients suffering from conditions such as

schizophrenia, or maybe OCD, seem to face when confronted with anomalous experiences, worries and feelings. If it is true that delusions are adaptive, then we need more evidence that they are the only available explanations for such disturbing experiences and thus that they are the only explanations that can provide some contact with the environment rather than no contact at all.

References

- American Psychiatric Association. (2013). *DSM-V: Diagnostic and statistical manual of mental disorders (5th Rev ed.)*. Washington, DC: APA.
- American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders (4th ed., Text Revision)*. Washington, DC: American Psychiatric Press.
- Anders, S., Tanaka, M., & Kinney, D. K. (2013). Depression as an evolutionary strategy for defense against infection. *Brain, behavior, and immunity*, *31*, 9–22.
- Andrews, P. W., & Thomson, J. A., Jr (2009). The bright side of being blue: depression as an adaptation for analyzing complex problems. *Psychological review*, *116*(3), 620–654.
- Antrobus, M., & Bortolotti, L. (2016). Depressive delusions. *Filosofia Unisinos*, *17*(2), 192-201.
- Baer, L., Brown-Beasley, M., Sorce, J. and Henriques, A., (1993). Computer-assisted telephone administration of a structured interview for obsessive-compulsive disorder. *American Journal of Psychiatry*, *150*(11), 1737-1738.
- Bell, D. (2003). *Paranoia*. Cambridge, UK: Icon
- Bortolotti, L. (2020). *The epistemic innocence of irrational beliefs*. Oxford: OUP.
- Bortolotti, L. (2016). The epistemic benefits of elaborated and systematised delusions in schizophrenia. *British Journal for the Philosophy of Science*, *67*(3), 879–900.
- Bortolotti, L. (2015). The epistemic innocence of motivated delusions. *Consciousness and Cognition*, *33*, 490–499.
- Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3* (2), 77-101.
- Corlett, P. (2019). Factor one, familiarity and frontal cortex: a challenge to the two-factor theory of delusions. *Cognitive Neuropsychiatry*, *24*(3), 165-177
- Corlett, P. (2012). Delusions. In V. S. Ramachandran, *Encyclopedia of Human Behavior*. Second Edition, (pp. 667-673). Academic Press.

- Davies, M., Coltheart, M., Langdon, R., Breen N. (2001). Monothematic delusions: Towards a two-factor account *Philosophy, Psychiatry, & Psychology*, 8 (2), 133-158
- Eisen, J. L., Phillips, K. A., Coles, M. E., & Rasmussen, S. A. (2004). Insight in obsessive compulsive disorder and body dysmorphic disorder. *Comprehensive psychiatry*, 45(1), 10–15.
- Ellis, H.D., Young, A.W. (1990). Accounting for delusional misidentifications. *The British Journal of Psychiatry*, 157 (2), 239-248
- Eysenck, M.W. (2013). *Anxiety: The cognitive perspective*. Hove, Psychology Press
- Federici, A., Summerfeldt, L., Harrington, et al. (2010). Consistency between self-report and clinician-administered versions of the Yale-Brown Obsessive–Compulsive Scale. *Journal of Anxiety Disorders*, 24(7), 729-733.
- Fineberg, S., & Corlett, P. (2016). The doxastic shear pin: Delusions as errors of learning and memory. *Cognitive Neuropsychiatry*, 21(1), 73–89.
- Fletcher, P.C., Frith, C.D. (2009). Perceiving is believing: A Bayesian approach to explaining the positive symptoms of schizophrenia. *Nature Reviews Neuroscience*, 10 (1), 48-58
- Foa EB, Kozak MJ, Goodman WK, et al. (1995). DSM-IV field trial: Obsessive-compulsive disorder. *American Journal of Psychiatry*, 152, 90–96.
- Garety, P. and Hemsley, D. (1987). Characteristics of delusional experience. *European Archives of Psychiatry and Neurological Sciences*, 236(5), 294-298.
- Hayes, S.C., Strosahl, K.D., & Wilson, K.G. (1999). *Acceptance and Commitment Therapy: An experiential approach to behavior change*. New York: Guilford Press.
- Horwitz AV, Wakefield JC (2007). *The loss of sadness: How psychiatry transformed normal sorrow into depressive disorder*. New York, NY: Oxford University Press.
- Kabat-Zinn, J. (1996). *Full catastrophe living*. London: Piatkus.
- Langdon, R. and Bayne, T. (2010). Delusion and confabulation: mistakes of perceiving, remembering and believing. *Cognitive neuropsychiatry*, 15(1), 319–345.
- Leckman, J. F., Denys, D., Simpson, H. B., Mataix-Cols, D., Hollander, E., Saxena, S., Miguel, E. C., Rauch, S. L., Goodman, W. K., Phillips, K. A., & Stein, D. J. (2010). Obsessive-compulsive disorder: a review of the diagnostic criteria and possible subtypes and dimensional specifiers for DSM-V. *Depression and anxiety*, 27(6), 507–527.
- McKay, R., Langdon, R., & Coltheart, M. (2005). “Sleights of mind”: Delusions, defences, and self-deception. *Cognitive Neuropsychiatry*, 10, 305–326.
- Mishara, A. L., & Corlett, P. (2009). Are delusions biologically adaptive? Salvaging the doxastic shear pin. *Behavioral and Brain Sciences*, 32(6), 530.

Nesse R. M. (2000). Is depression an adaptation? *Archives of general psychiatry*, 57(1), 14–20.

Poyurovsky, M. (2013). *Schizo-obsessive disorder*. New York, NY: Cambridge University Press

Egodystonicity, recovery and free will in OCD

Abstract: Egodystonicity describes a thought that is not consistent with one's sense of self. The notion is used in the clinical discourse to indicate when one does not incorporate the symptoms of one's illness - such as obsessions and compulsions in the case of OCD - into one's sense of self. In this paper I show that egodystonicity plays an important role in discourses on recovery and perceptions of free will in OCD. While it is not completely clear whether egodystonicity favours recovery from OCD, its presence is supposed to favourably influence control over one's obsessions and compulsions, thus making the person feel freer. I argue that egodystonicity is neither good nor bad in itself, but that this depends on the values and the aspects of the self it refers to, such as one's sense of desirability, morality or rationality. Of these aspects, seeing one's obsessions and compulsions as consistent with one's sense of rationality might pose a challenge to recovery and perceptions of free will, while it does not seem to be a problem if obsessions and compulsions are seen as in syntony with other valued aspects of the self. I illustrate this by presenting the experiences of some people suffering from OCD. Implications are drawn that extend beyond OCD and might be of interest to both philosophers and mental health professionals.

1. Introduction

OCD or obsessive-compulsive disorder is a serious mental health condition which is characterized by the presence of obsessions and compulsions. As DSM 5 (APA 2013, 235) puts it, *Obsessions are recurrent and persistent thoughts, urges, or images that are experienced as intrusive and unwanted, whereas compulsions are repetitive behaviours or mental acts that an individual feels driven to perform in response to an obsession or according to rules that must be applied rigidly.*

OCD is usually characterized as an egodystonic illness, as egodystonicity is held to be one of the core features of obsessions. The term "egodystonic" has its roots in Freudian psychoanalysis: it was used to describe a thought whose content was expression of the *id* but in contrast with the values of the *ego*, or with the person's conception of the ideal self (Freud 1973). In more recent times, as Purdon *et al.* (2007, 200) beautifully put it, a thought that is egodystonic is defined as one that is *perceived as having little or no context within one's own sense of self or personality. The thought is perceived, at least initially, as occurring outside the context of one's morals, attitudes, beliefs, preferences, past behaviour, and/or one's expectations about the kinds of thoughts one would or should experience. The thought gives rise to considerable emotional distress and is resisted.* For example, a person might have the sudden thought of committing a burglary and become severely distressed by the presence of the thought, as he considers it in contrast with his self-representation as an honest person. As a consequence, he might start resisting the thought by asking for reassurance or suppressing the thought. The opposite notion of egodystonicity is egosyntonicity, which is *descriptive of values, feelings, ideas that are consistent with one's ego, that feel real and acceptable to consciousness* (Reber 1985, 229-230). With regard to mental illness, egosyntonicity is used to indicate when one incorporates the symptoms of a mental illness into one's sense of self. For example, if an honest person suffers from intrusive thoughts of committing a burglary, he might end up believing that he is not so honest after all, revising his sense of self.

Egodystonicity entertains an ambivalent relationship with treatment and recovery from OCD. On the one hand, egodystonicity seems to negatively correlate with symptoms severity (Belloch, Roncero and

Perpiñá 2012) and positively correlate with good insight and treatment compliance (Summerfeldt 2006). On the contrary, egosyntonicity is often an impediment to recovery, as shown by egosyntonic body image beliefs in Anorexia Nervosa (Gregertsen, Mandy and Serpell 2017) and by egosyntonic beliefs about possessions in hoarding disorder (Kings, Moulding and Knight 2017). On the other hand, however, it has been pointed out that egodystonicity could make obsessions worse insofar as it draws attention and gives importance to them (Purdon *et al.* 2007; Rachman 2006). A heightened perception that a thought is in stark contrast with one's preferences, values and beliefs about oneself could lead to distress, an overinterpretation of the meaning of the thought and to a drastic revision of one's sense of self (*If I had that thought, that must mean that I am a heartless criminal!*)⁵.

The notion of egodystonicity has also been recently recognised to play a role in perceptions of free will in OCD (Van Oudheusedn *et al.* 2018). In philosophical debates, OCD is usually held to compromise a person's free will (see Meynen 2012 and 2010 for a comprehensive review) and free choice (Churchland 2002; Strawson 1994), to the point that it has been defined as a malady of free will (Levy 2003). Van Oudheusedn *et al.* (2018) highlights how egodystonicity should enter the debate on perceptions of free will in OCD, as their empirical study shows that egodystonicity leads to an increase in mastery over one's obsessions and compulsions. On the contrary, egosyntonicity would be bad for mastery over one's obsessions and compulsions. This would be confirmed by the fact that in the study patients displaying egosyntonicity towards their obsessions and compulsions found it harder to resist or stop them compared to those who displayed egodystonicity: according to the authors, a decreased resistance to obsessions and compulsions would negatively affect perceptions of free will.

In this paper, I am going to investigate the role that egodystonicity and egosyntonicity have been assigned in both the treatment and recovery narrative of OCD and in philosophical discourses on free will. I will argue that egodystonicity and egosyntonicity are vague notions that are *per se* neither beneficial nor detrimental to recovery and perceptions of free will in OCD, as this essentially depends on the values and aspects of the self that these notions refer to. The self is in fact a complex and multifaceted entity (see e.g. Audet, Aardema and Moulding 2016; Higgins 1987), and, as already noticed (Belloch, Roncero and Perpiñá 2012; Purdon *et al.* 2007), some thoughts, such as obsessive ones, can be in syntony with some aspects of the self but in contrast with others. I show that considering one's obsessions and compulsions as syntonic with some valued aspects of the self, such as, for example, one's sense of morality, does not negatively affect one's perceptions of free will and one's recovery from OCD. However, I propose that considering one's obsessions and compulsions in syntony with one's sense of rationality could be detrimental to recovery and perceptions of free will in OCD. I also show that considering one's obsessions and compulsions in syntony with one's sense of rationality equals to what mental health professionals call having a poor cognitive insight into one's illness. In other words, I show that cognitive insight is a sub-set of egodystonicity. To do so, I will report

⁵ Although it is debatable whether it is egodystonicity that is the problem in this kind of thought process or rather the meaning that the person attaches to the thought. The fact that a thought is perceived to be in contrast with one's values and beliefs and that it causes distress could also be read by the person as a confirmation that she has different values and beliefs from those suggested by the thought. Indeed, this might reflect the thought process of non-clinical people who experience intrusive thoughts. The fact that the person with OCD reads it as a sign that she has different values and beliefs from what she thought she had might indicate that the problem lies not in perceiving the thought as egodystonic but in interpreting it in an egosyntonic manner (see Langlois *et al.* 2004).

the results of some interviews of people suffering from OCD. These findings have important implications that span beyond OCD and that are of interest to both philosophers working on free will and clinicians.

The paper is structured as follows. After a methodological section (2), I analyse the relationship between egodystonicity and recovery (3). In 3.1., I explain that in the literature on the topic egodystonicity plays an ambiguous role in relation to recovery. In 3.2., I argue that from an analysis of my participants' interviews it emerges that it is only egosyntonicity towards one's sense of rationality that is detrimental to recovery from OCD. I then focus on the relationship between egodystonicity and perceptions of free will (4). More specifically, in 4.1., I present the main claims of Van Oudheusedn *et al.* (2018); in 4.2., I present some cases from my sample of participants that seem to contradict those claims; in 4.3., I argue that, *contra* Van Oudheusedn, it is only egosyntonicity towards one's sense of rationality that is detrimental to perceptions of free will in OCD. In (5) I thus draw the conclusions and future implications of my study.

2. Method

Participants

All the seven participants self-reported a formal diagnosis of OCD made by a psychiatrist. One participant reported comorbid bipolar disorder and another comorbid depression. The inclusion criteria, alongside diagnosis, were being native English speakers and having good cognitive capacities. We excluded those with a history of special educational provision or learning disability. Their age ranged from 27 to 43 years old. They were 4 females and 3 males. Their YBOCS (Yale-Brown Obsessive-Compulsive Scale) final scores were the following: Shelley=24; Roger=12; Emily=27; Audrey=13; Diane=0; Fred= 30; Jim=22. The cut-off points for the final score are the same as those of the clinician-administered version of the at : 0–7 = subclinical; 8–15 = mild; 16–23 = moderate; 24–31 = severe; 32–40 = extreme (Federici *et al.* 2010). For the purposes of the present study, only the reports of three participants have been thoroughly analysed, because they more clearly represent deviant cases to Van Oudheusedn's claims.

Recruiting

Participants were recruited through Twitter: they responded to a call for volunteers advertised on my personal profile that was retweeted by institutions such as the University of Birmingham, the BDD Foundation and OCD Action or by people studying or working at the University of Birmingham. The call stated that *Researchers at the University of Birmingham are seeking participants who suffer from OCD and who would be willing to talk about their experiences of wellbeing and control.* At the moment of the interview, participants were asked if they were officially diagnosed with OCD.

Ethical approval, consent and confidentiality

The project was reviewed by the University of Birmingham's Humanities and Social Sciences Ethical Review Committee and was granted full ethical approval on 4th May 2020 (ERN_19-1513).

All participants provided written consent prior to the interviews. Their names have been changed to ensure anonymity.

Interviews

The interviews took place on Skype. Interviews were designed to last for approximately an hour. They consisted of two stages: 1. Answering a self-report version of the YBOCS (Yale-Brown Obsessive-Compulsive Scale), a 10-item scale used in clinical practice to measure the severity of OCD symptoms. The self-report version of the YBOCS was provided to me by email by Gail Steketee and Randy Frost, who in turn took the questionnaire from Baer *et al.* (1993). Beyond the 10 items that are also present in the clinician-administered version, the self-report version of the YBOCS also includes two additional items that measure insight (item 11) and avoidance of important things (item 12). The scores resulting from answers to items 11 and 12, however, have not been added up to the final score of the questionnaire. 2. answering questions from a semi-structured interview on experiences of wellbeing, functioning, control and engagement with the environment. The questions were inspired to the Symptomatology and Perceived Free will rating scale (SAPF), a 15-item scale contained in Van Oudheusden's *et al.* (2018) and utilised to assess perceptions of free will in OCD. The SAPF highlights three factors that measure perceptions of free will.

- D) the perceived ability to change one's course of action when faced with an obsession or compulsion (alternative possibilities factor);
- E) the experience of obsessions or compulsions as intentional (intentionality factor);
- F) the experience of being the source or owner of the obsessions or compulsions (ownership factor), which is then considered by the authors as a measure of egosyntonicity

To capture F, I have shaped my questions on items 2 and 3 of the SAPF, which are intended to measure egosyntonicity (*To what extent are your obsessions and compulsions [or OCD] a part of you?; To what extent are your obsessions and compulsions your own?*). Items 4, 5, 10 and 11 of the SAPF measure D (*To what extent can you suppress your obsessions and compulsions? To what extent can you exert control over your obsessions and compulsions? To what extent can your obsessions and compulsions be influenced in some way or another? To what extent are the obsessions and compulsions avoidable?*). To cover these questions, I have utilised items 4, 5, 9 and 10 of the YBOCS, i.e. *How much of an effort did you make to resist the obsessive thoughts? How often did you try to disregard or turn your attention away from those thoughts as they entered your mind? How much control did you have over your obsessive thoughts? How successful were you in stopping or diverting your obsessive thinking?; How much of an effort did you make to resist the compulsions? Or how often did you try to stop the compulsions?; How much control did you have over the compulsive behavior? How successful were you in stopping the ritual(s)?*. Sometimes, I have also asked the following questions: *Are you able to not think about your obsession or to think about something else?; "Are you able to not do your compulsion or to do something else?*. Finally, to capture the insight levels of participants, I have relied on the participants' responses to item 11 of the YBOCS (*Do you think your obsessions or compulsions are reasonable or rational? Would there be anything besides anxiety to worry about if you resisted them? Do you think something would really happen?*) as well as on their responses to the interview. Although semi-structured, interviews offered participants a choice regarding the topics they would like to discuss. Interviewees were also invited to talk about any other aspects of experience they felt it important to highlight to the researcher: this aimed to maintain an openness to participants' concerns throughout data collection. Responses to the interviews were analysed using thematic analysis (Braun

and Clarke 2006). Coding drew out key themes, words and phrases. 'Deviant cases' were sought to challenge emerging interpretations. Overall reliability was established by probing the relationship between each individual transcript and the themes across the interviews as well as through discussions within the research supervisory team to forge shared interpretations.

