

Investigating Homelessness And Social Cognition

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ABSTRACT

Introduction: The relationship between homelessness and brain injury is a growing area of interest in the literature. Several studies have used cognitive screening tools to ascertain the level of cognitive impairment present in this population and very few studies have used comprehensive neuropsychological batteries. Social cognition remains an underexplored area in homelessness, and it may serve as a causal and perpetuating factor. Better understanding the social cognitive needs of homeless individuals can help inform intervention strategies and preventative policies.

Aims: The present study aims to use a comprehensive neuropsychological test battery including social cognition measures to explore the cognitive needs of a sample of homeless men.

Methods: Eight residents of a homeless hostel took part in the study. Scores were analysed against normative data and exploratory non-parametric correlations revealed tentative relationships between cognitive domains. A case series analysis was also conducted for descriptive data exploration.

Results: Individual and group-level exploratory analyses revealed several cognitive difficulties, including impairment in a mentalising task. No impairment was found in the domains of empathy and emotion recognition.

Discussion: The findings add to the literature on cognitive impairments in homeless men and suggest the need for including social cognition measures in routine assessments. Implications for clinical practice and future research are discussed.

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LIST OF ABBREVIATIONS

ABI: Acquired Brain Injury
ACE: Adverse Childhood Experience
ACS NTS: Advanced Clinical Solution Affect Naming Task
ADHD: Attention Deficit Hyperactivity Disorder
ASC: Autism Spectrum Conditions
BIC: Brain Injury Clinic
BISI: Brain Injury Screening Index
CI: Cognitive Impairment
CP: Clinical Psychologist
DKEFS: Delis-Kaplan Executive Function System
DSM: Diagnostic and Statistical Manual of Mental Disorders
EEG: Electroencephalogram
EF: Executive Functions
FAB: Frontal Assessment Battery
FEANTSA: European Federation of National Organisations Working with the Homeless
GP: General Practitioner
IQ: intelligence Quotient
IRAS: Integrated Research Application System
LD: Learning Disability
MBT: Mentalisation-Based Therapy
MMSE: Mini-Mental State Examination
MPAI-4: Mayo-Portland Adaptability Inventory
MRI: Magnetic resonance imaging
PIE: Psychologically Informed Environment
QCAE: the Questionnaire of Cognitive and Affective Empathy
RBANS: Repeatable Battery for the Assessment of Neuropsychological Status
RMET: Reading the Mind in Eyes Task
SSQ Strange Stories Questionnaire
TBI: Traumatic Brain Injury
ToM: Theory of Mind

WAIS-III: Wechsler Adult Intelligence Scale, third edition

WM: working memory

WTAR: Weschler Test of Adult Reading

1. INTRODUCTION

The following chapter will present a narrative literature review on homelessness, providing a broad overview of the scale of the problem, the policies in place and the causes of homelessness. The review will focus on brain injury and cognitive impairments as one of the prevalent health needs of this population and an outline of the role of clinical and neuropsychology in homelessness will be presented. Then, a narrative review of the construct of social cognition will be offered, and the chapter will narrow its focus on the intersection between homelessness and social cognition through a scoping literature review. Finally, the rationale and aims of the study will be outlined together with the three research questions.

1.1 Homelessness

In the United Kingdom, a person is legally considered homeless when they do not have access to accommodation in the UK or abroad (National Audit Office, 2017). Homelessness can manifest in different ways including rough sleeping, couch surfing, living in temporary accommodations or hostels, and squatting (Gunner et al., 2019). “Rough sleeping” refers to when a person has no access to shelter and lives on the streets; “couch surfing” is defined as a person who stays temporarily in other people’s homes, usually by sleeping on their couch; finally, “squatting” is when someone lives in an abandoned or empty building, typically illegally.

1.1.1 Frequency

The rising trend in homelessness reached 220,000 people in England in 2019; this number dropped to approximately 200,000 in 2020 during the COVID-19 pandemic due to government initiatives in response to the pandemic such as the eviction ban, the increase of Universal Credit and the ‘Everyone In’ scheme (Fitzpatrick et al., 2021). The aim of the scheme was to find temporary accommodation for all rough sleepers in the country, galvanized by the need for social distancing to contain the

spread of Coronavirus. The scheme was a success and it was estimated that nearly 90% of rough sleepers were helped, however, due to a lack of funding and social housing this success was short-lived (Whitehead et al., 2021). Following the termination of such government initiatives, the figures rose again to 271,000 people in England being homeless (Shelter, 2023).

1.1.2 Causes

Structural, interpersonal, and individual factors are part of the multi-dimensional causes of homelessness (Benjaminsen & Andrade, 2015).

The root of homelessness has traditionally been explained as either 'individualistic' or due to 'structural' causes. 'Individualistic' factors locate the problem in the person's behaviours or vulnerabilities such as addiction or poor mental health, whereas 'structural' explanations attribute it to broader social and political factors such as cuts to welfare spending and unemployment (Johnson et al., 2018). More recently, scholars leaned towards a 'hybrid' approach to understanding the causes of homelessness that emphasise the vulnerability of certain groups of people to social and economic disadvantages (Benjaminsen & Andrade, 2015), however, this approach has been criticised as promoting a reductionist understanding of social causation (Bramley & Fitzpatrick, 2018). Bramley and Fitzpatrick (2018) argue for an approach to understanding homelessness that allows for the possibility of a range of causal pathways that lead to the same effect. Therefore, diverse but interrelated elements can explain the causes of homelessness in any one instance. These elements include socioeconomic backgrounds and health difficulties.

1.1.2.1. Socioeconomic and Political Factors: social causes of homelessness are contingent; while social factors may cause homelessness, they do not cause it on every occasion due to other social or economic factors that may serve as a buffer between cause and effect (Bramley & Fitzpatrick, 2018). Comparative research funded by the European Commission supports the hypothesis that welfare has a significant impact on rates and causes of homelessness and that the state of the housing market may have a bigger impact than changes to the labour market (Stephens et al., 2010). Countries that have a stronger and more generous welfare system and better functioning social and labour markets are thought to have smaller homeless communities, however, their needs tend to be more complex (Stephens &

Fitzpatrick, 2007). For example, a study from 2015 found that the use of shelters in Denmark, a country with a strong welfare state, was significantly lower per capita compared to the USA, but also that homeless people in Denmark were more likely to experience mental health difficulties (Benjaminsen & Andrade, 2015). The opposite has also been found to be true: countries with poorer socio-economic contexts have a higher prevalence of homelessness; for example, the incidence of 'lifetime homelessness' is higher in the UK and the USA, both countries with higher poverty and income inequalities, compared to Belgium and Germany.

Evidence from the British Cohort Study, which followed British adults from around the age of 16 to 30 in 1970 over a period of approximately 10-15 years, suggests that social deprivation, particularly childhood poverty, is the biggest risk factor for homelessness, along with a number of other demographic characteristics (Bramley & Fitzpatrick, 2018). Although women and ethnic minority groups are more at risk, childhood poverty was the single largest contributor to homelessness. Living in rural areas where housing markets are less pressured was associated significantly less with the risk of being homeless. The authors were also able to test the impact of adverse events during the teenage years and found the greater risk was with not living with both biological parents at age 16, having been excluded from school, having used drugs, and having been in care. Having children by the age of 26 and having a long-term illness also increased the risk, whereas being in a relationship or living with parents at age 26 appeared to be protective factors from homelessness. Experiencing unemployment and living in rented accommodation was a risk factor, however, leaving education at an older age was a protective factor.

1.1.2.2 Social Inequalities and Mental Health: UK government reports highlight that health and social inequalities also play a role in the rising trend of homelessness (Local Government Association, 2017). Those who become homeless due to lack of housing or loss of employment typically need little support to return to housing. In contrast, people who become homeless due to significant mental health needs and system failures, such as being discharged from a hospital as homeless or leaving prison, are homeless for longer and have significant support needs (FEANTSA, 2017). Rates of Adverse Childhood Experiences (ACEs) and complex trauma are over-represented in homeless populations (Liu et al., 2020). ACEs refer to a wide

range of negative experiences during childhood such as neglect, abuse, experiencing events such as natural disasters or war. ACEs have been found to have a long-lasting effect and influence on both neurological and psychological development. Epidemiological studies suggest that people who have experienced four ACEs are twelve times more likely to experience mental health difficulties in adulthood (Felitti et al., 1998). In particular, lack of parental care and abuse is associated with the risk of adulthood homelessness. For this reason, many researchers claim that the path to homelessness is thought to begin during childhood (Herman et al., 1997).

The growing understanding of mental health difficulties in this population further highlights that homelessness is not only a housing issue. An extensive interview survey conducted in 2010 identified that over 25% of interviewees reported feelings of anxiety, depression, and suicidality (Fitzpatrick et al., 2011); the study found an intersection between homelessness and other mental health concerns such as alcohol addiction, hard drug use and victimisation. The experience of homelessness may be considered a traumatic experience, in part due to the experience of social exclusion as well as due to the higher risks of being a victim and witnessing violent assault and abuse.

1.1.2.3 Brain Injury: there is growing evidence of greater than typical rates of brain injury in homeless populations (Lafferty, 2010). The changes in thinking skills and functioning that occur following a brain injury, may contribute to becoming homeless. Cognitive impairments are frequently associated with executive dysfunction, communication, adaptive and emotional difficulties (Headway, 2018) all of which can contribute to unemployment, help-seeking and engaging with professionals and social care, and daily complex activities such as paying rent or bills (Stone et al., 2019). Furthermore, homeless individuals are at a higher risk of incurring a brain injury due to the increased likelihood of being involved in violent assaults, accidents or falls (Stubbs et al., 2020). The impact of brain injuries on this population will be further discussed in section 2.3.

1.1.2.4 Unhelpful Narratives: with the aim of normalising and promoting understanding towards those who become homeless, a narrative has emerged that

'we are all two paycheques from homelessness' (Fitzpatrick et al., 2011). Although the intentions are noble, this narrative assumes that homelessness is a random occurrence for which no one is truly responsible, or solely in the hands of the individuals experiencing it. The most disadvantaged groups of society are systemically more at risk to experience homelessness due to personal, social, and economic factors that are outside of their control. As exemplified by Bramley and Fitzpatrick (2018) an ethnic minority woman who experienced childhood poverty, grew up with a single parent, left education at 16, was not in continuous employment does not have a partner, has a child and lives in rented accommodation, is 118 times more likely to experience homeless by age 30 compared to a white man who did not experience childhood poverty, grew up in the rural south of the country, attended higher education, lived with his parents at age 26, is single and child-free.

1.1.3 Health Needs And Healthcare Provisions For The Homeless

Homeless people, especially rough sleepers, have some of the poorest health outcomes in the country due to multiple unmet and complex health needs. Homeless people are fourteen times more likely to die by suicide (Office for National Statistics 2019b), seven times more likely to die from HIV and/or hepatitis infection (Crisis, 2010) seven times more likely to die from falls, at a much younger average age of 45 years (Crisis, 2012), 80% report a mental health need (Homeless Link, 2014). Sadly, evidence suggests that around a third of deaths are caused by a treatable, if not preventable, medical condition (Aldridge et al., 2018). Poor health is often both a causal and perpetuating factor of homelessness (The King's Fund, 2020).

Due to their complex needs, homeless individuals face several barriers when trying to access healthcare services. These range from low literacy or language barriers that make navigating the health systems challenging, to not meeting service requirements such as a permanent address or telephone number. In addition, they may encounter staff who are biased or hold prejudices towards people who are homeless (The King's Fund, 2020), or who are not adequately trained in working with this population, including a lack of training in trauma-informed care (Medcalf et al., 2018). However, homeless people will need to access a range of services in their lifetime, spanning from primary care to specialist services such as mental health and

drug and alcohol services. Their point of entry into the healthcare system are typically GPs, A&E and homeless services such as hostels and outreach teams (The King's Fund, 2020).

1.1.3.1 Specialist Health Care Provision: in lieu of the complex needs of this population, specialist services have been created to address the barriers to healthcare. For example, homeless individuals are 40 times less likely to be registered with a General Practitioner (GP) compared to the general population (Elwell-Sutton et al., 2016). To address this disparity, primary care centres for the homeless have recently been developed to provide essential services including GPs, dental care, nursing and counselling services (NHS England, 2018).

Other specialist services have developed throughout the UK such as NeuroTriage, a Community Interest company based in Liverpool that aims to increase the understanding between homelessness and neuropsychological needs. NeuroTriage works in collaboration with already existing provisions for the homeless and provide neuropsychological assessment and tailored interventions as well as providing training and support to staff. In their end-of-year report from 2019, NeuroTriage reported good outcomes for the individuals they worked with in terms of care received and cost savings (NeuroTriage, 2019).

1.1.4 Current Policies Addressing Homelessness in England

An in-depth evaluation of the policies concerning homelessness is beyond the scope of this chapter. However, the most relevant policies and frameworks will be summarised below.

Political choices have the potential to both alleviate or exacerbate homelessness; in the UK there have been several political attempts to address homelessness since 1977. However, political action must be supported across different parts of government to work well and must also aim to reduce policies that contribute to homelessness (Crisis, 2018). For example, policies influencing housing supply and affordability, public sector spending and eligibility for housing assistance directly impact homelessness.

The Homelessness Reduction Act (2017) aims to reduce barriers to accessing preventative support, relief and rehousing assistance and was one of the biggest changes to the rights of homeless people in England (Crisis, 2015; Shelter, 2018). The policy placed an emphasis on prevention by extending the period in which someone can be considered 'at risk' of homelessness from 28 to 56 days and gives local authorities the responsibility to 'take reasonable steps' to prevent homelessness in those at risk. Furthermore, it places a relief duty to help a homeless person to find suitable accommodation available for at least six months, including both social housing and private tenancy. The policy widens the responsibility to prevent and tackle homelessness to a broader range of public authorities, such as hospitals and prisons, which are required to make a consensual referral to a housing association. However, the local authority support can come to an end if the applicant is considered to deliberately and unreasonably refuse the accommodation or help provided.

The NHS Long Term Plan (NHS, 2019) reports that 50 per cent of the homeless population in the UK have unmet mental health needs. However, the report recognises that at the time there was no specialist service to successfully engage those who are homeless. The report also notes the barriers homeless people face when trying to access mainstream mental health services. Therefore, the NHS Long Term Plan announced plans to invest £30 million aimed to fund specialist services for this population. The consequence of this funding has led to the introduction of jobs in this sector and the roll-out of Psychologically Informed Environments (PIEs) in homeless hostels.

Lastly, while not directly addressing homelessness, welfare policies also affect homelessness trends with an association between cuts to welfare spending and increasing the prevalence of people losing their accommodation (O'Leary & Simcock, 2020).

1.1.5 Relevant Frameworks

The housing first approach (Pleace & Bretherton, 2013) is built on the principle that housing is a human right. It prioritises providing a stable home to those who have

experienced homelessness and have chronic health and social care needs, placing no conditions on the tenancy. Once housed, the residents are offered intensive and coordinated support to meet their physical and mental health needs (Crisis, 2018). In Finland, Housing First has reduced significantly the number of rough sleepers as well as other forms of homelessness (Kaakinen & Turunen, 2021). Further international evidence comes from Canada where 73% of those who accessed the program remained housed compared to 32% who accessed traditional homelessness services (Crisis, 2018); Denmark, where 74% to 95% of people maintained their housing over a four-year period; the USA and France, where the rate of success was 85% measured over a five year period; and Australia, where the housing retention rate was 95% after one year. Successful Housing First programs are also found in the UK. Bretherton and Pleace (2015) evaluated nine Housing First services that operated in England by interviewing sixty service users that had been housed since 2014. They found evidence of a reduction in self-reported physical and mental health problems, in drug and alcohol use and positive evidence of better social integration and familial relationships (Bretherton and Pleace, 2015). Currently in the UK, Housing First is not a widely available service and a national policy to change this is lacking, despite the evidence of its effectiveness.

Fitzpatrick et al., (2019) argue for a “five-level” homeless prevention framework which are: the universal, targeted level, crisis, emergency, and recovery levels. The first level refers to efforts made to prevent homelessness at a population level, which is currently low in England due to unaffordable housing and insecurity (Fitzpatrick et al., 2019). The second level entails targeted interventions towards those at higher risk of homelessness, such as young people leaving local authority care or those who have been in prison. The crisis prevention level is currently addressed by the Homelessness Reduction Act (2017), and it concerns supporting those in impending homelessness. The emergency level differs from the third level as it concerns people at a more immediate risk of becoming street homeless. Some current legislations target this group of people (the Rough Sleepers Initiative and No Second Night Out), however, longer-term support is currently not guaranteed. The final level of prevention proposed by Fitzpatrick et al., (2019) targets recovery from repeated homelessness. An example of an initiative that meets this level of prevention is Housing First.

1.2 Homelessness and Clinical Psychology (CP)

Efforts to understand the emotional and psychological needs of homeless people eventually led to the complex trauma guidance published in 2010 by the Department for Levelling Up, Housing and Communities (formerly known as the Ministry of Housing, Communities & Local Government) and the National Mental Health Development Unit (NMH DU). This guidance recognised the complex needs of this population as well as the innovative practices that a small number of frontline services were developing. In an article published in *"The Psychologist"* describing the current state of psychologists working in homelessness, only two services across the UK were reported and described (Jarrett, 2010). Jarrett (2010) makes compelling arguments about the role Clinical Psychologists can have in preventing and tackling homelessness by offering direct support to homeless people as well as by supporting hostel staff. The NHS Long Term Plan (NHS, 2019) pledged to invest £30 million to tackle the mental health needs that 50% of homeless people are estimated to have. This has resulted in new CP roles being created to work in homeless hostels across London. Working according to the competencies of CP, interventions can be offered at a direct and indirect level. As CP work in an integrative way, psychological interventions can look different depending on the team's therapeutic orientation. An example of how a team of psychologists can integrate with hostel staff and residents was offered by Williamson and Taylor (2015). They described the NHS pilot service they developed in the London Borough of Lambeth within a homeless hostel run by the charity Thames Reach. They adopted a psychodynamic approach to understanding the distress and behaviours of the residents as well as the dynamics between the staff and residents. They offered mentalisation-based treatment (MBT) training to staff as well as consultations and reflective practice. They also offered medial proximity interventions to the residents by engaging in activities such as gardening or playing games with them; finally, they offered formal therapeutic work in the form of MBT, group MBT and MBT-informed art therapy (Williamson and Taylor, 2015). After two years, they found that 70% of the residents engaged with the psychologists at the hostel and many started to engage with mainstream mental health services.

1.2.1 Psychologically Informed Environments (PIEs)

The concept of PIE was introduced by Johnson and Haigh (2011) as a way to draw upon good practice principles when working in housing services for the homeless. Crucially, PIEs do not outline a set of strict guidelines to adhere to; instead, it calls for service-led initiatives stemming from reflective practice within the staff team, while building upon the recognition and awareness of the resident's complex emotional and psychological needs (Haigh et al., 2012). There are five core elements that constitute a PIE: adhering to a psychological model; staff training and support; reflective practice; working on the built environment; evidence-generating practice. Recently, the key features of PIE were revised into five headings: psychological awareness; staff training and support; learning and enquiry; spaces of opportunity; the three Rs (rules, roles and responsiveness). The recent development of PIEs expanded the psychological focus on models to a more general psychological understanding of the various systems. Evidence about the impact of PIEs has started to emerge in the literature. Using qualitative interviews, Buckley et al., (2021) evaluated the implementation of psychological team formulation in two hostels. They found that staff reported positive changes such as perceiving themselves and the residents more positively, an increased understanding of their service users and feeling able to take a different approach to their work, as informed by the formulation. However, Schneider et al., (2022) call for more research on the effectiveness of PIE and highlight the challenge in evaluating an approach that does not draw upon defined theoretical frameworks.

While there is growing evidence and interest in the role of CP in working with people who are homeless, there has not been a focus on the role of neuropsychology in this population. Considering the higher rates of brain injury compared to the average population, the role of neuropsychology in preventing and supporting the homeless requires further exploration.

1.3 Homelessness and Neuropsychology

Neuropsychology is concerned with the assessment and rehabilitation of people with a brain injury or other neurological disease. Assessments carried out by a neuropsychologist include cognitive assessments, functional analyses, and psychological assessments. Neuropsychologists can also be involved in capacity assessments following a brain injury as well as risk assessments. The role of neuropsychology also concerns interventions such as cognitive rehabilitation, group or individual therapy, behavioural management and psychoeducation. In a multidisciplinary context, neuropsychologists can offer consultations and staff training.

1.3.1 Traumatic Brain Injury

TBI is a change in brain function or pathology caused by an external mechanical force (Menon et al., 2010). TBI is one of the leading causes of death and disability globally; the causes of brain injuries are most commonly road traffic accidents, assaults, and falls (Graham et al., 1995). The severity of TBI can range from mild to moderate and is determined by the loss of consciousness and severity of memory loss or alteration following the injury (known as post-traumatic amnesia). TBIs are categorised into closed and penetrating head injuries.

1.3.1.1 Closed Head Injuries: CHIs are the most common type of TBI and are caused by a nonpenetrating injury to the brain that does not fracture the skull (Ginsburg & Huff, 2023). They are typically caused by sudden acceleration and deceleration, such as during a road traffic accident. This rapid change in velocity causes a concussion in the brain and can happen with or without hitting a surface. In the absence of surface contact, the movement of the brain in the skull can also cause brain damage (also called coup and contra coup injury). Axonal injuries are common after such injuries, resulting in the shearing or tearing of axons.

1.3.1.2 Penetrating Brain Injuries: PBI occur when the skull is fractured or otherwise damaged leaving the brain matter unprotected. These are typically caused by an injury caused by a foreign object or bullet. The penetrating damage is typically

localised, and the impairment is related to the corresponding region of the brain, however, these injuries can also be susceptible to coup and contra-coup damage.

The cognitive sequelae of TBI in the general population are well established in the literature; changes in brain function can lead to concentration problems, memory, attention impairments, poor judgement and have a dramatic impact on functional outcomes for social interaction, problem solving, skills acquisition, and occupation (Burra et al., 2009).

1.3.2 Cognitive Impairment In Homeless People

Broadly, cognitive impairments depending on aetiology can affect attention, memory, language, visual-spatial functioning, overall awareness, and problem-solving skills (Petersen & Negash, 2008). A comprehensive systematic review by Stone et al., (2019) concluded that cognitive impairments were over-represented in homeless populations. Studies investigating the neuropsychological and cognitive function of homeless people have found a range of impairments that vary greatly among individuals. Cognitive domains are underpinned by several cognitive functions, and identifying core impairments is challenging. The literature on this topic has used a wide range of cognitive measures, varying from brief screening measures (Brown et al., 2012; To et al., 2015) to in-depth neuropsychological batteries (Pluck et al., 2020; Andersen et al., 2014; Nishio et al., 2017) and have focused either on prevalence rates or on aetiology of cognitive impairments. Studies that have employed in-depth neuropsychological assessments typically address rates of neurodevelopmental disabilities, namely learning disabilities, ASC, and ADHD. Nevertheless, the literature has frequently identified cognitive deficits associated with ABI, such as stroke, and TBI, such as following a road traffic accident.

