Exploring the relationship between experiences of homelessness with cognitive and social cognitive functioning

Hannah Reene

A thesis submitted in partial fulfilment for the degree of Professional Doctorate in Clinical Psychology requirements of the University of East London

May 2024

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

LIST OF ACRONYMS

ACC	Anterior cingulate cortex
ACEs	Adverse childhood experiences
ACS ANT	Advanced Clinical Solutions Affect Naming Task
ADHD	Attention deficit hyperactivity disorder
AI	Anterior insula
BPS	British Psychological Society
COPD	Chronic obstructive pulmonary disease
DKEFS	Delis-Kaplan Executive Function System
EAL	English as additional language
EEG	Electroencephalogram
EUPD	Emotionally unstable personality disorder
HAND	Human immunodeficiency virus-associated neurocognitive disorder
HIV	Human immunodeficiency virus
HRNB	Halstead–Reitan Neuropsychological Battery
HUD-VASH	Housing and Urban Development-Veterans Affairs Supportive Housing
LGBTQ+	Lesbian, gay, bisexual, transgender, queer and additional non-heterosexual / non-cis-gendered identities
MSCEIT	Mayer-Salovey-Caruso Emotional Intelligence Test
NEPSY-II	Neuropsychology Assessment – Second Edition
NICE	National Institute for Health and Care Excellence
OFC	Orbitofrontal cortex
ONS	Office for National Statistics
PTSD	Post-traumatic stress disorder
QCAE	Questionnaire of Cognitive and Affective Empathy
RBANS	Repeatable Battery for the Assessment of Neuropsychological Status
SAMHSA	Substance Abuse and Mental Health Services Administration
SST	Strange Stories Task
STM	Short-term memory

TASIT	The Awareness of Social Inference Test
TBI	Traumatic brain injury
TMT-A	Trail Making Test A
TMT-B	Trail Making Test B
ToM	Theory of mind
TPJ	Temporo-parietal junction
VIF	Variance inflation factor
vmPFC	Ventromedial prefrontal cortex
WAIS-III	Wechsler Adult Intelligence Scale - Third UK Edition
WAIS-IV	Wechsler Adult Intelligence Scale - Fourth UK Edition
WM	Working memory
WMS-IV	Wechsler Memory Scale - Fourth UK Edition
WTAR	Wechsler Test of Adult Reading

ABSTRACT

Introduction: People experiencing homelessness have higher rates of physical and mental health conditions when compared to the general population. Cognitive functioning of people who are homeless is also a widely studied area in research, and is affected by a number of co-occurring experiences such as traumatic brain injury, health status, and substance misuse. Very few studies have explored social cognition in the context of homelessness. Social cognition carries huge implications for our functioning in social groups, and therefore it is important to understand if this is an area of difficulty for homeless populations.

Aims: The present study sought to understand the cognitive and social cognitive profile of a group of people experiencing homelessness, and to what extent cognitive and social cognitive functions are related.

Method: Forty-one people experiencing homelessness and accessing support from a charitable organisation completed a neuropsychological battery of optimal ability, cognition, and social cognition. A cross-sectional correlational design was used, and participant data was compared to normative data for each test.

Results: Analysis revealed impairments in objective measures of social cognition, as well as on a number of cognitive tasks. There were some notable correlations between performance on cognition and social cognition tasks, however cognition variables contributed only a small amount of variance to performance on tasks of social cognition.

Discussion: These findings are the first to comprehensively explore social cognition in people experiencing homelessness and highlight an additional area of need. Results are supportive of a domain-specific theory of social cognition. Implications for clinical practice, funding, and policy are discussed.

ACKNOWLEDGMENTS

I would like to express my thanks and gratitude to the following people:

Firstly, to all of the people who took part in this study and made me feel welcome in the centre. I do not take for granted the time and effort you gave to me, and you will long remain in my thoughts.

To Graeme, Becky, Tasmin, and everyone working in the centre who were so kind in providing me with the time, opportunity, and space to complete this piece of research, when your time was so preciously being divided amongst so many other priorities.

A special thanks to Iwona, for your instrumental role in helping me to get started and with recruitment, particularly in those early days. I am certain I would not have met so many people without your support.

To my supervisor, Matthew Jones Chesters, thank you for your knowledge and guidance in integrating my desire to work with people experiencing homelessness with a relatively new venture into neuropsychology, and your patience and humour along the way.

Finally, to my family and friends, for checking in and reassuring me during the times when the finish line felt so far away.

1. INTRODUCTION

1.1. Homelessness

1.1.1. Definitions

‘Homelessness’ represents a heterogeneous set of experiences which can range from rough sleeping and ‘rooflessness’, to those who are living in temporary or otherwise insecure accommodation, such as with family or friends without long-term security (Crisis, 2022). In the most recent UK census, 13,955 people were recorded as homeless in England and Wales in 2021 (Office for National Statistics, 2023). However, there are variations in how homelessness is defined, understood, and recorded, and as such, national figures do not capture the full picture of exactly how many people are experiencing homelessness at a given time. Many people will not show up in homelessness statistics, and official figures are therefore likely to be an underestimate (Bax & Middleton, 2019). Across the European Union, there is a lack of unity on an agreed definition of homelessness. Although rough sleeping is widely considered within definitions of homelessness, there are differences as to whether those living in unstable or insecure accommodation are recorded as homeless across Europe (Busch-Geertsema & Fitzpatrick, 2008).

In the UK, the statutory definition of homelessness as defined by the Housing Act (1996) refers to: those who do not have accommodation, those who have accommodation but are unable to secure entry, those for whom it is not considered ‘reasonable’ to occupy their current accommodation, and those at risk of violence or domestic abuse in their current home (as determined by the local authority). Gaetz (2012) refers to observed experiences of homelessness as falling broadly into four categories of unsheltered, emergency sheltered, provisionally accommodated, and at risk of homelessness.

The Homelessness Reduction Act (2017) amended previous legislation and wrote into UK law the duty of local housing authorities to prevent homelessness and to secure

accommodation for those who find themselves homeless. The Act represented a turning point in the statutory responsibility to increase provisions for people experiencing homelessness, who are so often positioned on the margins of society. However, the power of local authorities to accept or reject somebody as 'homeless' depending on the reason given for leaving existing accommodation means that some can find themselves deemed 'intentionally homeless' if the local authority does not perceive the explanation provided as sufficient. Charities such as Shelter (2018) point out the dangers of setting arbitrary thresholds in order to be determined 'homeless', and the impact this could have on the gatekeeping of services. Clearly, further improvements are needed to capture the nuances of defining 'homelessness' as set out in law.

1.1.2. Patterns of Homelessness in the UK Context

The first known study of homelessness in the UK was published by Rowntree and Sherwell (1899), who recorded information on housing, occupation, and income of wage-earning families in York. They reported on patterns of migration, population growth, and family structure, as well as the impact of poverty on these families. Since then, our understanding of homelessness and the factors which influence official statistics, particularly the economic and political climate, have increased in research.

Experiencing one episode of homelessness increases the likelihood of experiencing homelessness again and falling into a defined category of 'chronically homeless' (one episode lasting for one year, or four separate episodes of homelessness over the course of two years; Tsai et al., 2017). Others may find themselves intermittently homeless based on current circumstance, or homeless in response to life crisis or transition (Fazel et al., 2014).

In the UK, patterns of homelessness can be mapped onto shifts in relative emphasis on economic prosperity versus welfare in political ideology. For example, the 1980s saw a shift in ideology under Margaret Thatcher's 'New Right', which focused on liberalism, independence, economic prosperity, and competition within the free market (Marsh &

Rhodes, 1992). As a consequence, the importance placed on economic growth and competition at the relative expense of the previous emphasis on the welfare state meant health and socioeconomic inequalities became more pronounced and rates of homelessness subsequently increased (Anderson & Christian, 2003; Scott-Samuel et al., 2014).

Official rates of homelessness remained high into the 1990s until a shift under Tony Blair's 'Third Way' saw an attempt to integrate the principles of neoliberalism upheld in the previous government with a refocusing on the social democratic agenda (Forrest & Hirayama, 2009). The increase in rate of taxation for high earners, as well as the introduction of a national minimum wage, tax credits, and policies such as Sure Start to support families had some impact on economic prosperity, and there is some evidence that rates of homelessness had begun to fall in the early 2000s (Fitzpatrick & Stephens, 2007).

Sadly, this shift did little to maintain the small gains identified in the early 2000s, and the current welfare system in the UK is dominated by conditionality and sanctions, which are arguably punitive in nature (Reeve, 2017). Despite a pledge from the UK government to end rough sleeping by 2024 (Department for Levelling Up, Housing, and Communities, 2022), rates of homelessness have recorded an increase year on year in the last five years (Crisis, 2022). The £20 rise in Universal Credit and 'Everyone In' initiatives in 2020 reflected attempts to reduce the impact of the covid-19 pandemic on the risks of being threatened with homelessness. However, such policies were only temporary, and official figures show rates of homelessness increased by 7% during this period (Crisis, 2022). The present socio-political climate has led to increases in food and energy prices, at a time when the UK government's emphasis on raising economic growth has simultaneously led to cuts in the funding for public services (Ogden et al., 2023).

1.1.3. Causes of Homelessness

Just as definitions of homelessness change with time and context, so too has our

understanding of the factors which cause a person or family to become homeless. There is no single overarching framework which can conclusively explain the causes of homelessness in the UK. Fitzpatrick (2005) has suggested that causes of homelessness operate across at least four levels of economic, housing, interpersonal, and individual factors, of which their intersections can differ across the lifespan.

1.1.3.1. Economic and Housing Factors

There has undoubtedly been a shift in our understanding of homelessness in the last two decades, away from an emphasis on individual circumstances, and toward being primarily influenced by a complex combination of economic and social structures (Fitzpatrick et al., 2013). This shift is not unique to the UK, and studies in other nations such as Germany (Busch-Geertsema & Fitzpatrick, 2008) and Japan (Okamoto, 2007) have made comparisons to the UK context, identifying the role of housing policies and economic (in)stability on official recorded rates of homelessness.

Poverty is consistently reported as one of the most powerful precipitators to becoming homeless (Johnsen & Watts, 2014; Rowntree & Sherwell, 1899; Shinn & Gillespie, 1994; Toro et al., 2007). The prevalence of lifetime homelessness is greater in the UK and US, where poverty and income inequality are more pronounced, than in other countries where this is less obvious, such as Germany and Italy (Toro et al., 2007). The Great Recession of 2008 was generated by a burst in the housing bubble and had lasting effects on rates of homelessness across the world (Bainbridge & Carrizales, 2017). One review found poverty can account for as much as 54% of the variance in explaining homelessness in the UK (Bramley & Fitzpatrick, 2018). Economic factors play the greatest role in the likelihood of young people becoming homeless, for whom unemployment levels are generally higher (Fitzpatrick, 2000; Fitzpatrick et al., 2013). The risks and likelihood of living in poverty also interact with the marginalisation which faces many groups and communities in society, including those identifying as lesbian, gay, bisexual, transgender, queer, or other minoritised sexual identities (LGBTQ+; Fraser et al., 2019) as well as those from racialised backgrounds (Olivet et al., 2019).

As previously commented, there is a strong relationship between homelessness and the housing market in the UK. The relationship is perhaps even stronger in countries where the housing benefit system plays less of a protective role in subsidising rent for low-income households (Busch-Geertsema & Fitzpatrick, 2008). In the UK, young people are most likely to be affected by instabilities in the economy and the housing market, and becoming homeless at a younger age is associated with longer and repeated episodes of homelessness, as well as poorer health outcomes (Kershaw et al., 2003). In comparison, microlevel factors and personal crises, such as bereavement, are considered more influential for older people who become homelessness (Crane et al., 2005). Even so, macrolevel factors such as economy and housing structures remain an influential driver of homelessness in the UK.

1.1.3.2. Individual and Interpersonal Factors

Relationship breakdown has been suggested as one of the most frequent immediate triggers for homelessness in people living in England (Pleace et al., 2008). Attempts to model longitudinal pathways into homelessness have suggested that 'official' recording of homelessness tends to occur relatively later than expected (at around 30+ years old) and is preceded by a number of experiences in teenage years and early twenties, such as leaving institutional care, becoming a victim of violent crime, mental health difficulties, substance misuse, and other adverse life events such as redundancy and eviction (Fitzpatrick et al., 2013).