Differences with Van Oudheusedn's et al (2018)

While Van Oudheusedn's et al. is a quantitative study, involving 295 participants, mine is a qualitative one. The different approach utilised by the studies gives rise to important differences, both in terms of the sample of participants (which in my study is limited to 7) and of the nature of the gathered data. The responses to Van Oudheusedn's questionnaire fall into pre-established categories, while in my case, as questions are left open ended, they are more complex and richer. The richness and complexity of the responses also explain why it has not been possible to ask all the items of the SAPF that measure egosyntonicity and alternative possibilities in each interview. However, at least one question relating to egosyntonicity and alternative possibilities has been asked to all participants.

3. Egodystonicity and recovery

3.1. The ambiguity of egodystonicity in recovery from OCD

The role of egodystonicity is ambiguous when it comes to treatment and recovery from OCD. On the one hand, egodystonicity is welcomed when patients, especially younger ones such as children and adolescents, are aided to take a distance from their obsessions and compulsions (Wagner 2003. But see also Schwartz 1998 for adults). This strategy can take many forms, such as encouraging young patients to identify the OCD with a monster or a bully that tricks them into thinking that they are mad or bad. The patient is then invited to oppose an active resistance to the monster or bully, which consists in understanding that the person, and not the OCD, is in charge of his actions and thoughts. This strategy, that can be called of externalization of OCD, is in syntony with other therapeutical approaches employed in the therapy and treatment of other mental illnesses, such as bipolar disorder and schizophrenia. These approaches are based on the reduction of the so-called self-illness ambiguity, which promotes that separation between one's identity and one's illness that has been recognised to be key to agential empowerment and recovery (Dings and Glas 2020; Sadler 2007). The goal is to support the patient in building a more solid sense of self - made of aspirations, strengths and weaknesses - that is independent from one's illness. On the other hand, however, egodystonicity seems to be bad for recovery insofar as it highlights the contrast between the thought and one's ideal self, which in turn triggers anxiety and an overestimation of the value of the thought itself. However, it has also been pointed out that egodystonicity could be a protective factor in the long term: when a thought is recurrent, finding it in contrast with one's ideal sense of self can promote resistance to the thought, which in turn is key to recovery (Purdon *et al.* 2007).

In what follows, I will show that the relationship between egodystonicity and recovery from OCD is indeed complex, but I will also try to sketch a way out of this complexity. Firstly, I will highlight that egodystonicity and its contrary, egosyntonicity, can be good or bad depending on the values and beliefs about the self that one takes into consideration. The self is a complex and multifaceted notion, and some thoughts, such as obsessive ones, can be in conflict with some values of the self but in harmony with others. Purdon *et al.* (2007) delineate three dimensions of egodystonicity and egosyntonicity: desirability, rationality and morality. The person who has the sudden thought that she might

contaminate other people, and who washes her hands a hundred times per day to avoid that, has a thought that can be in harmony with her self-representation as a caring and loving person, thus with her sense of morality, but in contrast with her sense of rationality, as she acknowledges that the washing is excessive. I will show that in my sample egodystonicity can sustain recovery when it helps people acknowledge that their obsessive thoughts and compulsive behaviours are irrational. On the contrary, when obsessions or compulsions are perceived to be syntonic with one's sense of rationality, this has a negative impact over illness severity and recovery. However, I will also highlight that a certain kind of egosyntonicity, consisting in perceiving one's obsessions and compulsions to be in syntony with other valued aspects of the self beyond rationality – such as one's sense of morality - might not be detrimental to recovery.

I will do so by illustrating the cases of some of my interviewees: Emily, Fred, Roger.

3.2. Egodystonic with what?

Emily was the participant who apparently perceived her obsessions and compulsions as the most egodystonic. To the question: *Do you feel that your obsessions and compulsions are a part of you?* This is what she answered.

No, I have hope that one day I will be able to get rid of them as I did in 2012/13. I do think I will be a slightly different person when I am well again because I'll have more energy and room for other thoughts and activities. I suppose I would say they are a big part of my life, but they aren't part of me - like an abusive partner [...] I definitely see it as an illness to be fixed, which is different to my sense of self. Maybe like if you had a broken leg, the leg is part of you, but the break isn't - it's something to be fixed. I suppose it is bound up with some hope that one day I will be able to escape this illness. If it were part of me, then it would necessarily be part of my future, which would make my future quite dark. It's totally different to the movement amongst autistic people where they are fighting to be recognised as autistic, not people with autism. I see OCD as an illness or parasite that's definitely not part of who I am.

The words parasite, abusive partner and a break in the leg clearly indicate that Emily perceived her OCD as something completely external to her identity. The interesting thing, however, is that Emily was also one of the participants who scored highest on the YBOCS (27), indicating that her OCD was severe at the time of the interview. What does Emily's case tell us about the value of egodystonicity in the journey towards recovery? Emily's conviction that her OCD was something completely alien to her sense of self did not seem to be sufficient to make a positive contribution towards her recovery at the time of the interview, as the YBOCS scores testify. However, there is also some room to argue that Emily did not see her illness as *completely* egodystonic. This seems to emerge both by her response to item 11 of the YBOCS (*Do you think your obsessions or compulsions are reasonable or rational? I think my obsessions or compulsions are unreasonable or excessive, but I'm not completely convinced that they aren't necessary*) and by the words that she uses to describe her level of conviction into the reasonableness of her obsessions.

Q: Would you feel relieved if you knew that your obsessive-compulsive beliefs were not true? For example, if you knew that not performing mental rituals did not mean to insult the Holy Spirit or increase your probabilities to go to hell?

A: Yes, it would be a huge relief. Although I think the thing to get across about OCD (at least for me) is that I already "know" they are not true, but they still "feel" true. They feel like a threat, so it is very hard to treat them otherwise. I suppose I would say my level of knowledge/belief is that I'm 99.9% confident that I can't cause others or myself to go to hell by not doing rituals, and I'm 85-90% confident that I am not insulting the Holy Spirit by not doing my rituals. I'm not sure where I'd put my knowledge in terms of the one about insulting the devil. But even a risk of 0.1% feels too high given that the consequence would be for eternity. To add another layer of complexity, I am fairly certain based on my understanding of Christianity that hell isn't a literal place and that no one will suffer eternal torment whatever they do. But there is still a residual fear of "what if it is?"

If Emily saw something even remotely rational in her obsessions and compulsions, that implies that she was also considering them to partly be in syntony with her sense of rationality. If this is the case, then Emily was adopting an egodystonic stance towards some aspects of her obsessions and compulsions – like their desirability, as she perceived them to rob her of energy that could be employed in more rewarding activities - but an at least partly egosyntonic one towards other aspects of her beliefs, such as the fact that they are rational. In other words, Emily was seeing her obsessive-compulsive beliefs as dissonant with her sense of desirability and consonant with her sense of rationality.

Different considerations apply to Roger's case. Roger's OCD was mild at the time of the interview, with a total score of 12 on the YBOCS. His attitude towards his obsessions and compulsions was very different from Emily's. I here report a piece of the interview I had with him.

Q: With regard to your obsessions and compulsions, would you say that they are a part of you? And how does this make you feel?

A: I would definitely say that my obsessions and compulsions are a part of me. I call them my MR IRRATIONAL side. I used to really hate my obsessional personality/way of thinking. However, I also love how funny I am, how intelligent I am and also how sensitive I am. Away from my obsessions and compulsions, I like who I am as a person. If I didn't have my OCD side, then I wonder would I have the other aspects of my personality that I like so much??? Would I be so sensitive, funny and clever without my obsessions and compulsions??? I don't like the compulsions, but I don't get frustrated with them as much as with my obsessional thinking. After all, my compulsions are just like the symptoms of coming from the obsessions. It's my irrational thinking and anxieties at times that more frustrate and annoy me!

As it appears, Roger considered his obsessions and compulsions as part of who he was. Although a certain degree of egodystonicity is present, as he says that his obsessions can frustrate and annoy him, differently from Emily, who sees her OCD as completely negative, Roger envisages some possible

benefits in suffering from OCD: the OCD side would in fact be linked with some valued aspects of the self, such as the fact that he is clever, funny and sensitive. Despite the fact that in general he seemed to display a higher degree of egosyntonicity compared to Emily, Roger seemed to be ahead of Emily in the journey towards recovery. Compared to Emily, he had a milder OCD at the time of the interview⁶, and he expressed much more positive feelings, like when he said: *Have you heard the English phrase, I'M A GLASS HALF-FULL person? As opposed to I'M A GLASS HALF-EMPTY? The first one means that I'm an eternal optimist these days. I'm full of positivity. I personally think the meds I'm on (aripiprazole and fluoxetine) are really helping me feel a lot less negative emotions than I was.* The fact that Roger was able to do better than Emily in terms of illness severity and recovery might be due to two factors. The first concerns the different content of Roger's and Emily's obsessions. While Roger's obsessions were more mundane and easier to disprove, Emily's were quite the opposite. The second factor is that it is likely that Roger considered his OCD – his “Mr. Irrational Side” - more dystonic with his sense of rationality than Emily did. This difference in attitudes towards the rationality of their own obsessive beliefs would be captured not much by their responses to item 11 of the YBOCS – to which they gave the same answer, deeming their obsessions and compulsions irrational and excessive but not completely unnecessary - but rather by their words during the semi-structured interviews. While Roger said that he could now acknowledge that his obsessions were irrational, Emily's insight into the reasonableness of her obsessions varied, ranging from the 99.9% of conviction that she could not go to hell if she did not perform her rituals, to the 85% that she could not insult the Holy Spirit, to the unsureness about insulting the devil.

The fact that recovery is hindered by considering one's obsessions and compulsions as syntonic with one's sense of rationality is also suggested by Shelley's and Fred's cases. Shelley and Fred were severely impaired by their OCD at the time of the interview (score of 24 for Shelley and of 30 for Fred on the YBOCS), even though they believed their obsessions to be fairly or, in the case of Fred, completely unreasonable, as confirmed by their words during the interview and to their response to item 11 of the YBOCS (Shelley: *I think my obsessions or compulsions may be unreasonable or excessive*; Fred: *I think my obsessions or compulsions are unreasonable or excessive*). Compared to the other participants, Shelley found her obsession that she might cause allergies to other people more reasonable. She deemed the belief to *unfortunately* be a part of her, and she added that she would have pushed a button to get rid of her illness if she could. On the other hand, Fred was very contradictory in reporting his attitudes towards the reasonableness of his obsessions. In the YBOCS, he claimed that he found them completely unreasonable, but during the course of the interview he claimed that *All of my intrusive thoughts are disturbing thoughts that I worry may be true/will happen and that is what distresses me.*

This indicates that both Fred and Shelley found their beliefs partly syntonic with their sense of rationality. As far as other aspects of their sense of self were concerned, Shelley did not find any positive in having OCD, while Fred claimed: *I feel reconciled with the idea of having OCD, when it is not bad it feels like me being me; when it is bad, it feels like something to heal, but I don't know what I would be like without it. it's just a natural part of me.* This seems to suggest that severity of illness

⁶ Roger's YBOCS score was 12 while Emily's was 27.

might be linked to finding one's obsessive beliefs reasonable rather than to finding other aspects of the illness in syntony with one's sense of self.

In what follows, I will argue that similar considerations bear on the debate on free will in OCD.

4. Egodystonicity and perceptions of free will

4.1. Van Oudheusedn *et al.* (2018)

In this section, I better explain why according to Van Oudheusedn *et al.* (2018) the notions of egosyntonicity and egodystonicity are central to discourses of perceived free will in OCD.

Henrik Walter (2011) has argued that the notion of free will employed in philosophical debates can be reduced to three key dimensions.

- A) Having alternative possibilities, i.e., being able to do this or that;
- B) Acting for understandable reasons;
- C) Being the source or owner of one's actions.

Drawing on Walter's free will dimensions, Sandra Van der Salm *et al.* (2017) created a questionnaire to assess perceptions of free will in movement and tic disorders. Van Oudheusedn *et al.* (2018) have then readapted Van der Salm's questionnaire to assess perceptions of free will in OCD: they have called the new questionnaire the Symptomatology and Perceived Free will rating scale (SAPF). The SAPF consists of 15 items that, according to the authors, reveal three factors, all mapping onto Walter's free will dimensions.

- D) the perceived ability to change one's course of action when faced with an obsession or compulsion (alternative possibilities factor);
- E) the experience of obsessions or compulsions as intentional (intentionality factor);
- F) the experience of being the source or owner of the obsessions or compulsions (ownership factor).

The questionnaire has thus been administered to a cohort of 295 participants suffering from OCD. Results show that OCD patients generally experience little freedom in the perception of alternative possibilities (D) as well as on the intentionality factor (E), meaning that obsessions and compulsions are hard to stop or resist and they are generally perceived as unintentional (but compulsions are experienced as more intentional than obsessions). However, somewhat contrary to the authors' expectations, patients with a poor insight (PI) have been found to exhibit a stronger sense of ownership towards their obsessions and compulsions (F) than patients with a good insight (GI). In the study, insight is used in its cognitive sense, to indicate the degree to which people are *able to look into their actual stream of consciousness, to distance themselves from specific dysfunctional cognitions and to apply various techniques to evaluate and correct them* (Beck and Warman, 85). For example, a person with OCD has a good cognitive insight into her illness if she acknowledges that her obsessive-compulsive beliefs are probably not true and irrational. According to the authors, the fact that poor insight positively correlates with ownership while good insight negatively correlates with it might be explained by the fact that factor (F) does not measure genuine ownership but rather egosyntonicity (F* from now on) which, contrary to ownership, would make one feel less free. The authors add that

this would also explain why in the study F^* negatively correlates with D , i.e. why obsessions and compulsions are harder to resist or stop the more they are perceived to be part of oneself.

The relationships between PI , GI , D and F^* can be summarized as follows (where \rightarrow stands for positive correlation and \searrow stands for negative correlation).

$$- PI \rightarrow F^* \searrow D$$

(i.e., the more one believes that obsessions and compulsions are reasonable, the more one thinks they are part of himself, the less one is able to resist or stop them)

and

$$- GI \searrow F^* \rightarrow D$$

(i.e., the more one believes that obsessions and compulsions are unreasonable, the more one thinks they are not part of himself, the more one is able to resist and stop them).

In what follows, I am going to question the relationships among these factors, showing that there are many nuances that cannot be captured by the above formulas. Firstly, my data show that it is not always true that $GI \searrow F^*$, i.e. that good insight positively correlates with egodystonicity. Intuitively, considering one's obsessions and compulsions as irrational or not true does not automatically lead to considering them as not part of oneself. That depends on the degree to which one considers one's self to be rational. As some of my participants attest, it is in fact possible to believe that obsessions and compulsions are irrational and at the same time part of oneself or, in other words, to acknowledge that one is not completely rational. But there is more. My data also question the accuracy of $F^* \searrow D$, i.e. that considering one's obsessions and compulsions as part of oneself necessarily means that one is less able to control them. As I will show, this is true if one considers obsessions and compulsions in syntony with one's sense of rationality, but not if obsessions and compulsions are considered to be in syntony with other valued aspects of the self. If the latter is the case, then it is possible to consider some aspects of one's illness in syntony with oneself and be able to control them.

Assuming that the authors are right in considering factor F as an expression of egosyntonicity rather than of ownership, in what follows I will speak of egosyntonicity instead of ownership. I should also make it explicit that assessing the claim that free will can be reduced to the alternative possibilities, intentionality and egosyntonicity/ownership factors, as Walter and Van Oudheusedn's hold, is beyond the scope of this paper. However, to avoid conceptual confusion and considering that the present study develops some insights of these authors, throughout the paper I will employ the term free will in the sense these authors intend it.

In what follows, I am going to compare and contrast individuals who display egosyntonicity towards their obsessions and compulsions with people who, on the contrary, see them as alien and egodystonic. The goal is to further explore Van Oudheusedn's suggestion that the former feel less free than the latter.

4.2. Against Van Oudheusedn et al.

In this section, I am going to present those cases that seem to contradict Van Oudheusedn's claim that perceiving one's obsessions and compulsions as egodystonic correlates with feeling freer and, on the contrary, that perceiving them as egosyntonic correlates with feeling less free.

1. Emily: GI\NF*\ND

○ **Egodystonicity**

Q: *Do you feel that your obsessions and compulsions are a part of you?*

A: *No, I have hope that one day I will be able to get rid of them as I did in 2012/13. I do think I will be a slightly different person when I am well again because I'll have more energy and room for other thoughts and activities. I suppose I would say they are a big part of my life, but they aren't part of me - like an abusive partner [...] I definitely see it as an illness to be fixed, which is different to my sense of self. Maybe like if you had a broken leg, the leg is part of you, but the break isn't - it's something to be fixed.*

Q: *How does this awareness make you feel?*

A: *I suppose it is bound up with some hope that one day I will be able to escape this illness. If it were part of me then it would necessarily be part of my future, which would make my future quite dark. It's totally different to the movement amongst autistic people where they are fighting to be recognised as autistic, not people with autism. I see OCD as an illness or parasite that's definitely not part of who I am.*

○ **Alternative possibilities**

Q: *How much control did you have over your obsessive thoughts? How successful were you in stopping or diverting your obsessive thinking?*

A: *Moderate control; sometimes I could stop or divert obsessions*

Q: *How much control did you have over the compulsive behavior? How successful were you in stopping the ritual(s)?*

A: *Sometimes I could stop compulsive behavior but only with difficulty*

2. Fred: GI\NF*\ND

○ **Egodystonicity**

Q: *Do you feel that your OCD is a part of you?*

A: *The OCD, what causes the obsessions I feel is part of me, because I have always had it. The actual obsessions and compulsions, I know they are not real and they should not be there.*

○ **Alternative possibilities**

Q: How much control did you have over your obsessive thoughts? How successful were you in stopping or diverting your obsessive thinking?