Focusing on traumatic brain injury (TBI) as an aetiology and cognitive impairments (CI) as causality for homelessness poses a challenge for generalising findings as the definition has changed over the course of updating the DSM, thus a focus on function may be more clinically helpful. The definition of CI may vary across cultures and lacks a standardised definition (Stone et al., 2019). There are multiple causes and compounding factors for CIs and impairments may come from more than one

source, and the pattern of their neuropsychological difficulties may shift over time (Backer & Howard, 2007). Furthermore, focusing on risk factors associated with pre-existing or developmental diagnoses such as autism or learning disability may be unhelpful as many adults with these difficulties do not have a clinical diagnosis (Stone, 2019). However, since clinical diagnoses and aetiology feature in most of the literature on this topic, they will be discussed below.

1.3.2.1 Learning Disability and Neurodiversity: learning disabilities (LD) by definition impact global cognitive abilities such as problem solving, abstract reasoning and processing speed. Without the necessary structural and familial support, it is not surprising that people with a learning disability are at risk of homelessness, however, this risk factor has received little attention in the literature (Trueland, 2009). Pluck et al., (2012) found that compared to the general population a sample of 80 homeless individuals showed impairments in memory and lower IQ scores. Patterson et al., (2012) found that childhood LD was associated with poorer educational attainment, longer lifetime duration of homelessness as well as poor mental health, early and severe substance use and poor physical health outcomes.

Neurodevelopmental difficulties such as Autistic Spectrum Conditions (ASC) can also impact cognition, specifically cognitive flexibility, social cognition and executive functions (Lai et al., 2014). Widely recognised challenges faced by autistic people include stress, mental health difficulties and lower employment rates (National Autistic Society, 2016). In addition, they may also be more at risk of homelessness due to the social impact of navigating a world made for those who are neurotypical, as well as due to extreme social exclusion mediated by neurodiversity (Garratt & Flaherty, 2021). Prevalence rates of homeless people with ASC range from 8.5% to 18.5% of the homeless autistic population (Kargas et al., 2019; Churchard et al., 2019). Autism and higher risk of homelessness, fewer opportunities to avoid homelessness and greater challenges in resolving it were among the themes (Garratt and Flaherty, 2021) uncovered in their qualitative study with autistic homeless people. In particular, they noted that participants with ASC experienced additional challenges of living with others due to behaviours that both autistic and neurotypical people struggled to tolerate in each other. Neurotypical people are able to avoid becoming homeless thanks to family and friendship networks; compared to

the non-autistic homeless people interviewed for the study, the five people with ASC did not have strong family or friendship ties resulting in non-existing moral or financial support. In addition, the way in which homeless hostels are set up can clash with the needs of people with ASC; for example, daily welfare checks from staff happening at unknown hours, or a noisy environment triggering sensory sensitivities. Finally, the complex and bureaucratic structure of support services can be especially hard to navigate for those who are neurodiverse for example, challenging interactions with staff can be misinterpreted as 'non-compliance' or 'behavioural problems'. While autism and its cognitive implication can pose a high risk for social exclusion, it may be argued that homelessness is not an outcome of autism, but rather of the barriers people with ASC face in society throughout their life (Stone, 2019).

1.3.2.2 Executive Functions: executive function (EF) refers to higher-order cognitive abilities such as planning, problem-solving and task initiation (Baggetta & Alexander, 2016). EF difficulties can create functional barriers to housing through difficulties in engaging with social care and the inability to receive support and carry out daily tasks such as paying rent (Chassman et al., 2022). However, EF is not routinely assessed in studies examining cognitive impairments in the homeless. A study assessing the frontal lobe function using the clock-drawing test, verbal fluency test and part B of the trail-making test, found that most of the participants performed poorly on the verbal fluency and trail-making test, suggesting an impairment in executive functions (Rogoz & Burke, 2016). While this is the only study that has employed good quality neuropsychological tests to assess EFs, a significant limitation is the lack of testing of other cognitive domains. As mentioned previously, it is not possible to assess only one cognitive domain as any domain is underpinned by multiple cognitive abilities. For example, a poor score on a timed test might be due to impaired processing speed, poor motor functions or verbal comprehension. A few studies looked at EF in children and parents living in homeless shelters (Distefano et al., 2020; Monn et al., 2017; Masten et al., 2012). A literature review found that young people who experienced poverty and homelessness were more likely to have impaired EF with working memory likely being a mediator (Fry et al., 2020). Masten et al., (2012) found that better EF in children living in homeless shelters with their families was a predictor for better school adjustment compared to

peers with poor EF. Promisingly, Distefano and colleagues (2020) tested a brief intervention for improving EF in this population of children and found greater improvements among treated children compared to peers who did not receive the intervention, suggesting that school readiness can be improved with direct interventions.

1.3.2.3 Traumatic Brain Injury: It is well established that rates of Traumatic Brain Injury (TBI) are over-represented among the homeless population. In a longitudinal study that followed up over three years, a sample of homeless individuals displayed an increased risk of TBI in that time (Nikoo et al., 2017). However, the way in which the incidence of TBI is reported across studies is a limitation of the literature. Definitions and approaches to TBI history taking vary considerably across countries; for example, one study noted that the older age of participants, sample size and use of a structured TBI history interview significantly predicted higher TBI detection (Stubbs et al., 2020). In contrast, asking a single or series of questions that were designed by the researchers but did not belong to a validated questionnaire, yielded much lower rates of TBI (Stubbs et al., 2020). Historic brain injury was consistently associated with poorer self-reported physical and mental health, increased health service use, criminal justice involvement, younger age of onset of homelessness, and self-reported memory concerns. Another challenge is that presenting symptoms of TBI can be misattributed to psychotic disorders, leading to inappropriate medical diagnosis and treatment (HCH Clinicians' Network, 2003).

Andersen et al., (2014) administered the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) and the Brain Injury Screening Questionnaire (BISQ) to a sample of homeless men living in shelters and found low performance on the assessment in the overall sample, as well as an association between history of TBI and poorer performance on tasks measuring attention. This was consistent with evidence indicating that attention difficulties are among the most common impairments following a brain injury, or it could represent a strength of the RBANS in measuring the construct of attention with high sensitivity. Higher-order attention processes are important for working memory, learning, concentration, information processing, time management and divided attention (Cicerone, 2002), which are consequently impaired following TBI. However, it was surprising that no significant

relationship between TBI and memory and visuospatial impairments was found; memory, in particular, is one of the most commonly affected domains following a TBI. The authors hypothesise that the small sample size and other confounding variables that they did not control for, such as malnutrition, might have influenced this outcome (Andersen et al., 2014). An alternative explanation may be that those whose memory impairment was easier to detect informally may have been identified earlier and housed in more appropriate accommodations. The relationship between brain injury and homelessness is considered bidirectional as TBI can precede homelessness as well as occur while homeless due to precarious living conditions (Chassman et al., 2022). Therefore, it is important to consider the relationship between TBI and homelessness more widely as it pertains to pathways both in and out of homelessness.

1.3.2.4 Acquired Brain Injury (ABI) and Substance Misuse: ABIs can be caused by events such as strokes and lack of oxygen to the brain (Maas et al., 2017), as well as by prolonged substance abuse such as alcohol. Homeless individuals have been observed to present with a history of both ABI and substance misuse preceding and while being homeless (Ponsford et al., 2007); substances are often used as a coping mechanism following ABI or during an episode of homelessness (Hayes et al., 2001). Substance abuse and ABI both impact the executive functions described above; a further impacted domain is pragmatic language use (Douglas, 2010). The inability to hold a conversation appropriately negatively affects social functioning and can lead to isolation, relationship breakdowns and possibly mental health difficulties such as depression (Douglas, 2010). Adshead et al., (2021) sought to understand the inter-relationship between substance misuse, ABI and homelessness through interpretative phenomenological analysis (IPA). They uncovered five themes associated with the interrelatedness of these two factors, with Adverse Childhood Experiences (ACEs) and trauma being the main overarching theme. All participants reported experiencing ACEs either prior to or at the same time as the ABI and subsequently negative relationships with peers or caregivers (Adshead et al., 2021). This was in line with the literature on ACEs and attachment as well as mental health difficulties (Felitti et al., 1998), and presents a good account of the experiences of a small group of homeless people. However, qualitative research does not employ objective measures of ACEs and the generalisability of the findings to the broader

population is challenging. Nevertheless, ACEs have been found to cause structural changes in the developing brain leading to EF impairments and chronic hypervigilance to emotional stimuli in their environment (Buimer et al., 2022). This can also lead to risk-taking behaviours which increase the chances of developing an ABI or misusing alcohol. Evidence also suggests that those who have experienced four or more categories of ACEs have a four to twelve-fold increased risk of developing alcoholism or drug use (Hughes et al., 2017). However, Kelly-Irving & Delpierre (2019) argue for caution when considering the impact of ACEs on the brain and psychological development of a single individual. The research on ACEs may be helpful when evidencing the need to tackle health inequalities in complex social environments at a population level and by influencing policies. But due to the multidimensional nature of ACEs as well as the retrospective research approach, and the diverse types of events that often co-occur and are considered cumulative, the risk of measurement error is high (Kelly-Irving and Delpierre, 2019).

1.3.2.5 Severe and Enduring Mental Health Difficulties: psychotic conditions such as schizoaffective and bipolar disorder are overrepresented in the homeless population (Ran et al., 2006; Schutt et al., 2009) and are known to have long-term effects in many on working memory, processing speed, problem-solving and executive functions. In severe cases, cognitive deficits can impair daily functioning (Schaefer et al., 2013). Poor attention, as well as memory and visual motor speed difficulties, can be present during a psychotic episode (Backer & Howard, 2007). Psychotic disorders have also been found to impair social cognitive abilities in non-homeless samples (Bertrand et al., 2007) such as emotion recognition (Edwards et al., 2001) and communication skills (Monti & Fingeret, 1987). The following section will present an overview of the construct of social cognition, followed by a scoping review of the literature on homelessness and social cognition.

1.4 Social Cognition

Currently, a universally agreed definition and conceptualization of social cognition do not yet exist (Pinkham et al., 2014; Schurz et al., 2021). Social cognition is a newly recognised cognitive domain and its impairment has been added to the latest edition of the American Psychiatric Association's Diagnostic and Statistical Manual for

Mental Disorders (DSM-V; American Psychiatric Association, 2013). Broadly, social cognition is an area of research and theory that ranges from basic perceptual abilities, such as the detection of biological motion stimuli to complex higher-order processes that underpin social behaviours, cooperation and reasoning (Barrett et al., 2010). Literature from social psychology has addressed social cognition within the framework of social knowledge, which is the body of knowledge one holds of the roles, rules, expectations, and goals of social situations (Lavoie et al., 2014), and attribution biases, which are inferences about social events that can be internal, external, positive, or negative (Pinkham et al., 2014). In this study, social cognition will be referred to as defined in the clinical neuropsychology literature, which refers to the capacity to attend to, recognise and interpret interpersonal cues that guide social behaviour (Frith, 2008).

Social cognition involves the perception and interpretation of social cues, but also information processing of people, including the self, and about social norms and procedures (Beer & Ochsner, 2006). One way of classifying social cognitive processes is into “hot” and “cold” abilities (Adolphs, 2010). “Hot” social cognition refers to the ability to emotionally resonate with others while understanding that the ‘other’ is a separate entity from the self; this includes affective empathy, emotional perception, and emotional resonance. “Cold” social cognition refers to the ability to explain behaviour through thoughts, intentions, and beliefs; this includes Theory of Mind, cognitive empathy, and pragmatics (the ability to use language to convey meaning in a social and interactional context). A similar model separates social cognition into affective and cognitive functioning, where affective processes relate to emotional information and the cognitive component relates to interpreting intentions, beliefs, and social knowledge (Etchepare & Prouteau, 2018). Moreover, social cognition has also been conceptualised as involving both implicit and explicit processes (Frith & Frith, 2007). ‘Low level’ processes such as the detection of facial expressions, gestures and tone of voice to identify emotions are believed to be implicit, that is happening automatically without awareness (Mancuso et al., 2011). High-level processes instead occur explicitly, and they involve abilities such as making inferences about complex mental states, perspective taking, and understanding subjective emotional states. These processes are required, for example, to solve interpersonal difficulties, understand sarcasm and regulate one’s

own emotions. In summary, the literature draws a distinction between the type of information processing (affective or hot vs cognitive or cold) and levels of information processing (low level implicit vs high level explicit).

Since social cognition does not refer to a specialised cognitive process, impairments are not caused by damage to a specific region of the brain, however, they are mainly associated with frontal networks (McDonald, 2013). Impairments in social cognition have been linked to poorer quality of life, unemployment, perceived social isolation and mental health outcomes (Henry et al., 2016). The majority of the literature on social cognitive impairments has focused on clinical pathologies such as schizophrenia, Autistic Spectrum Conditions (ASC) and more recently TBI and neurodegenerative processes. In the clinical neuropsychology literature, the main components of social cognition that have been used experimentally and clinically are the Theory of Mind, emotion perception and recognition, and various forms of empathy. As such, the present study and literature review will focus on these areas.

1.4.1 Theory of Mind (ToM)

Theory of Mind (ToM), also known as mentalising, is the capacity to infer what other people are thinking, feeling, or planning, and to understand their mental states might be different from our own (Kliemann & Adolphs, 2018). Most of the early empirical evidence of mentalising has come from the field of developmental psychology (Beaudoin et al., 2020), and atypical ToM has been constructed as central to the social difficulties observed in ASC.

The development of understanding other people begins at birth. Infants as old as a few days prefer looking at people's faces to inanimate objects. By the end of the first year of life, children are able to see themselves and others as 'intentional' beings (they discover that most actions are goal-orientated behaviours and not accidental) and they begin to recognise and show more interest in goal-oriented behaviours (Brandone & Wellman, 2009; Woodward & Guajardo, 2002). More developed children around the ages of 3 to 5 are able to grasp false-belief understandings, for example. A classic false-belief task has children observe a character put candy in a box; the character leaves and while they cannot see, the candy is moved to a

different location. The character then returns, and the child is asked where the character will look for the candy. Younger children answer incorrectly, and only children from around the age of five answer correctly (Wellman et al., 2008). Understanding the possibility of an internal world made up of ideas, thoughts and images is the hallmark of a Theory of Mind; By ages 6 and 7 children become aware of thoughts as a 'stream of consciousness' rather than isolated events (Wellman, 2018). A range of other cognitive skills are required for developing a Theory of Mind such as language, and executive functioning. Young people with typical development of a theory of mind are able to make inferences about others' thoughts, intentions and behaviours.

1.4.1.1 Assessment: the aforementioned study on false-belief abilities has paved the way for further research in the field, which has predominantly focused on children with ASC, and less so on adults. False-belief tasks were found to be easily solved and therefore produce ceiling effects in adults. Therefore, more complex and 'advanced' measures were created to assess for atypical ToM in adults. Tests of ToM can be divided into 'explicit' and 'implicit' measures. Examples of explicit measures include the Strange Stories task (Happé, 1994) which requires participants to infer the intentions of characters in verbal vignettes, and the Reading the Mind in the Eyes Task (RMET) (Baron-Cohen et al., 2001) which involves matching static images of the eyes to mental state words. Both tasks assess ToM through direct mental state questions. These types of tasks have been widely used in assessing ToM in adults, however, there has been a growing awareness of their limitations. Firstly, the general level of cognitive ability has been found to be highly correlated with performance on both tasks, verbal abilities in particular. Therefore, some individuals' ToM ability may be underestimated or overestimated, as high verbal skills can 'mask' ToM impairments (Livingston & Happé, 2017). In an effort to tackle these limitations, task measures of ToM that are thought to be 'implicit' have been developed. These tasks are believed to measure automatic or behavioural responses to stimuli such as in eye movements or reaction times (Apperly & Butterfill, 2009). However, such approaches have been criticized for measuring putative attentional processes rather than ToM. As it is evident from the literature, all ToM tasks come with their own limitations, however, there have been promising

findings in studies measuring reaction time using video-based tasks but further research is needed (Livingston et al., 2019).

1.4.2 Emotion Perception and Recognition

Within the field of cognitive psychology, emotion perception comprises the ability to discriminate between an inanimate object and a person (Arioli et al., 2018), and recognition refers to the appropriate interpretation of facial expressions of emotions (Paiva-Silva et al., 2016). Emotion perception and recognition are a fundamental part of social cognition, and crucial for social functioning. The contemporary scientific exploration of emotion recognition abilities began with Darwin (1872) who hypothesised that humans and some animals have an innate ability to understand the emotional meaning behind facial expressions. Several studies have researched humans' innate emotion recognition ability through neurophysiological and neuroanatomical studies. Neurocognitive research has suggested different cognitive processing pathways for objects and faces (Tsao & Livingstone, 2008). Emotional processing also refers to the ability to perceive and use emotions, and it involves identifying, facilitating, understanding, and managing emotions.

1.4.2.1 Assessment: behavioural measures of emotion perception and recognition have emerged since the 1960s, following Paul Ekman's' cross-cultural studies of emotion recognition. He suggested that six basic emotions (happiness, sadness, anger, surprise, disgust, and fear) are recognisable across cultures, supporting Darwin's hypothesis (Ekman & Friesen, 1978). He developed an instrument called the 'Pictures of Facial Affect' which consisted of black and white photographs of adult men and women displaying the six basic emotions. Variations of this test have been developed over the years to improve on Ekman's instrument, and assessing emotions recognition through static and emotionally charged pictures still remains a dominant method in the field (Paiva-Silva et al., 2016). Despite still being widely used, affect recognition tests using pictures have been criticised for lacking ecological validity as pictures are unable to convey nuanced expressions of emotions. Furthermore, the influence of sex, age, ethnicity, gaze direction and face position on emotion recognition has not been adequately addressed in comparative studies to date (Paiva-Silva et al., 2016). Other assessment methods include the use

of functional and structural MRI and EEG, which can provide insight into the facial recognition neuroanatomy (Habel et al., 2010; Kirihara et al., 2012), however, these may be inaccessible for some institutions. A minority of recent studies have used dynamic human face stimuli which provide a promising and more ecologically valid alternative to static stimuli (e.g. Langner et al., 2010). However, there currently is not a validated dynamic instrument of this kind.

1.4.3 Empathy

Empathy is understood to be a complex psychological construct which plays a crucial role in social interactions. While there are a number of ways in which empathy is defined, there is a consensus in the scientific community that at its core, empathy involves coordinating the affective state of another person, so that both the 'empathizer' and the empathic target are in a similar state (Coll et al., 2017; Cuff et al., 2016; Decety & Jackson, 2004). The debate centres around whether empathy only involves the recognition of the cognitive state, or the experience of an emotional state, or both; these two processes are called cognitive and affective empathy. The construct of empathy is not considered a unitary system, but a collection of cognitive systems such as perspective taking, emotion contagion and responsivity (Kilroy et al., 2019).

1.4.3.1 Assessment: several self-report questionnaires have been designed to assess empathy such as the Hogan Empathy Scale (HES; Hogan, 1969), the Interpersonal Reactivity Index (IRI; Davis, 1983), the Balanced Emotional Empathy Scale (BEES; Mehrabian, 2000) and the Empathy Quotient (EQ; Wakabayashi et al., 2006). Due to the lack of a standard definition, these questionnaires measure different aspects of empathy, none of which measure both cognitive and affective empathy. A more recently developed questionnaire has addressed this measurement gap; the Questionnaire of Cognitive and Affective Empathy (Reniers et al., 2011) has been normed using a sample of 925 University students in the UK and aims to measure several aspects of empathy.

1.4.4 Problems In The Assessment Of Social Cognition

There are several challenges to measuring social cognition. First, like all cognitive domains, social cognition involves multiple cognitive processes (such as perception, attention, memory, and decision making) which can be difficult to separate and measure individually (Bird, 2004). Second, there is a lack of a universally accepted method for measuring social cognition, which can lead to inconsistent results across studies (Charman et al., 1998). Thirdly, ecological validity is hard to achieve as many social cognition assessment tools are conceptualised at a highly theoretical level and may not accurately reflect real-world social interactions (Risko et al., 2012). Finally, social cognition can vary across cultures and demographic groups. The majority of assessment tools have been developed and validated with Western European populations making generalisability to other cultures or demographic challenging (Hajdúk et al., 2020).

1.5 Scoping Review: Homelessness And Social Cognition

A scoping review was conducted to identify and evaluate the literature conducted both in the UK and internationally on homelessness and social cognition. A literature search was conducted using the databases Academic Search Complete, PsychINFO and PubMed; only studies that directly involved homeless participants were included. The search produced 87 journal articles, which included nine duplicates; the majority of the studies did not recruit homeless participants and a minority of papers (seven) did not measure social cognition as defined in the present study. Only articles that recruited homeless participants and measured the construct of social cognition as defined in section 1.4 were included in the scoping review. This search produced four relevant studies that were carefully reviewed and are presented below.

1.5.1 Social Cognition As A Predictor Of Community Integration And Functioning

Green et al., (2022) researched the motivational and cognitive factors associated with community integration in a sample of homeless veterans with a diagnosis of a

psychotic disorder. They administered a battery of measures to ninety-five homeless people who were about to move into a “housing first” facility as a baseline and repeated the assessment after 12 months with fifty-three of those participants. The assessment included a clinical interview to diagnose mood or psychotic disorders in the sample, visual and auditory perception tests, cognition, social cognition, motivation and community integration. Cognitive functioning was assessed through the Neurocognitive Composite of the MATRIC Consensus Cognitive Battery which measures processing speed, attention, working memory, verbal memory, visual memory, reasoning and problem-solving. Social cognition was measured with The Awareness of Social Interference Test (TASIT), Part 3, which is a task of mentalisation and the Empathic Accuracy Task. The TASIT consists of a series of video vignettes showing people interacting, and it assesses the ability to use contextual information in addition to tone and face cues to extrapolate meaning from the conversation. The Empathic Accuracy Task involves watching videos of a person sharing a personal story, either personal or negative, and the participant’s task is to make continuous ratings about how the person is feeling ranging on a scale from 1 (extremely negative) to 9 (extremely positive). Community integration was measured through self-reported questionnaires about work and independent living and social engagement. The authors found that the participants who did not attend follow-up due to having been discharged from the program were more likely to have performed better on the mentalising task as well as on the other measures. Empathic accuracy at baseline was related to better scores on the independent living measure following 12 months. They found a correlation between empathic accuracy at baseline and independent living at 12 months and suggested a causal link between the two. There were no associations between perception, cognition and mentalising with independent living at 12 months. The lack of association between independent living and cognitive abilities was surprising, however, it could have been mitigated by the level of support the homeless veterans were receiving within the housing-first program. The study does not provide sufficient detail regarding what was considered a “good” or “bad” performance on the social cognitive measures and whether assessment scores were compared within the group or individually to normative data. Therefore, the method of analysis and interpretation cannot be fully evaluated in this review.

Wynn et al., (2021) expanded upon the previous study by using the same methodology on a more clinically diverse sample of homeless veterans to explore community integration outcomes. The same measures were utilised with the addition of an electroencephalography (EEG) measure of facial processing. They recruited 82 homeless veterans at baseline and 41 at follow-up, and found a strong association between motivation and social integration, as did study 1. The main difference between the studies was that study 2 did not find any associations between social cognition and community integration ratings at the 12-month follow-up. However, facial affect identification was correlated with higher ratings of independent living and work at baseline. Therefore, the study concluded that social cognition is a determinant of community integration in schizophrenia. However, the study failed to take into consideration whether the participants presented an impairment in social cognition. Regardless of the association between social cognition and the minute aspect of improvement they explored, highlighting an observable pattern of impairments would have been helpful to inform rehabilitation and recovery programs. The authors acknowledge that in fact, they did not take into consideration other neurological factors such as traumatic brain injuries.

