

Matthew R. Broome, Lisa Bortolotti

## Affective Instability and Paranoia

### Abstract: *Affective Instability and Paranoia*

The phenomenon of affective instability is not well understood yet but is experienced widely in some of its manifestations. According to recent empirical studies, it has an important role to play in the genesis of a variety of psychiatric disorders. In this paper, we want to focus on the role of affective instability in paranoia. Paranoia is characterised by having unjustified beliefs about being threatened by malevolent others and thus is linked to persecutory delusions. Causal accounts of paranoia tend to focus on how perceptual processes might be disrupted and cognitive processes might be biased, causing people to accept unjustified beliefs about being under threat. In this paper we argue that tracking affective instability helps us tell a fuller story, where disturbances of mood are a mediating factor between trauma and paranoia, leading people to experience the world and themselves as unpredictable.

*Keywords:* Affective Instability, Emotion, Mood, Paranoia, Persecutory Delusion.

### 1. *Why is affective instability important?*

On the basis of recent empirical work, in this paper we argue that affective instability deserves more attention than it has been given so far due to its being a likely causal factor in the genesis of psychiatric disorders. More specifically, we suggest that affective instability contributes to paranoia and is partially responsible for the formation of persecutory delusions. The significance of affective instability gives us some reason to challenge those accounts of paranoia that rely primarily or exclusively on perceptual anomalies and cognitive biases.

Why should we focus on affective instability? Here are four reasons. First, even if we cannot regard it as a homogeneous phenomenon, in some of its manifestations affective instability is experienced widely and constitutes a common reason for psychiatric referral (Broome *et al.* 2015a). According to the Adult Psychiatric Morbidity Survey (hereafter, *APMS*) 2007 (N=7403), 13.9% of the population experiences affective instability. Affective instability is more common in women than men, with the peak prevalence in those aged from 16 to 24. It gradually declines with age with only

7% of 65 to 74 year-olds reporting unstable mood (Marwaha, Parsons, Flanagan, Broome 2013).

Second, affective instability is a feature of distinct psychiatric disorders and negatively affects prognosis. One may be led to believe that affective instability occurs only in those disorders that are defined by mood dysregulation, such as bipolar disorder or emotionally unstable personality disorder. But it is reported in 40-60% of people with depression, anxiety disorder, post-traumatic stress disorder, and obsessive compulsive disorder, and is associated with increased health service use and suicidal ideation, independent of neurotic symptoms, alcohol misuse, borderline personality disorder and other confounders (Marwaha, Parsons, Broome 2013). Further, affective instability independently predicts worse long-term outcomes in euthymic patients with bipolar disorder (Strejilevich *et al.* 2013).

Third, the clinical significance of affective instability is not exhausted by its being a feature of distinct psychiatric disorders that compromises prognosis. Another reason for its clinical significance lies in the possibility that it be *at the origin of* such psychiatric disorders. For instance, affective instability is part of the prodrome of bipolar disorder (Howes *et al.* 2010), and can occur in the earliest phases of attention deficit hyperactivity disorder and depressive disorder. Further, it partially mediates the pathway from trauma to emerging borderline personality disorder, but also to the genesis of hallucinations, paranoia, and psychotic disorders (Marwaha *et al.* 2014). It is the latter relationship, the role of affective instability as a mediating factor between the exposure to traumatic experiences and the onset of paranoia and persecutory ideation, which we will discuss in more detail in this paper.