A: No control; I was rarely able to even momentarily ignore the obsessions.

Q: How much control did you have over the compulsive behavior? How successful were you in stopping the ritual(s)?

A: Sometimes I could stop compulsive behavior but only with difficulty.

3. Roger: GI→F*→D

○ **Egosyntonicity**

Q: With regard to your obsessions and compulsions, would you say that they are a part of you? And how does this make you feel?

A: I would definitely say that my obsessions and compulsions are a part of me. I call them my MR IRRATIONAL side. I used to really hate my obsessional personality/way of thinking. However, I also love how funny I am, how intelligent I am and also how sensitive I am. Away from my obsessions and compulsions, I like who I am as a person. If I didn't have my OCD side, then I wonder would I have the other aspects of my personality that I like so much??? Would I be so sensitive, funny and clever without my obsessions and compulsions??? I don't like the compulsions, but I don't get frustrated with them as much as with my obsessional thinking. After all, my compulsions are just like the symptoms of coming from the obsessions. It's my irrational thinking and anxieties at times that more frustrate and annoy me!

○ **Alternative possibilities**

Q: How much control did you have over your obsessive thoughts? How successful were you in stopping or diverting your obsessive thinking?

A: Much control; usually I could stop or divert obsessions with some effort and concentration

Q: How much control did you have over the compulsive behaviour? How successful were you in stopping the ritual(s)?

A: Usually I could stop compulsions or rituals with some effort and willpower

4.3 Egodystonic with what?

In this section, I am going to analyze the relationship between egodystonicity, egosyntonicity and the alternative possibilities factor in my sample. Van Oudheusden's findings suggest that there is a negative correlation between egosyntonicity and the alternative possibilities factor and a positive correlation between the latter and egodystonicity. In other words, the more one perceives his

obsessions and compulsions as alien to her sense of self, the more one should be able to control them; on the contrary, the more one perceives them to be in syntony with their sense of self, the less one would be able to control them. However, I argue that this claim is too generic, as it depends on what values or aspects of the self the obsessions and compulsions are syntonic or dystonic with. This is illustrated by Emily's and Fred's cases.

As I have already illustrated in the section on recovery, Emily is the one who, of all participants, seems to perceive her obsessions and compulsions as the most egodystonic, saying that they *are a big part of my life, but they aren't part of me - like an abusive partner [...] I definitely see it as an illness to be fixed, which is different to my sense of self. Maybe like if you had a broken leg, the leg is part of you, but the break isn't - it's something to be fixed.* However, contrary to Van Oudheusedn's *et al* predictions, Emily's strong sense of the symptoms of her illness as being alien and foreign to her sense of self - together with her good insight, as she acknowledged that the obsessions and compulsions are unreasonable and excessive, even if not completely unnecessary - is not coupled with a sense of being able to exercise much control over them. Emily reported that she could only sometimes stop or divert her obsessions and only sometimes stop her compulsions, and with difficulty. Similar considerations apply to Fred. As Emily, Fred seems to consider his obsessions and compulsions as egodystonic when he claims that he knows that *they are not real, and they should not be there.* At the same time, however, Fred's responses to the YBOCS reveal that he had no control whatsoever on his obsessions and only some control on his compulsions. This is even more striking considering that Fred was the participant who showed the best insight on the YBOCS, deeming his obsessions and compulsions to be completely irrational and excessive.

The interpretation of these results gets even more complex if one compares Emily's and Fred's cases with those of other people who seem to see their obsessions and compulsions as more syntonic with their sense of self. We have seen that Van Oudheusedn's analysis reveals that there seems to be a negative correlation between egosyntonicity and the alternative possibilities factor. In other words, the more participants see their obsessions and compulsions as part of who they are, the more they seem unable to control them. This perfectly fits with cases like Shelley's. Shelley presented a poorer insight compared to that of other participants, though still fair (*I think my obsessions or compulsions may be unreasonable or excessive* was the response to item 11 of the YBOCS). She reported that her OCD was a big part of her *but not in a positive way* and that she would not know what to do without it. She also added that at the time of the interview she had little control over her obsessions and that she could only delay her compulsions but at the end she had to carry them out. The YBOCS scores indicate that she was suffering from severe OCD at the time of the interview (score: 24). The most interesting case as far as egosyntonicity is concerned is represented by Roger. Roger seemed to see his obsessions and compulsions as part of who he is. These were his words: *I would definitely say that my obsessions and compulsions are a part of me. I call them my MR IRRATIONAL side.* He even envisaged some possible benefits in suffering from OCD: *I used to really hate my obsessional personality/way of thinking. However, I also love how funny I am, how intelligent I am and also how sensitive I am. Away from my obsessions and compulsions, I like who I am as a person. If I didn't have my OCD side, then I wonder would I have the other aspects of my personality that I like so much??? Would I be so sensitive, funny and clever without my obsessions and compulsions???* Differently from Shelley, however, he displayed much control over his obsessions and compulsions at the time of the

interview: he said he was in fact able to stop or control his obsessions and compulsions with some effort, concentration and willpower, as both his own words and the responses to the YBOCS reveal. Moreover, contrary to Van Oudheusedn's findings, he displayed good insight even considering his obsessions and compulsions as part of himself, as shown by response to item 11 of the YBOCS (*I think my obsessions or compulsions are unreasonable or excessive, but I'm not completely convinced that they aren't necessary*) and by some of his words, such as: *I know how I thought back then was irrational. For example, I would have been suicidal 20yrs ago if I'd have stood in dog dirt, I wouldn't feel this way now. I still don't like sick or poo, but not as scared of them as I once was.*

The question then is: what does set Emily, Fred and Roger apart from the other participants in their respective groups? In other words, what is it that, contrary to Van Oudheusedn's hypothesis, makes Emily and Fred have little or no control over their obsessions and compulsions despite considering them as not part of themselves? And what is it that makes Roger be in control of his obsessions and compulsions despite seeing them as part of himself and – on the top of that – as partially beneficial? The answer is that Emily and Fred saw their obsessions and compulsions more in syntony with their sense of rationality than Roger, while Roger saw his obsessions and compulsions more in syntony with other valued aspects of his self but not with his sense of rationality.

Firstly, I will focus on Emily's case. At a first glance, Emily saw her obsessions and compulsions as something completely external and alien to herself. There is also no doubt that she had a good – though not perfect - insight into her illness. She acknowledged that her obsessions and compulsions are the expression of an underlying mental illness and she deemed them to be unreasonable or excessive, although she was not convinced that they are completely unnecessary, as her response to item 11 of the YBOCS illustrates. If Van Oudheusedn's analysis is right, then Emily should also have had a good degree of control over her obsessions and compulsions, as measured by D. However, this was not the case: why? As I have already illustrated in the section on recovery, this is probably related to the content of the obsessions she is haunted by as well as by her level of insight into the unreasonableness of her obsessions. To recall, these are her words. *I'm 99.9% confident that I can't cause others or myself to go to hell by not doing rituals, and I'm 85-90% confident that I am not insulting the Holy Spirit by not doing my rituals. I'm not sure where I'd put my knowledge in terms of the one about insulting the devil. But even a risk of 0.1% feels too high given that the consequence would be for eternity. To add another layer of complexity I am fairly certain based on my understanding of Christianity that hell isn't a literal place and that no one will suffer eternal torment whatever they do. But there is still a residual fear of "what if it is?".* The fact that Emily does not have a full cognitive insight into her obsessions and compulsions (i.e., the fact that she does not find them *completely* unreasonable) is probably what prevents her from having more control on them. Similar considerations apply to Fred. Despite displaying an excellent insight on the YBOCS, the interview casts doubt on the fact that Fred believed that his obsessions and compulsions were completely irrational. This would explain why he said that *All of my intrusive thoughts are disturbing thoughts that I worry may be true/will happen and that is what distresses me.*

Emily's and Fred's cases highlight some interesting things, first and foremost that the notion of sense of self is a complex and multifaceted one, so that the same belief could be perceived to be egodystonic with some aspects and values of the self but egosyntonic with other of its aspects and values. In Emily's case, obsessive beliefs about going to hell are perceived to be egodystonic with some valued aspects

of her identity, as they are undesirable, but partly egosyntonic with her sense of rationality. Differently from Emily, Fred considered his obsessions and compulsions more in syntony with some aspects of his personality, but in a similar way to Emily, he also considered them to be in syntony with his sense of rationality.

What Emily's and Fred's cases point towards is that perceiving one's obsessions and compulsions as partly in syntony with one's sense of rationality is probably what prevents one from exercising control over them, while perceiving them as in syntony with other aspects of the self does not have an impact on this. But perceiving one's obsessions and compulsions as being in syntony with one's sense of rationality is nothing but a complicated way to say that the person finds his obsessional beliefs partly or completely reasonable, which coincides with the notion of having a good cognitive insight. In this sense, cognitive insight could be considered as a sub-set of the wider construct of egodystonicity.

It is interesting to compare Emily's and Fred's cases to that of Roger. Roger presents a good insight and considers his obsessions and compulsions to be a part of who he is. However, he also seems to have much control over his obsessions and compulsions. How is this possible? The fact is that in principle there is nothing contradictory in considering obsessions and compulsions as irrational, part of oneself and having control over them. Many people acknowledge that they are imperfectly rational agents and, in a similar way to Roger, try to resist irrational beliefs and impulses – be them obsessions or not: this is part of what growing as a person means, and Roger is no exception to this. Roger's case shows that it is not necessary to consider one's symptoms as something completely alien to oneself in order to exercise mastery over them. If the insights derived from the consideration of Emily's and Fred's cases are correct, the fundamental thing to exercise control over one's obsessions and compulsions is that one considers them as alien to one's sense of rationality or, in other words, that one has a good insight into the unreasonableness of his illness and symptoms. Roger's case seems to lend support to this intuition. Throughout the interview I had with him, Roger seemed to be aware of the irrationality that once characterized his way of thinking and of the progress that he has made since then. *People kept telling me it didn't matter, and that sick and dog dirt weren't everywhere, but I didn't believe or trust them. I didn't care what anybody else thought about sick or vomit, it's what I thought that mattered. I know how I thought back then was irrational. For example, I would have been suicidal 20yrs ago if I'd have stood in dog dirt, I wouldn't feel this way now. I still don't like sick or poo, but not as scared of them as I once was.* It seemed that Roger was more aware of the irrationality of his obsessive thoughts than Emily and Fred. This explains why he was able to exercise more control over his obsessions and compulsions despite considering them as in syntony with other aspects of his sense of self.

4.6 Limitations

This work also presents limitations that could be addressed in further studies. The first is the fact that diagnoses of OCD were not verified but self-reported. A second concern is the limited size of the sample in support of the hypothesis that egosyntonicity is bad for recovery only insofar as obsessions and compulsions are considered to be in line with one's sense of rationality. Although this limitation does not make the present findings invalid, it does not make them generalizable. Medications might also have been a potential confounder. A final limitation concerns the tools employed to measure

insight. It is possible that studies conducted on a wider population and with different measurements could yield different results.

5. Conclusions, implications and future directions

This paper has analysed how the notion of egodystonicity impacts on recovery and perceptions of free will in OCD. The goal was to explore the ambiguous role of egodystonicity in recovery and its supposedly positive influence on perceptions of free will. My paper has shown that egodystonicity and its opposite, egosyntonicity, are not entirely positive or negative, but that this depends on the values and aspects of the self they relate to. Seeing one's obsessions and compulsions as in syntony with some valued aspects of the self, such as one's sense of morality, does not seem to hinder one's journey towards recovery and make the person feel less free. What seems to do so is considering one's symptoms in syntony with one's sense of rationality or, in other words, not having a full cognitive insight, by failing to fully acknowledge that the obsessive thoughts and the attached compulsive behaviours are irrational. In this sense, cognitive insight can be considered as a sub-set of egodystonicity.

The implications of these findings are important beyond OCD and are of interest to both clinicians and philosophers working on free will. For clinicians, this study might inform treatment of OCD and potentially of other mental disorders. While it is of utmost importance to support the person in developing a sense of self that is distinct from one's illness, as this is fundamental in fighting senses of guilt and shame, at the same time clinicians should consider that there might be some value in partly identifying with one's mental illness: some of my interviewees, such as Roger, show that they find their illness not only a source of weakness but also one of strength and identity. At the same time, however, it emerges that considering obsessions and compulsions as in line with one's sense of rationality might hinder recovery, and clinicians should aim to challenge this specific way of thinking where possible. A second, important implication for clinically oriented people that can be drawn from my study is that cognitive insight is not always best assessed by quantitative measures - such as the YBOCS - that do not leave much space to the reflections of patients. This is especially shown by the cases of Fred and Emily, whose insight seemed to be better on the YBOCS than it then appeared from a deeper analysis of their interviews.

The second group of people that might be positively affected by this study are philosophers of free will. Something which emerges very clearly is that the notion of sense of self is a complex and multifaceted one. The self is made of different values and aspects that might at times conflict with one another. While it is possible to entertain a healthy relationship with more irrational sides of oneself and even considering them a possible source of value and strength, as shown by Roger and Fred, my findings suggest that one's sense of rationality is indeed a core value of the ego. This is shown by the fact that if an obsession is deemed to be even minimally rational, then it is very likely that it is not going to fade away.

Bibliography

American Psychiatric Association. (2013). DSM-V: Diagnostic and statistical manual of mental disorders (5th Rev ed.). Washington, DC: APA.

- Audet, J., Aardema, F. and Moulding, R., (2016). Contextual determinants of intrusions and obsessions: The role of ego-dystonicity and the reality of obsessional thoughts. *Journal of Obsessive-Compulsive and Related Disorders*, 9, pp. 96-106.
- Baer, L., Brown-Beasley, M., Sorce, J. and Henriques, A., (1993). Computer-assisted telephone administration of a structured interview for obsessive-compulsive disorder. *American Journal of Psychiatry*, 150(11), pp.1737-1738.
- Beck, A. T. and Warman, D. (2004). Cognitive insight: theory and assessment. In Amador, X. and David, A. *Insight and psychosis* (79-87). Oxford: OUP
- Belloch, A., Roncero, M. and Perpiñá, C., (2012). Ego-Syntonicity and Ego-Dystonicity Associated with Upsetting Intrusive Cognitions. *Journal of Psychopathology and Behavioral Assessment*, 34(1), pp.94-106.
- Braun, V. and Clarke, V. (2006.) Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3 (2), pp. 77-101.
- Churchland, P. S. (2002). *Brain-wise: Studies in neurophilosophy*. Cambridge, MA: MIT Press.
- Dings, R. and Glas, G. (2020). Self-Management in Psychiatry as Reducing Self-Illness Ambiguity. *Philosophy, Psychiatry, & Psychology*, 27 (4), pp. 333-347.
- Federici, A., Summerfeldt, L., Harrington, J., McCabe, R., Purdon, C., Rowa, K. and Antony, M., (2010). Consistency between self-report and clinician-administered versions of the Yale-Brown Obsessive-Compulsive Scale. *Journal of Anxiety Disorders*, 24(7), pp.729-733.
- Freud, S. (1973). *Introductory lectures on psychoanalysis*. New York: Penguin
- Gregertsen, E., Mandy, W. and Serpell, L., (2017). The Egosyntonic Nature of Anorexia: An Impediment to Recovery in Anorexia Nervosa Treatment. *Frontiers in Psychology*, 8.
- Higgins, E.T. (1987). Self-discrepancy: a theory relating self and affect. *Psychological Review*, 94, pp. 319–340.
- Kings, C., Moulding, R. and Knight, T., (2017). You are what you own: Reviewing the link between possessions, emotional attachment, and the self-concept in hoarding disorder. *Journal of Obsessive-Compulsive and Related Disorders*, 14, pp.51-58.
- Langlois, F., Ladouceur, R., Gosselin, P. et al (2004). Characteristics of illness intrusions in a non-clinical sample. *Behaviour Research and Therapy*, 42, 683–696
- Levy, D. A. (2003). Neural holism and free will. *Philosophical Psychology*, 16 (2), pp. 205–228.
- Meynen, G. (2012). Obsessive-Compulsive Disorder, Free Will, and Control. *Philosophy, Psychiatry, & Psychology*, 19 (4), pp. 323-332
- Meynen, G. (2010). Free will and mental disorder: Exploring the relationship. *Theoretical Medicine and Bioethics*. 31, pp. 429–443.

- Purdon, C., Cripps, E., Faull, *et al.* (2007). Development of a Measure of Egodystonicity. *Journal of Cognitive Psychotherapy*, 21(3), pp.198-216.
- Rachman, S.J. (2006). Treating religious, sexual and aggressive obsessions. In M.M. Anthony, C. Purdon, & L.J. Summerfeldt (Eds.), *Cognitive behavior therapy for OCD: Beyond the basics* (pp. 209-230). New York: American Psychological Association,
- Reber, A.S. (1985). *The Penguin Dictionary of Psychology*. New York: Penguin
- Sadler, J. Z. (2007). The psychiatric significance of the personal self. *Psychiatry: Interpersonal and Biological Processes*, 70 (2), pp. 113–129.
- Schwartz, J., (1998). *Brain lock*. New York: HarperCollins.
- Strawson, G. (1994). The impossibility of moral responsibility. *Philosophical Studies* 75(1–2): 5–24.
- Summerfeldt, L. J. (2006). Incompleteness, ordering, and arranging. In M. M. Anthony, C. Purdon, & L. J. Summerfeldt (Eds.), *Cognitive behavior therapy for OCD: Beyond the basics* (187-208). New York: American Psychological Association.
- Van der Salm SM, Cath DC, van RA-F, *et al.* (2017) Clinician and patient perceptions of free will in movement disorders: mind the gap. *Journal of Neurological and Neurosurgical Psychiatry*, 88, pp. 532–533.
- Van Oudheusden, L., Draisma, S., van der Salm, S., *et al.* (2018). Perceptions of free will in obsessive-compulsive disorder: a quantitative analysis. *BMC Psychiatry*, 18(1).
- Wagner, A., (2003). Cognitive-Behavioral Therapy for Children and Adolescents with Obsessive-Compulsive Disorder. *Brief Treatment and Crisis Intervention*, 3(3), pp.291-306.
- Walter H. (2001). *Neurophilosophy of free will. From libertarian illusions to a concept of natural autonomy*. Cambridge, MA: MIT Press.