1.5.2 Social Cognition In Homeless Veterans With Psychosis

Greenberg et al., (2019) measured social cognition together with general cognition, resilience, defeatist beliefs, symptoms of depression and anxiety and community functioning in a sample of 100 homeless veterans. Less than half of the sample had a diagnosis of psychosis. Cognitive and social cognitive abilities were measured using the MATRICS Consensus Cognitive Battery (MCCB, Kern et al., 2011); the battery measures processing speed, attention, working memory, verbal and visual memory, reasoning and social cognition. The MATRICS MCCB draws from the Mayer-Salovey-Caruso Emotional Intelligence Test and the Managing Emotions test (MSEIT; ME) to measure social cognition. The MSCEIT measures the ability to recognise emotions in faces and objects to generate an emotion and solve problems related to the emotion verbally; Through a multiple-choice questionnaire, it measures a person's understanding of what causes emotions and the ability to integrate emotions and thoughts to make effective decisions (Salovey et al., 2003). Greenberg

et al., (2019) found a strong correlation between resilience and motivational, negative and defeatist beliefs, as well as a less strong correlation with social cognition. They also found resilience to be related to community functioning and social relationships in the groups with a diagnosis of psychosis.

Llerena et al., (2018) sought to examine the consequences of unsheltered homelessness on cognition and clinical features using the MATRICS battery. The study formed the baseline of the longitudinal studies discussed above on a sample of homeless veterans with psychosis about to be housed. They recruited seventy-six participants, thirty of whom had been rough sleeping for the last six months and forty-six of whom had been living in sheltered housing. They found no difference in functioning or clinical symptoms between the two groups, and the “unsheltered” group was found to score better on measures of reasoning and problem-solving. The authors hypothesised that those who presented with more significant cognitive impairment may have been more likely to be offered housing support. Poorer social cognition was found to be related to longer time spent rough sleeping. Llerena et al., (2018) make important arguments about the impact of poor social cognition on community functions and the ability to manage emotions which could impact the ability to resolve conflicts with landlords and maintain a good relationship with support services.

1.5.3 Evaluation Of Studies

The above studies are the only studies to date to have measured social cognition in homeless people. The longitudinal design represents a strength as it provided the opportunity to follow up on the impact of cognition, especially social cognition before and after being enrolled in a housing first program. However, these studies also present limitations including several factors that impact the generalisability of these findings. The attrition rate in the longitudinal studies was high which according to the authors reduced the statistical power of the analyses and may have led to Type 2 errors (Green et al., 2022). The participants were exclusively male veterans in the USA, therefore the findings do not represent the wider homeless population. Homeless veterans are likely to receive additional support compared to the wider homeless population, making them a unique group of homeless individuals. While

the studies recruited both participants with and without psychosis, the measures utilised were normed with only people with a diagnosis of psychosis and a direct comparison of social cognition was not made between groups. While having used the same measure in all the studies is beneficial for a direct comparison, they measure a limited number of cognitive and social cognitive processes. For example, a measure of ToM appears to be lacking from the battery. The studies also did not control for other factors impacting cognition such as brain injuries and alcohol use and lacked a healthy control group. In all four studies, social cognition was one of the many variables measured, and never the focus of the research. Therefore, the authors did not report in detail the extent of the difficulties when present, and whether the frequency of impairment was statistically significant or how it related to other cognitive impairments.

1.5.4 Summary Of The Scoping Review

The scoping review highlighted the paucity of research on the relationship between social cognition and homelessness internationally and especially in the UK. Only four studies were identified, all of which had been conducted in the USA and on a very specific sample of homeless men. Therefore, the present study will be, to the author's knowledge, the first study to measure social cognition in homeless participants in the UK. It will also be the first study internationally to attempt to better understand the social cognitive needs of this population.

1.6 Study Rationale

The literature reviewed above strongly suggests that homeless individuals experience several health and mental health difficulties, in addition to unmet cognitive needs. Homeless people also face several barriers when trying to access services, however recent policies have attempted to address these. Recently, there has been an interest in understanding the link between brain injury and homelessness. Prevalence studies or those employing brief cognitive screening measures have not allowed for in-depth exploration of the pattern of cognitive difficulties experienced by those who are homeless, and social cognitive abilities have not been explored sufficiently.

A better understanding of the neuropsychological needs of homeless people can inform both systemic changes and individual person-centred interventions (Backer & Howard, 2007). Clinical implications may include the introduction of routine cognitive screening as well as cognitive rehabilitation strategies being used in housing contexts for the homeless. This study does not aim to ascertain causality between cognitive and social cognitive difficulties and homelessness. But rather, it is an exploratory study aimed at better understanding the individual needs of the participants, and specifically whether social cognitive difficulties should be considered and addressed. The results will inform the clinical implications and suggestions for future research in this area.

1.7 Aims and Research Questions

The proposed study will add to the existing literature on cognitive impairments in homelessness, furthermore, it aims to address the gap in the literature concerning social cognition in this population. The study will employ more sensitive and specific measures of cognitive functioning compared to the ones used in previous studies, including higher quality measures of social cognition. This will also be the first study focusing on social cognition functioning in homeless people. To achieve these aims, the study will endeavour to answer three research questions:

- Does a sample of homeless men show cognitive impairments?
- If so, does the sample show impairments in social cognition?
- Are observed weaknesses in social cognition co-occurring with other disorders of cognition, or are they the only detected cognitive difficulty?

The implications of this study will inform clinical practice, future research, and policy development. A better understanding of the neuropsychological needs of people who are homeless could provide greater insight into how to best care for homeless people and possibly shape currently available prevention policies.

2. METHOD

2.1 Epistemology

Before embarking on a research project, it is important to consider the philosophical position which influenced the study's methodology, including data collection and analysis. Epistemology refers to the study of knowledge, how knowledge is gathered and from which sources, including people's own beliefs and opinions (Elliott et al., 1999). Ontology, on the other hand, refers to the philosophy of being and the assumptions made about reality and what exists (McEvoy & Richards, 2003). Researchers should acknowledge how their epistemological stance has shaped the study's design and provide a rationale for the chosen position (Barker et al., 2002). The present study attempts to examine the relationship between cognitive structures (neuropsychology) and homelessness, which is the product of extreme marginalisation from society.

The study of cognition and neuropsychology originated from Western cultures, undermining the generalisability of the test batteries developed for individuals from non-western backgrounds (Kim & Zabelina, 2015). Neuropsychology is akin to positivism in that it examines the relationship between brain function and behaviour. Positivism, the basis of the scientific method which informs most empirical research, assumes that the properties of the world are observable and measurable through sensory experiences, as described by Galileo. This position has been critiqued, especially within the social sciences, for lacking a contextual understanding and consideration.

On the other hand, our understanding of homelessness has stemmed arguably from a social constructionist perspective (Cronley, 2010). The development of constructivism can be traced back to Immanuel Kant, who opposed the philosophical position of "the blank slate" and argued that experiences of reality are filtered through personal interpretation and social context. Therefore, reality is being created as it is being discovered. In the context of homelessness, its reality, and proposed theses of causality, are constructed by the interpretation of the media, politicians and the general population. Therefore, individualistic explanations of homelessness stem from an individualistic, western, society that has influenced researchers to formulate their questions in an individualistic vein, as well as policymakers.

2.1.1 Epistemological Stance

The epistemological framework of the present study is informed by the author's theoretical stance and beliefs about homelessness and neuropsychology. The study took a critical realist epistemological position. According to critical realism, unobservable structures cause observable events that can be understood only by the events that these structures generate (Trochim & Donnelly 2001). Critical realism considers how context may influence what is known about the world, and it assumes that while a real and consistent world exists, it can never be truly known with certainty (Bhaskar, 2010).

The author argues that homelessness is in large part the result of policy decisions. It is well understood that structural factors such as lack of affordable housing, and unemployment greatly contribute to homelessness (Hanratty, 2017). However, there are also individual factors, mediated by structural factors, that make certain groups of people more at risk of homelessness. One such factor may be one's neuropsychology and in particular their social cognitive skill. The structures of cognition are considered to be real but unobservable properties that inform behaviour; these properties will be measured by the participant's performance on neuropsychological tests. However, to avoid the positivist trap neuropsychological assessments may fall into, contextual information will be considered when examining people's performances.

It is important to highlight that the present study does not seek evidence of causality. Instead, the aim was to explore whether a sample of homeless people present with social cognitive difficulties and form hypotheses about how efforts to end homelessness and support homeless people might be informed by this.

2.2 Design

The study used a cross-sectional correlational research design to address the relationship between impairments in social cognition in a sample of homeless people; and if observable, whether these are separate from or underpinned by

variables that include premorbid functioning and other cognitive domains. In this study, the cognitive domains included memory, attention, executive functions and language skills. A cross-sectional design was chosen to ascertain the relationships in one group of homeless individuals at a single time point. As the study did not seek to evaluate causality, this design was deemed appropriate to answer the research questions.

The present study did not use a control group as no manipulation of variables or interventions was part of the design. Instead, individual performance was interpreted through a comparison with the normative data available and estimates of optimal functioning, allowing for within-subject comparisons. In addition, a case series analysis was employed for an in-depth exploration of each participant's cognitive profile. Due to the small sample size, non-parametric tests with bootstrapping and resampling procedures available on SPSS were selected.

2.3 Recruitment

Participants were recruited from an NHS Brain Injury Clinic (BIC) that operates within a male-only Homeless hostel in east London and serves its residents. The BIC offered a neuropsychological assessment to all residents who wish to undertake one, the results are then to the resident as well as the hostel staff team and GP (with consent).

2.3.1 Eligibility Criteria

Criteria to take part in the study were purposely minimal to give the opportunity to as many residents as possible to take part if they wished and to maximise the generalisability of the findings. The criteria for selection for the study were:

- Participants were residents of the hostel.
- Participants were either already under the care of the BIC or wished to be. It was not possible for the participants to take part in the study without being part of the BIC.
- Participants had to be adults over the age of 18 and be able to communicate in English. If they were able to talk to hostel staff in English without the support of an interpreter, they met the language criteria.

- Participants were not allowed to take part in the study if they were acutely unwell mentally or physically. For example, participants could not be actively suicidal or have an acute physical health condition that required hospitalization. However, substance use or dependence was not an exclusion criterion.

A decision was made to not exclude participants with psychiatric diagnoses such as schizophrenia, which would represent a potential confound to the data. This was done to give all the residents a chance to take part in the study if they wished, and to better understand their cognitive needs and strengths.

2.3.2 Recruitment Process

Using the above criteria, suitable participants were identified by the clinical psychologist in the clinic who had a working relationship with the residents. Hostel staff also helped identify residents who would be interested in taking part.

Participants who had already been assessed in the BIC in the last 6 months were approached and given information about the study. Residents who were not yet part of the BIC were approached to offer information about the BIC and if they were interested in having an assessment, they were given the details about the research project. The decision was made to only recruit participants who wished to be under the care of the Brain Injury Clinic to ensure the information collected about them would be used in a clinically meaningful way and shared with the GP. While this may have biased the sample, the potential positive impact on the participants was prioritised.

2.4 Sample Size

As there has not been a study to date measuring social cognition skills within a homeless population, the sample size was informed by studies that measured general cognitive impairment in this population; these studies have generally recruited fewer than 20 participants (Nishio et al., 2017; Pritchard, 2010). All efforts were made to recruit an ideal number of participants for the study, as a larger sample size would yield more powerful statistical calculations and therefore conclusions (Coolican, 2017). Unfortunately, due to various reasons including the

difficulty of engaging the population, only eight participants were successfully recruited into the study. However, the smaller sample size allows for a case series analysis approach to conduct a more in-depth analysis of each participant's cognitive and social cognitive function.

2.5 Ethics

2.5.1 Ethical Approval

A favourable ethical opinion was obtained from NHS Preston Ethics Committee on behalf of IRAS (Appendix A) as well as HRA approval (Appendix B); approval of capacity and capability was then obtained by the relevant NHS Trust (Appendix C).

2.5.2 Informed Consent

Due to the vulnerability of the population, and that data collection happened on different occasions, the principles of consent and confidentiality were reiterated several times before participants took part in the study. Following the BPS (2014) Code of Human Research Ethics, informed consent was sought prior to taking part in the study. The consent form (Appendix D) clarified that participant care would not be impacted by participating (or not) in the study. Participants were informed that the neuropsychological data collected would also be shared with the BIC and a report of their assessment would be stored on their patient electronic file. Participants were able to withdraw their consent up until three weeks following their participation. Prior to beginning the assessment, it was verbally reiterated that participation is voluntary.

2.5.3 Confidentiality and Data Protection

As all data collected for the study was also used clinically by the BIC, all paper records were stored in a locked filing cabinet in the psychology office as per their Trust's Standard Operating Procedure. Three weeks after the assessment was completed, the data used for research purposes was anonymously transcribed on an Excel sheet and kept in the secure UEL One-drive. The data involved raw scores, percentile ranges and scaled scores. Individual demographic data was kept in a

separate document which was password protected and was stored also in the UEL One-drive.

2.5.4 Harm Minimisation and Follow-up Support

To minimise fatigue, the assessment was split up to over three appointments and participants were given comfort breaks as required. In line with the team's standard operational procedure, residents were offered feedback on their assessment results and were referred to local neurorehabilitation services if needed based on their performance on the neuropsychological assessment and with their consent.

2.6 Procedure

The residents were told about the study by the hostel staff and the clinical psychologist of the BIC, and they were given an information sheet (Appendix E). If they wished to participate, they met with the clinical psychologist who explained the purpose of the BIC and administered the routine neuropsychological assessment and clinical interview. The participant subsequently met with the researcher, who provided an information sheet, and a verbal explanation of the project, and asked the participant to sign a research consent form. Residents who were already under the BIC and had expressed interest in the study were asked to sign a consent form which included permission for the researcher to access their previous neuropsychological assessment. All testing took place in a clinic room on the hostel premises.

The assessment started by asking participants about demographic information which included their age, the language they grew up speaking, and years in education as well as a history of past head injuries. Participants then completed the battery of neuropsychological tests.

The length of the complete assessment was approximately 1.5 hours. All participants completed the assessment over three different occasions and were offered breaks throughout to help minimise fatigue. Typically, the first assessment session was 30 minutes long with the team's clinical psychologist and it involved history taking and an interview to explore their cognitive difficulties. The second assessment

appointment was usually one week later and it involved administering the RBANS and other neuropsychological tests, this was carried out by either a member of the team's psychology team or the researcher. Finally, the researcher met with the participants for a third time to administer the social cognitive measures. This procedure was adopted to minimise fatigue and optimise the participants' attention capabilities.

At the end of the assessment, participants were debriefed, given a copy of the debrief sheet (Appendix F) and with their consent, a copy of the findings was sent to the team's clinical psychologist responsible for their care.

2.7 Measures

Demographic information was collected by the participants as well as additional information from the resident's key worker using the Mayo-Portland Adaptability Inventory (MPAI-4; Malec 2005) and their history of head injuries using the Brain Injury Screening Index (BISI; Ramos, 2020). The MPAI-4 is a 35-item instrument that is completed by a caregiver to assess the level of functional impact following a brain injury. The BISI is an 11-item screening tool (not diagnostic) used to help identify whether a person has sustained a brain injury.

The test battery consisted of neuropsychological tests routinely administered in the BIC and three additional social cognition measures (Table 1). The subtests for the routine assessment were taken from the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS; Randolph et al., 1998), the Delis-Kaplan Executive Function System (DKEFS; Fine & Delis, 2011), the Frontal Assessment Battery (FAB; Dubois et al., 2000), the Wechsler Test of Adult Reading (WTAR; Wechsler, 2001); the Brixton test (Burgess & Shallice, 1997) and Action Fluency. The social cognition tests were the Strange Stories Questionnaire (SSQ), the Advanced Clinical Solution (ACS) Affect Naming Task (ANT) and the Questionnaire of Cognitive and Affective Empathy (QCAE). The tests selected are considered reliable and valid measures for detecting cognitive impairments, social cognitive functions (Reniers et al., 2011), executive functions and premorbid abilities across diagnostic groups and adults aged 18 years and above (Cheng et al., 2011; Whitney et al., 2010; Van Den Berg et al., 2009).

Table 1*Neuropsychological Assessment Tools Used*

Cognitive Domain	Subtest
Optimal Functioning	WTAR
Verbal Short-term memory & Working Memory	RBANS Digit Span Forward Digit Span Longest Backward
Selective and Sustained Attention	RBANS Coding
Executive Function: Verbal	RBANS Semantic Fluency Action Fluency
Executive Function: Non-verbal	Brixton Test Luria Sequences (FAB)
Verbal Functions	RBANS Picture Naming
Visuospatial Function	RBANS Line Orientation RBANS Figure Copy
Learning & Memory: Verbal	RBANS Story Learning RBANS Story Recall RBANS Story Recognition RBANS Word List Learning RBANS Word List Recall RBANS Word List Recognition
Learning & Memory: Visuospatial	RBANS Figure Delayed Recall
Social Cognition/ ToM	Strange Stories Questionnaire ACS Affect Naming Questionnaire of Cognitive and Affective Empathy

2.7.1 Optimal Functioning

The ability to pronounce irregularly spelt words is believed to be resistant to cognitive decline, and this ability is thought to correlate well with general intelligence (Orme et al., 2004). However, it is also determined by level of education, country of education and socio-economic factors. The WTAR is comprised of 50 irregularly pronounced words which participants read aloud. The raw score can be transformed to an

adjusted standard and scaled score, taking age into consideration as a factor. The WTAR was co-normed with the Weschler Adult Intelligence Scale (WAIS-III) and has been validated also with groups of people putting forward poor effort (Steward et al., 2018).

2.7.2 Short-term Memory (STM) and Working Memory (WM)

STM is the ability to hold a small amount of information in mind for a short period of time, and WM refers to the ability to maintain and manipulate information. Subtests from the RBANS and the WAIS-IV were used to assess these domains.

RBANS Digit Span Forward is a measure of STM, in which numbers are given orally in strings of two to nine numbers and participants are asked to repeat them back to the examiner immediately. WAIS-IV Digit Span Backward measures WM; the task involves participants hearing a string of two to nine numbers and being asked to repeat them to the examiner in reverse order.

2.7.3 Selective and Sustained Attention

Attention is related to the speed and accuracy at which a person understands and reacts to the information they receive. In the present study, this domain was measured using the Coding subtest of the RBANS; participants were presented with a visual key with numbers one to ten, and a corresponding symbol matched to each number. They were asked to fill in as many corresponding symbols to each number as possible within a 90 second limit. The task draws on selective and sustained attention, visual perception, as well as motor functions.

2.7.4 Executive Function

Executive function is an umbrella term to refer to a set of cognitive functions that are involved in planning, monitoring and executing goal-directed behaviour.

RBANS Semantic Fluency and Action Fluency are both time limited tasks that measure how many words are generated by the subject in 60 seconds. The former measures the production of semantically related words, and the latter the production of verbs.

The Brixton Test measures the ability to detect and follow a rule. The participant is presented with one page at a time showing a blue circle. On each page, the blue circle is in a different position, according to a rule that they are asked to identify by predicting the next position of the blue circle.

FAB Luria Sequences assesses the execution of a motor program, inhibitory control and motor planning. The participant is asked to copy and learn two motor sequences; following this, during the opposition and inhibitory trials the participant is asked to respond to a set of stimuli following a rule which is changed between trials.

2.7.5 Verbal Functions

RBANS Picture Naming measures the ability to name common objects to confrontation such as a pencil, a wheel barrel and a well.

2.7.6 Visuospatial Function

Visual perception was assessed using Line Orientation and Figure Copy (RBANS). In the former subtest, participants were asked to make a judgment of line orientation by matching the angle and orientation of pairs of lines in space to a set of 11 lines arranged in a semicircle. Figure Copy involves copying a complex figure.

2.7.7 Learning & Memory

RBANS Story Learning, Recall and Recognition assess the ability to encode and retrieve a short story. In the learning trial, participants are read the story twice and after each time they are asked to repeat back as well as they can remember. After a 20-minute interval, they are asked to recall the story, assessing their ability to retrieve previously learned information. Following this, they are presented with a forced choice recognition trial where they are presented with details of the original story as well as a novel one and are tasked with indicating which details belong to the story they learned.

RBANS List Learning, Recall and Recognition trials are similar to the story subtests, with a learning, recall and recognition trial. However, instead of a semantically related story, participants are asked to learn a list of unrelated words.

2.7.8 Social Cognition

Following the routine neuropsychological assessment, tests of ToM, emotion recognition and empathy were administered to assess participants' social cognitive abilities. ToM was measured through an adapted version of the Strange Stories Test (SST; White et al., 2009). The original version developed by Happé (1994) included 24 stories, each depicting an unusual social situation which required mentalising to reach the correct interpretation of events or internal character state. After each story, two questions are asked to ascertain the reader's mentalization ability. Six non-mentalistic control stories were also incorporated which required an understanding of physical states. Several studies have since used modified versions of the SST, the present study employed a shorter version developed by White and colleagues (2009), which consisted of 8 mentalisation stories and 8 physical control stories. However, due to the cognitive fatigue and difficulty with engagement participants were experiencing when tasked with 16 stories, only the 8 mentalisation stories were administered. In addition, due to the variability in literacy skills, all vignettes were shown and read to the participants.

The ANT was employed to measure emotion recognition in facial expressions (Pearson, 2009). The participants were presented with 24 pictures of actors portraying one of six emotions: anger, fear, disgust, happiness, surprise and sadness (Ekman & Friesen, 1971) as well as neutral expression. The ANT is considered a standardised measure of affect naming, it has been shown to correlate with other tasks of social cognition, and it is believed to be valid cross-culturally (Kandalaf et al., 2012).

The QCAE (Reniers et al., 2011) was the final task of the assessment. It is a self-report questionnaire on which participants respond to 31 questions on a 4-point Likert scale, ranging from *strongly agree* to *strongly disagree*. The questionnaire aims to measure five aspects of the construct of empathy: perspective taking, live simulation, emotion contagion, proximal responsivity, and peripheral responsivity. The scores can be subdivided into affective empathy (experiencing the emotional state of another person) and cognitive empathy (understanding and recognising the psychological state of another person). The items are derived from previously validated measures of empathy (Hogan, 1969). The QCAE was normed using a

sample of 925 University students in the UK, and it has been validated against other measures (Reniers et al., 2011).

2.8 Data Analysis

The raw scores obtained were converted into scaled scores (Mean=10, SD=3) and percentiles; individual performance was compared to normative data to ascertain the level of age-related performance for each participant. A copy of the table used to interpret the scaled scores and percentiles can be found in Appendix G. The transformed scores were inputted into the IBM Statistical Package for Social Sciences (SPSS, Version 28) and analysed in accordance with the parameters of the data. Due to the small sample size non-parametric inferential tests were used; the tests selected were the one-sample Kolmogorov-Smirnov Z test to compare the sample's performance to normative data, and Spearman's Rho to explore relationships between subtests. In addition, a case series analysis provides the opportunity to explore and interpret individual neuropsychological profiles. This type of analysis is recommended in neuropsychological research as it allows to systematically assess a sample of related participants with the goal of exploring how and why they differ from each other (Schwartz & Dell, 2010). This method also allows for the testing of theories; in the present study, it has been utilised to test the theory that social cognitive impairments are present within the homeless population.