These experiences have been grouped in the literature as 'multiple exclusion homelessness', highlighting how homelessness becomes a more likely possibility for those experiencing additional social disadvantage, as well as the increased difficulty in being supported out of homelessness for these people once stable accommodation has been lost (Cornes et al., 2011; Fitzpatrick et al., 2011; Manthorpe et al., 2015). The social exclusion literature has highlighted the overrepresentation of single men with complex health and support needs in street homelessness (Bowpitt et al., 2011), and the disproportionate number of homeless persons who have spent time in institutional care as a child (Fitzpatrick et al., 2011). It has also revealed that for homeless asylum

seekers, who make up 28% of those sleeping rough in London (Broadway, 2011), experiences of deep social exclusion often do not begin until after their arrival in the UK, and rates of adverse childhood experiences are lower when compared to non-migrant populations (Fitzpatrick et al., 2012).

Collectively, this highlights the complex interactions between individual and interpersonal experiences with social status, discrimination, and access to economic support in homelessness in the UK. As put by Bramley and Fitzpatrick (2018), it refutes the myth that ‘we are all two pay cheques away from homelessness’ and instead that individual and interpersonal factors which drive homelessness are often underpinned by structural and economic disadvantage.

1.2. Homelessness and Health

It is well-established in the literature that experiences of homelessness and ill-health frequently present together. Many of those experiencing homelessness report seeking support from healthcare services before becoming homeless (Schanzer et al., 2007), and experiencing the environmental and psychosocial stressors of homelessness can worsen pre-existing health conditions (Hauff & Secor-Turner, 2014; Hwang, 2002). Once homeless, individuals face a number of barriers to accessing care, including: logistical concerns such as travelling to appointments and financial costs (Fine et al., 2023; Hauff & Secor-Turner, 2014), personal barriers such as remembering appointments (Davies & Wood, 2018), previous negative experiences of healthcare (McNeill et al., 2022), stigma and fear of stigma (Forchuk et al., 2008; Rae & Rees, 2015), and attempting to access an already fragmented healthcare system which cannot adequately coordinate complex and chronic health needs (Fine et al., 2023). Such barriers mean many people experiencing homelessness do not access healthcare services until their needs reach the level of severity where delaying help-seeking is no longer an option, and input from accident and emergency departments becomes the only viable route to receive medical care (Davies & Wood, 2018; Zerger et al., 2009).

As a person's position on the social ladder increases, so too does their life expectancy (Marmot, 2015). Experiences of deep social exclusion further marginalise and oppress people experiencing homelessness, and restrict their social and cultural capital (Annand et al., 2022), meaning those experiencing homelessness represent a prime example of the Inverse Care Law (Hart, 1971). The law states that the "availability of good medical care tends to vary inversely with the need for it in the population served" (Hart, 1971, p.405). People experiencing homelessness are under-represented in primary care services (Cheallaigh et al., 2017), whilst making up a disproportionate number of emergency hospital visits across several nations, including the UK (Field et al., 2019), the US (Garrett, 2012), and Australia (Davies & Wood, 2018). This is most pronounced in those experiencing unsheltered homelessness, who may be living in environments not designed for human habitation (Llerena et al., 2018). This can create a vicious cycle, where delayed access to appropriate care increases rates of morbidity (Becker & Foli, 2022) and mortality (Clifford et al., 2019; Seastres et al., 2020), subsequently raising the likelihood of poorer health outcomes and fractured relationships with healthcare providers. This has led to staggering statistics highlighting that when compared to their non-homeless counterparts, people experiencing homelessness have a reduced life expectancy by between 15 to 30 years (Perry & Craig, 2015; Seastres et al., 2020). If a person experiencing homelessness receives permanent supported housing, rates of hospitalisation often decrease (Rog et al., 2014).

Several attempts have been made to understand how services can better communicate with and support people experiencing homelessness. The role of previous negative experiences (Becker & Foli, 2022) and stigma (Daiski, 2007; Rae & Rees, 2015) are well-documented, and people experiencing homelessness may avoid accessing physical and mental health care due to fears that they will be discriminated against based on their social status and income (Wen et al., 2007). Having negative views of healthcare services, as influenced by experiencing stigma, is a strong predictor of engagement with health and wellbeing programmes (Armitage & Christian, 2003). In a scoping review, McNeill and colleagues (2022) identified six areas which contributed as barriers to people experiencing homelessness engaging in health-promoting behaviours: (lack of)

staff education, (in)flexibility of systems and services, poor coordination of care, patient preparedness for input, requiring management of complex health needs, and absence of holistic patient-centred care. It is evident that the challenges facing people experiencing homelessness in accessing healthcare are multifaceted, and considerable time needs to be spent repairing the ruptures in epistemic trust between healthcare providers and service users (Tsai et al., 2017).

1.2.1. Physical Health

It is estimated that around 40% of people experiencing homelessness report concurrently struggling with at least one physical health condition whilst homeless (Homeless Link, 2014; Plumb, 1997). Although it is difficult to establish causation, since most research records such figures at a single time point, it is believed that many are already attempting to cope with physical health conditions before becoming homeless, with one third already taking medication before losing stable accommodation (Schanzer et al., 2007). Homelessness can complicate pre-existing problems and lead to an unpredictable trajectory of illness (Shulman et al., 2018). This is particularly evident in conditions caused or exacerbated by exposure to cold temperatures, such as heart failure, chronic obstructive pulmonary disease (COPD), and hypothermia (Hauff & Secor-Turner, 2014).

There are higher rates of most physical health conditions in persons experiencing homelessness when compared to the general population, including cardiovascular disease (Aldridge et al., 2018), respiratory conditions and infectious diseases (Lanham et al., 2022), HIV (Beijer et al., 2012), and asthma and diabetes (Schanzer et al., 2007). Harsh environmental conditions including prolonged sun exposure, malnutrition, and stress can increase rates of some health conditions such as diabetes, hypertension, and some cancers (Chau et al., 2002), as well as increasing morbidity and mortality from both acute and chronic health conditions (Solliday-McRoy et al., 2004).

Many health conditions faced by people experiencing homelessness are treatable in primary care if services are accessed early enough (Davies & Wood, 2018). For persons experiencing homelessness, “basic survival is a daily goal” (Hauff & Secor-Turner, 2014, p.103), and the persistent search for food, water, and shelter may override ongoing physical health concerns until they are severe. Subsequently, uptake of routine and preventative health appointments such as dental care and cancer screening are low (Asgary, 2018; Guay, 2004). People experiencing homelessness are more likely to receive their medical care at A&E departments rather than outpatient services (Schanzer et al., 2007). At discharge, people may be deemed well enough to leave hospital, whilst requiring follow-up support for ongoing needs which cannot be adequately attended to if living on the streets or in shelters (Zerger et al., 2009).

These circumstances have been referred to by housing agencies as a ‘black hole’ in which people who are homeless are admitted to hospital and subsequently discharged without an adequate or coordinated care plan (Hewett et al., 2012). Both for those living on the streets and for those in sheltered accommodation or hostels, there are risks of deterioration at discharge. Hauff and Secor-Turner (2014) interviewed health service and shelter staff and identified a lack of training and confidence amongst professionals in addressing complex health needs for people experiencing homelessness. People who are homeless are often requested to be independent in managing their healthcare needs when entering a shelter, which means healthcare needs can go undisclosed, undiagnosed, and/or untreated. Shelter staff were concerned they could not sufficiently monitor their guests’ health needs, as well as logistical barriers in supporting them to access health appointments. Healthcare providers shared these concerns and highlighted the importance of establishing trust with homeless service users in order to better understand and address their complex health needs.

1.2.2. Mental Health

Compared to the general population, people experiencing homelessness have higher rates of most affective disorders including depression (Moschion & van Ours, 2021),

anxiety (Fitzpatrick et al., 2013), and post-traumatic stress disorder (Fine et al., 2023); as well as psychosis (Llerena et al., 2018) and severe mental illness (Fazel et al., 2008). Severe mental illness is used here as an umbrella term to refer to people experiencing a form of psychological distress with hugely debilitating implications for daily functioning (whilst it has traditionally been used to refer to diagnostic labels such as schizophrenia and bipolar disorder, it is used here to transcend labels which are rooted in diagnostic manuals, and to apply across time and context to a wider diversity of experience and distress). Mental health and homelessness share many common determinants, for example in times of financial strain (Radhakrishnan et al., 2021), job loss (Giano et al., 2020), and bereavement (Crane et al., 2005). Clear causality is difficult to establish, as it is likely that the stressors which can lead a person to become homeless will adversely affect mental health prior to losing accommodation, as well as factors such as isolation, stress, and victimisation contributing to further declines in mental health once homeless (Backer & Howard, 2007; Crisis, 2022).

For many people experiencing homelessness, their mental health problems begin early in life with adverse childhood experiences (ACEs). Moschion and van Ours (2021) examined early episodes of depression and anxiety amongst people who were homeless and found over half of their participants reported experiencing childhood physical, emotional, or sexual abuse. One third of their sample were not living with their biological parents by the time they were aged 14 due to separation, death, or conflict. Many people who are homeless report earlier experiences of institutional care (Fitzpatrick et al., 2011), abuse or neglect (Edidin et al., 2012; Fitzpatrick et al., 2013), and parental ill-health or incarceration (Shelton et al., 2009). Such experiences could result in difficulties attending school and not leaving with suitable qualifications (Scutella et al., 2013), followed by challenges finding fulfilling and stable employment (Reeve, 2017). ‘Street culture’ activities such as drinking alcohol and substance use, survival sex work, and involvement in petty crime could be a reflection of earlier attempts from young people to support themselves (Fitzpatrick et al., 2013). These behaviours are often precipitators to becoming homeless, whilst increasing the likelihood of further social exclusion and incarceration (Fitzpatrick et al., 2012).

1.2.3. Substance Use

People experiencing homelessness are arguably one of the most marginalised groups in society, and conversations about homelessness divide opinion. Representations in the UK media often depict people experiencing homelessness as determining and sometimes deserving of their fate, with beliefs that substance misuse is almost universally present (Parnell, 2023). In reality, the picture is more nuanced and complicated. Research tends to agree that misuse of alcohol (Asana et al., 2018; Glasser & Bridgman, 1999; McVicar et al., 2015) and other substances (Fine et al., 2023; Liu et al., 2022; Polcin, 2016) is overrepresented in homeless groups when compared to non-homeless populations. The relationship tends to be self-reinforcing, as substance misuse can be an antecedent to homelessness (Fitzpatrick et al., 2013) as well as the result of attempts to cope with the stress and trauma associated with lacking stable accommodation (Johnson & Chamberlain, 2008). However, it is important to note that substance use represents just one critical link between several causal factors which can link earlier adversity with homelessness (Maguire, 2017).

Many have commentated on the ‘tri-morbidity’ which faces somewhere between a third to half of people who are homeless (Stringfellow et al., 2015; Vallesi et al., 2021; Wood et al., 2017): the comorbid presence of serious or chronic physical health problems, mental health difficulties, and a substance use disorder. Tri-morbidity increases the likelihood of unplanned hospital visits (Himsworth et al., 2020), and once in hospital, is associated with longer average lengths of stay and increased likelihood of re-admission over a ten-year period (Russolillo et al., 2016; Schanzer et al., 2007). Causes for premature death tends to vary across the lifespan. Deaths in younger people who are homeless and especially those from the LGBTQ+ community are more likely due to mental health and/or substance use (Aldridge et al., 2019; Fraser et al., 2019; Seastres et al., 2020). Increased incidence of physical and sexual assault (Cray et al., 2013), reduced safety from harm in the family home (Feinstein et al., 2001) and stigma (Kidd, 2007) are likely contributing factors to a greater burden of mental health and substance use resulting in death for younger people who are homeless. Physical health

complications are more likely to be responsible for deaths in older people experiencing homelessness (Henwood et al., 2015).

1.2.4. Cognitive Functions

Cognitive functioning refers to a set of mental processes which underpin thinking and guide behaviour, and includes domains of learning and memory, attention, executive functioning, processing speed, and verbal and visuospatial functions (Lezak et al., 2004). Cognitive ability has important implications for adaptive skills such as problem-solving, making decisions, and social relationships (Backer & Howard, 2007). In homeless populations, it is widely reported that there are higher rates of cognitive impairment when compared to the general population. However, due to the heterogeneity of this group, the utilisation of small samples, and choice of neuropsychological tests employed, estimates of the prevalence of cognitive impairment in homeless populations vary widely, from 4 to 80% (Burra et al., 2009; Depp et al., 2015; Solliday-McRoy et al., 2004). People experiencing homelessness in the UK are not routinely assessed for their cognitive functions, and therefore it is possible that some prevalence rates reported in existing research reflect an underestimate.