Conclusions, implications, limitations and future directions

After such a long navigation, the reader might be surprised in finding out that the present thesis does not provide a conclusive answer to the question: are delusions a small pearl of the sea, or just a mirage of it? The thesis has in fact led the reader close to the Colombar, but this has not opened its mouth to reveal its secret. However, what counts most is that this thesis has found a way to make the Colombar do so. Out of metaphor, this thesis has shown *a method* to find out whether delusions are adaptive or not. As shown by paper 5, this method passes through empirical studies which compare either 1. people with delusions with people who face the same difficulties of people with delusions but who do not present delusional ideation or 2. the experiences of the same person before and after delusional ideation. If delusions are adaptive, a person who does not present delusions – as in case 1 - or a person before developing delusional ideation – as in case 2 - should be less engaged with her social or physical environment than a person with delusions or a person after developing delusional ideation. If this were the case, then delusions would be biologically adaptive, as improving one's engagement with the environment is key to surviving and reproducing in that environment.

Beyond this important conclusion, there are other significant conclusions that this thesis has reached and that I will briefly list in what follows.

As shown by Paper 1, delusions can be understood across different disorders as beliefs that are entertained with high levels of conviction, that are characterized by poor levels of cognitive insight and that are at odds with the beliefs of people belonging to the same culture of the deluded person.

As shown by Paper 2, in the psychological and philosophical literature on the topic, the maintenance of delusions is usually considered to be psychologically and biologically harmful in the long term. However, some accounts see the initial adoption of delusions as an emergency, short-term response to a crisis that should be understood in context. The paper also highlights the promises and challenges of this literature, including the complex relationship between the adaptive and the pathological side of delusions.

As shown by Paper 3, it is important to think thoroughly about the details of each theory of delusion formation and maintenance when arguing that delusions are adaptive or pathological. This is shown by the fact that only some versions of two-factor accounts are compatible with the claim that delusions are adaptive.

As shown by Paper 4, the claim that delusions are adaptive cannot be proved true theoretically but it can only be ascertained empirically. I have argued for this position by moving two objections to Fineberg and Corlett's predictive coding model of delusional adaptiveness.

As shown by Paper 6, egodystonicity and egosyntonicity are complex constructs - also encompassing the notion of cognitive insight - which are neither bad nor good *per se*, as demonstrated by the debate on recovery and perceptions of free will in OCD. Whether egodystonicity and egosyntonicity are good or bad depends on the values and aspects of the self they refer to. If obsessions and compulsions are deemed to be syntonic with one's sense of rationality, this is bad, as egosyntonicity in this case hinders recovery and perceptions of free will in OCD. On the contrary, if one's obsessions and compulsions are perceived to be syntonic with values of the self that are not one's sense of rationality, this is not detrimental to the process of recovery and to perceptions of free will in OCD.

These conclusions have important implications for clinical researchers, psychologists and philosophers. From the standpoint of empirical science, the present thesis provides a novel method to test the adaptiveness of delusions and, as already pointed out many times throughout the thesis, ascertaining whether delusions are adaptive can have important repercussions for the treatment of delusions. If delusions are designed to deliver biological benefits, an eradication of delusions could also cancel out the benefits that delusions bring about, with potential negative consequences for patients' mental and physical health. My research also aims to raise awareness of the importance of listening to lived experiences in reaching a better understanding of delusions and of their role in psychic life. It would have been difficult to understand all the nuances of delusional beliefs – such as the pros and cons of entertaining a delusional belief - without engaging with the richness of patients' reports, or without employing the methods of qualitative research; in some cases, it would have been virtually impossible to detect the presence of delusional beliefs altogether. This speaks in favour of the value of patients' voices and of a more qualitative approach when dealing with the understanding of complex phenomena in clinical practice. A further clinical implication, aligned with precision medicine, is the idea that the treatment of certain conditions should not be based on the presence or absence of general diagnoses, but tailored to the specific needs and symptoms of each patient. The same delusion, such as a persecutory one, could in fact play a positive role in the mental life of one patient but a negative one in the mental life of another, with important consequences for the clinical approach to be adopted.

From a more theoretical perspective, this research highlights that delusions are a transdiagnostic entity that can be found well beyond the realm of schizophrenic spectrum disorders. In line with the continuum model of psychosis, this challenges the traditional distinction between neurotic and psychotic disorders, as well as the widespread conviction that delusions are something completely alien not only to everyday thinking, but also to more common forms of thought disorder, such as obsessions. An interesting philosophical implication of this work is that it makes no sense to speak of clear-cut boundaries between normal, obsessional and delusional thinking: this hopefully will help further challenge the mental health stigma which is still associated with psychotic experiences and delusional beliefs. Even more importantly, as a contribution to recent discussions about research methodology in mental health, I hope that this work has managed to prove the necessity for more interdisciplinary work on the nature and role of delusions. *Contra* some philosophical accounts that claim with confidence that delusions are (or are not) adaptive, I have conclusively showed that we should be more cautious in judging about the adaptiveness of delusions: this is because establishing whether delusions are adaptive is not only a matter of abstract philosophical speculation, but also one of empirical investigation.

If this thesis only offers a partial answer to the question of whether delusions are adaptive, this is due partly to the complexity of the issue at stake and partly to the limitations of the present work, such as the relatively small size of the sample of participants, the method employed to assess the adaptiveness of delusions – retrospective self-reports – as well as the method employed to assess the presence of delusional beliefs in the first place – self-reports and self-report version of the YBOCS. It is likely that studies conducted with a larger sample of participants and with mixed methods – self-reports plus third-person observations, as well as different measures of delusional ideation, such as clinicians-led questionnaires – will yield different results on whether delusions, or certain kinds of delusions, are adaptive.

Despite its limitations, however, this thesis also has the merit of delineating several promising avenues for future research, which I will briefly sketch out in what follows.

A first avenue is the replication of the method of Paper 5 in the study of the role of delusional beliefs in other disorders than OCD. For example, what could a study of the benefits of delusional beliefs in BDD tell us about the nature of delusional beliefs in this disorder and its contested relationship with OCD? As far as schizophrenic spectrum disorders are concerned, what could a study of the benefits of delusions in these disorders tell us about the adaptiveness of delusions? Could these studies, taken together, tell us something more about the conception of delusions as natural kinds?

A second, potential avenue of research has to do with the relationship between psychological and biological adaptiveness. It is an assumption of some accounts of delusions – such as Bortolotti’s account of motivated delusions – that the psychological benefits of some delusions translate into epistemic and biological ones, for example when it comes to averting depression in the face of trauma. However, as I point out in Paper 5, it is questionable that this assumption is fully granted, as some research suggests that depression might be biologically adaptive in the face of trauma and loss, despite its being psychologically unpleasant. The implications of such contrasting accounts await to be investigated more clearly.

As illustrated by participants’ accounts in Paper 6, the relationship between delusions and obsessions is an interesting one, and one that requires further exploration. For example, as conviction in one’s delusions can wax and wane depending on the stage of the illness, what is the distinction between a strongly held obsession and a delusion in the remission phase, when the delusion is entertained with a lower degree of conviction? Also, it seems that both delusions and obsessions are central to one’s identity. Could this shared feature play a role in the understanding of the nature of delusions and eventually explain the continuity between one and the other?

Finally, the relationship between delusions and phenomena such as conspiracy theories is a blossoming area of research (e.g., Pierre 2020; Douglas et al. 2019; Dagnall *et al.* 2015). As pointed out, some of the basic surface features of delusions, such as high levels of conviction and poor levels of cognitive insight, also apply to the irrational beliefs found in conspiracy theories, which are sometimes referred to as mass delusions. However, other traits that are typical of delusional beliefs – such as cultural isolation – do not characterize the beliefs found in conspiracy theories. An interesting, still underexplored issue would be to investigate whether beliefs in conspiracy theories are adaptive and, if so, whether they are so in the same sense as some delusions are held to be.

References

- Dagnall, N. Drinkwater, K., Parker, A, et al. (2015). Conspiracy theory and cognitive style: a worldview. *Frontiers in Psychology*, 6. DOI=10.3389/fpsyg.2015.00206
- Douglas, K., Uscinski, J., Sutton, R., *et al.* (2019). Understanding Conspiracy Theories. *Advances in Political Psychology*, 40 (1). DOI: 10.1111/pops.12568
- Pierre, J. (2020). Mistrust and Misinformation: A Two-Component, Socio-Epistemic Model of Belief in Conspiracy Theories. *Journal of Social and Political Psychology*, 8(2), pp. 617–641

Appendix

**UNIVERSITY OF
BIRMINGHAM**

Research Support Group
C Block Dome
Aston Webb Building
University of Birmingham
Edgbaston B15 2TT

17th June 2020

Professor Lisa Bortolotti
Health Services Management Centre (HSMC)
University of Birmingham

Dear Professor Bortolotti

**Re: "Can delusions be adaptive? The case of OCD"
Application for Ethical Review ERN_19-1513**

I can confirm that the above project was reviewed by the University of Birmingham's Humanities and Social Sciences Ethical Review Committee and was granted full ethical approval on 4th May 2020.

I would like to remind you that any substantive changes to the nature of the study as described in the Application for Ethical Review, and/or any adverse events occurring during the study should be promptly brought to the Committee's attention by the Principal Investigator and may necessitate further ethical review.

Please be aware that whilst Health and Safety (H&S) issues may be considered during the ethical review process, you are still required to follow the University's guidance on H&S and to ensure that H&S risk assessments have been carried out as appropriate. For further information about this, please contact your School H&S representative or the University's H&S Unit at healthandsafety@contacts.bham.ac.uk.

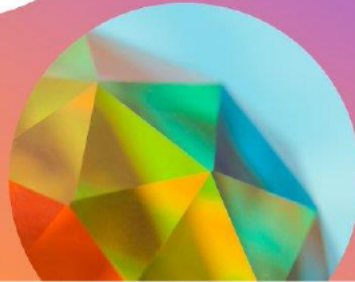
Yours sincerely

Mrs Susan Cottam
Research Ethics Manager



RESEARCHERS AT THE UNIVERSITY OF BIRMINGHAM ARE SEEKING PARTICIPANTS WHO SUFFER FROM **OCD** AND WHO WOULD BE WILLING TO TALK ABOUT THEIR EXPERIENCES OF **WELLBEING** AND **CONTROL**.

IF INTERESTED IN FINDING OUT MORE, PLEASE CONTACT EUGENIA LANCELOTTA AT:



Information sheet

Department of Philosophy • University of Birmingham

Title of
Study: Perceptions of control and wellbeing in OCD

Investigators:

Eugenia

Name: Lancellotta Dept: Philosophy Email:

Introduction

- You are being asked to be in a research study on perceptions of control and wellbeing in OCD.
- You were selected as a possible participant because you identified as living with OCD, you are over 18 years old, you live in the UK and you have never had a special educational needs provision.
- We ask that you read this form and ask any questions that you may have before agreeing to be in the study.

Purpose of Study

- In general, the purpose of the present study is to investigate perceptions of control and wellbeing in OCD. In particular, the study assesses whether delusional or other pathological beliefs in OCD enhance the sense of control and wellbeing of people suffering from OCD, helping them cope with the symptoms of their condition.
- Ultimately, this research may be published as a part of a PhD dissertation or a paper.

Description of the Study Procedures

- If you agree to be in this study, you will be asked to take part in an informal semi-structured interview and to answer to a questionnaire. The questionnaire measures the severity of OCD symptoms, and you can answer it before the interview takes place or during the interview itself. The interview explores perceptions of control and wellbeing in OCD. You can choose to be interviewed on Skype, Zoom or by email. There will be no set time for the interview; its duration will be up to you. In case of a Skype or Zoom interview, the interview will be audio recorded. We will ask you to sign a written consent form prior to completing the interview. After you have returned the consent form by email, you will be assigned a participant code which will be used to ensure confidentiality.

Right to Refuse or Withdraw

- The questionnaire and the interview ask questions regarding your perceptions of control and wellbeing that you may find difficult or sensitive. The decision to participate in this study is entirely up to you. You may refuse to take part in the study *at any time during the completion of the written questionnaire or the conduct of the interview* without affecting your relationship with the investigators of this study or with the University of Birmingham. Your decision will not result in any loss or benefits to which you are otherwise entitled. You have the right not to answer any single question, as well as to withdraw completely

from the process at any point during the conduct of the interview or the completion of the written questionnaire; additionally, you have the right to request that the interviewer not use any of your material until one week after the completion of the interview.

Risks/Discomforts of Being in this Study

- The questionnaire and the interview ask questions about perceptions of control, wellbeing and the nature of your OCD symptoms. You may find these questions sensitive or difficult. In the case you became distressed during the interview, you can stop the interview, do it at another time or withdraw altogether. This is up to you and we will not question your choice. If you would like us to, we can contact anyone to support you. You can also find a list of appropriate local services and support that you can access in the next page. If you became distressed during an interview (unless you have stated that you want to withdraw and/or not be contacted again), we will check in with you 24 hours later to see if you are okay and if there is any further way we might support you, such as by offering further links to resources such as helplines. In case there is an immediate risk for your safety or for that of other people, confidentiality will be broken to call someone you trust or, if you refuse, the police or an ambulance.

Benefits of Being in the Study

- The benefits of participation are to help challenge the stigma associated with mental health conditions, by investigating whether even pathological beliefs (such as delusions) can contribute to the proper functioning of individuals who find themselves in a situation of difficulty.

Confidentiality

- All information from this study (including personal data, email correspondence, your responses to the first questionnaire and your interview data) will be kept strictly confidential. Research records will be kept in a locked and password protected file on RDS (Research Data Store, the secure University of Birmingham IT system to store research data) for ten years before being deleted. We will not include any information in any report we may publish that would make it possible to identify you. The only people to have access to the research data will be the investigator of this project and her three supervisors. All your personal data (name, surname etc.) will be deleted within one week after the completion of the interview. In case there is an immediate risk for your safety or for that of other people, confidentiality will be broken to call someone you trust or, if you refuse, the police or an ambulance.

Payments

- There will be no payment.

Right to Ask Questions and Report Concerns

- You have the right to ask questions and report concerns about this research study: Eugenia Lancellotta will answer your questions by email before, during or after the research, from Monday to Friday, 9 a.m.-5p.m. Her email is On request, a summary of the results of the study will be sent to you via email. If you have any other concerns about your rights as a research participant that have not been answered by the

investigator, you may contact Prof. Matthew Broome at
Monday to Friday 9a.m- 5p.m.

from

Where to get urgent help

Call 999 or go to A&E now if:

- someone's life is at risk – for example, they have seriously injured themselves or taken an overdose
- you do not feel you can keep yourself or someone else safe

A mental health emergency should be taken as seriously as a physical one. You will not be wasting anyone's time.

Get advice from 111 or ask for an urgent GP appointment if:

- you need help urgently for your mental health, but it's not an emergency
- you're not sure what to do

111 will tell you the right place to get help if you need to see someone.

Use the [NHS 111 online service](#), or call [111](#).

You may be able to speak to a nurse, or mental health nurse, over the phone.

Mental health helplines

Samaritans

Confidential support for people experiencing feelings of distress or despair.

Phone: 116 123 (free 24-hour helpline)

Website: www.samaritans.org.uk

SANE

Emotional support, information and guidance for people affected by mental illness, their families and carers.

SANEline: 07984 967 708 (daily, 4.30pm to 10.30pm)

Textcare: comfort and care via text message, sent when the person needs it most: www.sane.org.uk/textcare

Peer support forum: www.sane.org.uk/supportforum

Website: www.sane.org.uk/support

No Panic

Voluntary charity offering support for sufferers of panic attacks and obsessive-compulsive disorder (OCD). Offers a course to help overcome your phobia or OCD.

Phone: 0844 967 4848 (daily, 10am to 10pm). Calls cost 5p per minute plus your phone provider's Access Charge

Website: www.nopanic.org.uk

OCD Action

Support for people with OCD. Includes information on treatment and online resources.

Phone: 0845 390 6232 (Monday to Friday, 9.30am to 8pm). Calls cost 5p per minute plus your phone provider's Access Charge

Website: www.ocdaction.org.uk

OCD UK

A charity run by people with OCD, for people with OCD. Includes facts, news and treatments.

Phone: 0333 212 7890 (Monday to Friday, 9am to 4.45pm)

Website: www.ocduk.org

Rethink Mental Illness

Support and advice for people living with mental illness.

Phone: 0300 5000 927 (Monday to Friday, 9.30am to 4pm)

Website: www.rethink.org

Consent form

Please tick all the boxes which apply

- I declare that I am aged 18 or over, that I have never had a special educational needs provision and that I live in the UK
- I understand that participation in the present research study is voluntary
- I consent to be interviewed by Skype or Zoom (video or voice call) or email. I also consent to my interview to be audio recorded by the researcher
- The interview is about perceptions of control and wellbeing in OCD. There is no set time for the interview. It will take as long as I wish it to be. I do not have to answer to any question I do not want to.
- I understand I can withdraw all or part of my data up to one week after the interview has taken place.
- I understand that data will be held confidentially. To ensure confidentiality, I will be assigned a code after I sign and return the present consent form. Data will be stored for ten years on the Research Data Store of the University of Birmingham. The data will be used for a PhD thesis and for the eventually related academic publications. In case there is an immediate risk for my safety or for that of other people, confidentiality will be broken to call someone I trust or, if I refuse, the police or an ambulance.
- I understand that I have the right to contact the investigator Eugenia Lancellotta and her supervisor, Matthew Broome, by email (provided on the information sheet) to ask questions about the present research study and report concerns related to it. Answers will be provided by email from Monday to Friday (9 a.m. - 5 p.m.)