2.9 Participant Characteristics

In total, 8 homeless men were recruited and completed testing. All men were unemployed and primary English speakers, their ages ranged from 34 to 67 (M=51, SD=11). Most participants (apart from one) reported a history of head injuries and substance use. The recruitment site was a male-only hostel, therefore the study recruited only men. This reflects the demographic of people who are homeless (Office for National Statistics, 2021), in addition, homeless women are more likely to "couch surf" or reside in a different type of supported accommodation (Shelter, 2021).

3. RESULTS

This section will provide an outline of the descriptive statistics of the sample, an inferential analysis of the data, and finally a case series analysis.

3.1 Group-Level Descriptive Statistics

Descriptive statistics were used to look at the mean and SD of the age-scaled scores derived for each subtest of the cognitive assessment; scaled scores can be evaluated relative to a mean score of 10. A total of 20 cognitive subtests were included in the analysis. The data was also scrutinised for skewness and kurtosis; the skewness value indicates the shape of data distribution and should be less than 1, while kurtosis shows the peak or dispersion of data distribution and should be less than 3.

For ease of exploration, the subtests were divided into two groups: cognitive subtests and social cognition. The cognitive domains shown in Table 2 include the scaled scores of optimal ability, verbal attention and working memory, executive functions, verbal, and visuospatial functions, learning and retrieval. Visual inspection of Table 2 shows relative sample weakness in several cognitive domains; working memory, coding, semantic fluency, executive functions, figure copy, story learning and recall, word list recall and figure copy delayed recall were at least 2 SD below the mean. On the other hand, the sample's performance on digit span forward, action fluency and picture naming, was around if not above the mean. The distribution of the figure copy and story learning scores appears positively skewed, with one participant scoring highly and the majority of the sample scoring lower. Relative strengths in word list recognition and list learning were also noted.

The descriptive statistics of the social cognition measures suggest a relative weakness in mentalising, but a relative sample strength in affect naming and both cognitive and affective empathy. The social cognitive tests scores are summarised in Table 3.

Table 2*Descriptive Statistics of Participants' Cognitive Scaled Scores (N=8)*

Subtest (SS)	Mean	SD	Min	Max	Skewness	Kurtosis
WTAR	6.63	4.984	1	13	.011	-2.058
Verbal Attention and Working memory						
Digits Forward	9.00	4.000	4	16	.357	.104
Digits Backward	6.63	3.962	1	14	.573	.909
Coding	5.00	2.878	1	10	.623	.004
Executive Functions						
Semantic Fluency	5.25	1.581	4	8	.904	-.695
Action Fluency	8.75	3.615	4	15	.317	-.244
Brixton Test	4.75	2.866	1	10	.576	.342
Verbal Function						
Picture Naming	10.75	1.909	7	12	-1.336	.775
Visuospatial Function						
Line Orientation	8.88	4.486	2	14	-.372	-1.636
Figure Copy	4.38	3.462	1	11	1.177	.750
Learning and Retrieval						
Story Learning	5.38	2.669	3	11	1.507	2.388
Story Recall	5.25	2.375	3	9	.714	-1.423
List Learning	6.00	4.209	1	13	.368	-.857
List Recall	5.88	4.016	1	13	.775	-.177
List Recognition	7.50	5.210	1	12	-.533	-2.168
Figure Recall	5.38	3.335	1	10	.149	-1.560

Table 3*Descriptive Statistics of Participants' Social Cognition Test Scores*

Subscale (SS)	Mean	SD	Min	Max	Skewness	Kurtosis
Cognitive Empathy	9.38	4.138	3	14	-.275	-1.260
Affective Empathy	10.88	3.357	6	15	-.309	-1.581
Strange Stories	5.25	3.012	1	10	.225	-.917
Affect Naming	9.25	4.132	2	15	-.610	.155

3.2 Group Level Exploratory Analysis

Due to the small sample size, a non-parametric test was used, as well as bootstrapping to resampling procedures available in SPSS. The data was compared to the putative norm through a one-sample Kolmogorov-Smirnov (K-S) N test with exact tests. The test looked at the variation between the sample's scaled scores and normally distributed scores with a mean of 10 and SD of 3 (Field, 2009). If the K-S test reveals a significant result, it can be concluded that the distribution in the sample is significantly different from a normal distribution with parameters of normative data (M=10, SD=3) transformations used in neuropsychological tests used in the study. Bootstrapping was used to account for the small sample, it's a process that does not assume the data is normally distributed so it can be confidently used on neuropsychological data which may not be. However, it should be noted that bootstrapping does not mitigate biased samples or sampling errors. The current sample may be considered biased as recruitment occurred from a population with known complex needs.

The one-sample K-S test revealed differences between the group's performance and the normative data in a number of cognitive domains (Table 4). Digit span backwards, coding, semantic fluency, Brixton test and figure copy were all substantially below the normative data.

Most memory subtests were also below the mean: story learning, story recall, list learning, list recall and figure recall (Table 4). These sample weaknesses will be considered while examining the social cognitive performance (Table 5).

Table 4

Cognitive Subtests Scaled Scores (SS) Compared to Normative Data (N=8)

Subtest (SS)	Most Extreme Difference	Kolmogorov-Smirnov Z	Exact Sig. (2-tailed)
Digits Forward	.250	.707	.613
Digits Backward	.506	1.430	.020
Coding	.659	1.863	<.001
Semantic Fluency	.748	2.114	<.001
Action Fluency	.284	.803	.458
Brixton Test	.784	2.217	<.001
Picture Naming	.373	1.054	.167
Optimal Ability	.452	1.279	.052
Line Orientation	.327	.925	.290
Figure Copy	.727	2.057	<.001
Story Learning	.716	2.026	<.001
Story Recall	.631	1.783	.001
List Learning	.534	1.510	.012
List Recall	.591	1.673	.003
List Recognition	.371	1.050	.170
Figure Recall	.577	1.633	.005

With regards to the social cognition subtests, on a group level, participants scored poorly on the mentalising task (Strange Stories) compared to the norms; the other social cognitive measures were not different to the mean. Affect empathy was nearly 1 SD above the mean.

Table 5

Social Cognition Scaled Scores (SS) Compared to Normative Data (N=8)

Subtests (SS)	Most Extreme Difference	Kolmogorov-Smirnov Z	Exact Sig. (2-tailed)
Cognitive Empathy	.248	.700	.625
Affective Empathy	.341	.965	.246
Strange Stories	.623	1.761	.002
Affect Naming	.202	.572	.839

While the K-S test made an arguably large number of comparisons (n 20), the p values were not corrected as each subtest assessed different areas of cognition that should be analysed. Even results that appear significant, are treated as indications of substantial differences from the normative data and due to the small sample size should be interpreted with caution.

3.3 Relationship Between Mentalising and Other Cognitive Functions

Non-parametric correlations were carried out to explore any relationships between the sample's performance on the strange stories task and the test scores.

Spearman's rank correlation (rho) was used to carry out the analysis. A notable correlation was found between mentalising and cognitive empathy, and affective empathy (Table 6) suggesting that they are related functions. As well as between affect naming and affective empathy.

Table 6

Spearman Correlation Among The Social Cognition Raw Scores

Variables	1	2	3
1. Strange Stories			

2. Cognitive Empathy	.838		
3. Affective Empathy	.647	.690	
4. Affect Naming	.758	.711	.735

Notable correlations were found between strange stories and judgement of line orientation, word list recall, digit span forward, digit span backward, coding, Brixton, picture naming, story learning, story recall, and figure delayed recall (Table 7). Additional notable correlations that were found are highlighted in bold in Table 7.

Table 7

Spearman Correlation between the Social Cognition and Cognition Raw Scores

Variables	Strange Stories	Cognitive Empathy	Affective Empathy	Affect Naming
Digit Span Forwards	.515	.293	.464	.309
Digit Span Backwards	.659	.571	.619	.590
Coding	.518	.407	.647	.527
Semantic Fluency	.560	.407	.587	.382
Action Fluency	.301	.287	.743	.667
Brixton Test	-.518	-.491	-.108	-.521
Picture Naming	.697	.504	.252	.765
Optimal Ability	.395	.381	.619	.566
Line Orientation	.806	.651	.819	.890
Figure Copy	.134	-.073	-.206	-.202
Story Learning	.717	.635	.467	.861
Story Recall	.473	.530	.542	.695
Word List Learning	.193	.311	.120	.073
Word List Recall	.617	.393	.319	.348
Word List Recognition	.306	.292	-.114	.154
Figure Delayed Recall	.494	.108	.275	.103

3.4 Case Series Analysis

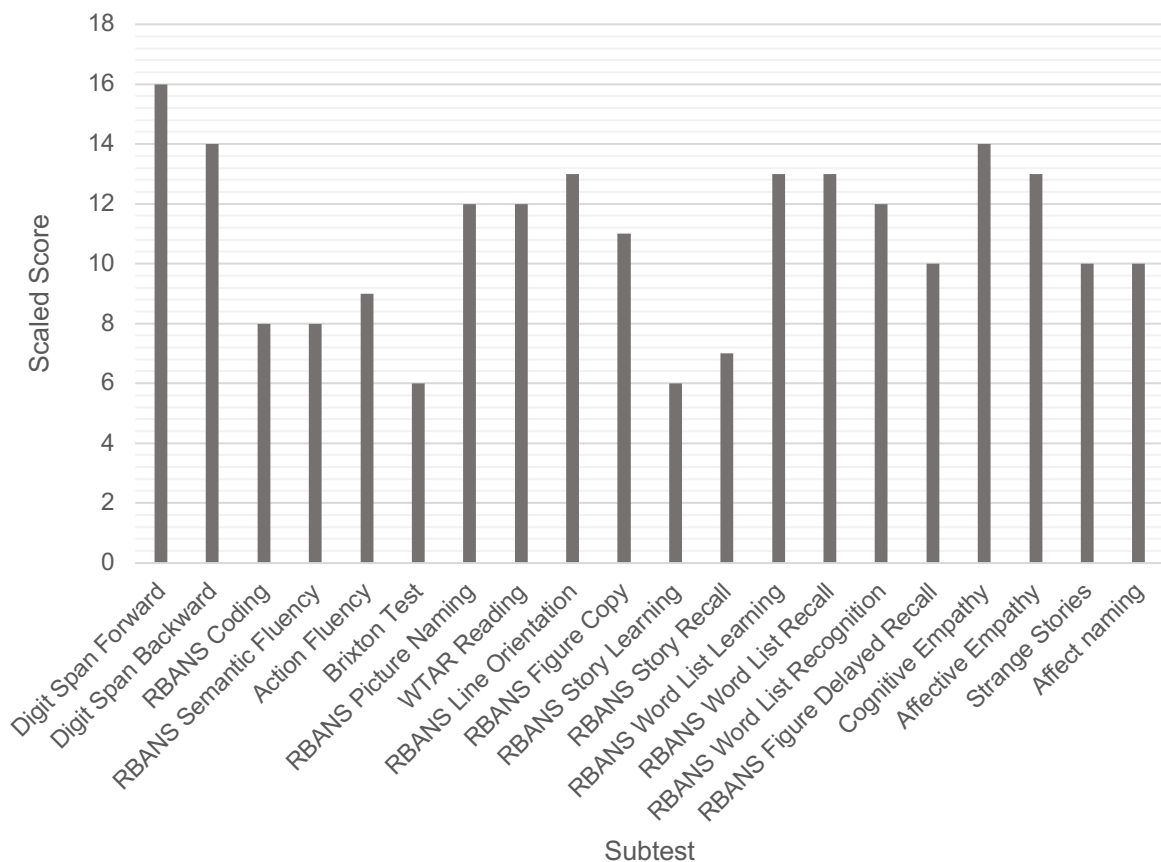
In line with previous neuropsychological research, and mindful of the small sample of the study, the following section will present an analysis of individual participant performances. This allows for qualitative observations of commonalities between demographic information as well as a detailed evaluation of individual performance which is not transparent in group-level analyses. Scores of subtests as scaled scores will be provided.

3.4.1 Participant One

Participant One was a black British English native speaker who left school at 22 with a vocational diploma in music; at the time of the assessment he was unemployed and 49 years old. On the MPAI-4, his key worker reported that he regularly used recreational drugs, Participant One had a diagnosis of schizophrenia. No difficulties with his cognitive abilities were reported, however, he was described as easily irritable, angry or aggressive when he was confronted with difficult topics. His key worker reported that he moderately struggled with appropriate social interactions, screaming and shouting to communicate when dissatisfied. He was described as having limited social involvement and struggling with participating in activities.

Figure 1

Participant One's Scaled Scores



3.4.1.1 Estimated premorbid functioning: based on his performance on a reading test and his demographic information, Participant One's optimum ability was estimated to be in the High Average range (75-90th percentile).

3.4.1.2 Working memory: on RBANS Digit Span Forward he exceeded expectations, performing the Superior range (98th percentile). He performed within expectation, in the High Average range (75-90th percentile) on a tasks measuring working memory (RBANS Digit Span Backward). This indicates that Participant One is able to hold information in mind, while also manipulating this information.

3.4.1.3 Learning and memory: he performed within expectations, in the High Average range (84th percentile) on a task measuring his ability to learn a list of words (RBANS List Learning); however, his performance was just within the Average range (51st-75th percentile) on a delayed recall trial and on a cued recognition trial,

remaining however within a satisfactory range. He performed in the Average range (50th percentile) on a visual recall task (RBANS Figure Recall). He scored well below expectation in the Low Average range on Story learning and recall trials (9th and 16th percentile respectively).

3.4.1.4 Executive functions: he performed slightly below expectation in the Average ranges (25th and 37th Percentiles) on tasks of verbal executive function (Semantic and Action Fluency) and well below expectation, in the Low Average range (9th percentile), on a rule anticipation task which measures non-verbal executive functions (Brixton Test).

3.4.1.5 Selective and sustained attention: on a task of visual selective and sustained attention (RBANS Coding) he scored below expectation, in the Average range (25th percentile).

3.4.1.6 Visuospatial: he performed satisfactorily on measures of visual abilities (RBANS Line Orientation and Figure Copy), in the Average ranges (51-75th and 63rd percentile).

3.4.1.7 Verbal: no difficulties were noted with his verbal skills as he performed in the Average range (51st-75th percentile) on a picture naming task.

Social Cognition: He exceeded expectations on self-reported cognitive and affective empathy abilities, with scores falling in the Superior and High Average ranges (91st and 84th percentile). However, he scored in the Average range (50th percentile) on both the affect naming and the strange stories task.

Overall, Participant one showed marked difficulties with executive functions, on a task that measured his ability to abstract, follow and switch rules. In addition, participant one appears to struggle with learning and recalling information given in a semantically related story structure. In relation to his social cognitive abilities, Participant One rated himself higher than average on cognitive and affective empathy. In contrast, he scored very slightly below expectation on a ToM task (Strange Stories) and emotion recognition; this performance cannot be explained by difficulties in verbal reasoning, short-term memory, or visual difficulties as there was

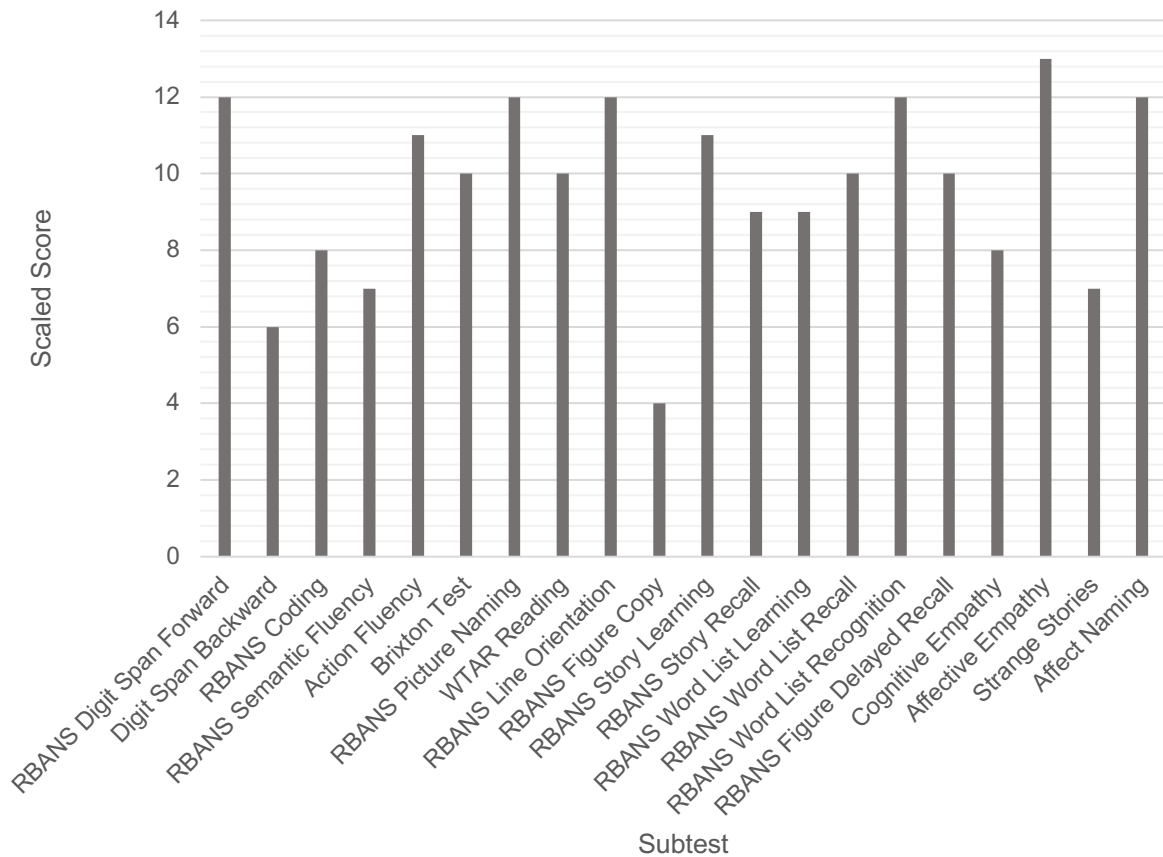
no evidence of impairments in these domains. However, it is possible that the general cognitive decline observed in the assessment has contributed to the lower than expected scores in mentalising and affect recognition.

3.4.2 Participant Two

Participant Two was a 51-year-old white British male primary English speaker who left school before age 15 with no qualifications; at the time of the assessment, he was unemployed. He sustained a brain injury when he was 18 months by falling off the roof of a car. He did not have memories of the accident, however, he was told that he had been unconscious and he was taken to a hospital. He did not report a history of any other illnesses affecting the brain. He reported noticing difficulties with his concentration. According to the MPAI-IV, he was described by his key worker as irritable and presented as aggressive and rude. His memory and problem-solving were not considered impaired by his key worker; however, he was noted to struggle with his mobility. He was reported to not engage in social activities within the hostel and was reported to use drugs.

Figure 1

Participant Two's Scaled Scores



3.4.2.1 *Estimated premorbid functioning:* participant two’s estimated level of functioning considering his demographic information and performance on the WTAR, was in the High Average range (75th percentile).

3.4.2.2 *Working memory:* he exceeded expectations on Digit Span forwards scoring in the High Average range (75th percentile), however, he performed below expectation on working memory, scoring in the Low Average range (10-24th percentile, Digit Span Backward).

3.4.2.3 *Learning and memory:* he scored in keeping with expectations or just below on all learning and delayed recall tasks (Story and List Learning, Recall and Recognition and Figure Recall), suggesting no impairments with his memory. A particular strength was noted in Story Learning.

3.4.2.4 *Executive functions:* he performed below expectation on the RBANS Semantic Fluency task, in the Low Average range (16th percentile). In contrast, his

performance fell in the Average range on Action Fluency (63rd percentile) and on the Brixton Test (50th percentile).

3.4.2.5 Selective and sustained attention: his performance did not indicate attentional difficulties, with performances on Coding within the Average range (25th percentile).

3.4.2.6 Visuospatial: on a judgment of line orientation task, Participant Two performed in keeping with expectations in the Average range (51-75th percentile). However, he performed below expectations, in the Borderline range (2nd percentile) on the RBANS Figure Copy task; he was able to perceive the 'Gestalt' of the picture, but his reproduction lacked the level of detail required to obtain a higher score.

3.4.2.7 Verbal: He performed within expectation, in the Average range (51-75th percentile), on the picture naming task and during the session was not observed to struggle verbally.

3.4.2.8 Social Cognition: on the QCAE Participant Two exceeded expectations, scoring himself in the High Average range (82nd percentile) on affective empathy, and within expectation in the Average range (28th percentile) on cognitive empathy. He again exceeded expectations on the affect naming test, scoring in the High Average range (75-90th percentile). However, he scored below expectation in the Low Average range (15th percentile) on the strange stories task.

Overall, Participant Two's performance suggests that his cognitive functions are preserved relative to an estimate of optimal ability. He presents with three areas of difficulty, in verbal executive functions (Semantic Fluency), working memory (Digit Span Backward) and visual-spatial abilities (Figure Copy). Participant Two appears to have a particular strength in recognising emotions from facial expressions, and he self-reports high levels of affective empathy. In contrast, his performance on a task that measures ToM suggests he might struggle with identifying the intentions of other people. This could not be explained by his cognitive functioning.

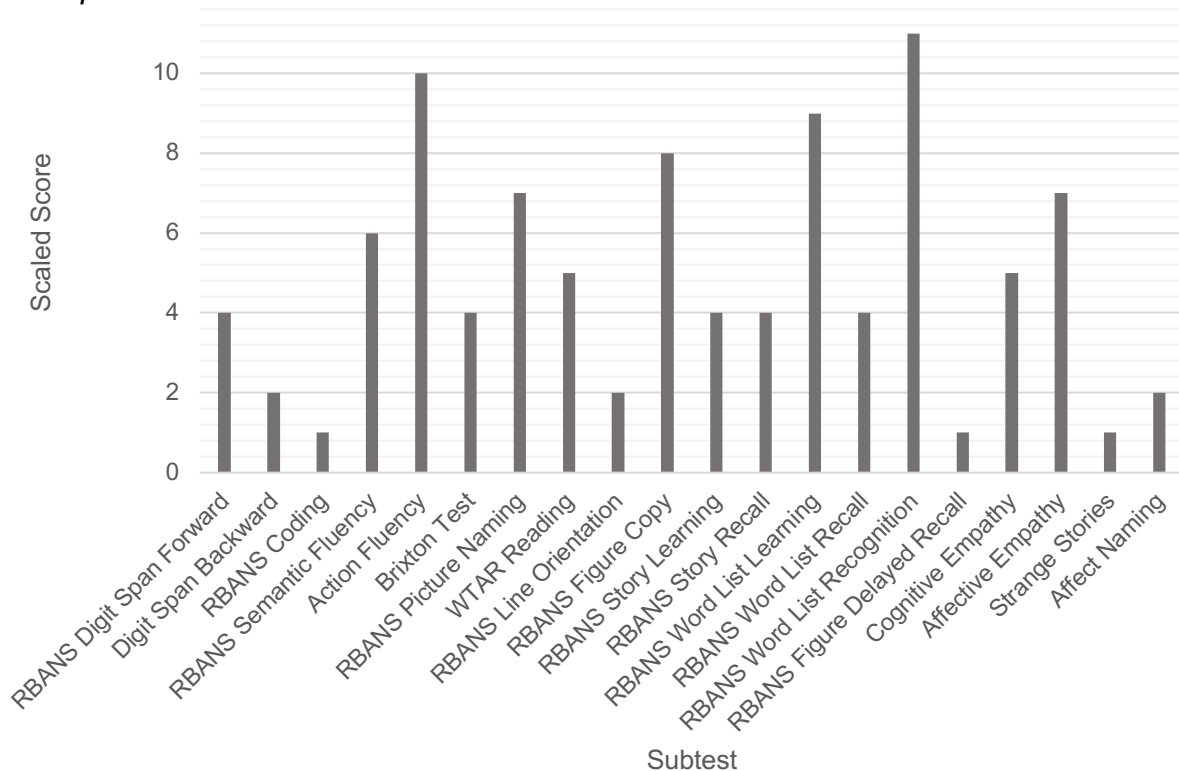
3.4.3 Participant Three

Participant Three was a primary English speaker of white ethnicity who left school at the age of 16 having obtained GCSEs; he reported receiving an A* in Maths and English. At the time of the assessment, he was 39 years old and unemployed. He reported his first head injury occurring at the age of 18, after falling and hitting his head on concrete during a fight. He remembers being told he sustained a concussion and feeling tired following the injury. At the time, he could not recall events just following the injury and he was told he had been unconscious. Participant Three estimated he sustained 10 or more blows to the head in his lifetime.