Fourth, affective instability is a common reason for referral to mental health clinicians (Bilderbeck *et al.* 2014) but qualitative research suggests that the outcome of such referrals is not always satisfactory. Users describe wanting to receive an explanation for their experiences and valuing a good interpersonal relationship with their clinical team. However, they often do not receive an explanation that they find adequate, and do not develop a good relationship with their clinical team. Possible reasons for these issues include users feeling discredited or dismissed, maybe due to diagnoses being hidden from them or presented to them in a way that does not seem to address their problems. This uncertainty concerning diagnosis may reflect clinicians' own struggles in thinking about affective instability. Clinicians may be trying to fit the users' experiences into a diagnostic construct such as bipolar disorder or emotionally unstable personality disorder, when in fact said experiences may elude the construct. That is because instability of mood is part of normal human experience to some extent and may emerge in a non-pathological context as a response to adverse circumstances. Moreover, it can be present in a variety of disorders, before a disorder begins,

or in areas of psychopathology that are in-between the existing diagnostic constructs of established taxonomies such as the DSM-5 and ICD-10.

For scientific, clinical, and ethical reasons, thus, it is important to develop a better conceptual understanding of affective instability to support clinical practice and users' experience.

## 2. *What is affective instability?*

In the philosophical literature, mood is understood in different ways and two common strategies are either to regard "mood" as a notion that is derivative with respect to the better explored notion of emotion and should be defined in contrast with emotion, or to characterise "mood" as an independent, self-standing notion that has distinctive features, and a distinctive phenomenology.

Those who choose to compare mood to emotion claim that moods feel very much like emotions, but, different from emotions, moods do not have a specific cause and do not need to have an intentional object. If we are angry, there is a cause and an object to our anger. We may be angry at the neighbour for playing loud music because we need to rest before a job interview tomorrow. But if we are experiencing a certain mood such as irritability or calm, there may be no specific cause to our mood, and no intentional object needs to be involved. We may feel calm, in general, for no reason. Also, while emotions are typically limited in their duration and manifest with particular facial expressions, moods can persist for longer and do not manifest with particular facial expressions (Ekman 1994).

Interesting clues about the difference between emotions and moods come from the way people use the language of affect in everyday contexts (Beedie, Lane, Terry 2005). Some of the distinctions people make when talking about moods and emotions do not map onto what psychologists study. For instance, we tend to describe someone as "moody" if their state of mind does not reflect the circumstances around them but rather is consistent with their usual attitude or their persistent traits; whilst we tend to call "emotional" someone who reacts strongly to external events.

Analysing mood and emotion in academic and non-academic writing, Beedie and colleagues found that apart from cause and duration one important factor for the layperson (but not for psychologist) was *control*. Most participants felt that emotions are uncontrollable whereas moods can be managed at least to some extent. This distinction between passivity and control, and the behavioural manifestations of affective instability (both how it can generate action and feelings, but also how the person seeks to manage the instability in more or less helpful ways) may be what leads to

help-seeking and disorder, rather than the valence, amplitude, and frequency of the fluctuation *per se*.

Some philosophers believe that moods should not be defined by their similarities and differences with emotions, because they have their own distinct phenomenology. For instance, Matthew Ratcliffe (2008), following work by Martin Heidegger, claims that moods are ways of being in the world and it is a mistake to think of them as *generalised* emotions. As moods are ways of being in the world, we are always *in a mood*, and changes of mood can have many different causes. Sometimes they signify the presence of a psychiatric illness. For instance, things may lose their practical significance for the person with depression. On this account, moods may also have an important epistemic role in revealing and eliding certain features of the person and their world.

Whether we conceive of moods as extended, generalised emotion-like states that can be controlled to some extent, or as something distinct and more fundamental, such as ways of being in the world, unexpected changes of mood are the phenomenon we need to understand better and that is a key aspect of affective instability. As anticipated, in the empirical literature that makes use of the term *instability*, spanning psychiatry, psychology and neuroscience, the term does not seem to capture a single phenomenon, or even a single construct. As often mood instability is taken to include phenomena such as emotional dysregulation, a principled distinction between mood and emotions does not seem necessary for an understanding of the construct of affective instability as it is currently used, though it may become relevant to future revisions of it. Indeed, empirical researchers seem to use affect, mood, and emotion interchangeably as they also can do with dysregulation, instability, lability and swings in this context when referring to changes of affect (Marwaha *et al.* 2013). In the literature, multiple terms are used to describe the same, or related phenomena, including emotional dysregulation, mood swings, emotional impulsiveness, and affective lability.

