State paranoia and urban cycling

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ABSTRACT

Consistent with a continuum approach to mental health, a growing body of research has established that paranoia occurs in the general population. The stress-vulnerability model would predict an association between environments high in threat and the presence of state paranoia, even in those with low dispositional trait paranoia. The present research examines whether urban cycling, a naturalistic environment high in interpersonal threat, is associated with state paranoia – operationalised as an explicit perception that other road users intend the agent harm. 323 members of the general population who regularly cycled in London completed measures of state and trait paranoia, anxiety, depression and stress. The majority of the general population sample (70%) reported experiencing state paranoia during urban cycling, and there was no association between state paranoia and trait paranoia. Reported state paranoia was higher during urban cycling than when using the London underground (a lower threat environment) and reported state paranoia on the underground was associated with trait paranoia. The findings are consistent with the stress-vulnerability model of everyday paranoia.

1. Introduction

Recent research has suggested that "ordinary individuals, in their everyday behaviour, manifest characteristics, such as self-centred thought, suspiciousness, assumptions of ill will or hostility, and even notions of conspiratorial intent, that are reminiscent of paranoia" (Fenigstein and Vanable, 1992, p. 130). A growing number of survey studies show that paranoia is indeed common in the general population (e.g., Ellett et al., 2003; Fenigstein and Vanable, 1992; Lincoln and Keller, 2008; Freeman et al., 2011). This finding is consistent with the idea that experiences such as clinical paranoia lie on continua functions with ordinary behaviour (Strauss, 1969). Ellett et al. (2003) first proposed an evolutionary account of 'everyday' (i.e. nonclinical) paranoia, proposing that a facility to suspect others of intending one harm was selected and distributed in humans due to its adaptive value in ancestral environments. An evolutionary perspective may also help elucidate why nonclinical (as well as clinical) paranoia can be persistent once actuated: There is clear adaptive value in remaining vigilant once a threat has been detected. In evolutionary terms, perceiving threatening stimuli or minimising the likelihood of missing a real threat could be adaptive (Preti and Cella, 2010) - a false positive (fearing harmless people) is potentially less costly than a false negative (failing to fear others who are truly hostile and therefore pose a genuine threat) (Cosmides, 1989; Cosmides and Tooby, 2005; Ermer et al., 2006).

Experimental research has begun to elucidate key current environmental factors that trigger paranoia – for example, showing that state paranoia is a response to a broken agreement from another person but not from a computer (Ellett et al., 2013). In nonclinical samples, state paranoia has been observed under conditions of induced high self-awareness plus task failure (Ellett and Chadwick, 2007), in virtual environments that lack an objective threat (Freeman et al., 2003), in response to social threat environments such as exclusion and loneliness (e.g. Kesting et al., 2013; Lamster et al., 2017), and in game theory environments (e.g. the Prisoner's Dilemma Game, Ellett et al., 2013), that capture some of the key environmental qualities known to trigger paranoia, including threat and ambiguity. The stress-vulnerability model (Zubin and Spring, 1977), would predict that the relationship between state and trait paranoia would vary depending on the prevailing level of interpersonal threat in an environment. Vulnerability in this context is operationalised by degree of trait paranoia, such that when environmental threat is low, one would expect there to be a strong positive relationship between state and trait paranoia - there needs to be some trait disposition present (i.e. vulnerability) in order to interpret a low threat environment in a paranoid way. Evidence for this comes from studies using a virtual reality paradigm, in which the environment is necessarily neutral and lacks objective threat, and a positive correlation ($r = 0.55$) has been found between state and trait paranoia (Freeman et al., 2003). However, as true environmental threat increases a stress-vulnerability model would predict that the association between trait and state paranoia would weaken, and that state paranoia

would occur even in those with low trait disposition. Indeed, this has been demonstrated in the laboratory: for example, a combination of induced high self-awareness plus task failure reliably induces state paranoia in those with low as well as high trait paranoia (Ellett and Chadwick, 2007).

It might, however, be argued that laboratory manipulations of state paranoia lack a degree of ecological validity. In order to overcome this, researchers have started to assess state paranoia in real-world naturally occurring environments that contain threat of interpersonal harm – physical, psychological, or both. Two studies have found that exposure to an urban environment (a busy shopping street in London) increased state paranoia in individuals with persecutory delusions (Ellett et al., 2008; Freeman et al., 2015). However, research is yet to examine whether exposure to an urban environment has a similar toxic effect in nonclinical populations.

One naturally-occurring urban environment high in interpersonal threat is urban cycling. Tragically, the threat is all too real. In 2013, for example, six cyclists died within a fortnight on the roads of London; and more than 200 over a decade. The threat is also interpersonal, in that the fatalities and serious injuries typically occur following impact with drivers of motor vehicles. An experience of state paranoia whilst cycling in London would entail more than simply recognition of risk of physical or psychological harm, with associated emotional and behavioural responses. To be classified as paranoia, there needs also to be a perception that other road users *intend* to cause harm to the agent (Freeman and Garety, 2000).