On the MPAI-IV, his key worker did not note any difficulties in his daily functioning. He was described as behaving appropriately with peers and staff; however, it was noted he fatigued quickly during the day. Participant Three was described as keeping mostly to himself and not engaging socially with peers or activities going on at the hostel.

Figure 2

Participant Three's Scaled Scores



3.4.3.1 Estimated premorbid functioning: based on the reading task, demographic information and Participant Two's general performance on the assessment, his optimal ability was estimated to fall in the Average range (25th to 49th percentile).

3.4.3.2 Working memory: he performed slightly below expectations, in the Borderline Range (2nd percentile) on the working memory task (RBANS Digit Span Forwards); and scored below expectations, in the Extremely Low range (<2nd percentile) on a mental manipulation of information task (Digit Span Backwards).

3.4.3.3 Learning and memory: he performed within expectations on Story Learning and Recall trials, in the Borderline range (2nd percentile) and exceeded expectations on the List Learning task as well as Recognition, in the Average range (37th to 63rd percentile). His performance on List Recall was in the Borderline range (2nd percentile).

3.4.3.4 *Executive functions*: participant Three's performance on verbal executive function tasks was satisfactory, falling within the Low Average and Average Ranges (9th to 50th percentile). On the Brixton test, he performed in keeping with expectation, in the Borderline range (2nd percentile).

3.4.3.5 *Selective and sustained attention*: on the RBANS Coding task, he performed below expectation in the Extremely Low range (<2nd percentile); as noted earlier, his performance was slightly better on the RBANS Digit Span Forwards task, in the Borderline range (2nd percentile).

3.4.3.6 *Visuospatial*: he performed satisfactorily on the figure copy task, in the Average range (25th percentile), but below expectation of the line orientation judgement task (Extremely Low range, <2nd percentile).

3.2.3.7 *Verbal*: He scored in the Low Average range (16th percentile) on the picture naming task. No speech impediments were observed during the assessment.

3.4.3.8 *Social Cognition*: participant Three rated himself as falling within the Borderline range (5th percentile) on cognitive empathy, and in the Low Average range (16th percentile) on affective empathy. He performed below expectation, in the Extremely Low range, on both the strange stories and affect naming tasks.

Overall, this pattern of performance suggests marked difficulties in selective and sustained attention, working memory, visuospatial, and non-verbal executive functions. While he performed within expectation on most measures, compared to the normative data available his performance is still indicative of difficulties as it falls in the Borderline range, within the 2-9th percentile. Relative strengths were noted in areas of verbal executive functions, figure copy and memorising a list of words. Participant Three appears to struggle with aspects of social cognition, however, it cannot be concluded whether these weaknesses are part of his general cognitive profile or a stand-alone difficulty. Nevertheless, his performance suggests a particular weakness in recognising facial expressions and mentalising, which is in line with his self-report on the QCAE.

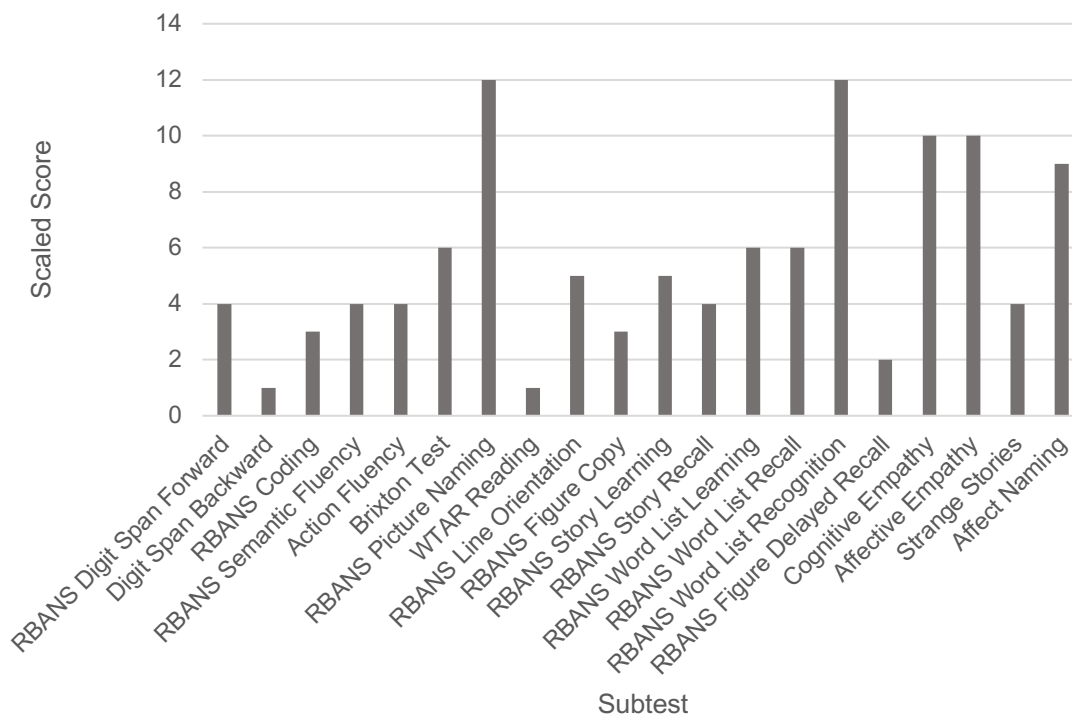
3.4.4 Participant Four

At the time of assessment, Participant Four was 57 years and unemployed. He was a white English-speaking man with a diagnosis of learning difficulties. It was unclear from the records how long if at all, he attended school. He reported sustaining three serious blows to the head: the first one occurred approximately 20 years prior while being detained in prison where he was hit on the back of his head; the injury required stitches, and although he did not become unconscious, he could not remember the events prior to the assault and reported feeling dizzy. The other two reported head injuries occurred five and three years ago caused by a fall and by an assault, respectively. He reported feeling dizzy after both injuries and losing consciousness following the most recent one.

On the MPAI-IV, his key worker reported difficulties with his functioning in terms of mobility, novel problem solving and articulation. It was reported and confirmed by him that he experiences flashbacks to past events. He was not reported to behave inappropriately or become irritable or angry unduly. However, he was reported to not engage socially with his peers or take part in hostel activities. He was described as requiring extensive support and supervision when carrying out most activities of daily living.

Figure 3

Participant Four's Scaled Scores



3.4.4.1 Estimated premorbid functioning: based on his performance on the assessment including the reading task and his demographic information Participant Four's optimal functioning was estimated to fall in the Borderline range (2nd percentile).

3.4.4.2 Working memory: he performed in the Borderline range (2nd percentile) on the RBANS Digit Span Forward task, and mildly below expectation, in the Extremely Low range (1st percentile) on Digit Span Backwards.

3.2.4.3 Learning and memory: he scored within expectation on the RBANS Story learning and recall trials, in the Borderline range (5th and 2nd percentile), he exceeded expectations on List Learning by scoring in the Low Average range (9th percentile). His performance on List Recall trial scored in the Extremely Low range (1st percentile). But he was satisfactory on the List Recognition trial (Average range, 51st-75th percentile).

3.4.4.4 *Executive functions*: he exceeded expectations in the Low Average range (9th percentile) on the Brixton Test. His performance remained within expectation in the Borderline range (2nd percentile) on tasks of verbal executive functions (RBANS Semantic and Action Fluency).

3.4.4.5 *Selective and sustained attention*: on the RBANS Coding task, he performed slightly below expectations in the Extremely Low range.

3.4.4.6 *Visuospatial*: his figure copy and judgement of line orientation were as expected, in the Borderline range (3rd to 9th percentile).

3.4.4.7 *Verbal*: his picture-naming skills were satisfactory, with his performance falling in the Average range (51st to 75th percentile). However, during the assessment, his speech was observed to be slurred at times.

3.4.4.8 *Social Cognition*: Participant Four rated himself in the Average range on both cognitive and affective empathy. He exceeded expectations, scoring in the Average range (25th to 49th percentile) on the affect naming task, but slightly below in the Borderline range (3rd percentile) on the strange stories task.

Overall, considering Participant Four's learning disability diagnosis and his limited schooling, it is not surprising his performance suggests difficulties in most cognitive domains. However, he showed relative strengths on a task measuring non-verbal executive functions (Brixton test) and on the list learning task. He exceeded expectations on the affect naming task, showing a relative strength in emotion recognition. With regards to his performance on the strange stories task, it cannot be interpreted whether this represents a difficulty with ToM, or if it was underpinned by his general cognitive abilities. The relative strength in affect naming may suggest a distinction between the construct of mentalising and emotion recognition. As noted earlier, emotion recognition is an evolved human capacity (Nieuwburg et al., 2021).

3.4.5 Participant Five

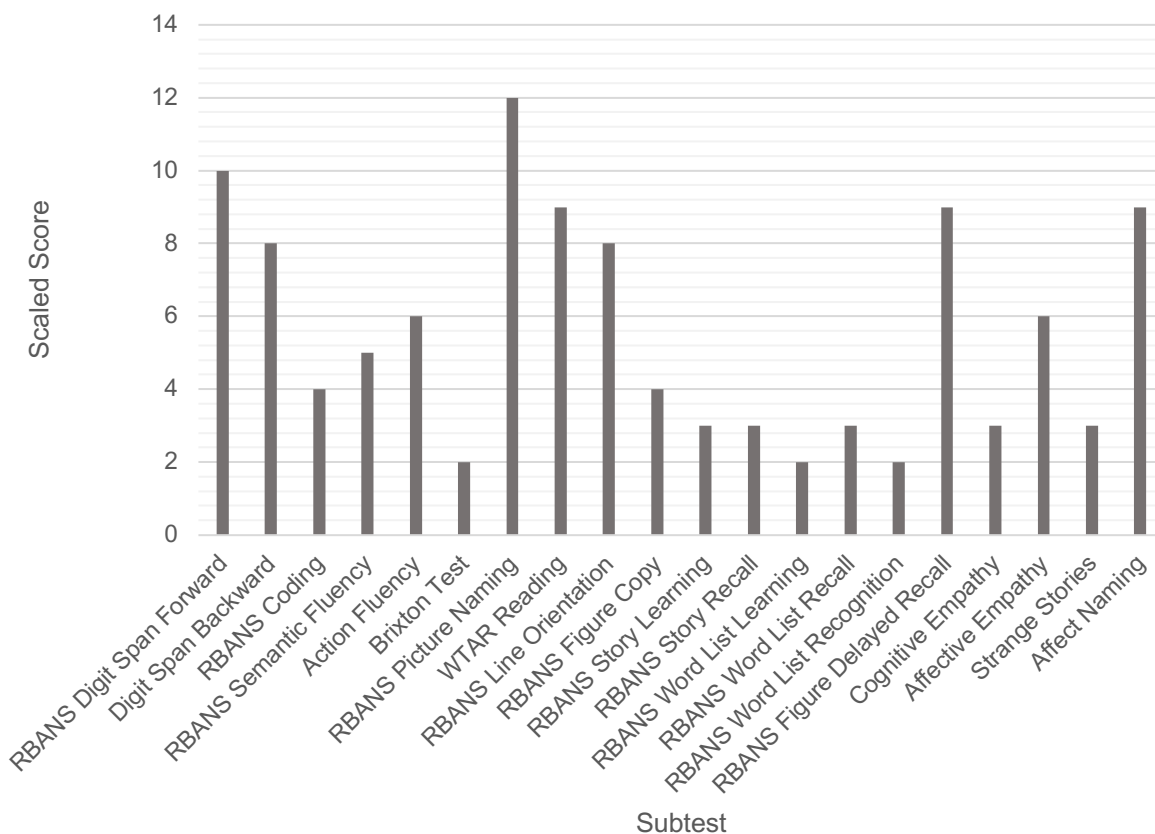
Participant Five was a black British man whose primary language was English. He left school with no qualifications at age 15 and was 62 years old and unemployed at

the time of the assessment. He did not report a history of head injuries, however, he did report using alcohol excessively and had recently noticed a decline in his memory.

On the MPAI-IV, his key worker indicated some difficulties with his mobility, attention and memory. They also described him as behaving inappropriately during social interactions and easily becoming irritable. It was reported that he did not engage socially with other residents.

Figure 4

Participant Five's Scaled Scores.



3.4.5.1 Estimated premorbid functioning: participant Five' optimal functioning was estimated in the Average range (25th to 49th percentile) based on the reading task and demographic information.

3.4.5.2 Working memory: his performance on RBANS Digit Span Forward fell within expectation in the Average range (50th percentile). He performed well below

expectation in the Extremely Low range (2nd percentile) on Digit Span Backward suggesting impaired working memory.

3.4.5.3 Learning and memory: he performed well below expectations, in the Extremely Low range (1st percentile) on verbal learning and recall trials. His performance on figure recall was also below expectation in the Borderline range (5th percentile).

3.4.5.4 Executive functions: on both tasks of verbal and non-verbal executive functions, Participant Five scored below expectations: in the Borderline range (5th percentile) on RBANS Semantic Fluency, Action Fluency and in the Extremely Low range (<1st percentile) on the Brixton Test.

3.4.5.5 Selective and sustained attention: on the Coding task, he scored well below expectation in the Borderline range (5th percentile).

3.4.5.6 Visuospatial: on judgment of line orientation task, Participant Five scored in the Low Average range (17th-25th percentile); he scored well below expectations in the figure copy task in the Borderline range (2nd percentile).

3.4.5.7 Verbal: no concerns were noted with his verbal skills, scoring in the Average range (51-75 percentile) on a picture naming task. No language problems were observed during the assessment.

3.4.5.8 Social Cognition: participant Five scored in the Extremely Low and Low Average ranges (1st and 9th percentile) on the self-report measure of cognitive and affective empathy respectively. He scored in the Extremely Low range (1st percentile) on the Strange Stories task; but was within expectations, in the Average range (37th percentile), on the affect naming task.

Participant Five showed marked impairments in the domains of learning and retrieval, with the exception of visual information recall. He also showed difficulties with tasks measuring executive functions, and other visuospatial abilities. He showed a relative strength in working memory and verbal abilities. With regards to his social

cognition, Participant Five self-reported difficulties with cognitive and affective empathy, suggesting that he not only struggles with “putting himself in the shoes of others” but that the emotional state of other people does not impact him greatly. He had good emotion recognition, but he performed poorly on the ToM task. This could indicate that despite recognising emotive facial expressions Participant Five struggles with understanding the intentions behind people’s behaviours. However, considering his general pattern of performance, his difficulties with mentalising are in line with his general cognitive functioning therefore not a stand-alone difficulty.

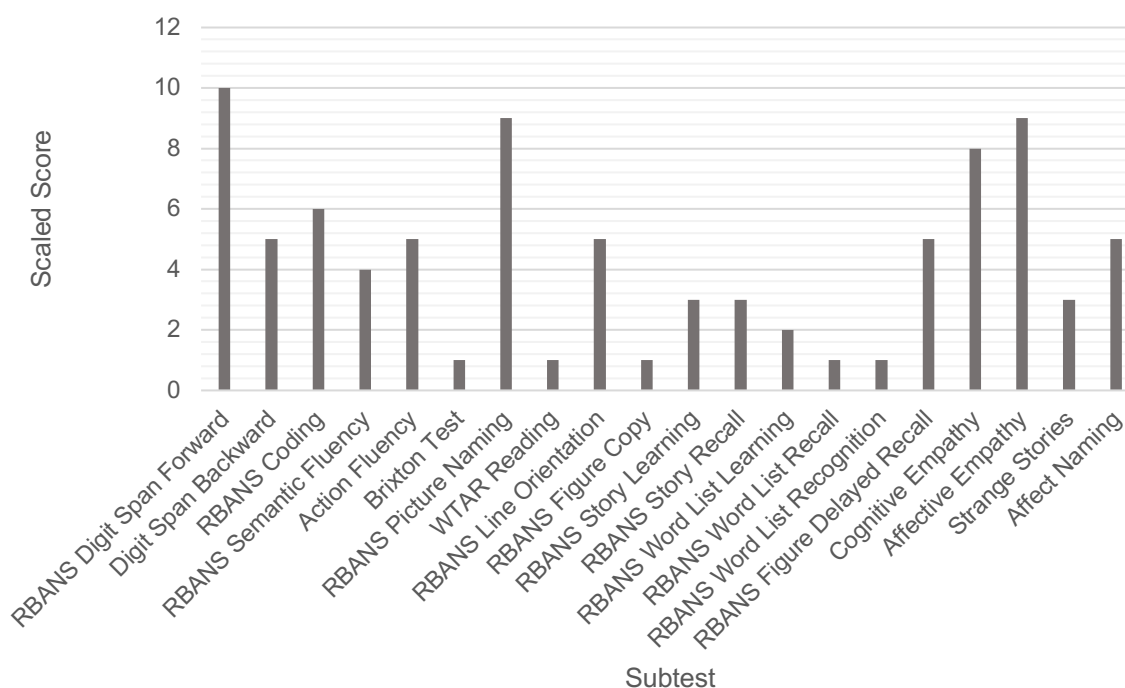
3.4.6 Participant Six

Participant Six was a white, English-speaking British man who left school at age 15 and at the time of assessment was 67 years and unemployed. He reported five head injuries, the first occurring around the age of 40 which left him unconscious for a few minutes. He reported becoming unconscious and feeling dizzy following most of his brain injuries.

No reports of socially inappropriate behaviour were noted by his key worker on the MPAI-IV, and no functional difficulties were observed either. He was described as socially engaged with his peers and taking part in hostel activities with no concerns.

Figure 5

Participant Six's Scaled Scores.



3.4.6.1 *Estimated premorbid functioning:* his optimal level of functioning was estimated to fall within the Low Average range (2nd to 9th percentile), based on the performance on the reading task, demographic information and performance on the assessment.

3.4.6.2 *Working memory*: he exceeded expectations on RBANS Digit Span Forwards, scoring in the Average range (50th percentile) and performed in the Extremely Low range (<1st percentile) on the Digit Span Backwards task.

3.4.6.3 *Learning and memory*: on all trials of verbal learning, recall and recognition, Participant Six performed in the Extremely Low range (1st percentile); on the RBANS Figure Recall trial on which he scored in the Borderline range (5th percentile).

3.4.6.4 *Executive functions*: participant Six scored in the Borderline range (2nd and 5th percentile) on RBANS Semantic Fluency and Action Fluency, and in the Extremely Low range (<1st percentile) on the Brixton Test.

3.4.6.5 *Selective and sustained attention*: on the Coding task, Participant Six performed at expectation in the Low Average range (9th percentile).

3.4.6.6 *Visuospatial*: he performed in the Borderline and Extremely Low range (3rd-9th and <1st percentile) on both visuospatial tasks (RBANS Line Orientation and Figure Copy).

3.4.6.7 *Verbal*: he performed above expectations on the picture naming task, in the Low average range (17th-25th percentile).

3.4.6.8 *Social Cognition*: on the self-rated QCAE, Participant Six scored in the Average range (25th and 37th percentile) for both cognitive and affective subtests. In contrast, he performed in the Extremely Low range (1st percentile) on the strange stories task and in the Borderline range (5th percentile) on the affect naming task.

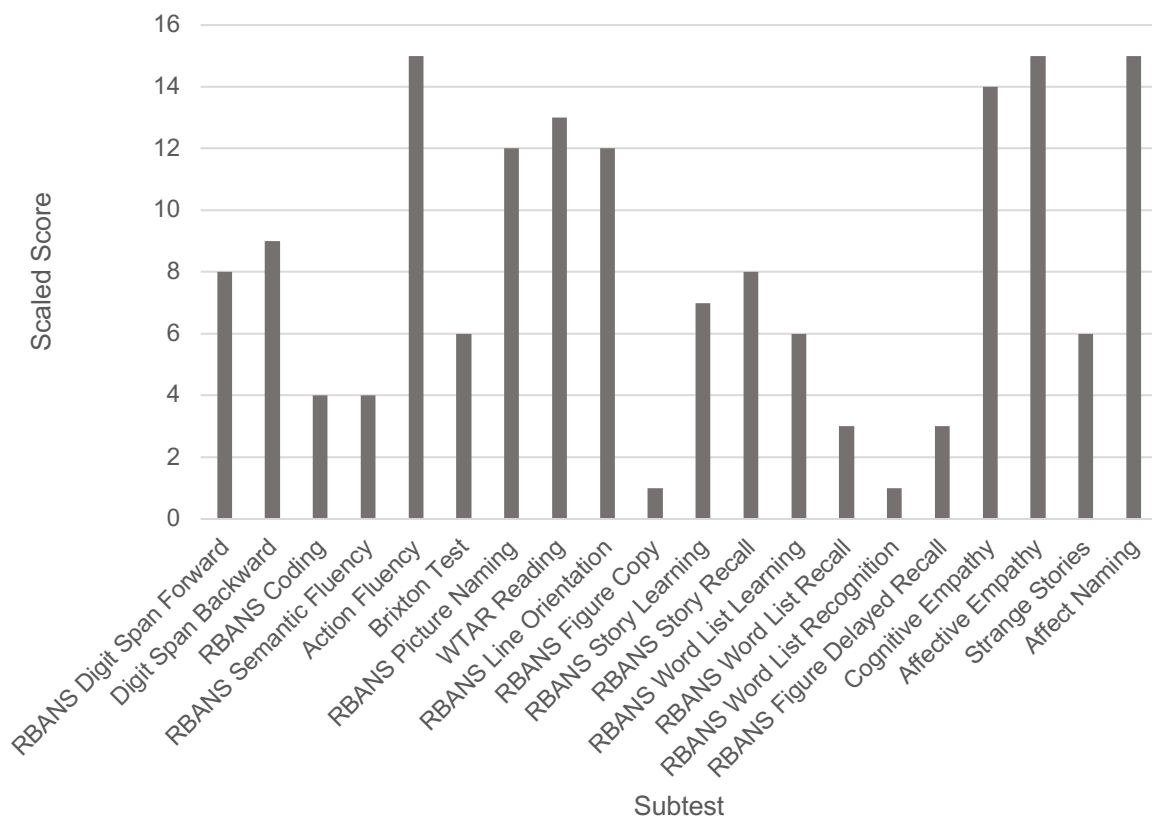
Participant Six's performance on the assessment suggests marked difficulties with most cognitive domains, including learning and retrieval, executive functions and verbal functions. A relative strength was noted with sustained attention and short-term memory. He did not report difficulties with empathy, however, he showed difficulties in recognising emotional expressions and with ToM. However, considering his pattern of performance across the assessment, the nature of these difficulties might be secondary to broader cognitive impairments.