1.2.4.1. Executive Function

Executive functioning processes involve those which allow a person to plan, organise, and prioritise their thoughts into purposeful behaviour, whilst inhibiting others, in order to improve performance across sets of tasks. These abilities form the basis of many of our social, emotional, and cognitive skills which allow a person to complete activities of daily living (Burra et al., 2009). Studies of the cognitive profile of people experiencing homelessness have identified these groups particularly struggle with their executive functioning when compared to normative samples, with up to 80% of people who are homeless reduced or impaired in this domain (Bousman et al., 2010; Burra et al., 2009; Gonzalez et al., 2001; Raphael-Greenfield, 2012). A study by Pluck et al. (2015) compared estimates of optimal ability with performance on tasks of executive functioning in people experiencing homelessness and identified that deficits in executive functioning

in their sample were likely acquired later in life, rather than organic or developmental in origin. Executive functioning difficulties were also associated with longer periods of homelessness. Similar findings of acquired deficit have also been reported in other cognitive domains, such as language ability (Pluck et al., 2020).

It is possible that poorer executive functioning could predispose a person to becoming homeless, for example through its impact on tasks which require the efficient and flexible management of time, money, and relationships. There is a lack of longitudinal studies exploring the effects of poorer executive functioning throughout life, which limits our causal understanding of this relationship. Nonetheless, poorer executive functioning certainly presents as an important barrier to exiting homelessness, for example in difficulties remembering and being able to attend various health and housing appointments and follow their recommendations, which often place high demands on people experiencing homelessness without offering adequate support to engage (Backer & Howard, 2007).

1.4.2.2. *Attributing Factors*

The causes of observed cognitive impairments in homeless populations are multi-factorial, and for many persons, will come from more than one source. Given there is a correlation between socioeconomic status and neurocognitive development (Hackman & Farah, 2009; Hanscombe et al., 2012), some difference is to be expected. Nonetheless, several additional comorbid experiences may also contribute to these differences.

People experiencing homelessness are at greater risk of neurotraumatic events which can lead to cognitive impairments. Rates of traumatic brain injury (TBI) are high amongst homeless populations, with single incident TBI ranging from 35-91% in people experiencing homelessness (Stone et al., 2019). An estimated 60% of people who are homeless with TBI report experiencing more than one incident of injury (Topolovec-Vranic et al., 2012). Cognitive impairment is a frequent sequalae of TBI, impacting primarily on attention and executive functioning processes, and disrupting learning, working memory, time management, emotion regulation, and information processing

(Andersen et al., 2014). Individuals who have suffered TBI tend to become homeless at a younger age than those who do not have TBI, and are more likely to have comorbid substance use disorders and mental health difficulties (Mackelprang et al., 2014). The majority of people who are homeless with TBI report sustaining a head injury prior to becoming homeless, and the mechanisms through which these people become homeless are likely to be complex and accumulate over several years (Worthington et al., 2020). Once homeless, these same individuals are at greater risk of further head injury through trauma, victimisation, and assault (Becker & Foli, 2022; Dell et al., 2021), with the potential to have additional impact on cognitive functioning and mental health.

Impairments in cognitive functioning are a core feature of psychosis and schizophrenia and could affect up to 85% of people with this symptomatology (Gopal & Variend, 2005). It is estimated that between 4-16% of people who are homeless experience psychotic symptoms, with variations in prevalence rates attributable to how these symptoms are grouped, defined, and measured (Folsom & Jeste, 2002). Poor attention is an early cognitive symptom of psychosis (Backer & Howard, 2007), with additional differences observed in tasks of executive functioning and volition (Goldberg & Green, 2002); possibly linked to abnormalities in frontal and temporal areas of the brain (Rains et al., 1995). The combination of cognitive and affective symptoms as well as the experience of disconnecting from reality increases the vulnerability of those with psychosis. Those experiencing a form of severe mental illness already experience a huge amount of marginalisation and stigma from wider society, and there is no doubt additional burden for those who concurrently experience psychosis and homelessness.

Behaviours observed by others and resulting from cognitive impairments and their comorbidities can lead to further difficulties for people experiencing homelessness when they are perceived as antisocial, rebellious, or disruptive. The narrative surrounding people who are homeless is so often positioned around ‘non-engagement’, as a homogenous group who are unable or unwilling to work with health services (Backer & Howard, 2007). An alternative and arguably more accurate perspective is that intervention programmes aimed to improve health, social, and housing outcomes for

people experiencing homelessness may not adequately assess or consider the cognitive needs of this population.

1.3. Social Cognition

Social cognition can be defined as a complex interaction of processes which allow individuals to understand and predict the mental states, intentions, and interactions of others of the same species (Frith & Frith, 2007). It is thought that higher-order social cognition processes distinguish humans from other species through our ability to shift our conscious experience to other times and places outside of the here-and-now (Adolphs, 2009). Social cognition encompasses a variety of processes and behaviours, inclusive of but not limited to: emotion recognition, possession of a 'theory of mind', social decision-making, knowledge of social norms, and experience of empathy.

The term 'social cognition' in psychology has been utilised across different fields and for different purposes. In social psychology, research into social cognition has focused on group processes, prediction of social behaviour, and its links to self-categorisation and social identity (Abrams & Hogg, 1999; Fiske et al., 2007). An evolutionary perspective emphasises the importance of social cognition in cooperative and pro-social behaviours, which allow humans to build social groups enabling survival and reproduction (Adolphs, 1999). Neuroimaging studies suggest a correlation between social group size and neocortex volume amongst primate species, to support an evolutionary function (Dunbar, 1998). In health psychology, models of social cognition have been used to predict engagement in health promoting or damaging behaviours (Ogden, 2003).

Within clinical psychology, social cognition appears most frequently in discussions around difference or impairment which affects social functioning and/or mental health. For example, a large body of literature has examined social cognition in autism (e.g. Baron-Cohen et al., 1985), schizophrenia and bipolar disorder (Baez et al., 2013), neurological disorders such as dementia (Panchal et al., 2016), and genetic

developmental disorders such as Williams syndrome (Karmiloff-Smith et al., 2012). More attention will be given to these presentations later.

Whilst the application of the social cognition literature can vary within the field of psychology, there is a shared agreement regarding the importance of social cognition for humans to survive and thrive. Humans are considered to be innately social creatures, and social learning forms the foundation through which we make sense of the world, requiring the processing of signals from other individuals (Kilford et al., 2016). Social cognition can support with threat detection and guide our behaviour. For example, the monitoring of eye gaze can help us to understand phenomena of interest to other people, as well as supporting us to deduce the intentions of others (Frith & Frith, 2006b).

Recent advances in technology over the last 20 years have helped the field of social cognition to flourish; for example, through the tracking of millisecond reaction times and developments in neuroimaging (Abrams & Hogg, 1999). Consequently, it is not possible to sufficiently cover all known domains of social cognition in detail here. Adolphs (1999) suggested there are two main theories within social cognition which are most studied and are particularly important in interpreting and predicting others behaviour: 'theory of mind', and experience projection through empathy. This review will therefore focus predominantly on these two areas.

1.3.1. Theory of Mind

The term 'theory of mind' (ToM) was first coined by Premack and Woodruff (1978) to refer to the process through which an individual "imputes mental states to himself and others" (p. 515). They tested a chimpanzee on her ability to understand the intentions and beliefs of a human after watching four 30-second videos of a human actor attempting to obtain some bananas which were inaccessible. They found the chimpanzee was able to understand the intention and purpose of the actor's behaviour, and use this to identify the correct solution in order to obtain the banana.

Since then, our understanding of ToM has hugely developed. ToM is often used interchangeably with other terms such as *mentalising* (e.g. Frith et al., 1991) and *mindreading* (e.g. Whiten, 1991). To possess a ToM, an individual must be able to understand other people as holding their own mental states and motivations (Wellman et al., 2001). It is now believed that some primate species may be able to understand intentionality of behaviour, however they lack an insight into persons as psychological beings. For example, chimpanzees are not thought to understand eye gaze as an indicator of directed or focused attention (Povinelli & Eddy, 1996). Studies of perspective-taking have also failed to find any evidence of higher-order abilities in non-human animals (Surtees et al., 2016). In humans, the development of a ToM takes place across several years of life and may continue developing well into adolescent years (Kilford et al., 2016).

Baron-Cohen (1999) put forward an argument for eight social behaviours which are dependent on the presence of a ToM:

- Intentionally communicating with others;
- Repairing failed communication with others;
- Teaching others;
- Intentionally persuading others;
- Intentionally deceiving others;
- Building shared plans and goals;
- Intentionally sharing a focus or topic of attention;
- Pretending.

1.3.1.1. Typical Development of a Theory of Mind

From birth, typically developing infants show a preference for social stimuli. There is evidence that newborn babies are oriented to face-detection (Johnson et al., 2005) and show a sensitivity to eye-gaze (Itier & Batty, 2009). Within the first few weeks of life, infants will smile and vocalise more to people than to inanimate objects (Legerstee, 1992). As social reciprocity develops over the first few months of life, infants have been identified to discriminate between displays of two different and opposite emotions (Walle

& Campos, 2012), and show an interest in ostension (behaviours designed to get another's attention; Mandel et al., 1995).

Gaze-following to visible targets may be present from as early as six months old, and early forms of joint attention have been observed from the first 9-15 months of life (Carpenter et al., 1998). It is at a similar time, at around 12 months, that infants can start to direct the attention of others through pointing (Tomasello et al., 2007), and start to develop a means for 'social referencing': using another person's reaction to a stimulus to form one's own response to it (e.g. Gergely et al., 2007). At around 14 months of age, infants will show a preference for familiar persons in their referencing, as they will learn from a familarised non-relative (Klinnert et al., 1986), but not from a stranger they have never encountered before (Zarbatany & Lamb, 1985).

From around the age of 18 months, there is "developmental watershed" (Frith & Frith, 2003, p. 460) as infants start to develop and refine their capabilities for language. Typically developing infants will start speaking in sentences by around the age of two. At 18 months, infants are thought to show the use of pretend play and understand pretense in others (Leslie, 1987). From 2-3 years old, typically developing infants demonstrate an ability to use dynamic information communicated from eye gaze to work out which toy another individual wants to play with (Lee et al., 1998).

The most significant developments in ToM have been observed between 3-5 years of age. It is at this time that infants are thought to develop knowledge for explicit mental state attribution, and can recognise corresponding language to refer to mental states through words such as 'think' and 'know' (Baron-Cohen et al., 1994). Typically developing three-year-olds appear to understand the 'seeing leads to knowing' principle: they understand that only when individuals look inside a box are they able to have knowledge of its contents (Pratt & Bryant, 1990). They can also identify that when holding up a two-dimensional picture with different images on each side, a person sat opposite them will only be able to see what is within their field of vision on their side (Flavell et al., 1981).

At four years old, but not before, typically developing infants will usually pass a test of false belief: they can understand the perspective of another person, despite this perspective running counter to the correct answer to a proposed question (Baron-Cohen et al., 1985). At this age, infants also begin to show an interest in deception and begin to practice it (Sodian & Frith, 1992), and their abilities for pretence and imagination allow them to be able to draw fictional entities which they would not have witnessed in reality (Karmiloff-Smith, 1990). The power of social identity and the in-group also begins developing at this age, as four-year-olds will show a preference for the information communicated by a voice of a familiar in-group member (Kinzler et al., 2011).

Although the foundations of a ToM are present by the time a typically developing infant is aged four or five, its development continues throughout childhood and into adolescence. At around 6-7 years of age, children pass second-order theory of mind tests, which require an understanding of what one individual thinks another individual is thinking (Miller, 2009). Neuroimaging studies of adolescence show marked differences in activation in some brain regions involved in processing ToM, suggesting its development continues through teenage years, at which time social group status is particularly salient (Kilford et al., 2016).

1.3.1.2. Cognitive Theory of Mind

It has been suggested that ToM can be separated into two components of ‘cognitive’ and ‘affective’ (Stone et al., 1998). Cognitive ToM requires the ability to use abstract reasoning in understanding the mental states of others. Much of the research into this area has compared individuals with typical cognitive ToM functioning to those who can experience difficulties with ToM, such as individuals with a diagnosis of autism.
When compared with neurotypical people (those without a diagnosis of autism or other neurodevelopmental conditions), autistic people find it harder to understand the mental states of others. Baron-Cohen et al. (1985) found that at four years, whilst the majority of neurotypical children passed ‘false belief’ tasks, 80% of autistic children did not. It has been proposed that this is due to difficulties in mentalising and taking the perspective of another, a hypothesis which has been further supported by research indicating

difficulties autistic people can experience with producing their own and understanding others' deception (Baron-Cohen, 1992), reduced pretend play (Baron-Cohen, 1987), difficulties drawing fictional entities (Scott & Baron-Cohen, 1996), and challenges identifying the desires and goals of another (Baron-Cohen et al., 1995).