Your signature below indicates that you have decided to volunteer as a research participant for this study, and that you have read and understood the information provided above. You will be given a signed and dated copy of this form to keep, along with any other printed materials deemed necessary by the study investigators.

Participant's Name:

Participant's Signature: _____ Date

Investigator's _____ Signature:

Date

Participant code:..... Age.....

Please specify if you suffer from other mental health conditions apart from OCD.....

YALE-BROWN OBSESSIVE COMPULSIVE SCALE
(Self-Report Version)

Recent research has shown that obsessions and compulsions occur quite commonly among normal people. While completing the inventories below, please keep in mind our definitions of obsessions and compulsions.

OBSESSIONS are unwelcome and distressing ideas, thoughts, or impulses that repeatedly enter your mind. They may seem to occur against your will. They may be repugnant to you, you may recognize them as senseless, and they may not fit your personality.

Examples of an obsession are the recurrent thought or impulse to do serious harm to your children even though you never would and the idea that house hold cleansers may lead to contamination and serious illness.

Obsessions differ from worries in that worries are about possible negative things related to life problems that you are afraid might happen. For example, you may worry about failing an exam, about finances, health, or personal relationships. In contrast to obsessions, your worries don't usually seem totally senseless, repugnant, or inconsistent with your personality.

COMPULSIONS, on the other hand, are behaviors or acts that you feel driven to perform although you may recognize them as senseless or excessive. Usually compulsions are performed in response to an obsession, or according to certain rules or in a stereotyped fashion. At times, you may try to resist doing them but this may prove difficult. You may experience discomfort that does not diminish until the behavior is completed.

Examples of a compulsion are the need to repeatedly check appliances, water faucets, and the lock on the front door before you can leave the house and repeated hand washing. While most compulsions are observable behaviors, some are unobservable mental acts, such as silent checking or having to recite nonsense phrases to yourself each time you have a bad thought.

Compulsions, as we define them here, are not to be confused with other kinds of compulsive behavior such as overeating, gambling, drinking alcohol, excessive shopping, or other "addictive behaviors."

Given the above definitions, please read carefully each item on the checklist below and 1) place a check mark beside each obsession and compulsion that you currently experience and that you have experienced at some time in the past. If you placed a check mark beside obsessions or compulsions that you currently experience; 2) circle the 2 most upsetting obsessions that you currently experience; and 3) circle the 2 most upsetting compulsions that you currently engage in.

YALE BROWN OBSESSIVE-COMPULSIVE SCALE SYMPTOM CHECKLIST
(GOODMAN, RASMUSSEN, ET AL.)

Aggressive Obsessions

Past	Current		Examples
___	___	1. I fear I might harm myself	Fear of eating with a knife or fork, fear of handling sharp objects, fear of walking near glass windows.
___	___	2. I fear I might harm other people	Fear of poisoning other people's food, fear of harming babies, fear of pushing someone in front of a train, fear of hurting someone's feelings, fear of being responsible by not providing assistance for some imagined catastrophe, fear of causing harm by giving bad advice.
___	___	3. I have violent or horrific images in my mind.	Images of murders, dismembered bodies, or other disgusting scenes.
___	___	4. I fear I will blurt out obscenities in class.	Fear of shouting obscenities in public situations like church, fear of writing obscenities.
___	___	5. I fear doing something else embarrassing.	Fear of appearing foolish in social situations.
___	___	6. I fear I will act on an unwanted impulse.	Fear of driving a car into a tree, fear of running someone over, fear of stabbing a friend.
___	___	7. I fear I will steal things.	Fear of "cheating" a cashier, fear of shoplifting inexpensive items.
___	___	8. I fear that I'll harm others because I'm not careful enough.	Fear of causing an accident without being aware of it (such as a hit-and-run automobile accident.
___	___	9. I fear I'll be responsible for something else terrible happening.	Fear of causing a fire or burglary because of not being careful enough in checking the house before leaving.

Contamination Obsessions

- | | | | | |
|-----|-----|-----|--|--|
| ___ | ___ | 10. | I am concerned or disgusted with bodily waste or secretions. | Fear of contracting AIDS, cancer, or other diseases from public rest rooms; fears of your own saliva, urine, feces, semen, or vaginal secretions. |
| ___ | ___ | 11. | I am concerned with dirt or germs. | Fear of picking up germs from sitting in certain chairs, shaking hands, or touching door handles. |
| ___ | ___ | 12. | I am excessively concerned with environmental contaminants. | Fear of being contaminated by asbestos or radon, fear of radioactive substances, fear of things associated with towns containing toxic waste sights. |
| ___ | ___ | 13. | I am excessively concerned with certain household cleansers. | Fear of poisonous kitchen or bathroom cleansers, solvents, insect spray or turpentine. |
| ___ | ___ | 14. | I am excessively concerned with animals. | Fear of being contaminated by touching an insect, dog, cat, or other animal. |
| ___ | ___ | 15. | I am bothered by sticky substances or residues. | Fear of adhesive tape or other sticky substances that may trap contaminants. |
| ___ | ___ | 16. | I am concerned that I will get ill because of contamination. | Fear of adhesive tape or other sticky substances that may trap contaminants. |
| ___ | ___ | 17. | I am concerned that I will contaminate others. | Fear of touching other people or preparing their food after you touch poisonous substances (like gasoline) or after you touch your own body. |

Sexual Obsessions

- | | | | | |
|-----|-----|-----|--|--|
| ___ | ___ | 18. | I have forbidden or perverse sexual thoughts, images, or impulses. | Unwanted sexual thoughts about strangers, family, or friends. |
| ___ | ___ | 19. | I have sexual obsessions that involve children or incest. | Unwanted thoughts about sexually molesting either your own children or other children. |

- | | | | | |
|-------|-------|-----|---|--|
| _____ | _____ | 20. | I have obsessions about homosexuality. | Worries like "Am I a homosexual?" or "What if I suddenly become gay?" when there is no basis for these thoughts. |
| _____ | _____ | 21. | I have obsessions about aggressive sexual behavior toward other people. | Unwanted images of violent sexual behavior toward adult strangers, friends, or family members. |

Hoarding/Saving Obsessions

- | | | | | |
|-------|-------|-----|--|--|
| _____ | _____ | 22. | I have obsessions about hoarding or saving things. away seemingly unimportant things that you might urges to pick up and collect useless things. | Worries about throwing need in the future, |
|-------|-------|-----|--|--|

Religious Obsessions

- | | | | | |
|-------|-------|-----|--|--|
| _____ | _____ | 23. | I am concerned with sacrilege and blasphemy. | Worries about having blasphemous thoughts, saying blasphemous things, or being punished for such things. |
| _____ | _____ | 24. | I am excessively concerned with morality. | Worries about always doing "the right thing," having told a lie, or having cheated someone. |

Obsession with the Need for Symmetry or Exactness

- | | | | | |
|-------|-------|-----|--|---|
| _____ | _____ | 25. | I have obsessions about symmetry or exactness. | Worries about papers and books being properly aligned, worries about calculations or handwriting being perfect. |
|-------|-------|-----|--|---|

Miscellaneous Obsessions

- | | | | | |
|-------|-------|-----|--|--|
| _____ | _____ | 26. | I feel that I need to know or remember certain things. | Belief that you need to remember insignificant things like license plate numbers, the names of actors on television shows, old telephone numbers, bumper sticker or t-shirt slogans. |
| _____ | _____ | 27. | I fear saying certain things. | Fear of saying certain words (such as "thirteen") because of superstitions, fear of saying something that might be disrespectful to a dead person, fear of using words with an apostrophe (because this denotes possession). |
| _____ | _____ | 28. | I fear not saying just the right thing. | Fear of having said the |

_____	_____	29.	I fear losing things.	wrong thing, fear of not using the "perfect" word.
_____	_____	30.	I am bothered by intrusive (neutral) mental images.	Worries about losing a wallet or other unimportant objects, like a scrap of note paper.
_____	_____	31.	I am bothered by intrusive mental nonsense sounds, words or music.	Random, unwanted images in your mind.
_____	_____	32.	I am bothered by certain sounds or noises.	Words, songs, or music in your mind that you can't stop.
_____	_____	33.	I have lucky and unlucky numbers.	Worries about the sounds of clocks ticking loudly or voices in another room that may interfere with sleeping.
_____	_____	34.	Certain colors have special significance to me.	Worries about common numbers (like thirteen) that may cause you to perform activities a certain number of times or about postponing an action until a certain lucky hour of the day.
_____	_____	35.	I have superstitious fears.	Fear of using objects of certain colors (e.g. black may be associated with death, red with blood and injury).
_____	_____	36.	I am concerned with illness or disease.	Fear of passing a cemetery, hearse, or black cat; fear of omens associated with death.

Somatic Obsessions

_____	_____	36.	I am concerned with illness or disease.	Worries that you have an illness like cancer, heart disease or AIDS, despite reassurance from doctors that you do not.
_____	_____	37.	I am excessively concerned with a part of my body or an aspect of my appearance (dysmorphophobia).	Worries that your face, ears, nose, eyes, or another part of your body is hideous, ugly, despite reassurances to the contrary.

Cleaning/Washing Compulsions

- | | | | | |
|-------|-------|-----|---|---|
| _____ | _____ | 38. | I wash my hands excessively or in a ritualized way. | Washing your hands many times a day or for long periods of time after touching, or thinking that you have touched, a contaminated object. This may include washing the entire length of your arms. |
| _____ | _____ | 39. | I have excessive or ritualized showering, bathing, tooth brushing, grooming or toilet routines. | Taking showers or baths or performing other bathroom routines that may last for several hours. If the sequence is interrupted, the entire process may have to be restarted. |
| _____ | _____ | 40. | I have compulsions that involve cleaning household items or other inanimate objects. | Excessive cleaning of faucets, toilets, floors, kitchen counters, or kitchen utensils. |
| _____ | _____ | 41. | I do other things to prevent or remove contact with contaminants. | Asking family members to handle or remove insecticides, garbage, gasoline cans, raw meat, paints, varnish, drugs in the medicine cabinet, or kitty litter.
If you can't avoid these things, you may wear gloves to handle them, such as when using a self-service gasoline pump. |

Checking Compulsions

- | | | | | |
|-------|-------|-----|---|---|
| _____ | _____ | 42. | I check that I did not harm others. | Checking that you haven't hurt someone without knowing it. You may ask others for reassurance or telephone to make sure that everything is all right. |
| _____ | _____ | 43. | I check that I did not harm myself. | Looking for injuries of bleeding after handling sharp or breakable objects. You may frequently go to doctors to ask for reassurance that you haven't hurt yourself. |
| _____ | _____ | 44. | I check that nothing terrible happened. | Searching the newspaper or listening to the radio or televisions for news about some catastrophe that you believe you caused. You may also ask people for reassurance that you didn't |

cause an accident.

____ 45. I check that I did not make a mistake.

Repeated checking of door locks, stoves, electrical outlets, before leaving home; repeated checking while reading, writing, or doing simple calculations to make sure that you didn't make a mistake (you can't be certain that you didn't).

____ 46. I check some aspect of my physical condition tied to obsessions about my body.

Seeking reassurance from friends or doctors that you aren't having a heart attack or getting cancer; repeatedly taking your pulse, blood pressure, or temperature; checking yourself for body odors; checking your appearance in a mirror, looking for ugly features.

Repeating Rituals

____ 47. I reread or rewrite things.

Taking hours to read a few pages in a book or to write a short letter because you get caught in a cycle of reading and rereading; worrying that you didn't understand something you just read; searching for a "perfect" word or phrase; having obsessive thoughts about the shape of certain printed letters in a book.

____ 48. I need to repeat routing activities.

Repeating activities like turning appliances on and off, combing your hair, going in and out of a doorway, or looking in a particular direction; not feeling comfortable unless you do these things the "right" number of times.

Counting Compulsions

____ 49. I have counting compulsions.

Counting objects like ceiling or floor tiles, books in a bookcase, nails in a wall, or even grains of sand on a beach; counting when you repeat certain activities, like washing.

Ordering/Arranging Compulsions

___ ___ 50. I have ordering or arranging compulsions. Straightening paper and pens on a desktop or books in a bookcase, wasting hours arranging things in your house in "order" and then becoming very upset if this order is disturbed.

Hoarding/Collecting Compulsions

___ ___ 51. I have compulsions to hoard or collect things. Saving old newspapers, notes, cans, paper towels, wrappers, and empty bottles for fear that if you throw them away you may one day need them; picking up useless objects from the street or from garbage cans.

Miscellaneous Compulsions

___ ___ 52. I have mental rituals (other than checking/counting). Performing rituals in your head, like saying prayers or thinking a "good" thought to undo a "bad" thought. These are different from obsessions, because you perform them intentionally to reduce anxiety or feel better.

___ ___ 53. I need to tell, ask, or confess things. Asking other people to reassure you, confessing to wrong behaviors you never even did, believing that you have to tell other people certain words to feel better.

___ ___ 54. I need to touch, tap, or rub things. Giving in to the urge to touch rough surfaces, like wood, or hot surfaces, like a stove top; giving in to the urge to lightly touch other people; believing you need to touch an object like a telephone to prevent an illness in your family.

___ ___ 55. I take measures (other than checking) to prevent harm or terrible consequences to myself or others. Staying away from sharp or breakable objects, such as knives, scissors, and fragile glass.

___ ___ 56. I have ritualized eating behaviors. Arranging your food, knife, and fork in a particular order before being able to eat,

- _____ 57. I have superstitious behaviors.
- _____ 58. I pull my hair out (trichotillomania).
- eating according to a strict ritual, not being able to eat until the hands of a clock point exactly at a certain time.
- Not taking a bus or train if its number contains an "unlucky" number (like thirteen), staying in your house on the thirteenth of the month, throwing away clothes you wore while passing a funeral home or cemetery.
- Pulling hair from your scalp, eyelids, eyelashes, or pubic areas, using your fingers or tweezers. You may produce bald spots that require you to wear a wig, or you may pluck your eyebrows or eyelids smooth.

Acknowledgments: The Y-BOCS was developed by Goodman, W.K.; Price, L.H., Rasmussen, S.A., et al. (1989). The Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) Part I: Development, use and reliability. Archives of General Psychiatry, 46, 1006-1011. It was modified for computer administration by John Greist and associates, (1992). A computer administered version of the Yale-Brown Obsessive Compulsive Scale. Psychological Assessment, 4, 329-332. The self-report version contained herein was developed by Lee Baer.

YALE-BROWN OBSESSIVE COMPULSIVE SCALE (Y-BOCS)

Thank you for completing the Y-BOCS checklist. Please make sure you circled the 2 most upsetting obsessions that you currently experience and that you circled the 2 compulsions that cause you the most difficulty.

Next, please complete the items given below. Remember the definitions of obsessions and compulsions and the examples of each that you may have noted on the checklist. Please place a check mark by the appropriate number from 0 to 4 under each question.

OBSESSIVE THOUGHTS

Review the obsessions you checked on the Y-BOCS Symptom Checklist to help you answer the first five questions. Please think about the last seven days (including today), and check one answer for each question.

1. How much of your time was occupied by obsessive thoughts? How frequently do the obsessive thoughts occur?

0= None - If you checked this answer, also check "None" for questions 2, 3, 4 and 5 and proceed to question 6.

1= Less than 1 hour per day, or occasional intrusions (occur no more than 8 times a day)

2= 1 to 3 hours per day, or frequent intrusions (occur more than 8 times a day), but most hours of the day are free of obsessions.

3= More than 3 hours and up to 8 hours per day, or very frequent intrusions (occur more than 8 times a day and during most hours of the day)

4= More than 8 hours per day, or near-constant intrusions (too numerous to count, and an hour rarely passes without several obsessions occurring)

2. How much did your obsessive thoughts interfere with your social or work functioning? (If you are currently not working, please think about how much the obsessions interfered with your everyday activities.) (In answering this question, please consider whether there was anything that you didn't do, or that you did less, because of the obsessions.)

0= No interference.

1= Mild, slight interference with social or occupational performance, but still performance not impaired.

2= Moderate, definitive interference with social or occupational performance, but still manageable.

3= Severe interference, causes substantial impairment in social or occupational performance.

4= Extreme, incapacitating interference

3. How much distress do your obsessive thoughts cause you?

0= None

1= Mild, infrequent, and not too disturbing distress

2= Moderate, frequent, and disturbing distress, but still manageable

3= Severe, very frequent, and very disturbing distress

4= Extreme, near-constant, and disabling distress

4. How much of an effort did you make to resist the obsessive thoughts? How often did you try to disregard or turn your attention away from those thoughts as they entered your mind? (Here we are not interested in knowing how successful you were in controlling your thoughts, but only in how much or how often you tried to do so.)

- 0= I made an effort to always resist (or the obsessions are so minimal that there is no need to actively resist them).
- 1= I tried to resist most of the time (i.e., more than half the time I tried to resist.)
- 2= I made some effort to resist
- 3= I allowed all obsessions to fill my mind without attempting to control them, but I did so with some reluctance.
- 4= I completely and willingly gave in to all obsessions.

5. How much control did you have over your obsessive thoughts? How successful were you in stopping or diverting your obsessive thinking? (If you rarely tried to resist, in order to answer this question, please think about those rare occasions on which you did try to stop the obsessions.)

NOTE: Do not include here obsessions stopped by doing compulsions.