Traditionally, mood states have been seen to be governed more by their valence and subjective sense than by their dynamism and impact on behaviour, and this has influenced the way instability has been measured. The existing measures of affective instability assess three core attributes (Marwaha *et al.* 2013): oscillation, intensity, and a subjective sense of the capacity to control affect and behaviour. No single measure comprehensively assesses affective instability. Combinations of distinct assessments are needed, so that to have measure the enriched concept of affective instability we may need the Affective Intensity Measure (AIM), the Affective Lability Scale (ALS), and the Affective Control Scale (ACS), each of which targets one of the three core attributes (Marwaha *et al.* 2018).

Whereas assessments of affective instability in clinical samples typically use one or more rating scales (or assume instability is present based upon diagnosis (Broome *et al.* 2015b) the APMS studies mentioned above rely upon a single question to assess affective instability (“Have you had a lot of sudden mood changes over the last several years?”). This is taken from the structured interview for the DSM-IV diagnosis of borderline personality disorder. Clearly, different measures will result in different estimates of prevalence and, potentially also in different phenomena being assessed and measured. The nomenclature surrounding affect or mood includes valence, intensity, frequency of shift, rapidity of rise-times and return to baseline, reactivity to psychosocial cues, and the extent to which there is overdramatic expression.

Collating the main overlapping dimensions, definitions, and their measurement scales, a recent systematic review proposed that affective instability is “rapid oscillations of intense affect, with a difficulty in regulating these oscillations or their behavioural consequences” (Marwaha *et al.* 2013). The presence of these various elements mandates a multidimensional approach to the assessment of affective instability. The current uncertainties may contribute to the fact that people experiencing unstable mood are not consistently given an explanation of the phenomenon by their clinicians, even though it has been shown that they would value one (Bilderbeck *et al.* 2014).

Progress in defining and measuring affective instability can be facilitated by taking advantage of two recent developments. First, the affective instability literature to date is almost entirely derived from the use of *retrospective questionnaires*. Clearly, this has been and remains a valuable approach. However, responses to retrospective questionnaires are known to suffer from limitations including recall bias, and may be a particular problem for studies of affective instability given its *dynamic* nature (Solhan *et al.* 2009), and the relationship between affect and memory. Both variation and intensity need to be recalled in addition to the mood state *per se*. Momentary real-time assessment and remote monitoring methodologies can largely overcome these problems, and give greater insight into, and a more detailed quantitative characterisation of, the nature of affective instability in daily life. Second, it is increasingly possible to use remote sensors and other devices (e.g. via smartphones, smart watches, or patches) to capture the behavioural, physiological, and environmental correlates of affective instability, and in this way provide a much richer and deeper understanding of what the person is experiencing when moods change (Glenn, Monteith 2014).

### 3. *What is the relationship between affective instability and paranoia?*

Previous research has undercut the Kraepelinian dichotomy between *manic-depressive illness* and *dementia praecox*, the precursors of today's bipolar and schizophrenia, demonstrating the importance of mood states in the onset of psychotic disorders and in particular symptoms such as delusions and hallucinations. Most people who experience a first-episode of psychosis will experience depression in the prior year, and those who are Ultra High Risk (UHR) for psychosis, or an At Risk Mental State (ARMS) (Marwaha *et al.* 2016; Thompson, Marwaha, Broome 2016) have high prevalence of anxiety and depressive symptoms, which often meet the diagnostic threshold. Such symptoms may predict the persistence and distress linked with psychotic experiences in those who have not previously been help-seeking. Further, in thinking about cognitive models of symptom formation, anxiety may facilitate the development of aberrant cognitive schema and beliefs, influence the generation of anomalous experiences and then the maintenance of delusions once formed (Freeman *et al.* 2015; Startup *et al.* 2016).