Of course, none of these differences are found universally in autistic people. Some four-year-olds did pass Baron-Cohen et al.'s false-belief paradigm, and Happé (1995) identified that autistic children can pass tasks of false belief by the age of nine; albeit five years later than their neurotypical counterparts. Senju et al. (2009) suggested that although autistic people can pass explicit ToM tasks, they do so through conscious learning, as they do not show the same anticipatory eye gaze during these tasks as neurotypical people.

A more 'advanced' and widely used ToM test was developed by Happé (1994) and is known as the Strange Stories Task. Participants are assessed for their interpretation of naturalistic everyday situations which require an understanding of non-literal language and communication, such as joking, persuasion, pretence, and telling a 'white lie'. There have been some revisions and adjustments to the stories used (e.g. White et al., 2009), however it has been consistently identified that autistic individuals find such tasks challenging when compared to neurotypical individuals (Jolliffe & Baron-Cohen, 1999a; Kaland et al., 2008; Pedreño et al., 2017). Interestingly, a review found a correlation between ToM abilities and autobiographical memory in autistic individuals, which could explain one process through which they may struggle with disambiguating a social scenario (Adler et al., 2010).

1.3.1.3. Affective Theory of Mind

Affective ToM can be defined as holding knowledge of emotions and using this knowledge to understand and represent the emotional state and behaviour of another person (Shamay-Tsoory & Aharon-Peretz, 2007; Stone et al., 1998). It involves the recognition of an emotion, and an understanding of how this emotion may map onto the feelings and intentions of the person expressing it. Ekman and Friesen (1976) identified

the existence of six primary basic emotions of happiness, sadness, anger, disgust, surprise, and fear. Whilst neurotypical individuals show good recognition of basic emotions, there are mixed reports regarding the abilities of autistic people in this area. Some studies have suggested that autistic people cannot recognise some primary emotions in others (Baron-Cohen et al., 1993; Golan et al., 2006); others have found no evidence of difficulties when matched for verbal mental age (Castelli, 2005; Jones et al., 2010; Ozonoff et al., 1990).

The development of an affective ToM is thought to be nuanced. Autistic individuals tend to struggle on tests of affective ToM which require use of the eyes for affective information, as demonstrated in the Reading the Mind in the Eyes Test (Baron-Cohen et al., 2001). Autistic people do use eye contact, albeit differently to neurotypical individuals, in that they tend to employ eye contact less often to regulate joint attention or goal-detection (Baron-Cohen, 1989a; Phillips et al., 1992). Many autistic people report discomfort or pain associated with eye contact, however, they can make sense of other information from the face to identify emotions (Hobson et al., 1988). They may find more complex affective ToM states difficult to identify, such as trustworthiness and approachability of a face, which requires the integration of several cognitive and affective sources of information (Adolphs et al., 2001). Subsequent tests of affective ToM have been developed which involve matching emotions shown on faces to an affective word, such as the Affect Naming Test, which correlates moderately with other affective ToM tests and may hold advantage in allowing the use of information from the whole face in making judgments of emotional states (Kandalaft et al., 2012).

1.3.2. Empathy

Empathy refers to the experience of an observer's feeling matching, being similar to, responding to, or being concerned with another person's emotional experience (Baron-Cohen & Wheelwright, 2004). It allows us to understand the intentionality of other people and to experience an emotion triggered by another person's emotional experience. Empathy guides our own behaviour in that it motivates us to act in a pro-social way, with

evolutionary, neuroendocrine and neurophysiological underpinnings (De Vignemont & Singer, 2006; Decety et al., 2012). Empathy is thought to constitute two separate but related components of cognitive (understanding) and affective (feeling) empathy (Dvash & Shamay-Tsoory, 2014).

The capacity and use of empathy can be disrupted by a number of presentations and experiences, and research in this area carries huge social and ethical implications. In neurotypical people, females tend to score higher than males in this domain, and autistic people tend to self-report lower levels of empathy and perspective taking than neurotypical individuals when matched for age and gender (Baron-Cohen & Wheelwright, 2004). A number of reasons have been put forward as an explanation for this finding, including heightened difficulties autistic people experience in noticing and interpreting cognitive and affective changes within another person, as well as knowing if or how to express a socially appropriate response (Fletcher-Watson & Bird, 2020). Some studies have suggested that empathy can increase (Greenberg et al., 2018) or decrease (Chaitin & Steinberg, 2008) in response to a person experiencing traumatic events. Experiencing traumatic brain injury can also disrupt capacities for empathy (de Sousa et al., 2011). An interesting pattern has been observed in individuals with schizophrenia, showing greater levels of affective empathy alongside reduced levels of cognitive empathy, when answering the Questionnaire of Cognitive and Affective Empathy (QCAE; Horan et al., 2015; Reniers et al., 2011), which is supportive of our understanding of empathy as a multi-faceted construct.

1.3.3. Atypical Social Cognition

As well as studies of autism and neurodevelopmental models, differences in social cognition have been widely studied across a number of genetic and organic conditions. It is not within the scope of this review to sufficiently capture such an extensive body of research in detail. What follows is a summary of some of the most studied variations in social cognition, as well as those most applicable to experiences of homelessness.

1.3.3.1. Neurodegenerative Conditions

In Parkinson's disease, which involves the progressive loss of nerve cells, individuals show impaired performance on tasks of both cognitive and affective ToM (Roca et al., 2010). It has been suggested that executive functioning processes play at least a partially meditating role in these difficulties (Bora et al., 2015). In those with symptoms of dementia, there is evidence of impaired recognition of emotional expressions and experience of empathy which accompanies loss of awareness of the self (O'Keeffe et al., 2007). Panchal et al. (2016) suggested answers on a self-report questionnaire of social norms could distinguish between fronto-temporal dementia and Alzheimer's disease, highlighting the sensitivity of such measures in distinguishing diagnostic idiosyncrasies with regards to social cognition. Emerging evidence highlights the possibility of impairments in social cognition in those with HIV-associated neurocognitive disorders (HAND; Butler, 2016). Understanding the influence of various neurodegenerative conditions on social cognitive functioning is particularly interesting as it reflects acquired impairments which may correspond with loss of function in neural regions associated with social cognition (see 1.3.4).

1.3.3.2. Genetic Disorders

Understanding the presentation of social cognitive functions in syndromes which are entirely genetic in their aetiology is important when considering the foundations of our social cognition as innate and/or learned. In Williams syndrome, involving the deletion of genetic material from chromosome 7, individuals show 'hyper-sociality' and friendliness, characterised by increased use of eye contact and very little social anxiety or wariness of strangers; although this is accompanied by corresponding difficulties in recognising facial affect and reduced engagement in joint attention (Järvinen-Pasley et al., 2008). In Turner syndrome, found only in females due to the partial or complete missing of an X chromosome, there is evidence for differences in social interaction and communication, for example in processing of direct eye gaze (Elgar et al., 2002). Some females with Turner syndrome also meet the criteria for an autism spectrum condition, sharing difficulties with ToM (Wolstencroft et al., 2018).

1.3.3.3. Severe Mental Illness

Research has identified reduced ability to recognise emotions in others in individuals diagnosed with schizophrenia and bipolar disorder (Baez et al., 2013). Samame et al. (2012) suggested weakened emotional processing is common in those diagnosed with bipolar disorder. Reduced levels of self-reported empathy and ability to take the perspective of another are also frequently identified in people diagnosed with bipolar disorder (Cusi et al., 2010). In people diagnosed with schizophrenia, there is evidence of poor performance across various tests of ToM, poorer than those with frontotemporal dementia, as verbal cues were helpful for the latter group only (Kosmidis et al., 2008). It has been suggested that these impairments in schizophrenia could be understood as deficits in context processing of tasks of social cognition (Baez et al., 2013).

1.3.3.4. Substance Use

Emerging evidence suggests an association between substance use and poorer social cognition (Sanvicente-Vieira et al., 2017). In particular, alcohol can negatively affect ToM functioning (Onuoha et al., 2016). There is likely a dose-response relationship, with chronic drug use associated with more deleterious effects on ToM, empathy, number of social contacts, and social behaviour (Preller et al., 2014). However, further research is needed to tease out the relative contributions of the physiological and psychological effects of substances, and comorbid mental health difficulties and/or TBI. There is also the issue of causation, as substance use is often preceded by early adversity, and it is not always clear whether identified ToM difficulties precede and/or follow substance use (Eidenmueller et al., 2021).

1.3.4. Neural Correlates of Social Cognition

Our knowledge of social behaviour is far more extensive than our understanding of the underlying neural processes (Happé & Frith, 2014). The development of neuro-imaging techniques in recent decades has supported with a view that the social brain network in humans undergoes a lengthy period of development which is unmatched by other species (Barnea-Goraly et al., 2005). Kennedy and Adolphs (2012) propose four major

social processing networks involved in social cognition, involving the amygdala, mentalising, empathy, and mirror networks.

1.3.4.1. Amygdala Network

Earlier research examining the amygdala concluded it performs an important role in fear conditioning and in threat detection (LeDoux, 1996; 2003). Now, we understand the amygdala plays a more general role in processing emotionally salient stimuli, whether it appetitive or aversive (Aggleton, 2000). It may not be necessary for a person to directly experience these consequences, as observing them in another can lead to similar effects (Olsson et al., 2007). Klüver and Bucy (1939) found that monkeys with bilateral damage to the amygdala would demonstrate inappropriate responses to emotional objects, though their responses to non-emotional objects was preserved, suggesting the amygdala is particularly important to affective domains of social cognition. People with bilateral damage to the amygdala show difficulties recognising emotions from facial expressions (Adolphs et al., 1999), and are more likely to judge faces as trustworthy and approachable when presented with evidence which would usually indicate otherwise (Adolphs et al., 1998).

In primates, the degree of impairment to emotional processing tends to correlate with degree of damage to the amygdala, with larger lesions associated with greater difficulty processing social cues (Emery & Amaral, 2000). However, damage to the amygdala in humans may have less deleterious effects on emotional processing than when compared to monkeys with the same degree of damage (Adolphs, 1999). It is possible that humans possess additional mechanisms for emotional processing and social reasoning than other primate species, due to our capacity for declarative knowledge (Adolphs et al., 1995). Amygdala activation can be modulated through several pathways, most notably in the presence of genetic changes (Meyer-Lindenberg & Weinberger, 2006), and in response to significant and traumatic life events (van der Kolk, 2014). We still have a lot to learn about the role of the amygdala as one component of a distributed neural system, as well as the specific functions of the different nuclei within it (Swanson & Petrovich, 1998).

1.3.4.2. Mentalising Network

The mentalising network is postulated to involve areas of the ventromedial prefrontal cortex (vmPFC), the orbitofrontal cortex (OFC), and the temporo-parietal junction (TPJ); which are activated when thinking about the internal states of others (Adolphs, 2009; Kennedy & Adolphs, 2012). The case of Phineas Gage, who suffered bilateral lesion to his frontal lobe, highlighted the importance of the frontal regions in modulating socially appropriate behaviour (Damasio et al., 1994). Those with damage to the neural regions implicated in the mentalising network consistently show personality changes involving inappropriate social conduct and a lack of insight into these changes (Barrash et al., 2000), as well as diminished responses to emotionally charged stimuli (Damasio et al., 1990), reduced empathic concern for others (thought to be associated with difficulties integrating cognitive information required for the experience of empathy; Shamay-Tsoory et al., 2003), limitations to context interpretation and a skew toward utilitarian moral judgments (Koenigs et al., 2007), and challenges using probabilistic reasoning (Bechara et al., 1994). The impact of damage to the vmPFC is more pronounced in early onset patients, as these individuals may not have had the opportunity to acquire appropriate social knowledge prior to injury (Anderson et al., 1999; 2000).