In the current study, we examine empirically for the first time if members of the general population report experiencing state paranoia during exposure to an urban environment, specifically whilst cycling in London. A multi-dimensional view of paranoia will be applied (Chadwick and Lowe, 1994; Strauss, 1969), and the study will also assess the degree to which reports of state paranoia when cycling correlate with trait paranoia, as assessed by the widely used Fenigstein and Vanable (1992) Paranoia Scale. Operationalising vulnerability in terms of trait paranoia, the hypotheses were first, that cyclists would report experiencing state paranoia whilst cycling, and second, given the high degree of environmental threat, state paranoia would not be correlated with trait paranoia. In order to explore further the potential applicability of the stress-vulnerability model, we also examined reported state paranoia when using a lower-threat mode of transport, the London underground (Tube). The Tube was chosen as a comparison because in virtual reality research it has been found not to trigger state paranoia in people low in trait paranoia (Freeman et al., 2003, 2008) and because it includes an interpersonal quality of sharing the space with others. Hypothesis 3 is that reported state paranoia will be significantly higher when cycling than when using the Tube, and hypothesis 4 is that there will be a significant positive correlation between trait paranoia and reported state paranoia when using the Tube (i.e. because in lower threat/stress environments state paranoia arises because of vulnerability expressed as trait paranoia).

2. Method

2.1. Participants

The inclusion criteria for the study were that participants were adults aged 18 years or over, and cycled regularly in London (self-reported frequency of at least once per week). Average self-reported length of journey was 34.5 minutes (range 7–120 min). A total of 323 members of the general population aged 18–66 (M_{age} = 33.2, sd = 11.24) participated; 58% were male.

2.2. Measures

Paranoia Scale (Fenigstein and Vanable, 1992*)* is a trait measure of paranoia designed specifically for use with nonclinical populations.

Participants rate their agreement with each of the 20 items on a scale of 1, "not at all applicable to me," to 5, "extremely applicable to me." The following aspects of paranoia are measured on this scale: the belief that other people or external powerful sources are trying to influence one's behaviour or thinking; the belief in a conspiracy, i.e., that people are against the person in some way; the belief of being spied on and talked about behind one's back; a general suspicion or mistrust of others; and feelings of resentment. Example items from the scale include: 'someone has it in for me'; 'I sometimes feel as if I am being followed' and 'I am bothered by people outside, in cars, in stores etc watching me'. Fenigstein and Vanable (1992) reported an overall alpha of 0.84 (*N* = 581 across four samples), implying good internal consistency. Alpha in the current sample was 0.86.

State Paranoia Scale (SPS: Ellett et al., 2013*)* is a 4-item scale assessing state paranoia vis-à`-vis another person. For the purposes of the present study, participants were asked to rate how they perceive other people in cars, lorries and buses when they are cycling, or when using the tube, by marking responses on a 7-point scale anchored with two opposing statements. The four items are: (1) "Friendly towards me" vs. "Hostile towards me"; (2) "Wants to please me" vs. "Wants to upset me"; (3) "Wants to help me" vs. "Wants to harm me"; and (4) "Respects me" vs. "Has it in for me". For all SPS items, the paranoid end of the scale contained both an explicit threat and malevolent intention. Items were scored so that high ratings indicate higher levels of state paranoia (possible range = 4–28). The SPS has been shown to have good internal consistency (Cronbach's alpha = 0.92), and alpha in the current sample was 0.85.

Depression, Anxiety, Stress Scales-21(Lovibond and Lovibond, 1995*)* is a 21-item scale measuring depression, anxiety and stress during the preceding week. Each scale consists of 7 items rated on a 4-point Likert scale of frequency or severity (range 0–21 for each sub-scale). DASS-21 has been validated in a non-clinical population and was found to have good internal consistency (α = 0.94 for depression and α = 0.87 for anxiety).

2.3. Procedure

Ethical approval for the study was obtained from Royal Holloway, University of London. Participants were approached by email and were asked to complete an online survey about their experiences of cycling in London. All participants first read an information sheet summarising the broad aims of the project and gave online informed consent. All participants (*n* = 323) completed the state paranoia scale first, followed by the trait Paranoia Scale. A subsample of participants completed the DASS (*n* = 72) and the state paranoia scale in relation to using the Tube (*n* = 134).

2.4. Data analysis

We first present descriptive statistics for the state paranoia scale, and report (a) the number of participants endorsing each response category on the scale for each of the four items; (b) the proportion (*n* and *%*) of the total sample who provided a paranoid response (defined as endorsing 'maybe', 'probably' or 'definitely') for each item; and (c) an item level analysis of paranoid responses by participant. We then report mean scores on the state and trait paranoia measures and examine whether there were any gender differences. Correlational analyses were undertaken to examine relationships between state and trait paranoia, and anxiety, depression and stress. Finally, we examined whether there were differences in state paranoia when cycling compared to when using the Tube.

3. Results

Table 1 shows the number of participants endorsing each response category for each of the four state paranoia items. Taking a conservative