However, what was not clear is whether the links between mood disorders and psychosis meant that affective instability had a specific causal role in paranoia and other symptoms. Utilizing the APMS sample, it has been possible to identify some interesting correlations and potential causal relationships. In the sample, affective instability predicted not only the onset of paranoid ideation, but also its maintenance. This association between affective instability and paranoia remains after controlling for numerous confounds, and is not found with other phenomena, for instance between affective instability and auditory hallucinations.

Prior literature suggested that affective instability might explain some of the connections between childhood sexual abuse and personality disorder, and again, in this sample, affective instability explained approximately one-third of the variance in outcome from exposure to childhood sexual abuse and paranoia (Marwaha *et al.* 2014). In parallel to this work examining childhood sexual abuse, mood instability, and psychosis, it is also found that bullying is a traumatic exposure linked to both psychotic disorder and psychotic symptoms (Catone *et al.* 2015), with bullying doubling the risk of paranoia. Using novel epidemiological techniques this relationship can be unpacked, allowing a better understanding of the causal relationships between variables. This analysis (Moffa *et al.* 2017) revealed a complex relationship between traumatic exposure and psychotic symptoms. Bullying had a direct role in predicting drug use, worry, affective instability and paranoia, with these latter symptoms impacting on depression, anxiety and sleep, and in turn auditory hallucinations. Further worry and affective in-

stability also mediated the effect of bullying by an indirect route. A visual representation of this complex relationship can be found in Figure 1 (originally appeared in Moffa *et al.* 2017).

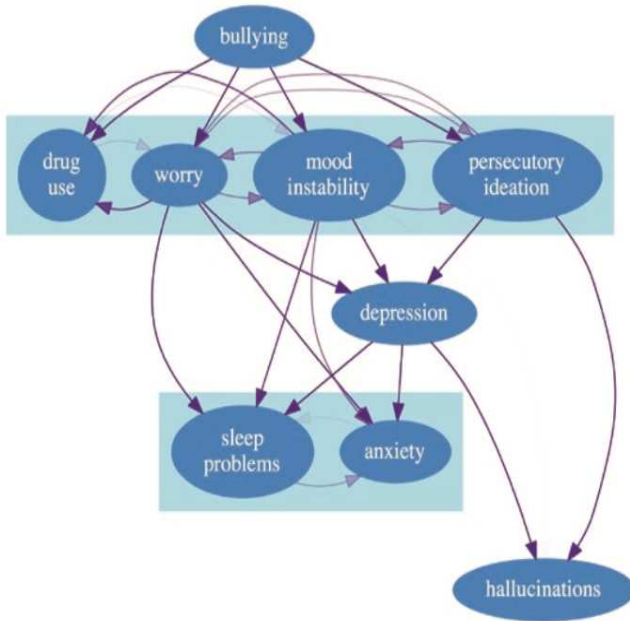


Figure 1. Variables mediating the relationship between bullying and psychotic symptoms.

How should we think about the causal role that affective instability plays in relation to paranoia? There are several options worth examining conceptually and exploring empirically. Although we may not have sufficient evidence overall to decide between them right now, it is important to be aware of them as they have different implications for research and clinical outcomes.

First, we may suppose that there is a causal link between affective instability and paranoia that is *biological*, with a single mechanism causally responsible for both affective instability and paranoia. For example, dopamine dysregulation, a feature of psychosis, could be this single mechanism. Whether due to schizophrenia or bipolar, abnormalities in this neurotransmitter may be a common factor explaining both affective instability

and paranoia. Similarly, in the other disorder with marked emotional fluctuation, borderline personality disorder, there has been an association with changed central dopaminergic and serotonergic functioning, and a dopamine transporter polymorphism, which again might connect persecutory thinking and mood instability.