1.3.4.3. Empathy Network

Empathy involves a tightly connected neural network including the anterior insula (AI) and the anterior cingulate cortex (ACC; Craig, 2002; 2008). The most commonly used paradigms employ cue-based or visual ‘empathy for pain’ tasks, which consistently see activation in the AI and ACC, and correlate with self-reported measures of empathy (Lamm et al., 2011). The neural networks activated during empathy for another’s pain are shared with those areas involved in the direct experience of pain, highlighting the role of the empathy network in understanding the subjective feelings of others (Decety, 2010). There are stronger empathy responses when we observe pain in those perceived as similar to the self (Brown et al., 2006), and perception of distress in others is a predictor of pro-social behaviour (Decety & Michalska, 2010). There is also evidence that age is related to the empathy network, with more direct and visceral experiences of empathy reported amongst younger people (Decety & Svetlova, 2012).

1.3.4.4. Mirror Network

The mirror network is involved in transforming sensory information from the actions of others into a motor format which complements social behaviour, involving areas of the parieto-frontal network (Rizzolatti & Fabbri-Destro, 2008). This network is important for social learning, and mirroring the movements and mannerisms of others can support with relationship building in what is known as the chameleon effect (Chartrand & Bargh, 1999). Mirroring a person's emotions provides feedback in neural information which can lead to another individual experiencing this same emotion (Gallese et al., 2004). It may also complement the work of the mentalising network in attempts to infer another's intentionality during complex social situations (Brass et al., 2007). There is still a lot to learn about the mirror network, particularly whether its functionality is innate and/or learned (Rizzolatti & Fabbri-Destro, 2008), as well as understanding exceptions, such as in Moebius syndrome, where emotion recognition and other aspects of social cognition are preserved, despite facial paralysis which limits mirrored expression (Bogart & Matsuomoto, 2010).

1.3.5. Critiques of Social Cognition

There is debate about whether social cognition requires something different from, or in addition to, general cognitive functioning processes (Adolphs, 2009). Some argue that social cognition utilises brain areas which are specifically designed to modulate our social behaviour, such as the fusiform face area in processing faces (Kanwisher et al., 1997) and neurons which respond specifically to gaze direction (Oram et al., 1998). Gweon et al. (2012) found evidence for increasingly specific and focal activation of brain regions involved in social cognition with age, supporting a domain-specific theory for social cognition. However, other studies have found evidence for a decrease in some focal brain activity with age (Golarai et al., 2007), suggesting increased focality is not universal.

Some tasks assessing ToM depend on executive control processes, as an individual is required to organise information and inhibit particular responses in a social context. For

this reason, it has been suggested the two are difficult to disentangle, and social cognition may be reflective of domain-general properties involved in cognitive functioning (Henry et al., 2006). Nevertheless, there is evidence that whilst related, ToM and executive functioning have distinct and separate neural pathways (Stone & Gerrans, 2006b), and a person can show impairment on a cognitive ToM task even when executive functioning processes are not essential to the task (Baron-Cohen et al., 1997a).

Adolphs (1999) has argued that whether or not social cognition is positioned as domain-specific or domain-general may depend on the domains of social cognition in question and how they are defined. As previously mentioned, social cognition has been applied to the understanding of a variety of behaviours and presentations. It is an abstract concept; one which is consistently evolving and developing along with neuro-imaging studies and research tools. There is some concern that concepts such as ToM have quickly dominated the social cognition literature, with little consideration to its intellectualising of everyday social activities, nor to how it can be applied helpfully to support interactions between and within people with autism who may find typical social communication more challenging (Leudar & Costall, 2009).

Leudar et al. (2004) argue the predominance of ToM within the social cognition literature has been aided by a publication bias, where studies which refute or challenge ToM tend to be ignored or receive lengthy scrutinisation in attempts to support the ToM hypothesis. Critics are cautious of the Cartesian assumption that ToM taps into hidden and unobservable mechanisms within the mind (Shanker & Stieben, 2009), and that ToM may not serve as an adequate explanation for understanding intentionality and behaviour (Antaki, 2004). Nonetheless, models of social cognition go some way in understanding and predicting behaviour. We must be cautious not to ‘explain away’ any variance which is unaccounted for in psychological models, and that theories generate synthetic truths in order to avoid becoming tautological (Ogden, 2003). Use of a combination of assessment tools and scrutiny of their theoretical bases can somewhat support with our interpretation of their findings.

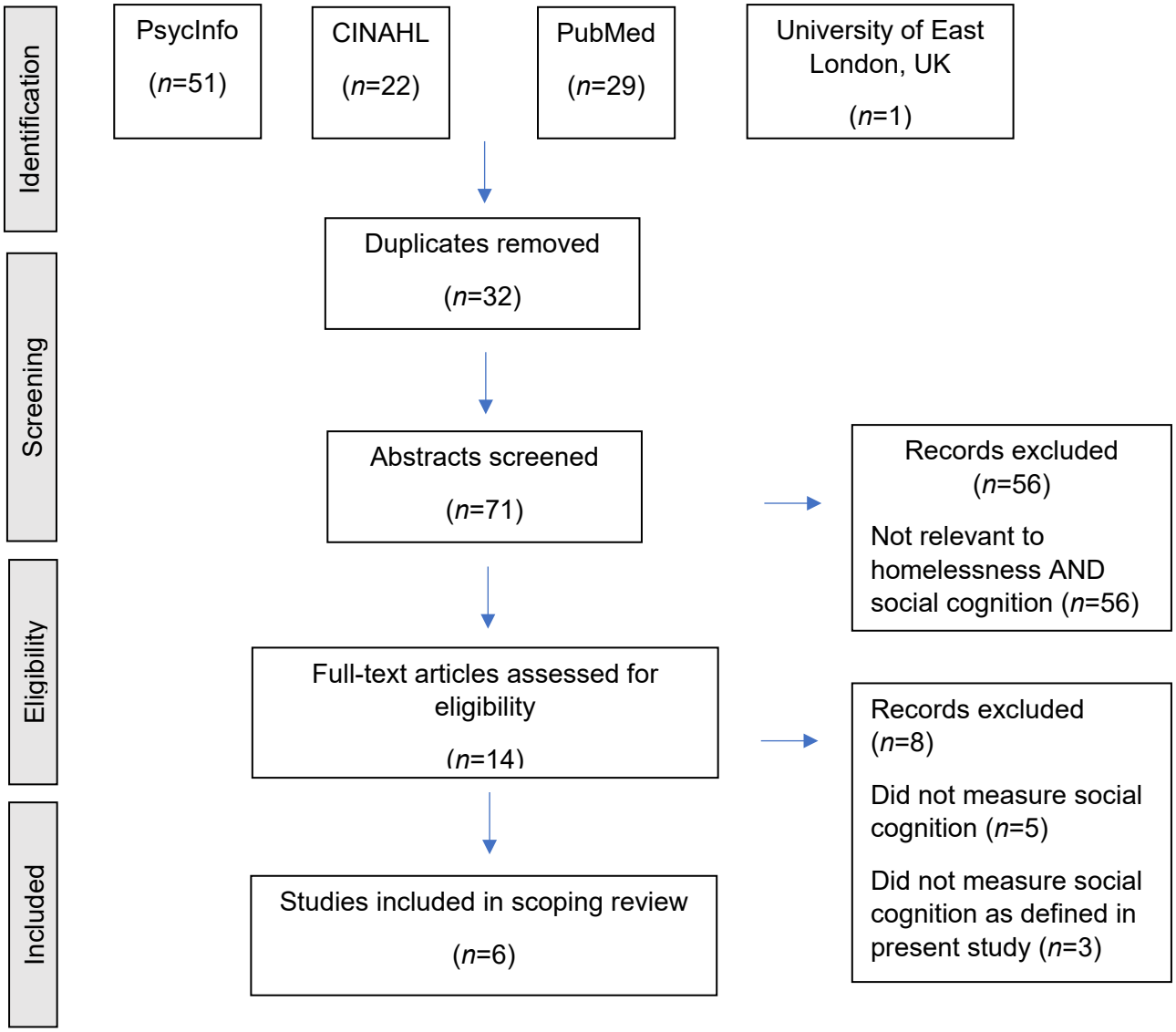
1.4. Social Cognition and Homelessness

1.4.1. Scoping Review

A scoping review was conducted using several online databases (PsycInfo, CINAHL Complete, PubMed) using key search terms ('social cognition' or 'social cognitive' and 'homeless' or 'homelessness') to understand and evaluate existing research exploring social cognition in people experiencing homelessness. The literature search process is outlined in Figure 1. A total of 71 studies were screened and six were included as relevant in the present review.

Figure 1

Screening and Eligibility of Research Identified in Scoping Review



1.4.2. Research with Homeless Veterans

Using measures of social cognition which examined understanding, perceiving, and managing of emotions, and using emotional understanding to facilitate thought (from the Mayer-Salovey-Caruso Emotional Intelligence Test [MSCEIT]; Mayer et al., 2003), Llerena et al. (2018, *n*=76) examined clinical and cognitive correlates of veterans who were homeless and known to have a diagnosis of a psychotic disorder. They found

evidence for poorer social cognitive functioning across both sheltered and unsheltered homeless groups, with an additional association between poorer social cognition and greater number of days spent unsheltered.

Greenberg et al. (2019, *n*=100) used the MSCEIT alongside measures of non-social cognition to explore predictors of resilience amongst homeless veterans. Social cognition was a moderate predictor of increased resilience in this population. This could have significant implications for people experiencing homelessness, given the associations between resilience and problem-solving ability and distress (Tenhula et al., 2014).

1.4.2.1. Community Integration

Three studies explored social cognition alongside non-social cognitive and motivational factors which potentially contributed to community integration in homeless veterans. Green et al. (2020, *n*=95) utilised a measure of mentalising (The Awareness of Social Inference Test [TASIT]; McDonald et al., 2002) and of emotional inference (Empathic Accuracy Task; Zaki et al., 2008) amongst homeless veterans with a diagnosed psychotic disorder. They found performance on the task of emotional inference positively correlated with likelihood of living independently at 12-month follow-up.

Horan et al. (2020) used the same social cognition measures as Green and colleagues to compare community integration outcomes for homeless veterans who did (*n*=96) or did not (*n*=80) have a history of psychosis. They identified a positive correlation between performance on the managing emotions subtest with social integration outcomes amongst homeless veterans with psychosis. For veterans without a history of psychosis, performance on this measure correlated positively with work and independent living outcomes.

Wynn et al. (2020, *n*=82) extended the methodology of Green and colleagues in a follow-up study examining community integration outcomes in homeless veterans without a known diagnosis of a psychotic disorder. They employed the Empathic

Accuracy Task utilised in study one with two additional measures of facial affect recognition from Ekman and Friesen's (1976) dataset, and electroencephalogram (EEG) facial processing from previous research by Wynn et al. (2008). Social cognition was not found to be a significant correlator with community integration variables at 12-month follow-up. Motivational factors were the most reliable predictor of positive community outcomes amongst homeless veterans without psychosis.

1.4.2.2. Evaluation

Although all five studies examining social cognition in homeless veterans report on a sound sample size, they each recruited participants from the same Los Angeles based veteran homelessness project (HUD-VASH). Whilst there is some evidence that veteran and non-veteran homeless groups share some similarities in their mental health status and response to housing interventions (Tsai et al., 2012a), there are undoubtedly limitations regarding the extent to which these findings can explain the social cognitive profile amongst people experiencing homelessness without veteran status and living outside of Los Angeles. In addition, these studies focused primarily on affective components of social cognition, with less attention given to cognitive components such as mentalising, and prioritised functional outcomes rather than firstly seeking to understand their samples' performance on measures of social cognition.

1.4.3. Brain Injury

In a recent unpublished doctoral thesis undertaken at the University of East London, Nardini (2023, *n*=8) employed a more comprehensive neuropsychological battery of cognition and social cognition in people who were homeless with TBI living in London. Measures of both cognitive and affective components of social cognition were used. A cognitive measure of mentalising used an adaptation of Happé's (1994) Strange Stories Task (White et al., 2009). Emotion recognition used the Affect Naming Test (ANT; Pearson, 2009). Empathy was assessed using a self-report questionnaire (Questionnaire of Cognitive and Affective Empathy [QCAE]; Reniers et al., 2011). Nardini identified differences in mentalising in this population: her participants scored

significantly lower than expected in the general population on tasks requiring understanding of ToM. There were no significant differences in emotion perception or empathy. Rigorous group-level statistical analysis was limited due to small sample size. In addition, this study focused on a specific population of people experiencing homelessness with TBI. Although many people who are homeless do report TBI events, which likely impact on their social cognitive functioning, these criteria will not apply to all and may limit generalisability of the study to wider homeless populations.