3.4.7 Participant Seven

Participant Seven was a British Indian man whose primary language was English. At the time of assessment, he was 34 years old and unemployed. He reported sustaining two brain injuries in his youth, around the ages of 14 and 15. One was sustained by being hit with a hockey stick and the other one was caused by being hit in the face with a brick during a fight. He reported feeling dizzy after both injuries and losing consciousness following the injury caused by the hockey stick. Participant Seven also reported frequent sleepwalking episodes which result in him falling as he is awakened. He reported these episodes started three years previously and occur 2 or 3 times a month.

Figure 6

Participant Seven's Scaled Scores



3.4.7.1 Estimated premorbid functioning: based on the reading task, demographic information and overall assessment performance, Participant Seven's optimal functioning was estimated to fall high in the Average range (50th to 74th percentile).

3.4.7.2 Working memory: he performed within expectation in the Average range (25th) on the short-term memory task (RBANS Digit Span Forward). However, he performed below expectations in the Low Average on the task of mental manipulation of information (Digit Span Backwards, 16th percentile).

3.4.7.3 Learning and memory: on both word list and story learning trials, Participant Seven scored below expectation in the Low Average range (25th), he scored in keeping with expectations on the story recall trial, in the Average range (25th percentile). On all remaining recall trials, he performed well below expectation in the Extremely Low range (<2nd percentile).

3.4.7.4 Executive functions: on RBANS Semantic Fluency, he scored well below expectations in the Borderline range (2nd percentile), in contrast, he scored well above expectations on Action Fluency, in the Superior range (95th percentile). On the Brixton test, he scored below expectation in the Low Average range (9th percentile).

3.4.7.5 Selective and sustained attention: on the coding task, he scored well below expectation in the Borderline range (2nd percentile) and within expectation on RBANS Digit Span Forward, in the Average range (25th percentile).

3.4.7.6 Visuospatial: on the test of line orientation judgement, he scored in keeping with expectations in the Average range (51st-75th percentile). On the figure copy task, he scored well below expectations, in the Extremely Low range (<1st percentile). Participant Seven appeared to perceive the 'Gestalt' of the figure, however, lacked attention to minute details in his reproduction of the figure resulting in a low score.

3.4.7.7 Verbal: on the picture naming task, he performed satisfactorily in the Average range (51st-74th percentile). In conversation during the assessment, Participant Seven presented with satisfactory prosody, fluency, articulation, and comprehension.

3.4.7.8 Social Cognition: on the self-reported measure of cognitive and affective empathy, Participant Seven scored in the Superior range (91st and 95th percentile) on both subtests. His emotion recognition performance was more than satisfactory, placing him in the Superior range (95th percentile). On the ToM task, he performed below expectations in the Low Average range (9th percentile).

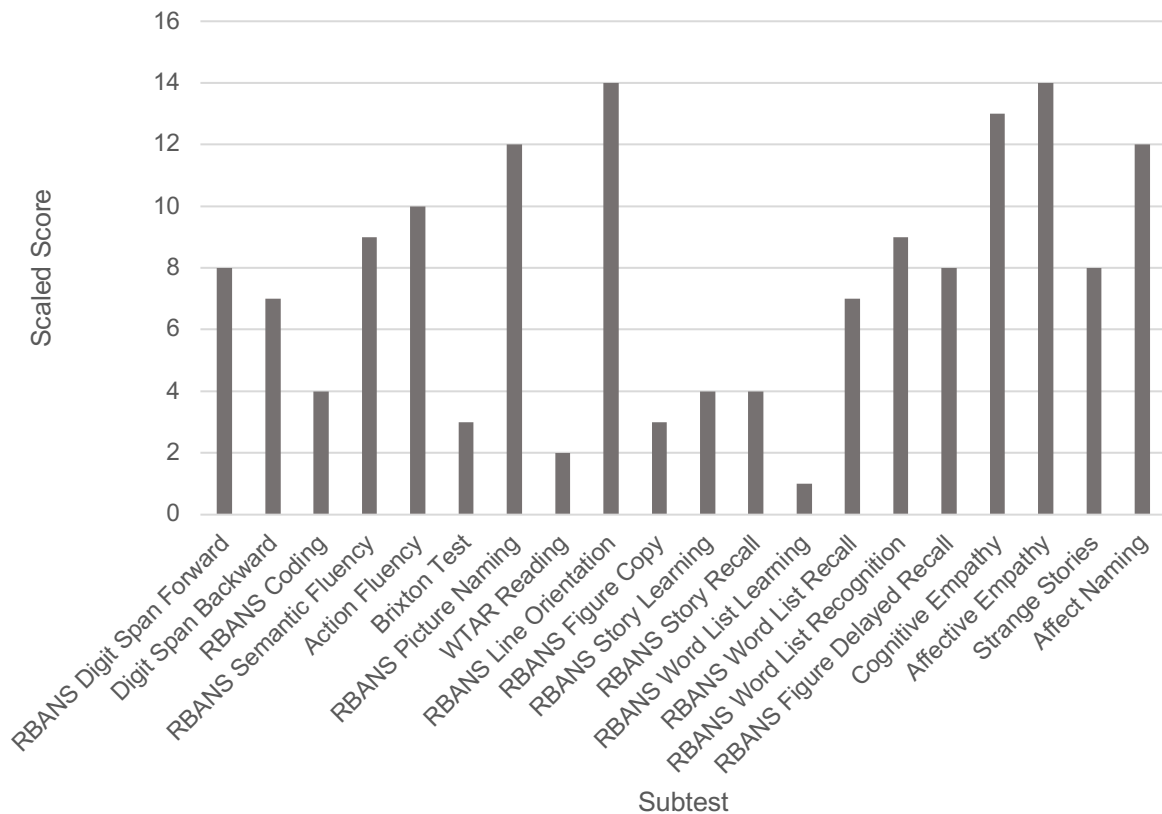
Participant Seven showed a decline in his cognition compared to his estimated optimal ability across a range of cognitive domains. He showed weaknesses in working memory, attention and some aspects of executive functions. His verbal abilities are a relative strength, which might mean that while Participant Seven appears verbally able and intact, he might encounter difficulties when more complex demands are placed on him. Most of his social cognitive functions appear to be intact, with the exception of mentalising, which might have declined in line with the other cognitive domains.

3.4.8 Participant Eight

Participant Eight was a white British man whose primary language was English. He was 51 years old and unemployed at the time of the assessment. He attended school for two years between the ages of 12 to 14 and has a history of severe childhood neglect. Unfortunately, his BISI and MPAI-4 were missing at the time of data analysis.

Figure 7

Participant Eight's Scaled Scores.



3.4.8.1 *Estimated premorbid functioning*: his optimal ability was estimated to fall between the Low Average to Average ranges (10th to 24th percentile), based on his overall performance on the assessment despite scoring in the Extremely Low range (1st percentile) on the reading task, in keeping with his low educational opportunity.

3.4.8.2 *Working memory*: he scored in the Average range (25th percentile) on the short-term memory task (Digit Span Forward) and in the Low Average range (16th percentile) on Digit Span Backward.

3.4.8.3 *Learning and memory*: he performed well below expectation on most tasks of learning and recall, ranging from Extremely Low (<1st percentile; Word List Learning) to the Borderline range (2nd percentile) on Story Learning, Recall and Word List Recall. He performed within expectations in the Average range (25th percentile) on the figure recall task and on word list recognition (25th percentile).

3.4.8.4 *Executive functions*: his performance on a task of verbal executive function (Action Fluency) fell within expectations, in the Average range (50th percentile); in contrast, he performed well below expectation on the Semantic Fluency task in the Borderline range (2nd percentile) and in the Extremely Low range on the non-verbal task (Brixton test, 1st percentile).

3.4.8.5 *Selective and sustained attention*: on the Coding task, Participant Eight performed well below expectations in the Borderline range (2nd percentile).

3.4.8.6 *Visuospatial*: on the figure copy task he performed well below expectation in the Extremely Low range (1st percentile); while he appeared to have perceived the “Gestalt” of the figure, Participant Eight lacked the attention to detail to reproduce the figure adequately. In contrast, on the Judgement of Line Orientation task, he performed above expectations in the High Average range (75th percentile).

3.4.8.7 *Verbal*: on the picture naming task, Participant Eight performed within expectation in the Average range (70th percentile). As noted, his reading score was extremely low in the 1st percentile.

3.4.8.8 *Social Cognition*: on the self-report task on cognitive and affective empathy, he performed well above expectation in the High Average and Superior ranges (84th and 91st percentile); he performed similarly on the affect naming task, in the High Average range (75th percentile) and within expectation in the Average range (25th percentile) on the strange stories task.

Overall, Participant Eight appears to have an impairment in the domains of learning and recall, working memory, and non-verbal executive functions. He also appears to have relative weaknesses in some aspects of visuospatial skills and verbal executive functions. His performance on the social cognitive tasks may be representative of his potential, as he scored within and above expectations on all tasks. Despite the lack of educational opportunities, poor literacy and concept formation, Participant Eight showed good potential in his cognitive abilities and no difficulties in social cognition.

3.5 Summary of Case Series Analysis

The analysis above considered each participant's performance on the assessment in depth. For each participant, an interpretation of the findings was offered considering their demographic information, informant report and performance on the tasks. From this qualitative analysis, common areas of impairment across participants were noted. Most participants shared a history of multiple head injuries, some resulting in loss of consciousness and memory. All participants were unemployed and most were reported to struggle with social engagement. Some participants were described to behave socially inappropriately and struggle with anger and irritability when their needs are perceived as not being met.

The most common impairment observed in seven participants was in mentalising, based on their performance in the Strange Stories task, followed by executive function and working memory difficulties, present in six participants. Learning and recall difficulties were observed in five people from the sample, and difficulties in attention and visuospatial skills were found in four people. Finally, the least common impairments were observed in affect naming, which was impaired in three participants, and verbal skills which were reduced in two participants. The case series analysis results should be interpreted with caution as they are of descriptive nature and of a small sample size (N=8). Nevertheless, there seems to be a problem in mentalising, sometimes accompanied by a general decline in cognition, particularly in executive functions and memory skills, but not always. The results also suggest that impairment in mentalising does not seem to be related to difficulties in affect naming, suggesting that emotion recognition skills remain relatively intact in

the context of cognitive impairment. It also suggests the two constructs are sufficiently distinct that impairments in one construct are not necessarily linked to problems in the other.

The second most common difficulty was in executive functions, which is a construct that may underlie the performance of the strange stories task. Both cognitive domains share some neuronal substrates, particularly the prefrontal cortex, however, the dorsolateral prefrontal cortex is more involved in executive functions while the medial prefrontal cortex is involved in mentalising. While executive functions are responsible for goal-directed behaviour, planning, cognitive flexibility, and impulse control, whereas mentalising is responsible for understanding the intention behind behaviour, both are required for solving social problems.

Difficulties in working memory, learning and retrieval may also underlie poor performance on the strange stories task. While all efforts were made to reduce the burden on memory by providing written stories, a good portion of the sample had literacy difficulties which might have affected prose comprehension. Working memory is also needed to take the time to problem-solve to answer the question posed by the task while not forgetting key components of the story.

Most striking was the substantial and reliable difference between performance on strange stories and affect naming versus self-reported empathy. Most of the participants rated themselves as average or above for cognitive and affective empathy, two people as Average and two people in the Low Average or Borderline ranges. It would be helpful for further research to explore whether people who are homeless have developed higher than average empathy skills, perhaps by pairing the self-report measure with an objective measure of empathy. Finally, based on the generally satisfactory group's performance on recognition tasks there were no indications of dissimulation for any of the participants.

4. DISCUSSION

There is growing evidence of higher rates of brain injuries and cognitive impairments in people who are homeless, compared to the general population. Poor cognition has been hypothesised to be a contributing factor to causing and perpetuating homelessness. A better understanding of the cognitive functioning of homeless individuals is needed to design services that meet their needs; while previous research has investigated the prevalence of brain injuries, few studies have attempted to understand cognitive weaknesses and no study to date has focused on social cognitive abilities. Social cognition refers to the set of cognitive skills involved in navigating and interacting in the social world. While there is not a universally recognised definition or construct of all aspects of social cognition, among psychologists, mentalising, empathy and emotion recognition have often been considered part of the construct. To date, this is the first study that addresses social cognitive impairments in a sample of homeless men.

The study sought to answer the following three research questions:

- Does a sample of the homeless population show cognitive impairments?
- If so, does the sample show impairments in social cognition?
- Are observed weaknesses in social cognition secondary to other primary disorders of cognition or are they independent?

Eight men ages 31 to 62 years who live in a homeless hostel were recruited through the NHS Brain Injury Clinic operating within the hostel. They completed a battery of tests that measured their memory, attention, working memory, verbal fluency, executive functions, optimal ability, and visuospatial, and social cognitive skills. All men shared similar demographic attributes; the majority had left school at 15, were unemployed at the time of assessment and had a history of head injuries. Because the present study did not explore causal factors into homelessness, information about the history of being homeless and whether the head injuries predated

becoming homeless was not collected. An informant measure was also collected where possible and included in the case series analysis.

The following findings must be interpreted with caution due to the study's small sample size and the use of inferential non-parametric tests. The case series analysis suggested that the participants' optimal ability level ranged from Borderline to High Average, showing large range within the sample. The most common difficulties were observed in mentalising, executive functions, working memory, learning and retrieval. Therefore, the case series analysis suggested a range of cognitive impairments including but not limited to poor ToM. The results of the case series analysis were broadly corroborated by the inferential statistics, suggesting that the participants in the study showed difficulties in several cognitive domains, including an aspect of social cognition.

4.1 Contextualising the Findings in the Literature

4.1.1 Cognitive Functioning

Compared to the normative data, the study's sample performed significantly below the norm in the domains of working memory, selective and sustained attention, functions, learning and retrieval, and visual skills. This is consistent with previous research that has identified high rates of cognitive impairment in homeless populations using cognitive screening tools such as the Mini Mental State Examination (MMSE) or brain injury screening measures such as the Brain Injury Screening Questionnaire (BISQ) (Burra et al., 2009; Joyce and Limbos, 2009; Okamura et al., 2017). The MMSE is a screening tool used to detect possible dementia, however, it does not represent an in-depth evaluation of cognitive functioning. The present study used a battery of tests that provide a more in-depth assessment of cognitive function, therefore adding to the strength of previous findings. Similar results were reported by previous studies that employed rigorous neuropsychological test batteries. For example, Andersen et al., (2014) administered the RBANS to a sample of thirty-four residents of an urban homeless shelter and found that residents with a history of TBI performed worse compared to a group of homeless residents that did not report a history of TBI. The only difference they

found between the groups was in attention, however, poor scores were reported on all cognitive domains assessed by the RBANS. Poor attention was also found in the present study as part of the coding task.

In line with a study examining mental illness and learning disabilities, Nishio et al., (2015) administered the WAIS-III, measuring participants' verbal comprehension, working memory, perceptual reasoning and processing speed, and finding a 61% prevalence rate of learning disabilities in a sample of 18 homeless men. In line with poor perceptual reasoning, the participants of the present study performed poorly on the figure copy task. However, on a qualitative evaluation of their drawings, it was apparent that while all participants could perceive the "gestalt" of the figure, they lacked attention to detail in their reproduction. A possible reason for this may be the unfamiliarity with the task, considering the low rate of educational opportunity. Executive functions have not been widely assessed in previous studies with the exception of two studies. Rogoz and Burke (2016) found poor scores on the trail-making test and verbal fluency and Schutt et al., (2009) found that difficulties in EF were related to significant difficulties in self-care and higher rates of challenging behaviours in formerly homeless people living alone. The present findings add to the previous evidence and suggest a particular weakness in the capacity to spot patterns and relationships between objects in the environment as well as the ability to adjust strategy based on feedback (Brixton test).

The results also suggested a group level impairment in learning and retrieval of new information. Similar results were found in a study conducted by Stergiopoulos et al., (2015) who found that a large sample (N=1500) of homeless adults showed impairments in verbal learning and recall as measured by the Hopkins Verbal Learning Test-Revised. Previous studies have also used reading tests as measures of optimal ability. In the present study, performance on the reading tests was often lower than performance on the other cognitive tasks. Reading ability is closely linked with educational opportunity which is often limited in homeless people. The results of a few men in the study suggested they had greater potential, and their performance on reading tasks may not be suitable to measure optimal ability in homeless people for which less educational opportunity and poor literacy is a feature. Alternative ways to ascertain optimal ability are the 'best performance' or demographic approach. The

former uses the best scores of an assessment as an indication of the previous level of functioning, assuming these areas have been preserved. One limitation of this approach is the potential for overestimating ability based on special interests or talents, as well as the potential of underestimating previous ability when there is a global impairment of cognition. The demographic approach assumes that socioeconomic status and ability are related, taking into account years of education and type of employment. Therefore, this approach would not be suitable to estimate optimal functioning in homeless adults as they often have not had the same educational opportunities.

Although the present study did not investigate the aetiology of the cognitive impairments, previous studies have suggested that aetiology is likely complex, and moderated or mediated by demographic differences such as level of education, age, gender, childhood poverty and clinical variables such as severe mental health difficulties and substance misuse (Stergiopoulos et al., 2015).

In summary, the sample of homeless men who took part in this study presented multiple zones of cognitive impairment consistent with existing research. This evidence of cognitive weaknesses will be taken into account when reviewing and interpreting the findings from the social cognitive tasks.

4.1.2 Social Cognition

The study examined three aspects of social cognition: mentalising, empathy (cognitive and affective) and emotion recognition. The sample did not show difficulties in the latter two constructs at an individual level or in group analysis. Therefore, there is no indication based on the current study that people who are homeless struggle with recognising emotions expressed through facial expressions or with empathy. However, due to the small sample size, and as this was the first study to date to assess social cognition in the homeless, further studies are needed to confidently make this conclusion. Moreover, the empathy measure relied on a self-reported view that participants had of themselves with respect to cognitive and affective empathy. A lack of insight might have contributed to these findings, although, there is no indication from previous literature that homeless men struggle

with empathy at a population level. Another possibility could be that the men who decided to take part in the study have greater empathic abilities and are a self-selected sample. The study did however find a group-level weakness in mentalising. It is challenging to interpret these findings within the context of previous literature as the literature on social cognitive impairments in homeless populations is scarce. Previous literature assessed social cognition as a predictor of future outcomes; for example, higher scores on a mentalising task predicted better community integration 12 months after being placed in a housing first facility (Green et al., 2009). In studies conducted with homeless veterans with a diagnosis of psychosis, better social cognition was positively correlated with resilience and better community integration (Greenberg et al., 2019). Llerena et al., (2017) found that deficits in cognition and social cognition were associated with a higher number of days spent rough sleeping. Crucially, the Strange Stories task relies on complex cognitive abilities including memory and verbal reasoning and it has been found to correlate with IQ (Livingston & Happé, 2017). As discussed in earlier chapters, all cognitive abilities rely on a multitude of domains; therefore, assessing one single ability is not possible (Lezak et al., 2012). As a result, it is possible that the weakness in the present sample is due to general cognitive decline rather than a specific impairment in social cognition. Nevertheless, the results suggest that difficulties in Theory of Mind should be investigated or at least considered when supporting homeless individuals. The sample's performance on the strange stories task cannot be explained by language difficulties as all participants were primary English speakers.

A significant correlation between mentalising and affect naming was found, indicating that better performance on one task was associated with better performance on the other. Mentalising was also correlated with visuospatial skills (line orientation), memory, attention (digit span forward and coding), working memory (digit span backwards) and picture naming. These correlations contribute to the interpretation that the social cognitive difficulties found in this sample co-occur and might be secondary to primary cognitive impairments. The sample of the present study did not show difficulties with empathy, which according to previous research (Green et al., 2009) is correlated with successful independent living in homeless people. The high scores on the QCAE were at odds with the group's performance on the other task. While mentalising and empathy represent separate aspects of social cognition, both constructs share elements which might contribute to and correlate in the present

study. It could be that the difference in scores is due to a lack of participant insight into their social cognitive difficulties, or that this sample of homeless men has exceptionally high levels of empathy. Future research should consider using a more objective measure of the construct in conjunction with self-report measures. The sample did not show difficulties in recognising emotions, and at an individual level, most participants were observed to perform at or above expectations. Emotion recognition may be a relative strength of this sample and not impaired in the homeless population. It could be hypothesised that living in adversity has led the participants to develop better skills in recognising emotions in other people for their own safety. Alternatively, this finding indicates that emotion recognition is a skill immune to cognitive decline. Affect recognition is a skill which has most likely developed through evolution and is especially relevant when living in socially adverse contexts.

In conclusion, an impairment in cognition and social cognition co-occurred in the examined sample of homeless men. It cannot be concluded whether these impairments were independent of each other or secondary to a primary impairment of general cognition. Further research is needed to explore the hypothesis that mentalising difficulties are secondary to EF impairments.

4.2 Implications and Recommendations for Clinical Practice

Psychologists may come into professional contact with homeless individuals, as well as people at risk of becoming homeless, in various clinical settings. Aside from those working in homeless hostels, psychologists working in acute settings such as psychiatric wards or A&E are likely to work with this population. Clinical psychologists working in brain injury settings are already aware of the clinical implications of cognitive impairments and should also be aware of the risk of homelessness in these clinical populations.

There is strong evidence from previous research that homeless people are likely to experience cognitive impairment due to a range of causes, including brain injuries (Chassman et al., 2022). Therefore, it is crucial for staff working in a homeless context to have an awareness of the implications of living with cognitive impairment, as well as the skills to identify and assess those in need of specialist support. While neuropsychology is a specialist branch of clinical psychology, all clinical

psychologists have developed competencies to work in these settings and therefore should draw on this aspect of their training even if not directly working in neuropsychology settings. Appropriate neuropsychological supervision should be provided to clinical psychologists working in homeless settings to help clinicians understand strategies and ways of working that are informed by the client's unique cognitive profile. The following section will outline the clinical implications of presenting with cognitive impairment, and generic neurorehabilitation strategies will be offered.

4.2.1 Homeless People With Cognitive Impairment

4.2.1.1 Poor working memory: WM is the ability to hold information in mind while ‘manipulating’ it, for example, the ability to carry out mental maths or follow a list of verbal instructions are activities that rely on WM. Homeless people with working memory difficulties may struggle with keeping up and remembering important information from a conversation. They may struggle with organising their thoughts or completing tasks that require holding information in mind. Strategies should be tailored to the individual needs; nevertheless, a good guideline for supporting WM is reducing the amount or “load” of information presented (Barman et al., 2016). This can be done by giving a small amount of information at the time and providing written or visual information.