Second, there may be a causal link between affective instability and paranoia which is *mediated by behavioural effects*. When people experience affective instability, they have mood swings. This provokes negative responses from the environment surrounding them, which as a result may appear as hostile to them. The perception of hostility by people, of the social world being “against them”, causes paranoia. Further, it may be that the association between trauma and instability is in part bi-directional – affective instability may evoke traumatic experiences such as social isolation, bullying or physical trauma. Further, those who suffer mood swings may use methods to manage their affect which in turn are risk factors for psychosis. These might include behaviours such as self-harm, impulsive behaviour, and substance misuse (for example, cannabis, amphetamine and cocaine are all linked to psychotic experience).

Third, the causal link between affective instability and paranoia may be *mediated by the way the person appraises the world*. Not only do other people seem hostile, but the world itself may appear as unpredictable and threatening to someone whose mood is unstable. This relates back to the Heideggerian conception of mood having a role in revealing the world in which we find ourselves. For those with mood instability, the world and their place in it fluctuate and there is no continuity over time. This unpredictability may generate a feeling of lack of safety and of being ill at ease and could be responded to by adopting paranoid thoughts.

Fourth, there may be a causal link between affective instability and paranoia that is *determined by the person's lifestyle* rather than behaviour. People experiencing affective instability react to the experience in different ways, and the reaction matters as to whether paranoia emerges. For instance, a person with mood swings can attempt to manage the situation by going for a run, sleeping, listening to music, using substances, or finding a sexual partner. These choices may all help modulate affect in short term but may have differential effects on psychosis. For instance, exercise and sleep are beneficial but using psychoactive substances or having traumatic sexual encounters may lead to psychotic experiences.

Fifth, the link between affective instability and paranoia may be *mediated by a form of self-appraisal*. Some people may not be able to form a reliable self-image due to their experiences of mood changes, and as a result they may not be able to explain the past and predict what is coming next in a way that enables them to plan their actions and project themselves into



the future. Because of the mood changes, they may give the impression that they are unreliable and feckless, causing others to reducing social interactions with them and avoiding commitment over time. They may also struggle to impose coherence on their life trajectories and to structure their lives narratively with the effect that they feel fragmented as well as isolated and under threat.

#### 4. *Models of delusion formation and affective instability*

The suggestion that affective instability has a causal role to play in the adoption of some delusional beliefs may strike us as incompatible with the most influential accounts of delusion formation. This is not the place for a review or an assessment of such accounts, but one popular way of thinking about the adoption of delusions is to start from the role of anomalous experience.

In *empiricist* accounts of delusion formation, the experience comes first, and the belief follows. Delusions involve modifications of the belief system that are caused by “strange experiences” due to organic malfunction or other factors (Bayne, Pacherie 2004; Davies, Coltheart, Langdon, Breen 2001). For instance, Tony experiences people watching him with suspicion or hostility, and as a result he forms the hypothesis that they want to cause him harm; or something does not feel right when Anna looks at her sister, and as a result she come to believe that the person she is looking at is not really her sister but an impostor. The proximal cause of the delusional belief is a certain highly unusual experience (Bayne, Pacherie 2004, p. 2) and the anomalous nature of the experience is responsible for the unusual content of the belief. Indeed, most empiricist accounts start their analysis of the aetiology of delusion with a claim about people having anomalous experiences. For some empiricists, anomalous experience is sufficient for the formation of delusions, giving rise to *one-factor theories* of delusion formation (see e.g. Maher 1974). For other empiricists, anomalous experience must be combined with some sort of reasoning deficit or bias in order to give rise to delusions, giving rise to *two-factor theories* of delusion formation (see e.g. Stone, Young 1997; Aimola Davies, Davies 2009; Coltheart 2010).