1.5. Present Study

1.5.1. Rationale

Emerging evidence across a small number of studies with specific inclusion criteria and outcomes show some associations between homelessness and social cognition in veterans with and without a history of psychosis, and in those who have experienced TBI. We know that TBI, veteran status and severe mental illness are over-represented in people experiencing homelessness, and therefore can make some generalisations to other homeless populations. However, people experiencing homelessness reflect a diverse group who differ in earlier experiences, context to becoming homeless, and health status. It is surprising that so few studies have centred social cognition in their study of the cognitive profile of homelessness, given the aforementioned implications social cognition has for our functioning in social groups and quality of our relationships (Adolphs, 1999). To do so could provide additional pieces to the complex puzzle of providing stable accommodation and social integration for homeless populations in the UK.

1.5.1.1. Relevance to Clinical Psychology

The role of a Clinical Psychologist has increasingly broadened in recent years, and practitioners find themselves working across different levels of health services, as well as in social care, charities, private organisations, research, policy and public health. It was mentioned earlier that rates of homelessness have increased by 7% in recent years

(Crisis, 2022). Clinical Psychologists, by virtue of their role, will often find themselves working directly and indirectly with people experiencing homelessness and witness the pressures that services come under to meet needs as well as targets. Indeed, The NHS Long Term Plan (2019) explicitly refers to a pledge to increase mental health support for people who are homeless; a role partially fulfilled by Clinical Psychologists.

A key competency skill of a Clinical Psychologist is an ability to develop a shared understanding of a person's needs and experiences through formulation (British Psychological Society [BPS], 2017). This may involve integrating biological, psychological, social, and cognitive factors which influence a person's communication and relationship to help. A Clinical Psychologist is consequently well-placed to integrate an understanding of social cognition and homelessness into their clinical work, as well as when working more broadly in advocacy positions in services, policy, and public health settings.

Wells (2021) asked Clinical Psychologists for their perspective on the responsibilities and proposed guidelines when working in homelessness services. She identified that, as well as working directly with people accessing services, Clinical Psychologists reflected on adopting an important role in supporting relationships between staff, as well as facilitating development of staff skills in supporting people experiencing homelessness, through an integration of psychological models and consultation frameworks. Therefore, with growing knowledge of how social cognition is related to homelessness, Clinical Psychologists can incorporate the evidence base to contribute to staff training and service development in homelessness services in the future.

1.5.2. Aims

The present study aims to understand the neurocognitive profile of a population of people experiencing homelessness engaged with a charitable organisation. Specifically, the study will employ a range of measures assessing cognitive and social cognitive

functioning to explore whether there are differences in each of these domains when compared to normative standards.

1.5.3. Research Questions

- How does this sample of people experiencing homelessness perform on measures of cognition and social cognition?
- To what extent is performance on measures of social cognition and cognition related?
- If performance is related, to what extent can performance on measures of cognition predict performance on measures of social cognition?

2. METHOD

2.1. Epistemology

2.1.1. Background

The philosophical assumptions of ontology and epistemology are fundamental to fields of theory, research, and practice. Ontology involves the nature of ‘reality’ and the meaning of a ‘concept’; the questions regarding the interpretation of our reality and what can be said to exist (Goertz & Mahoney, 2012). Epistemology concerns the nature of knowledge; how we claim to know and seek to know about the existence of ‘concepts’ and ‘reality’, and our perceived limitations of this knowledge (Willig, 2013). In psychology, there is growing recognition that epistemology has played an important role in its own history and the harm caused by psychology striving to be seen as an objective and impartial ‘science’ (Jovanović, 2010).

Neuropsychology originates from a dual emphasis on biology and psychology, mapping observable behaviour onto the structure and function of the brain (Lezak et al., 2004). It

represents a positivist stance, with an emphasis on the scientific method measuring the real and observable (Pribram, 1990). Neuropsychology therefore employs quantitative approaches to data collection and interpretation, comparing numerical test scores to normative data available in the general population, in order to produce scaled scores and percentile ranges. Neuropsychology has its roots in western science and therefore reflects an emphasis on individualism as well as the promotion of neuroimaging and neuropsychological assessment. This has created problems in a globalised world, where neuropsychological materials are devised and normed on a western ideal and receive criticism for limitations to their cultural sensitivity. It is also recognised that the brain is complex and our understanding still in its infancy; there is a huge conceptual leap from brain to mind which has been frequently discussed in relation to neuropsychology (Barrera Valencia & Calderón Delgado, 2013).

In contrast, the conceptualisation of ‘homelessness’ is better associated with a social constructionist perspective. Social constructionism emphasises the evolving nature of concepts and experiences through our social interaction and language (Barker et al., 2016). This process permeates through all levels of society, including between individuals, within communities, messages transmitted through the media, and systemic policies and practices. For people experiencing homelessness, these messages have continued to focus on individual responsibility for the circumstances which have led a person to become homeless (Parnell, 2023). Therefore, a social constructionist perspective is aligned with a qualitative approach to research, involving a focus on use and evolving of language (for example, using discourse analysis). Whilst efforts have been made to reframe perspectives on homelessness and highlight the growing systemic, health and housing needs of people experiencing homelessness (Cronley, 2010), change is slow and continuously met with challenges from the very top of the power structures in UK society (Otte, 2023).

2.1.2. Epistemological Stance

The present research reflects the epistemological stance of critical realism. Critical

realism assumes there is a real and observable world which exists, whilst remaining cautious about the limits to how certain we can be about these claims (Barker et al., 2016). Observable phenomena are understood to be underpinned by unobservable structures. It emphasises that research should be 'intersubjectively testable' and therefore repeatable by other researchers (Campbell & Cook, 1979). From this perspective, homelessness is observable, as well as rooted in its time and societal context, which is changeable.

I would argue that homelessness exists as a product of social and economic inequalities in society. Whilst we can see and observe homelessness (to an extent) in those sleeping rough on the streets or sofa surfing, its underpinning structures and mechanisms of influence are varied and likely present a different picture for each individual. It has already been mentioned how the definition of homelessness is internationally changeable in law. Experiences of trauma, abuse, severe mental illness and brain injury are not always observable and increase the likelihood that a person experiencing homelessness will present with cognitive and/or social cognitive profile differences when compared to the general population. For these individuals, differences in social understanding and communication could serve to fuel the existing stigma and marginalisation faced by this group, labelling them as unwilling or unable to engage. Therefore, the position of the researcher is that it is vitally important to develop our understanding of the cognitive and social cognitive profile of people experiencing homelessness, in order to better provide and tailor models of intervention, clinical guidance, and policy.

The epistemological position of a researcher will inform their approach to data collection and interpretation. For the present study, quantitative methods were employed in line with approaches used within neuropsychology. Participants received numerical scores on tests of cognition and social cognition, which were compared to age-scaled normative data to obtain scaled scores. In addition, each participant received a verbal explanation and written letter describing their relative strengths and challenges. This was to limit deficits-focused language and emphasis within the findings, and to place findings within

their relative context (for example, explaining how findings capture a person's ability at a particular time, which may be affected by several changeable factors such as nutrition, quality of sleep, number of stressors a person is experiencing).

2.2. Design

Due to the exploratory nature of the present study, a cross-sectional correlational design was used. Participants were assessed at a single time point to provide an understanding of their optimal abilities, cognitive functioning (including domains of attention, verbal, visuo-spatial, learning and memory, executive functioning), and social cognition (emotion perception, theory of mind, empathy). This design was used to understand the neurocognitive profile of participants on individual and group levels, and to understand if social cognitive functioning was separate from or related to performance on measures of optimal ability and/or general cognition.

As no variables were manipulated in the research, individual and group-level performance were interpreted in relation to optimal ability and the standardised norms available for each test, which account for age.

2.3. Recruitment

Participants were recruited from a charitable organisation in the South East of England which supports people experiencing homelessness. The organisation operates from a community hub which provides access to a number of services including food, shelter, washing facilities, computer access, art and music materials, and structured activities such as yoga classes. The centre is staffed by people with a wide range of backgrounds and skills, including project workers, nurses, and social workers.

2.3.1. Eligibility Criteria

People experiencing homelessness represent a heterogeneous group with varying experiences and comorbid health needs. To capture as wider variation of experience as possible, eligibility criteria were deliberately minimal and required:

- Participants to be experiencing a form of homelessness;
- Over the age of 18;
- Fluent in English (able to communicate with the centre staff without an interpreter);
- No known diagnosis of a learning disability (as completing the full battery may not be representative of the cognitive changes sometimes associated with experiences of homelessness);
- Not currently experiencing an acute episode of ill physical or mental health (e.g. expressing suicidal ideation);
- Self-reported sobriety from alcohol and other substances at the time of testing (as being under the influence of substances would likely affect performance and not be representative of actual functioning; ongoing substance use or dependence itself was not an exclusion criteria).

2.3.2. Recruitment Process

Staff at the centre who had existing relationships with service users were vital in supporting with initial relationship building and recruitment. Staff informed service users of the study and made recommendations to some to participate. It is possible that their recommendations stemmed from questions around some of these individuals' level of cognitive functioning. As the novel component of this research focused on social cognition, this did not feel detrimental to the study's goals. As the researcher built up a presence in the centre, they were less reliant on signposting from the staff and were able to approach service users themselves as part of the recruitment. It was ensured that the eligibility criteria were met before agreeing to go ahead with participation.

2.4. Sample Size

As this study represents a novel exploration into the social cognitive profile of a population of people experiencing homelessness, there is little existing research from which an ideal sample size could be informed. In quantitative research, a higher sample size yields greater power for statistical analysis, and efforts were made to build relationships and increase the likelihood of participation. Previous efforts have noted difficulties with engaging participants and smaller sample size (Nardini, 2023). Existing research exploring the relationship between experiences of homelessness and cognitive functioning report varying sample sizes, with smaller sample sizes in those recruiting on a more local level, for example from shelters or local councils (e.g. Andersen et al., 2014 [*n*=34]; Pritchard, 2010 [*n*=14]). Much larger sample sizes in research of homeless groups tended to come from retrospective analysis and/or access to national databases (e.g. McMillan et al., 2015 [*n*=1590]; To et al., 2015 [*n*=1181]). As this research involved persons accessing support at a singular centre of small to medium capacity, sample size was estimated to yield participation of around 20-30 people. In total, 41 participants were recruited into the study.

2.5. Measures

Demographic information was collected first to ensure eligibility to participate in the study. Following this, participants completed a neuropsychological battery of optimal ability, cognitive functioning, and social cognition (Table 1).

Many of the focal tests included in the battery were part of the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS; Randolph et al., 1998). The RBANS measures domains of attention, language, visuospatial abilities, learning and memory. It has been validated across populations with varying cognitive abilities and with good diagnostic accuracy (Randolph et al., 1998; Shura et al., 2018). In addition, the RBANS takes less than 30 minutes to administer and is therefore less taxing on attention and effort than undertaking all or parts of other comprehensive test sets (e.g.

Wechsler Adult Intelligence Scale - Fourth UK Edition [WAIS-IV], Wechsler Memory Scale - Fourth UK Edition [WMS-IV], Delis-Kaplan Executive Function System [DKEFS]). As per usual recommendations (e.g. Lezak et al., 2004), additional tests were included in the battery to provide greater coverage of cognitive domains, in particular for verbal comprehension, working memory and executive functions.

Table 1

Summary of Neuropsychological Test Materials Used

Cognitive Domain	Subtest
Optimal Ability	WTAR
Short-Term Memory (STM)	RBANS Digit Span Forward
Working Memory (WM)	WAIS-IV Digit Span Backward
Selective and Sustained Attention	RBANS Coding
	HRNB Trail Making Test Part A
Verbal	RBANS Picture Naming
	SST Physical Stories
Visuo-Spatial	RBANS Line Orientation
	RBANS Figure Copy
Learning & Memory	RBANS Word List Learning
	RBANS Word List Delayed Recall
	RBANS Word List Recognition
	RBANS Story Learning
	RBANS Story Delayed Recall
	RBANS Figure Delayed Recall
Executive Functioning	RBANS Semantic Fluency
	Action Fluency
	HRNB Trail Making Test Part B
	Bimanual Alternation

Executive Functioning: Luria & Motor	Motor Sequencing (Luria)
	Motor Opposition
	Motor Inhibition
Social Cognition	SST Mentalisation Stories
	ACS Affect Naming
	QCAE

2.5.1. Optimal Ability

The ability to pronounce atypically spelled words is thought to be resilient to decline until the later progression of cognitive impairment and correlates with indicators of intelligence (Ghabanchi & Rastegar, 2014). For this reason, reading ability is commonly used as an estimator of premorbid or optimal functioning in neuropsychology. The results on such tests should also be considered within the context of years and level of education as well as socioeconomic background, as each also correlates with traditional measures of intellectual ability (e.g. Ritchie & Tucker-Drob, 2018).

