The flat landscape

Clementine Edwards considers emotional deficits in schizophrenia, in the latest in our series for budding writers (see www.bps.org.uk/newvoices)

> Indifference seems to be the external sign of their state... The will... disturbed in a number of ways, but above all by the breakdown of the emotions. The patients appear lazy and negligent because they no longer have the urge to do anything either of their own initiative or at the bidding of another. (Bleuler, 1950/1908).

I found this quote in the early days of my PhD. I often return to it as a reminder of the little progress we've made in treating schizophrenia, a disorder that affects 1 per cent of the population, over the last 65 years. You might have expected to read something about hearing voices or paranoia – the unusual experiences known as positive symptoms. Negative symptoms are a loss of normal experiences, something that is less obvious but often the main cause of the long-term consequences of the illness. This cluster of symptoms includes low motivation, social withdrawal, low pleasure, slow speech and reduced facial expressions and gestures. There are still no treatments targeting negative symptoms; in fact, the antipsychotics given to most people with a diagnosis of schizophrenia may make them worse. The majority of people I have met whilst doing my research are socially isolated and engage in very few activities, and many struggle to care for themselves.

Negative symptoms are often considered less important than the positive symptoms of schizophrenia. It has also been assumed in the past that they are only present due to antipsychotic medications or comorbid depression. However, the evidence shows that negative symptoms are independent of side-effects, positive symptoms and comorbid depression and that they appear early on in schizophrenia (e.g. Blanchard & Cohen, 2006; Loas et al., 2009). Once an individual with a diagnosis of schizophrenia is less paranoid or their voices have faded they are considered to be on the road to recovery. But this process is so often stalled, sometimes for decades, by negative symptoms.

People often ask why I chose negative symptoms as the focus of my PhD. After all, other research areas are more popular and communication difficulties coupled with the low motivation of those affected can make them a challenging group to work with. Perhaps it was because my initial reading had shocked me – the papers repeatedly stated that negative symptoms were linked to worse outcomes and longer illness in people diagnosed with schizophrenia (Foussias et al., 2011; Loas et al., 2009; Rocca et al., 2014), yet there are no treatments available. I felt I had identified an area in desperate need of more research.

Part of the delay in treatment development has been due to a lack of clarity surrounding the causes of negative symptoms. People diagnosed with schizophrenia report that they enjoy everyday activities less than controls, but if we ask them to rate their pleasure whilst viewing an image or film these ratings are similar to controls (Cohen et al., 2011). If you can experience as much pleasure as others why would you report that you don't?

The answer may lie in the temporal experience of pleasure (Kring & Caponigro, 2010). Questionnaires and interviews tend to assess consummatory pleasure (how much you enjoy something at the time), and films are better at measuring anticipatory pleasure (how much you look forward to something). The problem in schizophrenia seems to be with anticipation, and this poses a new question: If you enjoy activities as much as others, why wouldn't you look forward to them and do them again?

My initial assumption was that the general population are good at anticipating how much they're going to enjoy something, and individuals with a diagnosis of schizophrenia are not. However, multiple studies suggest we're not very good at predicting our future emotions at all (e.g. Gilbert & Wilson, 2007). When anticipating a scenario we run a brief simulation of how it will go in our head and use our emotional reaction to this simulation to judge how we'll feel during the event itself: we are pleasantly excited about the party at the weekend because every time we run our simulation of it we feel excited. But these simulations are biased towards our best, worst and most recent experiences. This means not only that our predictions can over- or underestimate what we'll actually feel, but that they change all the time as we have new experiences that influence these simulations. There are many benefits that may arise from inaccurate predictions of emotions; for example, if we overestimate how happy we'll feel after a run or once we've done the laundry we are more likely to do that activity. Underestimating pleasure might also be important for motivation – as the saying goes, 'a pessimist is never disappointed', and this may preserve motivation for the future.

Given that we're not very good at predicting our emotions anyway, what

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makes this even more difficult for people diagnosed with schizophrenia? It has been consistently shown such individuals struggle to learn from positive experiences or rewards (Strauss et al., 2013). However, when given negative feedback (in laboratory contexts this often means losing some money) they learn similarly to controls. It seems that individuals diagnosed with schizophrenia struggle to update or change their future expectations on the basis of positive experiences. We know how sensitive anticipation is to the influence of recent or important events, so an inability to learn from these may cause problems. But those diagnosed with schizophrenia could also lack the usual biases influencing their simulations, so they are more accurate when predicting and therefore less motivated. Indeed, using a gambling task, such individuals were less susceptible to the biases that caused controls to behave irrationally (Doll et al., 2014).

Negative symptoms of schizophrenia are often considered less important than the positive

Alternatively there could be different biases operating in people diagnosed with schizophrenia that result in consistently reduced anticipatory pleasure, as reported in a study asking participants to rate their anticipated enjoyment of activities (Gard et al., 2007). However, studies report either no difference or higher anticipatory pleasure in individuals diagnosed with schizophrenia compared with controls (Choi et al., 2014; Trémeau et al., 2010; Trémeau et al., 2014).

Unfortunately, all of these studies measure anticipatory and consummatory pleasure using a variety of different methods including images, questionnaires, films and daily pleasure ratings. As a result, it is difficult to draw specific conclusions and identify treatment targets. This problem has been the focus of my research, and I have tackled it using a task that shows people images, asks them how they feel viewing each one, and to anticipate how they'll feel when they see it again. Preliminary findings suggest that both controls and those diagnosed with schizophrenia show the same bias in anticipation: overanticipating less pleasant images and underanticipating highly pleasant images. This pattern was, however, significantly more pronounced in the schizophrenia group, who did not seem to differentiate between high- and low-pleasure experiences (Edwards et al., 2015).

I was struck by how these findings of flat rather than reduced anticipatory pleasure resounded with my experience of talking to individuals experiencing high negative symptoms. When asked about the future, these individuals are not pessimistic or negative in their reply. They discuss an upcoming holiday or family occasion with the same enthusiasm as their next blood test or doing the washing-up. Life seems to have lost its extremes, and the landscape looks very flat all around them; no dark ravines for them to fall down but also no mountains to climb and admire the view from the top. It is easy to see, given these circumstances, how they often end up isolated and struggle to motivate themselves. How could we intervene to change this pattern?

Cognitive remediation therapy, designed to improve neurocognitive abilities such as attention, working memory, cognitive flexibility and executive functioning, has been shown to be effective in tackling deficits, with some studies reporting secondary effects on negative symptoms (Cella et al., 2014; Farreny et al., 2013). If this could be adapted to target simulations and anticipation it may prove effective. Others have suggested that individuals diagnosed with schizophrenia have 'low-pleasure beliefs', believing that they do not enjoy things to the extent where it affects their anticipation. This could be due to a history of experiencing few pleasurable activities and may be targeted by cognitive behavioural therapy (Grant et al., 2012).

One way of targeting anticipatory difficulties may be to use the individual's own real-time reports of their enjoyment, recorded on an app, as a tool to motivate them to repeat that activity again. This is also potentially overcomes the problems associated with retrospective ratings of pleasure. I encountered a lot of pessimism about my chances of recruiting individuals with high negative symptoms to take part in a study which involved carrying a device around for six days. I was pleasantly surprised when many of my participants were very happy to help and often reported a benefit from the prompts to think about their emotions. I have high hopes that such technology could help people struggling with negative symptoms out of the flat landscape they see around them, and into the world of deep ravines and glorious summits that the rest of us try our best to navigate. Helping them anticipate the highs and even the lows is a good place to start.

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