In *rationalist* models of delusion formation, the belief comes first, and influences the person’s experience determining its anomalous features. Tony believes that his colleagues intend to harm him, and as a result he perceives their apparent staring at him as if it was malevolent. Anna believes that someone looking almost identical to her sister has replaced her, and as a result the person claiming to be her sister doesn’t look to Anna as her sister does. The top-down thesis about delusion formation has been proposed for Capgras, some delusions in schizophrenia such as the delusion of reference, and delusions of passivity, when people report that there are external

influences on their thoughts and actions (see Campbell 2001; Eilan 2000; Sass 1994; Stephens, Graham 2000).

What could the role of affective instability be in such models, which prioritise the perceptual or cognitive route to delusions? We believe that the inclusion of affective instability among the causal factors responsible for paranoia and persecutory ideation is actually compatible with the models of delusion formation briefly listed above and can help explain why persecutory delusions have the content they do.

In empiricist models, affective instability can definitely impact on people's experiences and contribute to their being anomalous. We saw that when we have mood swings we tend to interpret other people's reactions to our own behaviour as hostile, and to see the world as unpredictable and threatening. Another route from affective instability to the threatening nature of reality comes from thinking of ourselves as unable to explain and order our experiences, and thus as unable to plan accordingly. Rationalist models are not incompatible with acknowledging a causal role to affective instability either. For instance, the initial belief that the person may acquire could be about the unpredictability of the world, and the hostility of her peers, and further beliefs and experiences might be shaped by that. The initial belief may be motivated by an experience of affective instability.

Finally, how could the role of affective instability be characterised in Bayesian models of delusion formation?<sup>1</sup> Bayesian decision theory is an account of how individuals might optimally use evidence to form and update beliefs. According to this theory, the extent to which we update a given belief in response to contradictory evidence should depend on the changeability of the object of the belief. Thus, an inhabitant of Birmingham, UK might more readily discard their belief "It will be sunny today" in response to a weather-forecast predicting rain than an inhabitant of a region with less changeable environmental conditions, such as a desert. It could be that those with affective instability experience a very changeable, "volatile" world. Bayesian decision theory describes how belief-generation might optimally operate, with belief change driven by mismatches between expected and actual occurrences: *prediction errors*. This account has been applied to paranoia and schizophrenia (Fletcher, Frith 2009; Adams *et al.* 2013). According to Bayesian theory, the rate at which we update a given belief should vary in proportion to the rate of change of its referent – the *environmental volatility* (Behrens, Woolrich, Walton, Rushworth 2007). Those

<sup>1</sup> The Bayesian model of delusion formation is often described as involving just one-factor and does not adopt the same neat distinction between experience and belief as the previous models, thereby eluding the empiricist/rationalist dichotomy.

with affective instability on this account may update beliefs more rapidly, performing as if in a permanently volatile environment. This would lead to a rapid fluctuation of beliefs which are in keeping with a high changeable environment but are out of kilter with a more stable one. Such a mismatch may lead to increased salience and personal meaning, resulting in the generation of many unusual explanations, some of which may be persecutory in nature.

### *5. Conclusions*

Paranoia and persecutory delusions are often attributed to a number of factors that tend to be seen as primarily perceptual or cognitive rather than affective. Even those who embrace a multidimensional approach (such as Freeman, Garety 2014), emphasise the cognitive dimension, including a certain thinking style that induces worry, negative thoughts about the self, unusual experiences, and reasoning biases. In this paper, we suggested that a better understanding of the notion of affective instability in its several manifestations and some recent evidence hinting at its role in the genesis of some psychiatric disorders can lead us to hypothesise a causal link between sudden mood changes and the adoption of paranoid beliefs or the formation of persecutory delusions.