4.2.1.2 Attention deficits: a person with poor attention may have difficulty staying focused, completing tasks that require sustained attention, and filtering out distractions. This can impact their ability to learn, work, and socialise. In the context of homelessness, it may be difficult to remain concentrated during important meetings with support workers in which important information is being shared and discussed. It may also be especially difficult to focus on a conversation in a noisy environment, for example in the context of a busy homeless hostel. To support these difficulties, reducing environmental distractions can be helpful (Barman et al., 2016). For example, reducing noise in hostel rooms, minimising interruptions during meetings and de-cluttering the environment are all strategies that could help support attention.

4.2.1.3 Executive Functioning Impairments: a person with poor executive functions may struggle with planning, decision-making, problem-solving, and task-switching. This can impact their ability to set and achieve goals, manage time, and prioritise tasks. For example, a person living in a homeless hostel with an impairment in executive functions may struggle to plan and organise their day to attend appointments on time. Supporting executive functions can involve providing instructions for completing a task which required a number of steps, providing support when planning a daily schedule, and supporting people to engage in monotasking rather than multitasking (Chung et al., 2013).

4.2.1.4 Poor Memory. A person with poor learning and retrieval may have difficulty learning new information and recalling previously learned information. This can impact their academic and occupational performance, as well as their ability to engage in social interactions. Homeless individuals with memory problems may struggle to remember important facts and information about their care or have difficulty recalling the names of people they have met before. Providing visual or written information in an easy-to-read format, stored in an organised way and keeping to a routine can help support learning and recall (Gopi et al., 2022).

4.2.2 Neuropsychological Rehabilitation

Chan et al., (2022) carried out a review of the rehabilitation interventions offered to homeless people with a TBI. They found a small number of studies that integrated TBI and homelessness into their interventions; Chan et al., (2022) suggested three areas of opportunity to tailor existing rehabilitation interventions to this population: a) offer regular cognitive screening, b) offer a comprehensive neuropsychological and functional assessment, c) make use of the multidisciplinary team. The purpose of the neuropsychological assessment should be to identify cognitive and functional needs and inform rehabilitation priorities and accommodations of the environment. Tailored changes to the environment have been found to support people with TBI to maintain their housing (Brocht et al., 2020). The current study offers additional evidence of the need to better adapt rehabilitation interventions for those who are homeless and present with cognitive impairment.

4.2.3 Changes in Behaviour

There is extensive evidence of the relationship between the frontal lobes and goal-direct behaviour. Damage to this area through head injuries, substance misuse or excessive alcohol use can lead to changes in behaviours, including loss of behavioural control (McAllister, 2008). Cortical damage caused by alcohol can lead to impulsivity and socially inappropriate behaviours as well as impulsivity which can contribute to the persistence of alcohol use disorder (Crews & Boettiger, 2009). Impulsive behaviours have been observed in patients who have sustained damage to both cortical regions and frontal lobes, and those who had sustained orbital lesions exhibited more risk-taking behaviours (Floden et al., 2008). Behaviours that challenge others are often observed in people in distress including those who are homeless; raising awareness of the possible organic cause of these behaviours may serve to avoid blaming individuals and formulating better strategies to support positive behaviour change.

4.2.4 Homeless People Who Present With Poor Social Cognition

While problems in social cognition might be related to primary cognitive impairment, it remains important to consider social cognition when working with homeless people. A person with poor mentalising abilities may have difficulty understanding their own and others' thoughts, feelings, and intentions. This can impact their ability to empathize, connect with others, and navigate social interactions. For example, they may struggle to understand sarcasm or irony in conversation, have difficulty attributing mental states, or have trouble with perspective-taking during conflicts. Relationship breakdown is one of the most common reasons for becoming homeless (Douglas, 2010). Therefore, interventions targeted at developing social cognitive skills could support social and familial relationships.

A way to support homeless people who may struggle with ToM is to provide psychoeducation about the complexities of social interactions; specific conversations in which multiple perspectives and explanations are offered may also be beneficial. Indirect ways of supporting those with mentalising difficulties are equally important and can include staff training and support which will be discussed in the following section.

Poor ToM which has been present since childhood and not explained by a brain injury is also related to Autism. In the absence of other neuropsychological difficulties, clinical staff should consider taking a detailed history with the client as well as with an informant, if possible. If there is an indication from their developmental history that they may have ASD, a referral to an adult ASD service should be considered if a diagnosis would be of benefit to a consenting individual.

4.2.5 Neuro-PIEs

The recommendations above are compatible with the Psychologically Informed Environments (PIE) approach, which is a widely used framework in the design and delivery of care in homeless hostels. One of the elements of a PIE is a system-wide psychological awareness and clinical use of a psychological theory or model. Commonly used models and theories in PIEs include mentalisation-based therapy, trauma-informed care and attachment theory, which have been successfully implemented in hostels across London. However, the addition of awareness of cognitive function at a service level could further shape ways of working; for example, influencing how important information is communicated to residents. A personalised neuropsychological formulation could also take psychological awareness one step further by sharing an understanding of the unique strengths and areas of need of each homeless person. Crucially this information must be shared with the person as well as the wider system, with their consent. Psychoeducation about the impact of their difficulties should be offered as well as referrals to more appropriate housing or specialist services. Evidence of the benefits of this approach can be found in case examples shared by the service NeuroTriage which highlights the severe social exclusion and the importance of social care and healthcare services working in conjunction (NeuroTriage, 2019). They also offer an estimate of the economic impact of their work for each case example by noting the reduction in the involvement of emergency services and other secondary care provisions since the specialist neuropsychological input.

Training can increase the psychological safety of staff (Hunt et al., 2021) and could be offered to all those who work in the hostel, including those who do not have a clinical or support role such as administrators or maintenance staff. Equipping them

with the knowledge and understanding of the neuropsychological processes that may be going on for homeless people will help with job satisfaction and retention. Staff also need to have a safe space to receive support for the emotional toll of their jobs.

Evidence-generating practice is already a feature of PIEs (Tickle, 2022), and it is especially important to keep collecting outcome evidence of the impact of Neuropsychologically informed PIEs. Within the "Spaces of Opportunity" element of PIEs (Tickle, 2022), it is important to create and foster working relationships with local neuro-rehabilitation services to support homeless people in accessing them and receiving specialist support if the support of the Neuro-PIE is not enough to meet their needs. Alternatively, strong consultation links with neuropsychology teams could be established to offer specialist support *in-house* by the PIE CP.

4.2.6 The Role of Clinical Psychologists In Prevention

The prevention framework argued by Fitzpatrick (2019) and discussed in the introduction chapter speaks about universal, targeted, crisis, emergency and recovery prevention. Clinical psychologists who work across different services such as generic MH, in-patient, forensic settings, and neurorehabilitation settings, as well as those working with care leavers, can actively contribute to targeted prevention. Preventative efforts could include advocacy, raising awareness, direct clinical work and influencing policy. Knowing the link between cognitive impairment and homelessness, clinical psychologists should advocate for service users' needs by communicating their formulations with the wider team in an accessible way. The benefits of a shared formulation in a multidisciplinary context include the wider sharing of specialist psychological knowledge and an effort to challenge individual blaming narratives. Particularly in a neurorehabilitation context, raising awareness of the impact of brain injury on functioning is very important. For example, it is common for people who have sustained an injury to their frontal lobes to have an impairment in insight, therefore not fully understanding their limitation while coming across verbally as highly functioning. In these contexts, it is key that the clinical psychologist ensures that teams such as social care or housing understand the daily support required to complete important tasks such as budgeting or paying rent.

Clinical psychologists can also offer reflective practice and training to key services such as supported accommodations or hostels. In a study by Yousefzadeh (2021) which interviewed psychologists working in adult MH, the participants hypothesised that increased awareness of the risk factors of homelessness could increase empathy towards service users. Working closely and increasing awareness among commissioners and stakeholders may also be a preventative strategy as these influential bodies review budget allocations impacting on service provisions (Yousefzahed, 2021).

Considering homelessness is the most extreme form of social exclusion, clinical psychologists should advocate for improving service access, for example by having a generous Did Not Attend (DNA) policy, or the number of engagement sessions on offer. Time dedicated to engagement has often been cited as essential to creating good working relationships with service users who present with complex needs. CPs can also choose to engage in political activism; Rahim and Cooke (2019) argue that the profession holds a powerful position within the NHS that can be harnessed in challenging social inequalities upheld by the current political choices.

4.3 Recommendations for Future Research

Further research with a larger sample size is needed to better understand social cognition in homeless people. Future research should also employ a variety of measures in addition to or instead of the ones used in the present study, for example, a more sensitive affect recognition task could be used instead of the simple picture based formats. To control for differences in educational opportunities and therefore literacy, a video format task might be more appropriate instead of highly verbal strange stories task. One such test available is the Movie for the Assessment of Social Cognition (MASC; Dziobek et al., 2006), which has been found to distinguish participants with a diagnosis of Asperger's from a matched control group.

Efforts should be made to recruit homeless women in future studies as they are underrepresented in current research, and a generous amount of time should be allocated to establish a trusting relationship with potential participants. Building good

working relationships is very important to engage with people who are experiencing homelessness as they have likely experienced social exclusion and may have attachment difficulties (Anderson & Rayens, 2004). Each opportunity for a positive engagement experience may be very beneficial to the individual and professionals as well as researchers should hold that responsibility.

In addition, validation studies for screening tools and assessment measures normed on the homeless population would be beneficial to create clinical measures that better suit this demographic. Moreover, future studies are strongly encouraged to continue using sensitive and robust neuropsychological assessments rather than screening tools to produce better quality data and consider using a standardised protocol across studies to help with the replicability of findings.

As suggested by Stone's et al., (2018) scoping review, more qualitative research to understand the experience of homeless people is needed: the impact and manifestation of poor social cognition could be explored during qualitative interviews. This research could aid in giving a voice to the most excluded and marginalised people in the country and shed more light on the mechanisms leading to homelessness in those with cognitive and social cognitive impairments. Both qualitative and quantitative research on the impact of adding clinical neuropsychological theories and approaches to PIE is also recommended.

4.4 Recommendations for Policy

This study adds to the evidence in the literature of the significant needs of the homeless population, the recognition of which should be reflected in policies influencing housing and healthcare. The relevant policies discussed in the introduction of this study were the Homeless Reduction Act (2017) and the NHS long-term plan (NHS, 2019).

The Homeless Reduction Act outlines the responsibility of professionals in the public sector to support people at risk of becoming homeless due to their housing situation (within 56 days). The list of responsible professions unfortunately does not include

clinical psychologists, nor any of the settings in which psychologists frequently work such as primary or secondary MH teams. However, CPs can have a role in the prevention of homelessness and therefore it is recommended the profession should be considered in future iterations of this policy. Moreover, experts by experience should be consulted in future relevant policies and clinical psychologists can play a role in advocating for their meaningful inclusion.

Providing better care for the homeless was discussed in the NHS Long Term Plan (2019), and it is important this issue remains on the agenda for the upcoming long-term plan with more funding and professions allocated to tackling and preventing it. Clinical psychologists could more actively contribute to public policies by sharing their expertise on the psychological impact of marginalisation and social injustice. For example, psychologists could contribute to the evidence presented to the All Party Parliamentary Group on Ending Homelessness. Currently, there is no unified public policy for Housing First, and it is up to local authorities and voluntary sectors to organise such provisions. Clinical psychologists could advocate for a national Housing First program, as there is evidence it alleviates the psychological harm and supports people to recover from their health and mental health difficulties whilst living in a suitable accommodation for their needs. The Clinical Psychology profession is therefore encouraged to continue collecting evidence of the impact of cognitive and social cognitive impairments. This data does not need to be shared only through academic publications but also through audits and service evaluations which are more compatible with the role of CPs.

4.5 Critical Review

While the present study offers novel tentative evidence on the social cognitive functioning of homeless men, it has several limitations. These limitations highlight the preliminary nature of the present study, with the recommendation that future research addresses the limitations to produce better quality evidence.

4.5.1 Generalisability

There are several factors that undermine the generalisability of the findings. Firstly, the small sample size affords only a limited representation of the wider population. Small N studies also lack statistical power: a greater sample size might have yielded more robust findings are allowed for parametric analyses. Parametric tests are still considered more statistically robust than non-parametric testing. However, bootstrapping and resampling procedures were used to mitigate this limitation in this study.

Recruiting only from one site might have also created a bias in the sample which again might not be generalisable to the wider homeless population. Another unintended consequence of the single-site nature of the study was that only men were invited to take part in the project. Women are often missed by traditional homelessness services as they more often “couch surf” and therefore often 'invisibly homeless'. Furthermore, the study did not consider other factors which might have influenced the participants' performance such as drug and alcohol use. To make the study as accessible as possible there were no exclusion criteria concerning use of substances during the research appointments.

Comorbidities were not recorded and considered during data analyses and a control group was not utilised; therefore, the performance could have been influenced by confounding variables that influence cognition such as drug and alcohol use and psychiatric diagnoses such as schizophrenia. However, it is still valuable to measure a “snapshot” of a person's cognitive strengths and difficulties at a particular time of their life, even if they are struggling with substance or alcohol dependence and do not have access to adequate nutrition or may be living with chronic stress. A neuropsychological assessment can identify current difficulties, while it does not shed light on the cause of the difficulties and it may be insufficient evidence for a diagnosis, it can still help to identify and offer strategies for functional impairments.

4.5.2 Neuropsychological Measures

There are a number of limitations to the tests that were used in the study, some of which relate to common issues in the field of neuropsychology. One of the

challenges is that the measures used have not been normed on the homeless population. Normative data could give researchers a better understanding of the “typical” cognitive functioning of homeless people.

Like most neuropsychological tests, the ones used in this study lack ecological validity due to the nature of being an artificial test administered in a controlled environment. This problem especially impacts social cognitive tests that do not reflect real-world scenarios.

The strange stories task involved the use of fictitious vignettes which were read out to the participants by the researcher. While every effort was made to maintain the same prosody, it is virtually impossible to control for possible prosody and environmental effects. The administration method also raises questions about the measure’s validity, as the task was normed with participants who read the vignette themselves. However, to ensure literacy ability was not a barrier to participating in the study, the researcher also read the vignettes to all participants. A theory of mind task for adults with poor literacy does not yet exist, future research should use a more appropriate task such as a recorded film version of the vignette.

Another issue with the study is that of inter-rater reliability, an important measure through which researcher effects are reduced. The SS task also involves the rating of participants’ responses which could be interpreted differently by different researchers. The present study did not employ a second rater method thus creating a possibility of bias in scoring the participants’ responses.

4.6 Reflexivity

Research reflexivity is important to hold in mind and appreciate the researcher’s influence on the design of the study as well as the interpretation of the finding and the recommendations made. While my epistemological stance was discussed in the methods section, it is also important to acknowledge personal reflections that have stemmed from carrying out the research. Although I am a clinician working in the

NHS who has met and offered therapeutic support to marginalised people, I have never worked with homeless men who are arguably the most marginalised people in our society. Throughout this project, I have learned the importance of developing trust with the participants to help them engage with psychological work while being aware that I was on a tight research schedule and needed to balance the competing clinical and academic demands of the Doctorate two positions which at times felt at odds with each other.

As a researcher, my priorities included recruiting as many participants as possible and collecting good-quality data. This involved ensuring I was following the ethical guidelines around participant safety and confidentiality. It was also important to establish good professional relationships with the staff, which meant choosing not to challenge views or comments that were shared even though I did not agree with them. As a clinician, I made an effort to make people's participation in the research as meaningful as possible by sharing their results and neuropsychological formulation with the team's CP. While ethical approval was granted for this information sharing, it is unusual for research data to be used in such a way; however, it was important to make the most of the clinical information gathered from people who may struggle to engage with other NHS services that are not built to fit their needs.

I have also had the opportunity to witness the assumptions colleagues had about the level of engagement of the residents and directly compare these to my experience of engaging the participants. There was a strong narrative that the participants would have not wanted to share their National Insurance Numbers (NIN), a requirement to receive the voucher provided to thank people for their participation. However, no participant expressed any reservations and provided their NIN immediately. Another assumption was that all of the participants would sell their vouchers for cash to buy drugs. And while I do not know what every participant did with their voucher, I helped a few purchase items online that they had wanted. These events have made me reflect that highly skilled "experts" working with a particular population are not immune to making generalised assumptions. It has also made me wonder whether anyone can become an expert on a group of people when human behaviour is so hard to predict and fully understand. However, these experiences are parallel to

other conversations I have witnessed or been a part of in other mental health settings. All professionals are fallible humans that sometimes make mistakes. I have found the psychoanalytical model of Malan's triangle of defence helpful when trying to compassionately understand where pejorative assumptions may come from, as well as find ways to challenge these. As noted by the NeuroTriage report (2019) a large proportion of people who work in the homeless sector are either exhausted by pathological empathy or cynical due to compassion fatigue.

On a personal level, I was motivated to conduct this research as I find homelessness to be one of the most infuriating injustices. The UK is the fifth-largest economy in the world and despite being one of the richest countries globally around 17% of the population live in absolute poverty and 13% in absolute low income, this includes 16% of children (House of Commons, 2023). These figures are predicted to rise with the cost of living crisis the country is currently facing. Despite this, current political priorities do not seem to be related to addressing this disparity, in the researcher's opinion.

Last but certainly not least, I would like to reflect on the obstacles that the system of NHS ethics poses to carrying out valuable research with clinical populations. While submitting the application earlier might have helped with recruitment, it is important to recognise the obstacles researchers need to overcome to produce meaningful research with some of the most marginalised groups. Research conducted in the NHS is valuable, and I hope over time the system will allow researchers to focus their time on engaging with potential participants rather than with bureaucracy.

4.7 Concluding Statement

The present study found that a sample of homeless men display cognitive impairment in a number of important cognitive domains, including executive functions and working memory. To the researcher's knowledge, this is the first study to measure social cognition in homeless participants, and while the results need to be interpreted with caution, a weakness in mentalising was found. Further research is needed to better understand the relationship between social cognition and homelessness. Nevertheless, social cognition is a construct which should be

routinely assessed in this population as part of a wider neuropsychological assessment. The field of homelessness would benefit from more input from clinical neuropsychology and clinical psychology within a wider multidisciplinary care team, and public policies should reflect this.

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6. APPENDICES

Appendix A: REC Favourable Opinion



North West - Preston Research Ethics Committee

Barlow House
3rd Floor
4 Minshull Street
Manchester
M1 3DZ

Telephone: 0207 104 8019

Please note: This is the favourable opinion of the REC only and does not allow you to start your study at NHS sites in England until you receive HRA Approval

10 August 2022

Miss Bianca Nardini
School of Psychology, University of East London
Stratford Campus
Water Lane
E15 4LZ

Dear Miss Nardini

Study title:	Investigating Social Cognition and Homelessness
REC reference:	22/NW/0177
Protocol number:	30/04/2022
IRAS project ID:	313420

Thank you for your letter of , responding to the Research Ethics Committee's (REC) request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Appendix A: REC Favourable Opinion (continued)

Good practice principles and responsibilities

The [UK Policy Framework for Health and Social Care Research](#) sets out principles of good practice in the management and conduct of health and social care research. It also outlines the responsibilities of individuals and organisations, including those related to the four elements of [research transparency](#):

1. [registering research studies](#)
2. [reporting results](#)
3. [informing participants](#)
4. [sharing study data and tissue](#)

Conditions of the favourable opinion

The REC favourable opinion is subject to the following conditions being met prior to the start of the study.

Confirmation of Capacity and Capability (in England, Northern Ireland and Wales) or NHS management permission (in Scotland) should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements. Each NHS organisation must confirm through the signing of agreements and/or other documents that it has given permission for the research to proceed (except where explicitly specified otherwise).

Guidance on applying for HRA and HCRW Approval (England and Wales)/ NHS permission for research is available in the Integrated Research Application System.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of management permissions from host organisations

Registration of Clinical Trials

All research should be registered in a publicly accessible database and we expect all researchers, research sponsors and others to meet this fundamental best practice standard.

It is a condition of the REC favourable opinion that **all clinical trials are registered** on a publicly accessible database within six weeks of recruiting the first research participant. For this purpose, 'clinical trials' are defined as:

- clinical trial of an investigational medicinal product
- clinical investigation or other study of a medical device
- combined trial of an investigational medicinal product and an investigational medical device

Appendix A: REC Favourable Opinion (continued)

- other clinical trial to study a novel intervention or randomised clinical trial to compare interventions in clinical practice.

Failure to register a clinical trial is a breach of these approval conditions, unless a deferral has been agreed by the HRA (for more information on registration and requesting a deferral see: [Research registration and research project identifiers](#)).

If you have not already included registration details in your IRAS application form you should notify the REC of the registration details as soon as possible.

Publication of Your Research Summary

We will publish your research summary for the above study on the research summaries section of our website, together with your contact details, no earlier than three months from the date of this favourable opinion letter.

Should you wish to provide a substitute contact point, make a request to defer, or require further information, please visit:

<https://www.hra.nhs.uk/planning-and-improving-research/application-summaries/research-summaries/>

N.B. If your study is related to COVID-19 we will aim to publish your research summary within 3 days rather than three months.

During this public health emergency, it is vital that everyone can promptly identify all relevant research related to COVID-19 that is taking place globally. If you haven't already done so, please register your study on a public registry as soon as possible and provide the REC with the registration detail, which will be posted alongside other information relating to your project. We are also asking sponsors not to request deferral of publication of research summary for any projects relating to COVID-19. In addition, to facilitate finding and extracting studies related to COVID-19 from public databases, please enter the WHO official acronym for the coronavirus disease (COVID-19) in the full title of your study. Approved COVID-19 studies can be found at: <https://www.hra.nhs.uk/covid-19-research/approved-covid-19-research/>

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

After ethical review: Reporting requirements

The attached document "After ethical review – guidance for researchers" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study, including early termination of the study

Appendix A: REC Favourable Opinion (continued)

- Final report
- Reporting results

The latest guidance on these topics can be found at <https://www.hra.nhs.uk/approvals-amendments/managing-your-approval/>.

Ethical review of research sites

[Omit this sub-section if no NHS sites will be taking part in the study, e.g. Phase 1 trials in healthy volunteers]

NHS/HSC sites

The favourable opinion applies to all NHS/HSC sites taking part in the study, subject to confirmation of Capacity and Capability (in England, Northern Ireland and Wales) or management permission (in Scotland) being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Non-NHS/HSC sites

I am pleased to confirm that the favourable opinion applies to any non-NHS/HSC sites listed in the application, subject to site management permission being obtained prior to the start of the study at the site.