- 0= Complete control.
- 1= Much control; usually I could stop or divert obsessions with some effort and concentration
- 2= Moderate control; sometimes I could stop or divert obsessions
- 3= Little control; I was rarely successful in stopping obsessions and could only divert attention with great difficulty
- 4= No control; I was rarely able to even momentarily ignore the obsessions.

COMPULSIONS

Review the compulsions you checked on the Y-BOCS Symptom Checklist to help you answer these five questions. Please think about the last seven days (including today), and check one answer for each question.

6. How much time did you spend performing compulsive behavior? How frequently did you perform compulsions? (If your rituals involved daily living activities, please consider how much longer it took you to complete routine activities because of your rituals.)

- 0 = None. If you checked this answer, then also check "None" for questions 7, 8, 9, and 10, then answer 11 and 12.
- 1= Less than 1 hour per day was spent performing compulsions, or occasional performance of compulsive behaviors (no more than 8 times a day)
- 2 = 1 to 3 hours per day was spent performing compulsions, or frequent performance of compulsive behaviors (more than 8 times a day, but most hours were free of compulsions)
- 3 = More than 3 hours and up to 8 hours per day were spent performing compulsions, or very frequent performance of compulsive behaviors (more than 8 times a day and during most hours of the day)
- 4= More than 8 hours per day were spent performing compulsions, or near-constant performance of compulsive behaviors (too numerous to count, and an hour rarely passes without several compulsions being performed)

7. How much did your compulsive behaviors interfere with your social or work functioning? (If you are not currently working, please think about your everyday activities.)

- 0= No interference
- 1= Mild, slight interference with social or occupational activities, but overall performance not impaired
- 2= Moderate, definite interference with social or occupational performance, but still manageable
- 3= Severe interference, substantial impairment in social or occupational performance
- 4= Extreme, incapacitation interference

8. How would you have felt if prevented from performing you compulsion(s)? How anxious would you have become?

- 0= Not at all anxious
- 1= Only slightly anxious if compulsions prevented
- 2= Anxiety would mount but remain manageable if compulsions prevented
- 3= Prominent and very disturbing increase in anxiety if compulsions interrupted
- 4= Extreme, incapacitating anxiety from any intervention aimed at reducing the compulsions

9. How much of an effort did you make to resist the compulsions? Or how often did you try to stop the compulsions? (Rate only how often or how much you tried to resist your compulsions, not how successful you actually were in stopping them.)

- 0= I made an effort to always resist (or the symptoms were so minimal that there was no need to actively resist them)
- 1= I tried to resist most of the time (i.e., more than half the time)
- 2= I made some effort to resist
- 3= I yielded to almost all compulsions without attempting to control them, but I did so with some reluctance
- 4= I completely and willingly yielded to all compulsions

10. How much control did you have over the compulsive behavior? How successful were you in stopping the ritual(s)? (If you rarely tried to resist, please think about those rare occasions in which you did try to stop the compulsions, in order to answer this question.)

- 0= I had complete control.
- 1= Usually I could stop compulsions or rituals with some effort and willpower
- 2= Sometimes I could stop compulsive behavior but only with difficulty
- 3= I could only delay the compulsive behavior, but eventually it had to be carried out to completion.
- 4= I was rarely able to even momentarily delay performing the compulsive behavior

11. Do you think your obsessions or compulsions are reasonable or rational? Would there be anything besides anxiety to worry about if you resisted them? Do you think something would really happen?

0= I think my obsessions or compulsions are unreasonable or excessive

1= I think my obsessions or compulsions are unreasonable or excessive, but I'm not completely convinced that they aren't necessary

2= I think my obsessions or compulsions may be unreasonable or excessive

3= I don't think my obsessions or compulsions are unreasonable or excessive

4= I am sure my obsessions or compulsions are reasonable, no matter what anyone says

12. Have you been avoiding doing anything, going anyplace, or being with anyone because of your obsessional thoughts or because you were afraid you would perform compulsions?

0= I haven't been avoiding anything

1= I have been avoiding doing a few important things

2= I have been avoiding some important things

3= I have been avoiding many important things

4= I have been avoiding doing most everything

Written interview topic guide

Please answer only the questions that you feel like responding. I have highlighted the most important ones for the scope of my research. Thanks!

- First of all, could you tell me a little bit about your OCD?

Probes:

When did these experiences begin?

What do you feel might have caused them?

Could you tell me how you feel about having these experiences?

Is there any part of these experiences that you'd describe as good, valued, wanted?

Obsessions

Now, could I ask you a bit more about x, which you identified as an obsession (or use terminology used by participant, above):

Could you describe this please?

Are you able to not think about X or to think about something else?

How does this make you feel?

Do you feel that x just comes to you or do you want to think about it?

How does this make you feel?

Do you think your x is a part of you?

Probe if yes: Could you tell me a little bit about this?

Probe if not: Where do you think x is coming from?

How does this make you feel?

Do you think that your obsessions are true?

Would you feel relieved if you knew that your obsessions were not (or most likely not) true?

Compulsions

Now can I ask you a bit more about y, which you identified as a compulsion (or terminology of the participant):

Could you tell me how you feel when you do y?

Could you explain why you do it?

Do you think that doing y is a good way to prevent what you fear from happening?

Are you able to not do y or to do something else?

How does this make you feel?

Do you feel that you want to do y or do you feel you do y against your will?

How does this make you feel?

Do you feel y has a purpose?

Probe: When you are doing it versus from a distance (i.e. now)

Do you think doing y is a part of you? (Do you think you are the source of y?)

Probe if yes: Could you tell me a little bit about this?

Probe if not: Where do you think y is coming from?

How does this make you feel?

Are there any other aspects of your experiences of x and y that you feel it is important to highlight, that we haven't covered?

Transcript 1: Emily

Q: Please tell me a little bit more about your OCD (obsessions and compulsions), i.e. how your experiences begin, what you feel might have caused them and above all how you feel about having these experiences. Is there any part of these experiences that you'd describe as good, valued, wanted?

A: Currently - my obsessions are almost all on the topic of 1) insulting the Holy Spirit (because there is a text in the Bible that says you can't be forgiven if you do this - so I am scared of going to hell. My logical investigation of that text is that it doesn't mean OCD insults, but I'm still afraid.) 2) insulting the devil, 3) causing myself to go to hell, 4) causing my partner to go to hell. Whenever I want to do something (anything at all, but especially things I particularly want to do like have a drink with friends), my OCD will tell me that one of the 4 things will happen if I do it. The four outcomes are also linked to colours, numbers, movements etc. So for example if I make a movement towards the colour white that "means" I'm insulting the Holy Spirit. There's nothing I can do that will fully stop it, even for a while. Sometimes I get a bit of relief from playing involving computer games, but it still creeps in with things like whether I can click on a certain colour.

Past - my OCD started properly when I was 10, with fears that my mum would die if I didn't do certain things like touch the desk when I walked past. I also thought I could breathe in cancer from the cancer research shop. Over the years I had those thoughts and also thoughts that someone else's loved one would die and I would be responsible for it. I also washed my hands a lot so that they had cuts on, but I would still use hand sanitiser which really hurt the cuts (when I was about 12-14 years old). At one stage I alternated between being frightened that I had HIV and would give it to others (I didn't have HIV), and being frightened that I would catch HIV. Since I was in my late teens/early 20s my OCD has been mostly religious, though I still had fears of killing and giving cancer to important people's loved ones (especially my partner's mum), until my early 20s. Part of the reason the obsessions are religious now is because I managed to defeat the other themes, but religious ones are hard to shift because you don't know if they've happened until you die. This "past" section is just some of the obsessions and compulsions I had, I have had a lot of different ones.

I have had lots of different courses of therapy (mainly CBT) and I have been on antidepressants for OCD since I was 17. There is one occasion where therapy really worked - we used cognitive reappraisal and ERP, and I managed to recover to a non-clinical level. That was in 2012-13. I stayed well for about a year or 2 and then OCD came back, partly because of the stress of my PhD.

I think the cause is a mixture of being genetically vulnerable to mental illness, and growing up in a household where my dad would get very angry at unpredictable times. He was never physically violent. But my mum, me and my sister were scared of my dad. Dad wouldn't take responsibility for his behaviour, so I learned that I had to try and manage his emotions (this is also what my mum did, which I think I learned from her). I moved house when I was 10 so I could go to a high school with a 6th form - this high school was different to all of my friends and most people I knew. That seemed to be the "trigger" event, if there was one (there were OCD signs from when I was a younger child, but I

wouldn't say it was full blown OCD until I was 10/11). I was also lonely in high school and had very few safe places as a teenager. So I grew up in chronic stress and I think that contributed to my OCD. Actually the one time I got better from OCD coincided with my dad moving out of my mum's house (I had finally persuaded mum that she didn't have to live in such an unhappy relationship), and I moved in with my partner. I think this context contributed to helping me get better on that occasion.

How I feel about these experiences - sad, hopeless, frustrated, fed up, angry, constant suffering. Living with OCD is a nightmare and it is particularly cruel in that it uses the things you care about. At the moment, my guinea pig is ill and OCD is incorporating her likely death into my bad thoughts in terms of the behaviours I have to do. The one time I got well it genuinely felt like living in a different world and I thought "no wonder other people manage to get on with life so well".

The only good thing to come from OCD is that I can understand other people with mental illness better. But that isn't worth what OCD has taken from me - I think I'm quite a caring person and try to understand others' experiences even if I don't have them myself. If I am being entirely honest the question of whether there is anything good, valued, or wanted caused by OCD makes me feel quite negative because for me OCD is continual suffering, and it has taken so much from me. I do try to make positives out of it (e.g. I study mental illness to try and reduce other people's suffering), but the positives are from my efforts to deal with OCD, not from OCD itself.

Q: Would you feel relieved if you knew that your obsessive-compulsive beliefs were not true? For example, if you knew that not performing mental rituals did not mean to insult the Holy Spirit or increase your probabilities to go to hell?

A: Yes, it would be a huge relief. Although I think the thing to get across about OCD (at least for me) is that I already "know" they are not true, but they still "feel" true. They feel like a threat, so it is very hard to treat them otherwise. I suppose I would say my level of knowledge/belief is that I'm 99.9% confident that I can't cause others or myself to go to hell by not doing rituals, and I'm 85-90% confident that I am not insulting the Holy Spirit by not doing my rituals. I'm not sure where I'd put my knowledge in terms of the one about insulting the devil. But even a risk of 0.1% feels too high given that the consequence would be for eternity. To add another layer of complexity I am fairly certain based on my understanding of Christianity that hell isn't a literal place and that no one will suffer eternal torment whatever they do. But there is still a residual fear of "what if it is?"

I'm not sure if this is backed up by research but I get the impression that people's knowledge/belief in the thoughts begins higher and gets lower the longer they live with and try to understand the thoughts. Cognitive reappraisal helped me to get up to that 99.9% figure for some of the thoughts. Then again with OCD it will use whatever it can - if you're not 100% certain then it's not enough and you "have" to do as OCD says. Which is part of the problem because very few things in life are 100% certain.

Q: Would you say that performing the rituals is a good (or maybe even the best possible) way to prevent what you fear from happening? (like not going to hell, etc.)

Would you say that your obsessions and compulsions are a part of you? How does this make you feel? (if you feel differently about your obsessions compared to your compulsions, then please specify it)

A: No, I don't think it is a good way to prevent the fear from happening. If anything, it makes things worse as it means many of my thoughts about Christianity are frightening and I can't engage with my faith in the way I'd like to. Sometimes when I'm in the midst of a particularly strong obsession it feels like it could prevent the fear from happening, but I think there is always a part of my brain that knows it can't.

No, I have hope that one day I will be able to get rid of them as I did in 2012/13. I do think I will be a slightly different person when I am well again because I'll have more energy and room for other thoughts and activities. I suppose I would say they are a big part of my life, but they aren't part of me - like an abusive partner.

Q: *You said that your obsessions and compulsions are a big part of your life but not of you. Where do you think they are coming from then? And how does this make you feel?*

A: I think they come from my brain, or more specifically a disorder of my brain. I definitely see it as an illness to be fixed, which is different to my sense of self. Maybe like if you had a broken leg, the leg is part of you, but the break isn't - it's something to be fixed. In terms of how it makes me feel - I suppose it is bound up with some hope that one day I will be able to escape this illness. If it were part of me then it would necessarily be part of my future, which would make my future quite dark. It's totally different to the movement amongst autistic people where they are fighting to be recognised as autistic, not people with autism. I see OCD as an illness or parasite that's definitely not part of who I am.

Q: *Do you feel that your obsessions just come to you, or do you want to think about them?*

A: I never want to think about them. Often they seem to just come but other times they will be triggered by a sight, sound, relevant topic within a non-OCD thought, word, etc. Sometimes I can "sense" the bad thought coming so I do the compulsion before it gets the chance to become a fully formed thought in my head.

Q: *Do you feel that you want to perform the compulsions or that do you do them against your will?*

A: I do them against my will - I feel like I have to do them. It doesn't really make me feel any better, though it sometimes keeps away the very high levels of anxiety that I would get if I didn't do them. But with OCD it's difficult to do compulsions precisely enough that you feel like it's complete/enough. Doing compulsions is frustrating for that reason and also because I know I don't really need to be doing them, but I find it very hard not to.

Q: Please tell me a little bit more about your OCD (obsessions and compulsions), i.e. how your experiences begin, what you feel might have caused them and above all how you feel about having these experiences. Is there any part of these experiences that you'd describe as good, valued, wanted?

A: My OCD started back when was around 12/13yrs old. I had this worry that I would get headaches during the day, so can remember everyday taking half a paracetamol with my lunch at school.

Then smells and urine became a problem. I remember smelling wee on the family home bathroom carpet (when I was 12/13) and feeling like somebody had just thrown about 10 TONNES of urine all over me. Mine was never a fear of germs, getting them or passing them on. It made me feel dirty and contaminated and I just couldn't cope feeling like that. We had a family dog at the time and I can remember accidentally walking in his urine in the house, my socks going yellow and the smell. I'd rush up to the shower to wash my feet as soon as possible, full of anxiety.

Then I felt dirty going to the toilet, both ways. My OCD got that bad that I can remember for a few months, having a shower every time that I went to the toilet. Going at school was problematic, and so I used wet wipes to wipe myself clean in a cubicle. Again, I just needed piece of mind, equilibrium. I couldn't concentrate on my schoolwork or anything else unless I felt uncontaminated.

I was very distressed at this time and a highly anxious individual generally. I worried about schoolwork, playing sport (I was v good at football and cricket), and was bullied for the last year of school. This latter aspect made my OCD worse I think.

Then OCD wise, I had a worry of standing in dog dirt. I still have this a bit now, although I'm tonnes better than I was years ago. I would have been suicidal had I trodden in dog dirt back then, I wouldn't be now.

Then around 10yrs ago I accidentally sat in vomit at my local doctors. I didn't know until the day after it had happened, so had spread the smell of sick all around the house. I threw away loads of stuff including ALL my clothes, it was a true nightmare.

Luckily, I got a second opinion on the NHS and it was this which was the start of me getting better. Through a combination of CBT and MEDS, I slowly but surely started improving.

I NEVER once enjoyed having my OCD, not even for a second. At the time I felt very embarrassed and ashamed of my OCD, you see I'm a massive perfectionist. I realise now that my OCD was my way of coping with uncertainty and anxiety in my life. Nevertheless, I have never felt lucky or even slightly thankful to have had these experiences. It's cruel, debilitating and a bully. I call my OCD, my MR IRRATIONAL side. I like who I am when my MR RATIONAL is stronger than MR IRRATIONAL.

Q: Think about a time when your obsessive-compulsive beliefs were particularly strong. At that time, would you have felt relieved if you had known that those beliefs were not true? For example, with contamination obsessions: would you have felt relieved if you had known that you wouldn't get

seriously contaminated (e.g. by dog dirt or vomit) even if you didn't wash your hands or clothes a lot? Compared to those times, do you feel better now that you know that your obsessive-compulsive beliefs might be excessive or unreasonable?

A: People kept telling me it didn't matter and that sick and dog dirt weren't everywhere, but I didn't believe or trust them. I didn't care what anybody else thought about sick or vomit, it's what I thought that mattered.

I know how I thought back then was irrational. For example, I would have been suicidal 20yrs ago if I'd have stood in dog dirt, I wouldn't feel this way now. I still don't like sick or poo, but not as scared of them as I once was.

I feel very sad thinking back at how my life once was with the severe OCD. I wasted about 10-15yrs of my life. I'd have breezed through uni if I had been less anxious and my OCD hadn't been as bad. We had mice at our uni flat and I ended up having to redo the year because I was so scared of the mice pooing everywhere.

Q: *Would you say that you experienced more negative emotions when your obsessive beliefs were stronger or now that they are better? With regard to your obsessions and compulsions, would you say that they are a part of you? And how does this make you feel?*

A: I experienced A LOT MORE NEGATIVE EMOTIONS when my obsessive beliefs were stronger. It felt like my mind was in a prison that I couldn't escape from. I was depressed, self-harmed, and suicidal at times. I dreaded waking up some days because of how bad the obsessions and compulsions were.

Have you heard the English phrase, I'M A GLASS HALF-FULL person? As opposed to I'M A GLASS HALF-EMPTY? The first one means that I'm an eternal optimist these days. I'm full of positivity. I personally think the meds I'm on (aripiprazole and fluoxetine) are really helping me feel a lot less negative emotions than I was.

NEXT QUESTION:

I would definitely say that my obsessions and compulsions are a part of me. I call them my MR IRRATIONAL side. I used to really hate my obsessional personality/way of thinking. However, I also love how funny I am, how intelligent I am and also how sensitive I am. Away from my obsessions and compulsions, I like who I am as a person. If I didn't have my OCD side, then I wonder would I have the other aspects of my personality that I like so much??? Would I be so sensitive, funny and clever without my obsessions and compulsions??? I don't like the compulsions, but I don't get frustrated with them as much as with my obsessional thinking. Afterall, my compulsions are just like the symptoms of coming from the obsessions. It's my irrational thinking and anxieties at times that more frustrate and annoy me!