We observed that further examining and potentially acknowledging such a causal contribution of affective instability to paranoia and the adoption of persecutory delusions would be compatible with the main models of delusion formation currently discussed in the empirical and philosophical literature. If the causal link can be ascertained, then there are some significant implications for prevention and treatment that should be explored next. For instance, instability of mood would need to be addressed in the attempt to prevent psychotic episodes and people at risk of psychosis would need to be supported in implementing lifestyle changes that are conducive to an improvement in emotional regulation, such as sleeping better.<sup>2</sup>

Institute for Mental Health  
University of Birmingham, United Kingdom  
E-mail: M.R.Broome@bham.ac.uk  
E-mail: l.bortolotti@bham.ac.uk

<sup>2</sup> Lisa Bortolotti acknowledges the support of a European Research Council Consolidator Grant (grant agreement 616358) for the project entitled “Pragmatic and Epistemic Role of Factually Erroneous Cognitions and Thoughts” (PERFECT). Matthew Broome acknowledges the support of the Coventry and Warwickshire Partnership NHS Trust and the Mental Health Research Network (MHRN) UK, Heart of England Hub.

## References

- Adams, R.A., Stephan, K.E., Brown, H.R., Frith, C.D., Friston, K.J. 2013: "The computational anatomy of psychosis", *Front Psychiatry*, 4 (47).
- Aimola Davies, A.M., Davies, M. 2009: "Explaining pathologies of belief", in M.R. Broome, L. Bortolotti (eds.), *Psychiatry as Cognitive Neuroscience: Philosophical Perspectives*, Oxford, Oxford University Press, pp. 285-326.
- Bayne, T., Pacherie E. 2004: "Bottom up or top down?", *Philosophy, Psychiatry, & Psychology*, 11 (1), pp. 1-11.
- Beedie, C.J., Lane, A.M., Terry, P.C. 2005: "Distinctions between emotion and mood", *Cognition and Emotion*, 19 (6), pp. 847-878.
- Behrens, T.E.J., Woolrich, M.W., Walton, M.E., Rushworth, M.F.S. 2007: "Learning the value of information in an uncertain world", *Nature Neuroscience*, 10 (9), pp. 1214-1221.
- Bilderbeck, A.C. *et al.* 2014: "Psychiatric assessment of mood instability: qualitative study of patient experience", *The British Journal of Psychiatry*, 204 (3), pp. 234-239.
- Broome, M.R. *et al.* 2015a: "Mood instability: significance, definition and measurement", *The British Journal of Psychiatry*, 207 (4), pp. 283-285.
- Broome, M.R. *et al.* 2015b: "Neurobiological and behavioural studies of affective instability in clinical populations: A systematic review", *Neuroscience and Biobehavioral Reviews*, 51, pp. 243-54.
- Campbell, J. 2001: "Rationality, meaning and the analysis of delusion", *Philosophy, Psychiatry, & Psychology*, 8 (2-3), pp. 89-100.
- Catone, G. *et al.* 2015: "Bullying victimisation and risk of psychotic phenomena: analyses of British national survey data", *The Lancet Psychiatry*, 2 (7), pp. 618-624.
- Coltheart, M. 2010: "The neuropsychology of delusions", *Annals of the New York Academy of Sciences*, 1191, pp. 16-26.
- Corlett, P.R., Murray, G.K., Honey, G.D., Aitken, M.R.F., Shanks, D.R., Robbins, T.W., Bullmore, E.T., Dickinson, A., Fletcher P. C. 2007: "Disrupted prediction-error signal in psychosis: Evidence for an associative account of delusions", *Brain*, 130 (9), pp. 2387-2400.
- Davies, M., Coltheart, M., Langdon, R., Breen, N. 2001: "Monothematic delusions: Towards a two-factor account", *Philosophy, Psychiatry and Psychology*, 8 (2-3), pp. 133-158.
- Eilan, N. 2000: "On understanding schizophrenia", in D. Zahavi (ed.), *Exploring the Self*, Amsterdam, John Benjamins, pp. 97-113.
- Ekman, P. 1994: "Moods, Emotions and Traits", in P. Ekman, R. Davidson (eds.), *The Nature of Emotion*, Oxford, Oxford University Press.