The Wechsler Test of Adult Reading (WTAR; Wechsler, 2001) asks participants to read aloud 50 words of progressive difficulty and irregularity. It was initially co-normed with the introduction of the Wechsler Adult Intelligence Scale III (WAIS-III) and has since been validated across samples including for persons with traumatic brain injury, and military veterans; as well as recent application to studies of homelessness (Green et al., 2008; Whitney et al., 2010; Pluck et al., 2012).

2.5.2. Short-Term Memory (STM) and Working Memory (WM)

Short-term memory (STM) refers to the ability to store and recall information for short periods of time. Working memory (WM) requires the ability to simultaneously hold this information in mind and manipulate it.

RBANS Digit Span Forward was used as an assessment of short-term memory. Participants are asked to repeat a string of numbers in the order they are orally

presented, with increasing difficulty (from two digits to nine digits). The test is discontinued after participants fail both trials of a string length.

WAIS-IV (Wechsler, 2008a) Digit Span Backward was included as a measure of working memory. It requires participants to listen to a string of numbers, as above, and repeat them in reverse order (e.g. 6-2-9 becomes 9-2-6). This is considered a more difficult task due to the added requirement of manipulating the numbers to recall in reverse order. Research has indicated this measure to have good classification accuracy among a mixed neuropsychiatric sample (Resch et al., 2023).

2.5.3. Selective and Sustained Attention

Attention refers to the ability to direct and maintain the focus of our concentration or awareness on a particular task or stimulus. Selective attention requires the ability to attend discriminately to some stimuli over others, often in the presence of alternative available stimuli. Sustained attention refers to the ability to maintain focus on a task over a period of time.

RBANS Coding presents participants with a key of similar symbols with corresponding numbers underneath. Individuals are asked to match symbols with their corresponding number as quickly as possible for 90 seconds. It draws upon selective and sustained visual attention.

Trail Making Test Part A (TMT-A; Reitan, 1955) is a timed test of visual attention and processing speed. It requires participants to connect a series of numbered circles from 1-25 as quickly as possible. The TMT is a widely used measure which is brief to administer and thought to have good inter-rater reliability (Bowie & Harvey, 2006).

2.5.4. Verbal Functions

Verbal-conceptual measures assess receptive and expressive language abilities.

RBANS Picture Naming presents participants with a series of ten drawings of common objects (e.g. pencil, kite) and asks them to name the objects aloud.

The Physical Stories within the adapted Strange Stories Task (SST; White et al., 2009; adapted from Happé, 1994) is an assessment of language comprehension. Participants are presented with eight short social stories and asked about their understanding of physical states. Due to the variations in reading ability of participants, the option was provided to present these stories verbally.

2.5.5. Visuo-Spatial Abilities

Visuospatial ability refers to a person's capacity to correctly interpret the form and orientation of visual stimuli.

RBANS Line Orientation presents ten sets of two lines joined at different angles. Each line corresponds to a numbered angle indicated on a key above. Participants are asked which two numbers correspond to the lines below.

RBANS Figure Copy shows an unusual figure and asks participants to copy out the design as shown. It is scored according to element presence and placement.

2.5.6. Learning and Memory

Learning and memory functions are closely connected. Learning requires the encoding of information. Memory functions require the ability to store and recall this information and are divided into domains of verbal and visual performance.

RBANS Word tasks presents participants with a list of ten words (e.g. apple, carpet) and asks them to recall as many as they can over a series of four trials (learning). Participants are then asked to recall these words 20 minutes later (recall) and presented

with a list of words, some of which were present in the previous list, and asked which they recognise (recognition).

RBANS Story task is a similar paradigm which asks participants to listen to and recall a short story (learning). Participants are then asked to recall this story again 20 minutes later (recall).
RBANS Figure Delayed Recall asks participants to draw out the figure copied earlier from memory (recall).

2.5.7. Executive Functions

Executive functioning refers to the complex set of skills and abilities that allow a person to flexibly plan, prioritise, organise, and inhibit information for purposeful action.

RBANS Semantic Fluency task provides participants with a category (fruits and vegetables) and asks them to recall as many items as they can think of in 60 seconds. It requires participants to reference semantic knowledge at speed and to inhibit irrelevant and repetition of items.

Action Fluency (Piatt et al., 1999) asks participants to recall ‘as many things people do’ as they can in 60 seconds. The task asks for one-word verb answers (e.g. walk, eat). It has been evidenced as having strong construct validity and test-retest stability (Woods et al., 2005).

The Trail Making Test Part B (TMT-B; Reitan, 1955) is a timed measure of set-switching and cognitive flexibility. It asks participants to join up a series of numbered and lettered circles in alternate order (e.g. 1-A-2-B). It records time taken to complete, which includes corrections in sequencing as highlighted by the test administrator. The TMT-B is thought to be a reliable indicator of executive dysfunction across several clinical populations (Periáñez et al., 2007).

Motor executive and frontal lobe functions were assessed using tasks of bimanual alternation and motor sequencing (Luria, 1970), and finger tapping tasks of motor opposition and inhibition. Each task is relatively simple but requires participants to maintain and flexibly switch between tasks according to changes in rules. Participants under the age of 65 are generally expected to successfully carry out all of the tasks. Failures in sequencing the tasks and/or remembering the task rules are thought to be a useful clinical indicator of impairment to executive functions.

2.5.8. Social Cognition

The Mentalisation Stories of the Strange Stories Task (from White et al., 2009) presented participants with eight short social stories requiring participants to have knowledge of the presence and state of the minds of others. It includes stories referencing functions of social cognition including deception, lies, persuasion, and manipulation. The original Strange Stories Task was created by Happé (1994) and involved 24 stories. The shorter version was used in the present study to support engagement and limit length of the neuropsychological battery administered.

Facial emotion perception was assessed using the Advanced Clinical Solutions (ACS) Affect Naming Task (ANT; Pearson, 2009). The ANT presents 24 photographs of people making facial expressions. Each photo represents either one of the six core ‘basic’ emotions (happy, sad, anger, fear, surprise, disgust; Ekman & Friesen, 1971) or a neutral expression. Participants are asked to select the corresponding emotion to each photo from a list of options. The ANT has been demonstrated to correlate well with other measures of social cognition and has good internal reliability (Kandalaft et al., 2012). The limitations of presenting static facial expressions over more dynamic, ecologically valid expressions are acknowledged; however, in the absence of robust stimuli and norms for dynamic expressions, and the supporting research for the ANT, the present measure was considered appropriate.

The Questionnaire for Cognitive and Affective Empathy (QCAE; Reniers et al., 2011) is a 31-item measure of cognitive and affective empathy. It involves the assessment of the cognitive subscales of perspective taking and online simulation, and the affective subscales of emotion contagion, proximal responsivity, and peripheral responsivity. Participants are asked to respond on a four-point Likert scale from strongly disagree to strongly agree. The QCAE has been normed according to sex and age using a sample of 925 university students and staff in the UK and has since been validated as measure of cognitive and affective empathy which correlates well with activation in known neural regions associated with empathy (Eres et al., 2015).

2.6. Ethics

2.6.1. Ethical Approval

Ethical approval was granted from the University of East London School of Psychology Ethics Committee (Appendix A), which supported recruitment through a charitable organisation.

2.6.2. Informed Consent

Before agreeing to participate in the study, participants were fully informed of the study's aims and what would be asked of them. A participant information sheet (Appendix B) was provided, and service users were given the opportunity to read this and ask questions. For those reporting reading difficulties, this was explained verbally. In line with the BPS Code of Human Research Ethics (2021), participants were informed of the voluntary time commitment, purpose of tests, and storage and usage of data. Participants were informed of their right to withdraw participation (within three weeks of participation, for data analysis purposes). If service users agreed to participate, they provided written informed consent (Appendix C). Each participant was informed that they would receive verbal feedback and an accompanying report of their results, which they

could choose to share with the team in the centre or others involved in their care if they wished.

2.6.3. Confidentiality

Participants were assigned an ID number through which their neuropsychological assessment data could be recognised. Identifiable information collected (e.g. on consent forms) was stored separately to the research data in a locked cabinet and not included in the electronic storage of data or the write-up. Personal data was stored and processed in accordance with General Data Protection Regulations and the Data Protection Act (2018). Electronic research data was stored securely on the university OneDrive for Business, accessible only to the researcher and research supervisor using a password-protected laptop.

2.6.4. Protection from Harm and Follow-Up Support

Participants were not deceived of the study's aims. They were given opportunities to ask questions before and after participation. Fatigue breaks were offered during testing if needed. Following participation, participants were given verbal feedback on their relative strengths and challenges before being provided with a written report. The debrief sheet provided advised participants of where they could access support in the unlikely event that they felt distressed following their participation, which included the centre as well as other local organisations (Appendix D).

2.7. Procedure

Staff at the centre distributed study advertisements and informed service users of the researcher's presence. Initially, staff primarily supported with recruitment through recommendations made to service users. Further participants were recruited through snowball sampling within the centre, and later as the researcher developed relationships within the centre, they asked service users if they wished to participate.

The assessments took place in a private room within the centre. After reading the participant information sheet and providing informed consent, demographic information was collected. Following this, participants completed the neuropsychological battery. Participation took approximately one hour. As an appreciation of the time given to participate, service users were each reimbursed with a £10 voucher following completion.

2.8. Data Analysis

Participants' raw scores were converted into scaled scores where possible (Mean = 10, SD = 3) and compared to normative data to understand their performance in the context of expected performance for their age. Raw and scaled scores were inputted into and analysed using the IBM Statistical Package for the Social Sciences (SPSS, Version 29).

Non-parametric tests were used to address whether the groups' cognitive profile significantly differed from the normative sample, with the norms therefore acting in the stead of a matched control sample. The Wilcoxon signed rank test is a non-parametric test which was used to compare group data to a hypothesised median of 10.

To understand the relationships within and between measures of social cognition and cognition, non-parametric correlations using Spearman's rho were conducted. Scatter plots were used to check the relationships between variables were linear. A Spearman's rho coefficient of greater than 0.40 is thought to reflect a moderate association, whilst a coefficient larger than 0.60 is thought to indicate a strong association between variables (Cohen, 1988).

To understand the relative contribution of cognition variables to performance on social cognition tasks of Affect Naming and SST Mentalisation Stories, multiple linear regressions were performed for the variables which showed the strongest associations with the social cognition measures. Four variables were entered on each occasion for the present sample size (*n*=31). As a rule of thumb, around 10-20 observations are

recommended per independent variable entered into a multiple regression (Harrell, 2015). A power calculation using G* power recommended a target sample size of *n*=85. Therefore, the multiple regression analyses were under-powered with the present sample, indicating a reduced likelihood of detecting a true effect. Given the exploratory nature of the present study and the effect sizes identified in the Wilcoxon signed rank test, multiple regressions were conducted, however it is acknowledged this had low statistical power.

2.9. Participant Characteristics

In total, 41 participants were recruited in the present study. However, there were a disproportionate number of male (*n*=36) to female (*n*=5) participants, which is broadly in keeping with official estimates of people experiencing homelessness from the 2021 Census which showed two-thirds of people who are recorded as homeless in the UK are male (Office for National Statistics, 2023). Given the unbalanced nature of this sample, and existing research observing there are gender differences in social cognition measures (Martin & Slepian, 2021), the decision was taken on theoretical grounds to analyse male and female participants separately. In addition, the majority of the present sample were primary speakers of English (*n*=35), with a smaller number citing English as an additional language (*n*=6). Differences were observed between primary and additional English language speakers in their performance on measures involving understanding or use of language. Again, these participants were analysed separately. Therefore, analysis of the group of male-identifying primary speakers of English is reported here (*n*=31).

Of these participants, their ages ranged from 24 to 73 years, with good coverage of adults of working age. Years of education ranged from 7 to 17, which was a good coverage of range and typical of a UK sample. Optimal intellectual ability, as captured by the WTAR, identified this participant group's premorbid functioning scaled scores were within expected limits when compared with the general population (Table 2). Regarding ethnicity, 87.1% (*n*=27) reported they were White British. There was wide diversity of housing status (Table 4) and presence of physical and mental health conditions (Table

5). In particular, the number of participants reporting current mental health difficulties exceeded previous estimates (Schanzer et al., 2007). Over half of the sample (54.8%) reported experiencing a head injury which had caused them to lose consciousness in their lifetime, and around one third (35.5%) reported multiple events. The majority of participants (74.2%) reported no current substance use problems. Around one-third of those with no current substance use reported previous addiction (38.7%).