Q: *Just a small clarification on obsessions: would you describe them as unwanted?*

Now I would like to focus a bit more on your compulsions: do you feel that you want to perform them, or you do them against your will? Also, do you think that they are a good way to prevent what you fear from happening (or did you use to think so)? How does this make you feel?

A: Firstly, I would definitely describe my obsessions as UNWANTED. I hate them, wish I didn't have them. However, I also love how sensitive I am. Away from my obsessions, I really like my jokey personality.

I still do a few compulsions and still get the urges to do more, but I FIGHT THEM (resist the urge to do so). I live with my mum at the moment and so I'll see her touch or do certain things in the house that I don't like. The old me would have shouted in panic, "WASH YOUR HANDS or CHANGE YOUR CLOTHES or YOU NEED A BATH". However, now I don't do this. I fight against my fear and don't say anything.

I used to think the compulsions served a purpose. For example, regarding my dog dirt phobia, once at university I got a taxi just 200 yards up the road cos I was that scared about the possibility of walking in dog dirt. Yes, in the short term it helped me, but LONG TERM it was the worst thing I could have done because it just reinforced my irrational thinking that dog dirt was EVERYWHERE (which clearly it wasn't).

The more you give into the compulsions then the bigger of an obsession it becomes. Another example is me worrying about sick being everywhere. Yes, in the short-term staying in at first made me feel safe, but then it got to the stage where I was afraid to go out anywhere. The more I started walking in town centres, then the less fearful I became of seeing and smelling sick everywhere I went. I now realise that giving into my obsessions with the compulsions is only a short-term answer. I feel more empowered that I'm standing up to my obsessions and compulsions now. Doing the compulsions throughout the day used to really tire me out, both mentally and physically. I became a recluse who never went out anywhere. You can't live like that or achieve things in life this way.

Q: How did your OCD develop? How long have you been having OCD?

A: I have had OCD all my life according to my psychotherapist. They said I have had symptoms since I was a very young child [...] I can remember times when I would walk over a panel on the floor and had to walk over several times until it felt right, otherwise I thought something bad would happen; and I remember touching door handles and have to touch them a certain amount of times just in case something bad was going to happen, or I would get dirty. So I had it since I was a child, and although my psychotherapist told me that I have always had OCD, it went up in waves: sometimes it was stronger, sometimes it was weaker, depending on what was going on in my life at the time. If I was particularly stressed out, I would have more symptoms. Around nine years ago there was an event in my life. I was with this girl, she was a particularly worrying girl, she used to worry a lot about things. That sparked me into worrying about things, it sparked my OCD off into a worse situation. I was worrying about everything at the time because she was worrying about everything, and so I started overthinking about things, and my OCD got worse nine years ago. Then it got worse again three years ago, when I finished my PhD, because I had nothing to do and my mind was free to think, while when I had my PhD, I had a lot of things to do. It got a lot worse and that is when I sought help with the doctors to try and find ways to calm down. I have been diagnosed with severe OCD. My compulsions and obsessions are known as pure OCD, colloquially speaking. It is very internal, very in my mind [...] The main compulsions and obsessions I have are over thoughts in my head, so I have a thought in my head and I have to go over it again and again, otherwise something would happen or it means something about me or the world, it means some kind of truth, and I have to know it is not real, and I have to go through it. That's the main obsession, and the main compulsion that I have is to keep going over again in my head, and that can take up 16 hours a day, so it is quite severe. I also have obsessions where I will check things, so I will check the door of the freezer to make sure the cat has not gone inside or in the microwave, and I will check it, I will check it, will check it. I have things where I have to switch the light on and off again to make sure that I feel I am not trapped between the two worlds of light and darkness, and I can't have anything that is dirty, otherwise it feels it is coming into me, so I have separate dishes and forks and I have to wash my hands.

Q: Do you find anything good or valued or even wanted in these experiences?

A: Not in my mental experiences, in the intellectual thought/ obsessions, I have nothing of value in those at all, they just make my life worse. They can take up 16 hours a day. The worst I have ever had, it has taken all my day up to a week [...] I find nothing of positive use in any of those. In the other ones,

it makes me a careful person, and very attentive person when it comes to cleanliness. I like specific things to be cleaned and I have higher standards compared to other people [...] but it depends on how far it is going; sometimes it can get in the way of my life, cause arguments with people: so those ones have some positives and negatives.

Q: Do you think that your obsessions and compulsions are reasonable in some sense, and if so to what extent?

A: I don't think my obsessions and compulsions are reasonable. It's like I have two voices in my head, one voice telling me I need to do something, the compulsions or obsessing over my thought and I have another, very quiet voice in the back of my head saying this is not true, this is not real. It's constantly having these two voices in my head, and I am constantly aware that what I am obsessing about is not real, and there is no reason for doing it, but I cannot stop myself from doing it, and so I am constantly aware that it is not real, but I cannot stop from doing it.

Q: Would you feel relieved if you knew that you don't have to perform the compulsions or if performing the compulsions was not good in stopping the obsessions?

A: Yes, I would. I have done a lot of CBT, and a lot of it is down on the compulsions and I have found that if you stop the comp then eventually the anxiety that comes with the obsessions decreases over a long period of time, so in theory it would be not to do the compulsions, because they prolong everything; the peace they give you is very short lived. However, at this moment in time it does not feel helpful to get rid of the compulsions, because it takes so long to go away, and the only way I can find peace is by doing the compulsions. I have to very slowly reduce what I am doing rather than take it away [...]

Q: You know your obsessions are not reasonable, but you cannot stop them, they just come to you. Do you want to think about the obsessions, or they come to you?

A: They come to me out of nowhere or I will have something that triggers it, I would see something and that would trigger a violent or a sexual thought [...] It is never me wanting to think about them, and sometimes it comes because I don't want to think about it[...] it is always unintentional.

Q: In what sense they got worse, the obsessions were more frequent and intense?

A: Before that, many of my OCD symptoms had really died down and I did not have many very of them [...] After that, I started to, because she wanted me not to think certain things, so I was worried about my thoughts, and I would have triggers in the outside world that would trigger a thought in my head and I would have I cannot have this thought and this way of behaving started to trigger the OCD off, being in a stressful atmosphere and having to watch everything you are thinking.... With that OCD

stress the mental thoughts, it started to grow into to other things like touching things, cleaning things, so more and more kept coming in, so it was kind of a slow progression.

Q: Do you feel that your OCD is a part of you?

A: The obsessions I worry about, I know they are not real, so they are not a part of me. So same with the dirtiness and the touching things. The OCD, what causes the obsessions, I feel is part of me ... because I have always had it.... The actual obsessions and compulsions, I know they are not real, and they should not be there [...] the disorder itself, I feel it is part of who I am. It is one of the reasons I wasn't going to the doctor, because I thought if I am going to the doctor, it might affect my thinking and my brain in a certain way, and my OCD is part of how my brain works.

Q: You said that the OCD is part of you and not obsessions and compulsions. Where do you think they come from?

A: My brain is wired slightly different to people who don't have OCD. There is some kind of imbalance in my brain or connection that is gone wrong [...] In CBT, I was told that everybody has these thoughts, intrusive thoughts but people with OCD, they stick with them, but other people they just think that was a strange thought [...]. my brain is just not working correctly and that is where the OCD comes from. The OCD feels like that is how my brain works, while the obsessions I recognise as something they are not real. When it happens, I have that voice [...] I can recognise that having the obsessions and having the compulsions is part of me, but the actual obsessions and compulsions they are not part of me.

Q: How does this make you feel, that OCD is part of you?

A: I feel reconciled with the idea of having OCD, it's just part of how I work and my quiriness. When it is not bad, it feels like me being me; when it is bad, it feels like something I want to get rid of, and to heal, but I don't know what I would be, because I have never been without it. I had times where I was less OCD or be more OCD. I don't know how I would be like without it. it's just a natural part of me, it's the same as being heterosexual. I am that way, I cannot imagine not being that way. Same with other traits. When it's worse, it is something I want to remove. It depends on how I feel at the time.

Q: When are you not having your worst moments, would you like to get rid of it?

A: No, I feel quite comfortable with it, I feel it is just part of me and if it does not cause any inconvenience to me or others... it helps me focus on whatever I am doing at the time. It helps me think a lot, because my brain never stops working [...]

Q: Are you able not to perform the com or do something else at all or in part?

A: No. In CBT we tried to cut it down so it don't do it, but I never got that far. I should tackle one specific obsession at the time [...] I am not able to stop the compulsion for very long, they have to happen and my brain would not let me focus on something other than that.

Q: How does it make you feel that you are not able to stop the compulsions?

A: It makes me feel worse because I know they are not something I should be doing, they are not real, I know they are not real and that by engaging in the obsessions via the compulsions I am treating it as if it is real, and I should not be doing it, because I know they are not real. Compulsions make me feel better in the short term, because they ease the anxiety of the obsessions, but I don't like doing them.

Q: You told me that you find your obsessions completely unreasonable. However, I wonder whether in the past you ever found your obsessions reasonable - or reasonable to a certain degree. It might not be the case, but if it is I would like to know two things. The first is to what extent you found the obsessions reasonable (completely, in part, depended on the moment etc.) The second thing I would like to know is if in those moments where you found your obsessions (and related compulsions) more reasonable, you felt better than now (in terms of mood, anxiety etc.) and you found something valuable in having these obsessions.

A: I guess how I would answer this is in a twofold way. My obsessions now (since they started to worsen in 2011) I find unreasonable and I haven't found them reasonable at all. I have always been aware that they are unreasonable. Mostly this is to do with my intrusive thoughts and mental obsessions.

Prior to 2011 when my OCD was less severe and I did not have intrusive thoughts/mental obsessions - only obsessions to do with touching things a number of times, praying about things lest someone die, observing things a number of times, switching things on and off, and checking things - I did find these reasonable as I believed that they were normal ways of avoiding things or making an outcome happen. Similarly, nowadays with non-mental obsessions I can 'feel' that they are reasonable even while being aware that they are not real. So for instance when I feel trapped between two worlds when turning a light on and off I feel that this is a normal way to feel and quite reasonable, even while I am aware that it is not real and shouldn't be this way. Similar to pre-2011/mental obsessions. So I would answer that for everything other than the mental obsessions there is an element of finding them reasonable when I have the obsession, even while I do not think they are real. The mental obsessions/intrusive thoughts however I never find reasonable. And I found my OCD more reasonable before 2011 when my mental obsessions/intrusive thoughts began (and made my other obsessions worse). Maybe being aware of the mental obsessions being unreasonable made me aware how unreasonable my other obsessions were. That and CBT. As for your other questions, and taking the above into consideration, (1) I would find the obsessions reasonable as I believed they had an impact on the world, so I believed them completely (pre-2011/mental obsessions). (2) My obsessions didn't cause me so much anxiety pre-2011/mental obsessions because the things I would obsess about weren't horrific. The worst is that

someone would die but I never stressed about this, rather I just followed my compulsions, and everything was fine. It was my normal way of operating and I didn't see the world any differently. I guess I found some value in them as I believed they gave me an ability to order the world around me and prevent things from happening. Nowadays with my mental obsessions and other obsessions I don't feel that way, perhaps because I am aware that they are not real and shouldn't be this way as well as that they are more horrific and anxiety-causing nowadays.

Q: *The first question is whether your conviction in your obsessive-compulsive beliefs pre-2011 varied in relation to some specific event; for example, did you become completely convinced or more convinced that unless you prayed a number of times someone would die after some distressful event, or after a happy one, or there was no triggering event whatsoever? The second question is about your present mental obsessions, the ones you deem to be unreasonable. What is it that makes you so distressed about them?*

A: To answer your questions:

(1) There were usually no events, just a thought. So say someone would be out of my sight and driving a car and I would think something would happen to them. But that was an everyday occurrence rather than something spurred on by specific events. Sometimes there were events and I assume my symptoms got worse with stress as they do now, but I don't remember anything specific.

(2) What makes me so distressed about my thoughts at the moment is that I do not like what they are about or the fear that they are true. So a violent thought pops up like I am going to stab someone and I worry that I will do it, even if I am asleep. And that distresses me because of the nature of the thought and that I believe it is true (even while always being aware that it is not true and won't happen). All of my intrusive thoughts are disturbing thoughts that I worry may be true/will happen and that is what distresses me.

Q: Tell me a little bit more about your OCD: when these experiences began, what you think might have caused them etc.

A: In hindsight, there were warning signs. I became very obsessed with body odour, affecting people, I was contaminating people, making people allergic and sick. It was with self-disgust and shame: I had a hard time with self-disgust. It started in 2014, just being more conscious of smells and doing things like putting on deodorant counting how many times I did the roll and had a full routine. In 2015 it got quite bad to where I did not leave the house... And dealing with it for the past five years. It's quite an uncommon type of obsession. I was also looking up online and trying to understand and I don't know how to deal with it. I was officially diagnosed in January 2018, but because I have bipolar disorder, they primarily pointed out at that; saying maybe you are a bit deluded. But then I saw prof. Veale because I was no, I will tell people I need to focus on OCD, and I kept saying I am depressed because of OCD and I cannot leave the house. You know, if you disengage with life, you risk becoming depressed even if you don't have a mood disorder. Prof. Veale diagnosed me, and I did CBT finally, but it didn't help.

Q: Doctors told you that you were a bit deluded. Can you tell me why they thought that?

A: With a worry of body odour, they said it's just your self-esteem, but now there is olfactory reference syndrome, a type of OCD, which is what I officially have. Instead of a fear of being contaminated, my fear is to contaminate: sometimes I worry that if people sneeze it's because of me, then this is why they said "that's bizarre, you are delusional".

Q: Were or are you still convinced that if people sneeze is about you?

A: Yes. Talking about it now, I can see that maybe this is part of a false belief but if I were to go outside and someone would sneeze, I would be, no, that is you. If I am removed, it's easier to rationalize it. If someone sneezed, my heart would raise and I would go, they are going to find out that they are making them allergic.

Q: Is there any part of these experiences in having these beliefs that you would describe as good, valued or wanted?

A: If I find some positive in it? No.

Q: Would you feel relieved if you were certain that these beliefs were not true?

A: Yes. I try not to seek reassurance, do you agree with my take on it?[...] because I am also afraid that someone would say yes, your anxiety is true. It's a double-edged sword, I want people to agree because I feel crazy that I am the only one to see it like this, but if someone were to agree, it would make things

worse. My whole thing now is, is it true or is it not? If it were gone, I would not have that anxiety anymore.

Q: *What do you do to test your beliefs, if you do something?*

A: Now I have gotten much better with behaviours, before I was seeing if people when I went out how they responded. If I used a type of deodorant and went to class and more people were sneezing or open the window, I would change product... I was trying to find a solution not to affect people. You linked the fact that someone opened the window to the fact that is was because of you? A lot of research into checking can you cause allergies in people so with allergies If someone would be opening the window, I would change deodorant. With allergies it's different than body odour... because with the body odour, I just have a routine and you can smell yourself but with allergy thing there is no smell, I had to rely on myself and say no, people have hay-fever.

Q: *Does your bipolar disorder predate the OCD?*

A: Bipolar disorder is from 2012 but then I was diagnosed in 2014 or December 2013: I started in 2012, I was just diagnosed with depression.

Q: *Do you think that your OCD symptoms arose when you were particularly distressed, or they were just random?*

A: I have lived in Singapore then and it is humid, so it kind of made sense. The OCD skyrocketed in psychotic depression; then I recovered from it except for this belief that I am an allergen. **Did the beliefs start developing when you were having psychotic depression?**

A: I was self-conscious before but during that episode it became a core belief and I haven't gotten over it since, it's almost five years [...] I was not leaving the house as much and it became a proper obsession.

Q: *Would you say that you felt better in terms of mood compared to when you were just depressed and not psychotic depressed or compared to now? How was your wellbeing in that period?*

A: I was aware that I was depressed but not aware that Katy Perry singing to me and telling me to do things, I was not aware that that was not ok, I went to the psychiatrist for my mood.

Q: *Was there something positive in the episode of psychotic depression?*

A: I don't know. I wondered if I used this because it's my only thing that I worry about that people would react negatively towards me. I don't care with what I say, it's the only thing where I fear how people respond towards me, so I have always wondered if I used this as a thing to say the only reason why people would feel negative is that.... I wonder if that has ever served a purpose [...] any negativity I put it down to that, rather than I should have not interrupted.

Q: *This belief of being an allergen is a relic of that period. Were you more worried about this belief when you were in the psychotic depression? Or did you do more compulsions?*

A: I was more extreme in my behaviour: I found online that tonsil stones can cause bad breath, so I took a scoop, so I have problems with my tonsils. Or I would take a brush for dishes and scrape my skin off to shed skin. I thought if that is making people allergic so you just shed it, I was bleeding: it was not self-harm but a method to try to control that. Now I am more anxious because I am more aware of that, it makes me more anxious, but I was more extreme in my behaviour then. With anxiety now is also what is if it is true no, people have told you it's not true, it's all in your mind... it's all this back and forth [...] When I was lost in it, I didn't have this back and forth, but it was here is your issue, here is how you fix it. I wasn't that clear in my thinking, more dangerous maybe but I wasn't that nervous.

Q: Your mood was worse compared to now?

A: In the depressive episode that lasted quite a few months.

Q: So you were feeling more sad, down?

A: I don't know about that, I never have emotional depression, having to count down to make myself move my arm. I came out of it a few months later when I got medication.

Q: When you have these obsessions, are you able not to think about it or think about something else?