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

<i>Document</i>	<i>Version</i>	<i>Date</i>
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Evidence of Insurance]	1	27 June 2022
IRAS Application Form [IRAS_Form_09052022]		09 May 2022
IRAS Checklist XML [Checklist_09052022]		09 May 2022
IRAS Checklist XML [Checklist_16052022]		16 May 2022
Letters of invitation to participant [Participant invitation]	1	16 May 2022
Other [Participant debrief sheet]	1	30 April 2022
Other [Agreement with Field Supervisor]	1	03 November 2021
Other [Responses to REC provisional outcome tables]	1	27 June 2022
Other [Demographics Form]	1.1	27 June 2022
Other [Demographic data]	1	27 June 2022
Other [ACS Emotion Recognition task]	1	13 July 2022
Other [QCAE]	1	13 July 2022
Other [Strange Stories task]	1	13 July 2022
Participant consent form [Consent Form]	2	27 June 2022
Participant information sheet (PIS) [PIS]	4	13 July 2022
Research protocol or project proposal [Research Protocol]	3	13 July 2022
Summary CV for Chief Investigator (CI) [CI CV]		30 April 2022
Summary CV for student [Student/CI cv]		30 April 2022

Appendix A: REC Favourable Opinion (continued)

Summary CV for supervisor (student research) [supervisor CV]	30 April 2022
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Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website:

<http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/>

HRA Learning

We are pleased to welcome researchers and research staff to our HRA Learning Events and online learning opportunities– see details at:

<https://www.hra.nhs.uk/planning-and-improving-research/learning/>

IRAS project ID: 313420 Please quote this number on all correspondence

With the Committee's best wishes for the success of this project.

Yours sincerely



**PP:Professor Karen Wright
Chair**

Email:preston.rec@hra.nhs.uk

Appendix B: HRA Approval



Miss Bianca Nardini
School of Psychology, University of East London
Stratford Campus
Water Lane
E15 4LZ

Email: approvals@hra.nhs.uk

22 September 2022

Dear Miss Nardini

**HRA and Health and Care
Research Wales (HCRW)
Approval Letter**

Study title: Investigating Social Cognition and Homelessness
IRAS project ID: 313420
Protocol number: 30/04/2022
REC reference: 22/NW/0177
Sponsor: University of East London

I am pleased to confirm that [HRA and Health and Care Research Wales \(HCRW\) Approval](#) has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

Please now work with participating NHS organisations to confirm capacity and capability, in line with the instructions provided in the "Information to support study set up" section towards the end of this letter.

How should I work with participating NHS/HSC organisations in Northern Ireland and Scotland?

HRA and HCRW Approval does not apply to NHS/HSC organisations within Northern Ireland and Scotland.

If you indicated in your IRAS form that you do have participating organisations in either of these devolved administrations, the final document set and the study wide governance report (including this letter) have been sent to the coordinating centre of each participating nation. The relevant national coordinating function/s will contact you as appropriate.

Please see [IRAS Help](#) for information on working with NHS/HSC organisations in Northern Ireland and Scotland.

Appendix B: HRA Approval (continued)

How should I work with participating non-NHS organisations?

HRA and HCRW Approval does not apply to non-NHS organisations. You should work with your non-NHS organisations to [obtain local agreement](#) in accordance with their procedures.

What are my notification responsibilities during the study?

The standard conditions document "[After Ethical Review – guidance for sponsors and investigators](#)", issued with your REC favourable opinion, gives detailed guidance on reporting expectations for studies, including:

- Registration of research
- Notifying amendments
- Notifying the end of the study

The [HRA website](#) also provides guidance on these topics, and is updated in the light of changes in reporting expectations or procedures.

Who should I contact for further information?

Please do not hesitate to contact me for assistance with this application. My contact details are below.

Your IRAS project ID is **313420**. Please quote this on all correspondence.

Yours sincerely,
Deanna Herron

Approvals Specialist

Email: approvals@hra.nhs.uk

Copy to: *Ms Catherine Hitchens*

Appendix C: Capacity and Capability Approval



Version 2, date 12/8/2022

Template Version No: 1.6

Authorisation When Using This Organisation Information Document as An Agreement

(when used as an Agreement, the Participating NHS Organisation is a “Party” to the Agreement and the Sponsor is a “Party” to the Agreement – collectively the “Parties”).

Authorisation on behalf of Participating NHS / HSC Organisation It is not intended that this confirmation requires wet-ink signatures, or a passing of hard copies between the Sponsor and participating NHS / HSC organisation. Instead, Sponsors are expected to accept confirmation by email from an individual empowered by the Participating NHS / HSC Organisation to agree to the commencement of research (including any budgetary responsibility, where the study involves the transfer of funds).	
^ Authorised on behalf of Participating NHS / HSC Organisation by:	
Name	[REDACTED]
Job Title	Service Director – R&D
Organisation Name	[REDACTED]
Date	16th November 2022

Appendix D: Consent form



UNIVERSITY OF EAST LONDON

Consent to participate in a research study

Investigating Social Cognition And Homelessness

Please Initial Box

I have read the information sheet and have been given a copy to keep. The nature and purpose of the research have been explained to me, and I have had the opportunity to ask questions about this information.

I understand what is being proposed and the procedures in which I will be involved.

I understand my involvement and the data collected, will remain strictly confidential. Only the researcher(s) involved in the study and the Brain Injury Clinic will have access to identifying data. We may break confidentiality if you disclose a risk of harm to yourself or others.

I understand what will happen once the research study has been completed.

I understand that I can withdraw my data from the research study up to 3 weeks from the date of assessment. After 3 weeks, the researcher reserves the right to use my anonymous data.

I consent to participate in the study.

Participant's Name (BLOCK CAPITALS)
.....

Participant's Signature
.....

Researcher's Name (BLOCK CAPITALS)
.....

Researcher's Signature
.....

Date:

Appendix E: Information sheet



Investigating Social Cognition And Homelessness

PARTICIPANT INFORMATION SHEET

You are invited to participate in a research study conducted by Bianca Nardini. Before you agree it is important you understand what your participation would involve. The purpose of this letter is to provide you with the information you need to consider in deciding whether to participate. Please take time to read the following information carefully. Your participation will not affect the care you currently receive, and there will be no personal benefit from taking part in the research.

Who has approved the study?

The study is sponsored by the University of East London and has received ethical approval.

Who am I?

My name is Bianca Nardini, I am a postgraduate student in the School of Psychology at the University of East London. This research is being conducted as part of my Professional Doctorate in Clinical Psychology and you are being invited to participate.

What is the research?

I am conducting research exploring Cognitive Functioning in people who are homeless, with an emphasis on social cognition.

Cognitive functioning includes learning, thinking, reasoning, remembering, problem-solving, decision-making, and attention. Social cognition refers to the way in which people use these skills in social contexts.

Description

Research suggests that one of the many causes of why people become homeless is an unrecognised difficulty in cognitive functioning. An additional reason may be the loss of social connections which might be partly due to difficulties in social cognition.

Why have you been asked to participate?

You have been invited to participate as you are currently a resident of the homeless hostel, you are over 18 and have no significant health problems that would stop you from taking part in the study. Your participation in the study, whether you decide to take part or not, will not affect the care you currently receive in the hostel.

What will your participation involve?

If you agree to participate, in addition to the usual tasks you would complete for the Brain Injury Clinic, we would like you to complete 3 extra paper and pencil tasks which will involve looking at pictures, reading or listening to stories, and completing a short questionnaire.

These additional tasks will take around 20 minutes and all of the tasks should take 65 minutes to complete.

You will be offered a £10 Amazon voucher to thank you for your time.

Appendix E: Information sheet (continued)

What are the risks of taking part?

You might find the tasks tiring, to minimise this you will be offered breaks throughout the assessment. Following your participation, you will be offered a meeting with a member of the psychology in hostel service to provide feedback on your results. The tasks can sometimes indicate that a person has suffered from a brain injury in the past. We may suggest a referral be made to a local brain injury service, but you can decide whether you wish to be referred.

How will we use information about you?

We will need to use information from the paper-and-pencil tasks you will complete. This includes the tasks you completed as part of your assessment with the Brain Injury Clinic and the three additional tasks that you completed.

We will also use some identifiable information about you. This information will include:

- Your name
- your age
- your gender
- the country you completed your education in
- years spent in education
- the first language you learned growing up

People will use this information to do the research to make sure that the research is being done properly.

Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study. All data will be anonymous

The information that you provide as part of the study will be shared with the Brain Injury Clinic as part of your assessment. The information you provide will be kept confidential. This means that it will not be shared with anyone apart from the services who you have agreed to share information with. However, we may break confidentiality if you disclose a risk of harm to yourself or others. You would be informed should this happen.

What will happen to the information that you provide?

We plan to publish the results of the study. All data will be anonymised, so no one can work out that you took part in the study. The results of the study are planned to be published, with only anonymised information included. Published anonymised data will be accessible to the public.

All identifiable information used for the research study will be kept securely, with hard copies stored in a locked cabinet on an NHS site and electronic data encrypted. Identifiable information used for the study will be destroyed at the end of the study. Anonymised electronic data kept for up to two years post study, for publication purposes.

What if you want to withdraw?

You are free to withdraw from the research study at any time without giving a reason. There will be no negative impact on the care you receive if you chose to withdraw from the study. You may also request to withdraw your data even after you have participated, provided that

Appendix E: Information sheet (continued)

this request is made within 3 weeks of the data being collected (after which point the data will be anonymised and analysis will begin, so withdrawal will not be possible).

What are your choices about how your information is used?

You can stop being part of the study at any time, without giving a reason, as long as you ask to do this within 3 weeks of the data being collected. After 3 weeks we will have started to analyse the data so it would not be possible to withdraw your data.

We need to manage your records in specific ways for the research to be reliable. This means that we won't be able to let you see or change the data we hold about you.

Where can you find out more about how your information is used?

You can find out more about how we use your information

- at www.hra.nhs.uk/information-about-patients/
- our leaflet available from Bianca Nardini or a member of the Psychology in Hostels team

Contact Details

If you would like further information or have any questions or concerns, please do not hesitate to contact me:

Principal Investigator: Bianca Nardini. Email: U2075221@uel.ac.uk

If you have any questions or concerns about how the research has been conducted please contact the research supervisor and/or the Patient Liaison Service (PALS) of the East London Foundation Trust.

- Dr Matthew Jones-Chesters. School of Psychology, University of East London, Water Lane, London E15 4LZ. Email: m.h.jones-chesters@uel.ac.uk
- PALS Freephone: 0800 783 4839 or Email: elft.pals@nhs.net

Appendix F: Debrief sheet



PARTICIPANT DEBRIEF LETTER

Thank you for participating in my research study on Social Cognition and Homelessness. This letter offers information that may be relevant in light of you having taken part.

What will happen to the information that you have provided?

The following steps will be taken to ensure the confidentiality and integrity of the data you have provided.

- Identifiable information will remain strictly confidential, with hard copies stored in a locked cabinet on site and electronic data securely stored.
- Information provided will be anonymised, using a unique identification number.
- Anonymised data will be accessible to the research team including the researcher and supervisor (contact details provided below).
- Anonymised data will be analysed and used in the write up of the research, which will be available to examiners and is planned to be published and readily available to the public.
- Once the study has been completed, identifiable information will be destroyed. Anonymised data will be kept for up to 2 years for publication purposes.
- You may withdraw at any time, without obligation to provide any reason. You have 3 weeks after data collection to request withdrawal of your data.

What happens next?

If you wish to receive a summary of your personal results, you will be offered an appointment with a member of the Psychology in Hostels team who will discuss your results and provide you with a written summary. If the results suggest you might benefit from a referral to a local brain injury clinic, we will discuss this with you and you will have the option to consent to an onward referral.

What if you have been adversely affected by taking part?

It is not anticipated that you will have been adversely affected by taking part in the research, and all reasonable steps have been taken to minimise potential harm. Nevertheless, it is still possible that your participation (or its after-effects) may have been challenging, distressing or uncomfortable in some way. If you have been affected in any of those ways you may find the following services helpful in relation to obtaining information and support:

Headway

Headway is the UK-wide charity that works to improve life after brain injury, providing vital support and information services.

Tel: 0808 800 2244; Email: helpline@headway.org.uk

Samaritans

Samaritans volunteers listen in confidence to anyone in any type of emotional distress, without judgement.

Tel: 116 123 (24 hours a day, 7 days a week); Email: www.samaritans.org

Appendix F: Debrief sheet (continued)

Mind

Mind are a charity who provide information and support on mental health issues.

Tel: 0300 123 3393 (9am to 6pm, Monday to Friday, except for bank holidays).

Email: info@mind.org.uk ; Text: 86463

Contact Details

If you would like further information about my research or have any questions or concerns, please do not hesitate to contact me:

Bianca Nardini E-mail: U2075221@uel.ac.uk

If you have any questions or concerns about how the research has been conducted please contact the research supervisor and/or the Patient Liaison Service (PALS) of the East London Foundation Trust.

- Dr Matthew Jones-Chesters. School of Psychology, University of East London, Water Lane, London E15 4LZ. Email: m.h.jones-chesters@uel.ac.uk
- PALS Freephone: 0800 783 4839 or Email: elft.pals@nhs.net

Appendix G: Psychometric conversion table

Scaled score	Percentile rank	Wechsler Qualitative Description	Z score	T Score
19	>99 th	Very Superior	+3.0	80
18	>99 th	Very Superior	+2.67	77
17	99 th	Very Superior	+2.33	73
16	98 th	Very Superior	+2.00	70
15	95 th	Superior	+1.67	67
14	91 st	Superior	+1.33	63
13	84 th	High Average	+1.00	60
12	75 th	High Average	+0.67	57
11	63 rd	Average	+0.33	53
10	50 th	Average	+0.00	50
9	37 th	Average	-0.33	47
8	25 th	Average	-0.67	43
7	16 th	Low Average	-1.00	40
6	9 th	Low Average	-1.33	37
5	5 th	Borderline	-1.67	33
4	2 nd	Borderline	-2.00	30
3	1 st	Extremely Low	-2.33	27
2	<1 st	Extremely Low	-2.67	23
1	<1 st	Extremely Low	-3.00	20

Appendix H: Substantial amendment REC approval



North West - Preston Research Ethics Committee

Barlow House
3rd Floor
4 Minshull Street
Manchester
M1 3DZ

Please note: This is the favourable opinion of the REC only and does not allow the amendment to be implemented at NHS sites in England until the outcome of the HRA assessment has been confirmed.

19 October 2022

Miss Bianca Nardini
School of Psychology, University of East London
Stratford Campus
Water Lane
E15 4LZ

Dear Miss Nardini

Study title:	Investigating Social Cognition and Homelessness
REC reference:	22/NW/0177
Protocol number:	30/04/2022
Amendment number:	313420.1
Amendment date:	09 September 2022
IRAS project ID:	313420

The above amendment was reviewed by the Sub-Committee in correspondence.

Ethical opinion

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved at the meeting were:

Appendix H: Substantial amendment REC approval (continued)

<i>Document</i>	<i>Version</i>	<i>Date</i>
Completed Amendment Tool [Amendment_Tool_Nardini_313420]	1	09 September 2022
Participant consent form [17.10.2022 Consent form for participants already assessed from the BIC]	2	17 October 2022
Participant consent form [17.10.2022Consent form. version 4]	4	17 October 2022
Participant information sheet (PIS) [17.10.2022Participant Information sheet for participants already assessed from the BIC]	2	17 October 2022
Participant information sheet (PIS) [17.10.2022Participant Information sheet]	6	17 October 2022
Research protocol or project proposal [17.10.2022+research+protocol]	3	13 July 2022
Summary, synopsis or diagram (flowchart) of protocol in non technical language [Consent flowchart]	1	12 September 2022

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

Working with NHS Care Organisations

Sponsors should ensure that they notify the R&D office for the relevant NHS care organisation of this amendment in line with the terms detailed in the categorisation email issued by the lead nation for the study.

Amendments related to COVID-19

We will update your research summary for the above study on the research summaries section of our website. During this public health emergency, it is vital that everyone can promptly identify all relevant research related to COVID-19 that is taking place globally. If you have not already done so, please register your study on a public registry as soon as possible and provide the HRA with the registration detail, which will be posted alongside other information relating to your project.

Statement of compliance


The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

HRA Learning

We are pleased to welcome researchers and research staff to our HRA Learning Events and online learning opportunities– see details at: <https://www.hra.nhs.uk/planning-and-improving-research/learning/>

IRAS Project ID - 313420:	Please quote this number on all correspondence
----------------------------------	---

Yours sincerely



Professor Karen Wright

Appendix I: Substantial amendment HRA approval

Dear Miss Nardini,

IRAS Project ID:	313420
Short Study Title:	Investigating Social Cognition and Homelessness 17/2/2022
Amendment No./Sponsor Ref:	313420.1
Amendment Date:	09 September 2022
Amendment Type:	Substantial Non-CTIMP

I am pleased to confirm **HRA and HCRW Approval** for the above referenced amendment.

You should implement this amendment at NHS organisations in England and Wales, in line with the guidance in the amendment tool.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website: <http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/>.

Please contact amendments@hra.nhs.uk for any queries relating to the assessment of this amendment.

Kind regards

Dr Ashley Totenhofer
Workflow Monitoring Manager
Health Research Authority

Ground Floor | Skipton House | 80 London Road | London | SE1 6LH

[E. \[amendments@hra.nhs.uk\]\(mailto:E.amendments@hra.nhs.uk\)](mailto:E.amendments@hra.nhs.uk)

[W. \[www.hra.nhs.uk\]\(http://www.hra.nhs.uk\)](http://www.hra.nhs.uk)

Sign up to receive our newsletter [HRA Latest](#).

Appendix L: Title change amendment tool

Amendment Tool

v1.6 06 December 2021

For office use

QC: No

Section 1: Project information				
Short project title*:	Investigatin Social Cognition and Homelessness			
IRAS project ID* (or REC reference if no IRAS project ID is available):	313420			
Sponsor amendment reference number*:	313420.4			
Sponsor amendment date* (enter as DD/MM/YY):	05 April 2023			
Briefly summarise in lay language the main changes proposed in this amendment. Explain the purpose of the changes and their significance for the study. If the amendment significantly alters the research design or methodology, or could otherwise affect the scientific value of the study, supporting scientific information should be given (or enclosed separately). Indicate whether or not additional scientific critique has been obtained (note: this field will adapt to the amount of text entered)*:	Title change from "investigatin Social Cognition and Homelessness" to "Investigating Homelessness and Social Cognition"			
Project type (select):	Specific study			
	Research tissue bank			
	Research database			
Has the study been reviewed by a UKECA-recognised Research Ethics Committee (REC) prior to this amendment?:	Yes		No	
What type of UKECA-recognised Research Ethics Committee (REC) review is applicable? (select):	NHS/HSC REC			
	Ministry of Defence (MoDREC)			
Is all or part of this amendment being resubmitted to the Research Ethics Committee (REC) as a modified amendment (i.e. a substantial amendment previously given an unfavourable opinion)?	Yes		No	
Where is the NHS/HSC Research Ethics Committee (REC) that reviewed the study based?:	England	Wales	Scotland	Northern Ireland
	Yes	No	No	No
Was the study a clinical trial of an investigational medicinal product (CTIMP) OR does the amendment make it one?:	Yes		No	
Was the study a clinical investigation or other study of a medical device OR does the amendment make it one?:	Yes		No	
Did the study involve the administration of radioactive substances, therefore requiring ARSAC review, OR does the amendment introduce this?:	Yes		No	
Did the study involve the use of research exposures to ionising radiation (not involving the administration of radioactive substances) OR does the amendment introduce this?:	Yes		No	
Did the study involve adults lacking capacity OR does the amendment introduce this?:	Yes		No	
Did the study involve access to confidential patient information outside the direct care team without consent OR does the amendment introduce this?:	Yes		No	
Did the study involve prisoners or young offenders who are in custody or supervised by the probation service OR does the amendment introduce this?:	Yes		No	
Did the study involve children OR does the amendment introduce this?:	Yes		No	
Did the study involve NHS/HSC organisations prior to this amendment?:	Yes		No	
Did the study involve non-NHS/HSC organisations OR does the amendment introduce them?:	Yes		No	
Lead nation for the study:	England	Wales	Scotland	Northern Ireland
	Yes	No	No	No
Which nations had participating NHS/HSC organisations prior to this amendment?	Yes	No	No	No
Which nations will have participating NHS/HSC organisations after this amendment?	Yes	No	No	No
Was this a "single site, self sponsored" study in England or Wales prior to this amendment?	Yes		No	

Appendix L: Title change amendment tool (continued)

Section 2: Summary of change(s)

Please note: Each change being made as part of the amendment must be entered separately. For example, if an amendment to a clinical trial of an investigational medicinal product (CTIMP) involves an update to the Investigator's Brochure (IB), affecting the Reference Safety Information (RSI) and so the information documents to be given to participants, these should be entered into the Amendment Tool as three separate changes. A list of all possible changes is available on the "Glossary of Amendment Options" tab. To add another change, click the "Add another change" box.

Change 1				
Area of change (select)*:	Administrative details for the project			
Specific change (select - only available when area of change is selected first)*:	Project identification (e.g. change of title, reference numbers)			
Further information (free text - note that this field will adapt to the amount of text entered):	The title has been changed to better reflect the project. The new title is "Investigating Homelessness and Social Cognition".			
Applicability:	England	Wales	Scotland	Northern Ireland
Where are the participating NHS/HSC organisations located that will be affected by this change?*	Yes	No	No	No
Will all participating NHS/HSC organisations be affected by this change, or only some? (please note that this answer may affect the categorisation for the change):	All		Some	
Add another change				

Section 3: Declaration(s) and lock for submission

Declaration by the Sponsor or authorised delegate

- I confirm that the Sponsor takes responsibility for the completed amendment tool
- I confirm that I have been formally authorised by the Sponsor to complete the amendment tool on their behalf

Name [first name and surname]*:	Trishna Patel
Email address*:	t.patel@uel.ac.uk

Lock for submission

Please note: This button will only become available when all mandatory (*) fields have been completed. When the button is available, clicking it will generate a locked PDF copy of the completed amendment tool which must be included in the amendment submission. Please ensure that the amendment tool is completed correctly before locking it for submission.

[Lock for submission](#)

After locking the tool, [proceed to submit the amendment online](#). The "Submission Guidance" tab provides further information about the next steps for the amendment.

Section 4: Review bodies for the amendment

Please note: This section is for **information only**. Details in this section will complete automatically based on the options selected in Sections 1 and 2.

	Review bodies														Category:			
	UK wide:						England and Wales:				Scotland:			Northern Ireland:				
	REC	Competent Authority MHRA - Medicines	Competent Authority MHRA - Devices	ARSAC	Radiation Assurance	UKSW Governance	REC (MCA)	CAG	HMPPS	HRA and HCRW Approval	REC (AWIA)	PBPP	SPS (RAEC)	National coordinating function		HSC REC	HSC Data Guardians	Prisons
Change 1:	(Y)					Y			(Y)									C
Overall reviews for the amendment:																		

Appendix M: Title change amendment HRA approval

Dear Miss Nardini,

IRAS Project ID:	313420
Short Study Title:	Investigating Homelessness and Social Cognition 17/2/2022
Amendment No./Sponsor Ref:	313420.4
Amendment Date:	05 April 2023
Amendment Type:	Non Substantial Non-CTIMP

I am pleased to confirm **HRA and HCRW Approval** for the above referenced amendment.

You should implement this amendment at NHS organisations in England and Wales, in line with the guidance in the amendment tool.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website: <http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/>.

Please contact [amendments@hra.nhs.uk]amendments@hra.nhs.uk for any queries relating to the assessment of this amendment.

Kind regards

Dr Ashley Totenhofer
Workflow Monitoring Manager
Health Research Authority

Ground Floor | Skipton House | 80 London Road | London | SE1 6LH

[E. amendments@hra.nhs.uk](mailto:E.amendments@hra.nhs.uk)

[W. www.hra.nhs.uk](http://www.hra.nhs.uk)