- 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), pp. 48-58.
- Freeman, D., Dunn, G., Startup, H., Pugh, K., Cordwell, J., Mander, H., Cernis, E., Wingham, G., Shirvell, K., Kingdon, D. 2015: "Effects of cognitive behaviour therapy for worry on persecutory delusions in patients with psychosis (WIT): A parallel, single-blind, randomised controlled trial with a mediation analysis", *The Lancet Psychiatry*, 2, pp. 305-313.
- Glenn, T., Monteith, S. 2014: "New Measures of Mental State and Behavior Based on Data Collected From Sensors, Smartphones, and the Internet", *Current Psychiatry Reports*, 16 (12), pp. 523-510.
- Howes, O.D. et al. 2010: "A comprehensive review and model of putative prodromal features of bipolar affective disorder", *Psychological Medicine*, 41 (8), pp. 1567-1577.
- Maher, B.A., 1974: "Delusional thinking and perceptual disorder", *Journal of Individual Psychology*, 30 (1), pp. 98-113.
- Marwaha, S. et al. 2013: "How is affective instability defined and measured? A systematic review", *Psychological Medicine*, 44 (9), pp. 1793-1808.
- Marwaha, S. et al. 2014: "Mood Instability and Psychosis: Analyses of British National Survey Data", *Schizophrenia Bulletin*, 40 (2), pp. 269-277.
- Marwaha, S. et al. 2016: "Fifteen years on – early intervention for a new generation", *The British Journal of Psychiatry*, 209 (3), pp.186-188.
- Marwaha, S. et al. 2018: "Affective instability in those with and without mental disorders: A case control study ", *Journal of Affective Disorders*, 241, pp. 492-498.
- Marwaha, S., Parsons, N., Broome, M. 2013: "Mood instability, mental illness and suicidal ideas: results from a household survey", *Social Psychiatry and Psychiatric Epidemiology*, 48 (9), pp. 1431-1437.
- Marwaha, S., Parsons, N., Flanagan, S., Broome, M. 2013: "The prevalence and clinical associations of mood instability in adults living in England Results from the Adult Psychiatric Morbidity Survey 2007", *Psychiatry Research*, 205 (3), pp. 262-268.
- Moffa, G. et al. 2017: "Using Directed Acyclic Graphs in Epidemiological Research in Psychosis: An Analysis of the Role of Bullying in Psychosis", *Schizophrenia Bulletin*, 43 (6), pp.1273-1279.
- Ratcliffe, M. 2008: *Feelings of Being: Phenomenology, Psychiatry and the Sense of Reality*, Oxford, Oxford University Press.
- Sass, L. 1994: *The Paradoxes of Delusion: Wittgenstein, Schreber, and the Schizophrenic Mind*, Ithaca, Cornell University Press.
- Solhan, M.B. et al. 2009: "Clinical assessment of affective instability: Comparing EMA indices, questionnaire reports, and retrospective recall", *Psychological Assessment*, 21 (3), pp. 425-436.

- Startup, H., Pugh, K., Dunn, G., Cordwell, J., Mander, H., Černis, E., Wingham, G., Shirvell, K., Kingdon, D., Freeman, D. 2016: "Worry processes in patients with persecutory delusions", *British Journal of Clinical Psychology*, 55, pp. 387-400.
- Stephens, G.L., Graham, G. 2000: *When Self-Consciousness Breaks: Alien Voices and Inserted Thoughts*, Cambridge, MA, MIT Press.
- Stone, T., Young, A.W. 1997: "Delusions and brain injury: the philosophy and psychology of belief", *Mind & Language*, 12, pp. 327-364.
- Strejilevich, S.A. et al. 2013: "Mood instability and functional recovery in bipolar disorders", *Acta Psychiatrica Scandinavica*, 128 (3), pp.194-202.
- Thompson, A., Marwaha, S., Broome, M.R. 2016: "At-risk mental state for psychosis: identification and current treatment approaches", *British Journal of Psychiatry Advances*, 22 (3), pp.186-193.