A: If I am at home, it is easier, I am not faced with gathering evidence. The more I go outside, the more evidence I collect. I tried exposure therapy, but I got worse. It's easier to go outside when I haven't been out for a month.

Q: Did you develop your bipolar depression all of a sudden? Both the disorder and the episode.

A: Genetically in my family there is history of mood disorder and psychosis, so I was at risk and when I was 19 I became depressed and I went to an inpatient thing, but I was misdiagnosed with depression and anxiety. I was put on an SSRI and then when I left, I was by myself trying to manage it and I would just go on antidepressant, go hypomanic, come off them, go on them again. I did that for about a year and at the end of 2013, I was pretty psychotic manic, so I was diagnosed then properly and then from December 2013 to October 2015 I didn't seek treatment. I took sleeping tablets, I fixed my schedule and focused on behavioural changes; and then in September/October 2015 I had this episode. My mood became really low: I cannot think of a reason for it. Looking back, I had quite a lengthy hypomania. I lost a lot of weight; I was a raw vegan. Afterwards, I just went into this slump and then I had psychotic depression and got that belief.

Q: Do you feel you have some control on your obsessions or compulsions?

A: The thoughts no, there is pure OCD, so I think I have obsessions and comp. I wouldn't eat. Now I do normal hygiene routine, so my behaviour has gone under control, and it is just this obsession I have to get rid of.

Q: Do you think your OCD is a part of you?

A: Unfortunately, yes. My mind wouldn't know what to do if all of a sudden it stopped. **Q:** How does this make you feel, the fact that you think it's a part of you?

A: Pessimistic about, it's harder to get over if it, if it feels so engrained, it's a part of me but not in a positive way. There's always the million-dollar question, if you had the button to push, would you push it to get rid of your mental illness? Many people would say no, because it's such a big part of me, I wouldn't know who I am without it. But I would push it and my mind would go "wow, what's the next thing we can grab onto?" I have never been non-anxious, I always need to mentally do something. Now when I go outside, I don't sit and enjoy my time, it's when is the next sneeze, so it's always very busy.

Q: Tell me a little bit about your OCD. when did it develop? What are your main obsessions and compulsions and how did your OCD begin?

A: In childhood there would be a lot of scrupulosity, the anxiety, guilt and shame feelings and those being so overpowering that they were with you all the time... Halfway through university, it started being quite bad, the first kind of obsessions were around issues of discrimination: slurs towards minority groups popped into my head and the compulsions were to try to use logic to reason and justify them, but that just ended up making them worse [...] why did you think that? You are not the kind of person who would think that. Maybe they have the bias that is deep rooted in your psychology trying to find a way to bring it to the surface and scribe it out, spend it all day everyday thinking about it and trying to reason with it and read about it using academia, using issues of racial justice trying to neutralize it. I started going out with my partner, who is South Asian and when I first started going out with him... The more anxious you get, the more your life gets changed, the more severe this kind of thing becomes, like entering a new relationship. It was getting worse, and it was targeting him, and then I broke down and confessed it to him and he said: I heard about intrusive thoughts, I know how it works, it does not define you. That was the first time I have ever heard of it [...] I did not seek professional help then. That conversation helped enough at the time to make it better to carry on with my life. But then it changed to moral scrupulosity and there were concerns about infidelity, analysing every interaction and trying to see if I crossed the line regarding relationship fidelity, and that turned into confessions - constant confessions - messaging people online, asking did this happen, did that happen driving all my friends mad, research [...] and then what I called memory mining... that made me really, really ill, it was really tough. That was 2017. That was 24/7. Wake up, thought pops in the head, everything launches out of control, all day and in the evening struggle to sleep, get to sleep, wake up, thought pops into head. One time I was at work, and I mentioned it to a friend of mine and used them for compulsive behaviour, casually bringing it up, pretending you are just having a conversation, but they could tell. This friend of mine, she said: you need to go home and call your doctor and you need to get help, and then I did. I got an appointment, they got me in very quickly. I went on escitalopram and took two weeks off work, and I got a referral to this therapist who was OCD specialised [...] I had a period of therapy for generalised anxiety earlier, it was not particularly useful because it was for the wrong kind of thing. I worked with her for 12 weeks, it was CBT: she worked around understanding your thought process and how they work, objectify them, explain them in

objective terms and not as part of your personality. I had to make a character for the OCD and see it as a bully who whispers into your ear and tell all these negative things [...] and that helped a lot. A lot of it was time, some of it was this book called Brainlock [...] It fluctuated but downwards, so now I have periods of time in which I have all the feelings that I had before but not as severely, and I can recognise them quickly and after a couple of days it will disappear. I learnt how to distract myself, use crafts, talk about it in the right way so as to not perpetuate it. I have been well for two years.

Q: Is there something that you would define as good or valued about these experiences in any sense?

A: You've got the empathy, the ability to understand other people's experiences from your own perspective but there is a lot of behaviour that accompanies that kind of thinking that I find it to be very helpful and also stay with me when I am well. my ability to obsess over things is sometimes good for me. my crafting for example is quite an obsessional thing. The progress that I make is because I am so fixated on it; even compulsions, that are the harmful part and have an impact on your mental health, sometimes helped me get tasks done. But that is not the things that make me ill. If I feel compelled to get something in order, if there is a task that could get something in order or it just feels right kind of place, I struggle to step away from the task, cause it makes me feel uncomfortable but then the task is done and it is done very well [...] Those kind of thoughts and behavioural patterns are part and parcel of that way of thinking which harmed me at one point but also helped me at other points.

Q: At a certain point, were you convinced that your obsessions were reasonable?

A: Yes, even now, when I am having a bit of a patch, I do, for example when I was getting intrusive thoughts about prejudice and discrimination, the thought that I was KKK racist... I thought I was the worst racist in the world, that was true in my head. Even now, if I am going through a difficult phase even if I say to myself this is OCD or someone else say this is OCD, there is a part of me that says no, the OCD is a trick to make yourself feel better, the OCD is a convenient thing ... to avoid responsibility. That is how it works, if it was not so deep rooted in your brain that this defines you as a person, it would not upset you as much.

Q: In which moment are you more convinced that your obsessions might be reasonable? Is there a triggering event, if you are more stressed, if this fluctuation varies according to the circumstances?

A: Alcohol, it would be not the day after but the day after that. If I was drinking a lot, two days later I was pretty much guaranteed that I would have a difficult time, where I would be completely convinced that the thoughts are true [...] Even then in the moment, there wasn't any evidence that would be able to convince me otherwise. Now I have not drunk at all since February. I think stress with Covid, when we were first locked down there were a couple of wobbly time periods, but it was a bit easier to tell myself that is OCD. I am wondering if alcohol was a big factor to be honest, because since I have

stopped drinking, I found it a lot easier to manage. Some triggers someone makes a joke they don't realise it is sensitive in the OCD context if a colleague makes a joke [...] for me that would trigger it and it would be at least a very good two days spiralling and I would focus on the comment and think the person thinks or knows something about me and they are bringing it up.

Q: In this moment, in which you are more convinced, do you think there is something good or better compared to the moments in which you are less convinced that your obsessions might not be true?

A: No. I am too traumatized, deeply and acutely traumatized, and I am in a state of panic, alarm, all the adrenaline going, tearful and withdrawn. I am not speaking to people and if I do, I am doing it compulsively. My quality of life is very, very poor and I cannot think about anything that is good about that at all.

Q: Would you feel relieved if you knew in that moment that your obsessions were unreasonable?

A: Yes, but no one would be able to tell me that because people have told me that before. The act of knowing that your obsessions are unreasonable is a huge part of recovering; the main factor of it is your belief about whether your obsessions are reasonable or not, if you believe that your obsessions are reasonable, that is the thing that makes you unwell, if you truly believe they are not, and you internalize that, if that was the case I am not sure I would not be going through a crisis. That's a baseline and knowing that is unreasonable and being able to move on with your life. Your attitude towards the thought is the main factor on whether you are well or unwell.

Q: Do you think your obsessions and compulsions are a part of you?

A: I don't think the disorder is who I am, but there are some traits which I will always have, and other people will have them and will never make them unwell, while other people will have them and be incredibly unwell. There are aspects of it that are part and parcel of who I am, but I don't think the actual distress and the disorder is who I am.

Q: How does the thought that it might be a part of you make you feel?

A: It's scary to know that I will always have to have tools in place throughout my whole life to stave it off, it reminds me of a physical chronic condition, like diabetes [...]. I am always going to be more psychologically aware of someone who has not gone through mental health problems before, being more mindful, always at least considering taking medications [...]. OCD will stay with me for the rest of my life even if I am not myself going through it, that was very hard to come to terms with. Partly that is why I natter on about it with my friends: if it is always going to be a part of my life, I might take that and use that as a way to help people out.

Q: Can you stop your obsessions or are you able to do something else to control them?

A: That is probably the most difficult thing, identifying what you can do to help while your brain is trying to get you to do compulsions, it is incredibly difficult, because the desire to stop the thought is so strong. A lot of the solutions are harmful – confessing, asking for reassurance, going through your memories etc. stop thinking about that. A lot of the things that do help take a bit longer [...] a lot of it has to be just to try to distract yourself, finds things that compel you to it, like a tv show, an activity that engages you [...]

Q: *Do you think that your compulsions have a purpose?*

A: I think they are my own way to try to make myself feel better or my own way of getting rid of the obsessions. It's almost logical: something is distressing you, so you take action to neutralize whatever that is. I think that is the reason I do the compulsions, to try to neutralize the obsessions and try to make myself feel better, but that does not work.

Q: How did your OCD develop? When did it start, what your experiences are?

A: I was diagnosed when I was 15, a long time ago. I was at school, and I was doing exams, it might have been to do with stress. I have a cousin who is allergic to lots of different food, and he was coming over to visit and I was anxious about whether he was coming into contact with any other food, and so I was obsessively cleaning things, I was worried that if something happened to him, that was my fault [...] My mum eventually took me to the doctor. It progressed, then I had handwashing, washing hands for a long time, taking really long showers. She took me to the doctor and as I was still a child I was referred quite quickly to CBT, and I had that for one year and a half, and that was really good, really helpful.

Q: Now do you still suffer form it?

A: I do. I have had different periods during the years since then when it has come back stronger and gone away. I had years when I was almost free from it and when I was at uni it came back, and it was really bad. That is when I started taking medications [sertraline for 5-6 years and then switched to fluoxetine] for it, and I have been on medications since then: now it's 8 years. It keeps things manageable, I still have it but that helps and sometimes if I am stressed it's worse.

Q: Do you suffer from other conditions apart from OCD?

A: When I was 20, I didn't want to leave the house because I was worried about the hygiene, safety and I got quite depressed. I was not going out, and I didn't want to see my friends because I was worried about germs and so on.

Q: Do your main obsessions revolve around cleaning or there are also other themes? **A:** In the past it was mostly to do with hygiene, public toilets, I would not use the toilets for ten hours [...] I was in a relationship, and it made things really difficult, because I got concerned with how clean my partner was, and that affected the relationship quite a lot [...] some of them [obsessions] was about protecting myself and others for protecting my family [...] Sometimes I get horrible images, I am on the bus and I see somebody getting hit by a car but it is all in my head and couldn't stop it from happening [...] Three years ago, I had a big loss in my family, and when it came back, that time my OCD was more to do with safety. I got obsessed about the hand break on my car, things like locking doors and the gas on the kitchen stove. I would spend an hour checking it and not be able to go out, and that was when it was quite bad again.

Q: Has there ever been a moment in which you think your obsessions are reasonable?

A: Yes, sometimes, especially because of coronavirus. I was saying to a friend of mine that when you do your exposure response, they may ask you to touch something and not wash your hands, saying you are not going to get ill, or it is unlikely you will get ill, whereas now all of the preventive work I was doing to stop getting germs, I was “maybe I was right then, because now I have been told, wash your hands all the time, wear face masks; so sometimes there is some rationality to it”. Now I am better at balancing things, recognising when it is OCD and when it’s a normal concern. One of the things I had to work really hard to overcome it was telling myself that it was not reasonable.

Q: In those moments in which you thought your obsessions were reasonable, did you feel better or worse compared to the moments in which you were not sure that your obsessions were reasonable?

A: I don’t know, sometimes when you are so convinced that something is reasonable or rational you are stuck in the moment; it would be really distressing, sometimes to me it seemed reasonable, but I know that for someone else it would not look like that. That caused me a lot of distress, I used to cry a lot and get angry. I would seek reassurance from other people [...] If it was, I am not sure either way, it was easier, but if I was convinced that something was reasonable, I would be a lot more distressed.

Q: Would you feel relieved in those moments in which you are convinced that your obsessions are reasonable if you knew that your obsessions are not reasonable?

A: I don’t think so, because when you are stuck in the middle of it you cannot see, you are convinced that something is a real threat, no matter what other people would tell you, you are just stuck in it, you can’t get out of it sometimes. People say just don’t wash your hands, just don’t check it... Well, I would if I could.

Q: Do you feel that your obsessions are a part of you?

A: It depends, because sometimes I feel they are, it does make up part of who I am, because it has been present for such a big part of my life, but then sometimes it isn’t, because I know they go, they change and they come back: that shows that they are temporary [...] Sometimes when I am feeling stronger about it, I really feel it is a part of me but it does not define me, I don’t want it to define me or stop me from doing things. When I have been in a bad space, I would probably answer yes, it is a big part of me, but now it is a part but not so prominent.

Q: How does this awareness that it’s a part of you - even if it doesn’t define you - make you feel?

A: It makes me aware that there are some things that will always going to bother me more than will other people. It depends on my mood and what is going on in my life at the time, but most of the time I think of it as it is just part of me and I have to get on with it. When things are easier, it is not too bad, it is something I have to accept, I know I have the tools to fight against it. I have accepted it as I know

I have mental health problems and I will probably always will have, but at least I am in a good place at the moment.

Q: Do you feel that your obsessions come to you against your will, or do you want to think about them?

A: Definitely against my will. Something gets stuck in my brain without me wanting them to [...] but sometimes I become hyperaware of something, because I have this obsession, I am looking or seeing for things people don't see [...]

Q: Are there moments in which you can stop your obsessions or divert your thoughts from them?

A: Yes. The behavioural therapy was important for that. Sometimes I am able to stop things in there and have the thought but then just have it, seat with it and don't act on it, even if in my head is like I need to check the lock again, sitting with it and trying to ignore it but then sometimes it's easier [...]. It depends on how I am.

Q: Do you think that compulsions have a purpose?

A: I think so, the obsessions might be if everything is not turned off on the cooker, then the whole block of flats is going to blow up. The compulsion is to keep checking it and so it does seem it is rational because by checking it, I will make sure that nothing will happen, but it's when I am checking again and again, that comes the problem. You do the compulsions to make yourself better, reassure yourself, to make it OK, but it does not always do that, sometimes it works, sometimes it doesn't.

Q: How do you feel when you perform the compulsions?

A: Anxious. It's weird cause you do it to try to reassure yourself, but it ends up making you feel stressed. You know that you should not be doing it because it is OK and you have been told it is ok and anything more than checking it once is maybe obsessive [...] You get more anxious the more you do it, it's a big vicious circle.

Q: Are you able to refrain from doing the compulsions?

A: Sometimes, I went out now and I didn't check the door [...], it depends, but yesterday I kept checking it. When I do manage to resist the compulsions and I go on with my day and I forget about it I am: "that's fine and everything is fine". I know in my head that if I give in to compulsions, it makes it worse.

Q: Do you feel your compulsions are against your will?

A: Against my will. Maybe I think I should do that because it felt the obsession was a problem, but normally I can rationalise it; in my head it feels like it is against my will, when it was bad in the past, I felt I was a slave to it. I couldn't stop doing it.

Q: Your OCD got worse when you started university. Was it a particularly stressful moment for you?

A: I was in my second year, I was in a long-distance relationship, it was difficult, and the relationship was not going very well, I was homesick and living in a house with people I wasn't very happy with. I felt quite alone, that combined with stress of other things made it bad again... When it gets bad it's usually after a big event. First time was when I was younger, we had a housefire, that was quite a logical thing to worry about; and then I went to uni, that was a big life change; and a few years ago, my brother passed away and that made it come back again. It's always after a big stressful event.

Q: *After a big life event, do you feel when it comes back it is really strong or it starts mild and then gets worse?*

A: It starts mild and then builds up, it's a gradual thing over time.

Q: *Why do you think it gets worse?*

A: I don't know, if I have got a lot of mental stress, it seems the way the stress comes out. After the initial shock of the event as a one off, it might be mild and then it starts getting worse once the stress is there [...] I guess it's a kind of coping mechanism especially when it has to do with safety [...] If I become depressed, it can kickstart the OCD. After a bereavement, I was really depressed and that kickstarted the OCD.

Q: *Is the fact that you have OCD a coping mechanism?*

A: It's when things are stressful and there is stuff I cannot control, that's something I can control, it's an outlet for me. I have some control in my life by carrying out compulsions, in that sense it is a coping thing, my OCD brain sees it as doing a good thing because I am going to protect people.

Q: *Would you say that when the OCD starts getting worse you are more in control or less?*

A: Less in control. Even though the irrational part of my brain thinks that by doing this I am more in control, I feel like me overall as a person I have less control because I am giving in to the compulsions, so I don't feel as mentally strong because the OCD is bad. It feels like I don't have control, but the OCD has control.

Q: *The moments in which it gets worse, are those the moments in which you are more convinced that your obsessions are reasonable?*

A: Yes.

Q: *Even in that moment, does it feel like you are out of control?*

A: I feel quite panicky, anxious, fast heart, fast beat, because I can't stop. Even though there is still a part of my brain who knows it is irrational, I find it hard to listen to that side because the other side is telling me what you are doing is reasonable, this is to help or make things safe. I listen to that bit.