Table 2

Participant Characteristics

	Mean	SD	Skewness	Kurtosis
Age	43	11.76	0.366	-0.238
Years of Education	11.13	1.98	0.443	1.445
WTAR Score (Scaled)	9.10	3.92	-0.494	-0.762

Table 3

Participant Ethnicity

	Frequency	Percentage
White British	27	87.1%
Black Caribbean	1	3.2%
Mixed – White British and Black Caribbean	1	3.2%
Indian	1	3.2%
White – Other (South African)	1	3.2%

Table 4

Educational Qualifications and Occupational Background

	Frequency	Percentage
Educational Qualifications		
No formal qualifications	18	58.1%
GCSE or equivalent	12	38.7%
Undergraduate degree	1	3.2%
Occupational Background		
DE: Semi-skilled and unskilled manual occupations, unemployed and lowest grade occupations	19	61.3%
C2: Skilled manual occupations	8	25.8%
C1: Supervisory, clerical, and junior managerial, administrative and professional occupations	4	12.9%
AB: Higher and intermediate managerial, administrative and professional occupations	0	0%

Table 5

Housing Status

	Frequency	Percentage
Rough sleeping	15	48.4%
Living in insecure environment	2	6.4%

Sofa surfing	3	9.7%
Living in temporary accommodation	5	16.1%
Currently housed, at risk of homelessness	6	19.3%

Table 6

Physical and Mental Health Conditions

	Frequency	Percentage
Physical Health Conditions		
None	21	67.7%
Yes	10	32.3%
Diabetes	3	9.7%
Respiratory condition	3	9.7%
Chronic pain	3	9.7%
High blood pressure	2	6.5%
Hemihyperplasia	1	3.2%
Heart failure	1	3.2%
Mental Health Conditions		
None	9	29%
Yes	22	71%
Depression	8	25.8%
Anxiety	7	22.6%
Post-traumatic stress disorder (PTSD)	5	16.1%
Emotionally unstable personality disorder (EUPD)	1	3.2%
Social anxiety	1	3.2%
Bipolar disorder	1	3.2%
Schizophrenia	1	3.2%

Table 7

Presence of Developmental Conditions

	Frequency	Percentage
None	21	67.7%
Dyslexia	5	16.1%
Autism	3	9.7%
Attention deficit hyperactivity disorder (ADHD)	4	12.9%
Dyspraxia	1	3.2%

3. RESULTS

3.1. Exploratory Data Analysis

Descriptive statistics were derived for the raw and scaled scores for each cognitive subtest. Firstly, the minimum and maximum scores helped to confirm there had been no data entry errors. A total of 22 subtests were included in the analysis. The data was also examined for skewness (as a measure of asymmetry of the data distribution; a value greater than 1 may indicate the data is skewed), and for kurtosis (as a measure of the peak of the distribution; a value greater than 3 may indicate a heavy- or light-tailed distribution around the mean). Box plots and histograms were used to further understand the distribution of the data, and to check for coding errors and outliers.

Table 8 gives the descriptive statistics for the scaled scores on the cognitive tests and for social cognition measures; *n*=31 except for WTAR and Digit Span Backwards, where *n*=30. Scaled scores are based on a normal distribution which assumes a mean of 10, and a standard deviation of 3. On visual inspection, group-level performance on tasks of optimal ability, verbal-conceptual, and visuo-spatial functions appear at least in keeping with normative estimates. Performance on Naming, Line Orientation, and Figure Copy were each negatively skewed, with participants scoring close to ceiling on these measures. There appears to be a relative weakness on tasks of verbal and visual attention, learning and memory, and executive functions. However, on Trail Making B, participants performed better than expected. Performance on a task of Story Learning was positively skewed, with the group distribution falling below the expected mean.

For the social cognition measures, participants' group-level performance on tasks of Affect Naming and SST Mentalisation Stories were below the expected mean for the general population, whilst scores on the self-report measure of empathy were in keeping with expectations.

Table 8

Descriptive Statistics for Cognitive and Social Cognitive Tests (Scaled Scores)

Domain & Test	Mean	SD	Min	Max	Skew.	Kurt.	S-W Sig.
WTAR	9.10	3.92	1	15	-0.49	-0.76	**.039**
Attention							
Digits Forward	8.23	2.66	4	15	0.55	-0.36	**.022**
Digits Backward	6.43	1.87	2	10	-0.48	0.56	.062
Coding	5.87	3.16	1	13	0.40	-0.61	.223
Trail Making A	10.03	2.81	3	15	-0.49	-0.21	.286
Verbal							
Naming	10.81	1.45	7	12	**-1.12**	1.02	**<.001**
Physical Stories	10.71	1.66	8	14	-0.25	-0.83	**.009**
Visual							
Line Orientation	10.42	3.25	2	15	**-1.00**	0.56	**.012**
Figure Copy	10.81	2.63	6	14	**-1.09**	-0.31	**<.001**
Executive							
Semantic Fluency	7.03	2.71	2	12	-0.10	-0.83	.198
Action Fluency	8.55	2.66	4	13	-0.14	-1.17	**.044**
Trail Making B	11.70	2.49	4	15	**-1.72**	**3.26**	**<.001**
Learning-Memory							
Word Learning	6.13	3.14	2	15	0.97	1.03	**.041**
Word Recall	7.77	2.85	3	14	-0.09	-0.62	.178
Word Recognition	7.90	3.86	1	12	-0.66	-0.90	**<.001**

Story Learning	6.84	3.57	2	17	**1.43**	2.70	**<.001**
Story Recall	7.32	2.59	3	14	0.32	0.09	.292
Figure Recall	8.97	3.49	3	17	0.09	-0.54	.540
Social Cognition							
Affect Naming	7.68	2.82	4	13	0.26	-1.22	**.018**
Mental Stories	8.06	3.15	1	12	-0.76	-0.10	**.012**
Cognitive Empathy	10.19	2.98	2	15	-0.68	0.71	.252
Affective Empathy	9.90	3.42	4	16	-0.05	-0.84	.299

3.2. Analysis of Cognitive and Social Cognitive Functioning

As shown in Table 9, participants' group-level performance was poorer than expected on most measures involving executive-attentional functions, with the exception of Trail Making A and B. Significant effects are highlighted in bold. There were no significant differences between participants and normative data in Trail Making A performance, a task of visual attention, and participants performed significantly better than expected on Trail Making B, a task of attentional set-shifting. It is worth noting the norms for Trails do not account for errors made in sequencing of the task (Tombaugh, 2004). Several participants (*n*=13) made errors on Trail Making B which required correction. Participants performed better than expected (median of 10) on verbal-conceptual tests. Group-level performance was significantly poorer than normative samples on verbal learning and memory tasks, whilst visual memory was in keeping with expected performance.

For the social cognition measures, sample performance on Affect Naming and SST Mentalisation Stories were significantly below the expected median. Individual profile analysis revealed more than two thirds of participants scored below the mean in Affect Naming (*n*=23). For SST Mentalisation Stories, this number represented over half of participants (*n*=18). In contrast, sample scores on the self-report measure of empathy were in line with expected scores in the general population.

Table 9

Participant Cognitive Subtest Scores Compared to Normative Data (Median=10)

Domain & Test	N	Wilcoxon W (Standardised)	Effect Size (r)	Asymptotic Sig. (2-sided)
WTAR	30	-1.14	0.21	.256
Attention				
Digits Forward	31	-3.18	**0.57**	.001
Digits Backward	30	-4.73	**0.86**	<.001
Coding	31	-4.42	**0.79**	<.001
Trail Making A	31	0.23	0.04	.819
Verbal				
Naming	31	2.47	**0.44**	.013
Physical Stories	31	2.15	**0.39**	.032
Visual				
Line Orientation	31	1.13	0.20	.258
Figure Copy	31	1.36	0.24	.173
Executive				
Semantic Fluency	31	-4.24	**0.76**	<.001
Action Fluency	31	-2.69	**0.48**	.007
Trail Making B	31	3.04	**0.55**	.002
Learning-Memory				
Word Learning	31	-4.19	**0.75**	<.001
Word Recall	31	-3.58	**0.64**	<.001
Word Recognition	31	-2.35	**0.42**	.019

Story Learning	31	-3.60	**0.65**	<.001
Story Recall	31	-4.04	**0.73**	<.001
Figure Recall	31	-1.62	0.29	.106
Social Cognition				
Affect Naming	31	-3.49	**0.63**	<.001
Mental Stories	31	-3.18	**0.57**	.001
Cognitive Empathy	31	0.64	0.12	.520
Affective Empathy	31	-0.13	0.02	.899

3.3. Relationships Between Social Cognition and Cognition Measures

Given that participants' performance significantly differed from normative samples on a number of cognitive and social cognitive subtests, non-parametric correlations using Spearman's rho were used to identify potential relationships between these variables. The full correlation matrix can be found in Appendix E. Notable correlations were identified between Affect Naming and SST Mentalisation Stories, as well as between Cognitive and Affective Empathy (Table 10).

Regarding the relationship between social cognition with other cognition measures, Affect Naming and SST Mentalisation Stories showed the most associations with other measures. As performance on a number of cognitive tasks increased, so too did performance on these social cognition measures. Notably, Affect Naming showed the strongest associations with Digit Span Backward, Line Orientation, Word Recognition, and Trail Making B. SST Mentalisation Stories showed the strongest associations with Naming, Figure Copy, Word Learning, and Word Delayed Recall. Interestingly, SST Physical Stories and SST Mentalisation Stories were not strongly correlated. A Wilcoxon paired samples test identified a reliable difference between SST Physical Stories and Mentalisation Stories, with participants scoring higher on the former (W = 53.00, Z = -3.57, p = <.001). Empathy scores showed fewer associations with cognitive measures, apart from Affective Empathy correlating with Line Orientation, Word Delayed Recall, and Figure Delayed Recall.

Table 10

Spearman's Rank Correlation Coefficients

Domain & Test	Affect Naming	Mental Stories	Cognitive Empathy	Affective Empathy
WTAR	0.39	0.11	-0.04	0.17
Attention				
Digits Forward	0.15	0.07	-0.13	-0.10
Digits Backward	**0.47**	0.38	-0.22	0.26
Coding	**0.44**	0.32	0.12	0.13
Trail Making A	0.23	0.17	-0.07	0.16
Verbal				
Naming	0.29	**0.46**	0.13	0.13
Physical Stories	-0.04	0.20	-0.17	-0.07
Visual				
Line Orientation	**0.49**	0.37	-0.05	**0.47**
Figure Copy	0.37	**0.52**	0.21	0.11
Executive				
Semantic Fluency	0.21	0.27	-0.01	0.08
Action Fluency	**0.42**	0.36	0.19	0.12
Trail Making B	**0.45**	0.22	0.13	0.18
Learning-Memory				
Word Learning	**0.41**	**0.44**	-0.10	0.25
Word Recall	0.39	**0.45**	-0.03	**0.49**
Word Recognition	**0.56**	0.35	-0.05	0.21
Story Learning	**0.43**	0.20	-0.01	0.20

Story Recall	0.33	0.33	-0.25	0.02
Figure Recall	0.38	0.30	0.07	**0.50**
Social Cognition				
Affect Naming	---	---	---	---
Mental Stories	**0.47**	---	---	---
Cognitive Empathy	0.24	0.13	---	---
Affective Empathy	0.27	0.23	**0.48**	---

3.4. Multiple Regressions

3.4.1. Affect Naming

Digit Span Backward, Line Orientation, Word Recognition, and Trail Making B were entered as predictors of Affect Naming performance in a multiple linear regression. The Variance Inflation Factor (VIF) was less than 10 for all entered variables, indicating there were no problems with collinearity within the variables. Including the constant, the overall regression model was statistically significant (R^2 = 0.46, F(4, 24) = 5.02, p = .004). However, none of the variables made a significant unique contribution to performance (Table 11). Digit Span Backward made the greatest unique contribution to performance. These findings were not expected.

Table 11

Regression Coefficients for ACS Affect Naming

Test	B	SE	β (standard)	t	Sig.
Digit Span Backward	0.46	0.26	0.31	1.75	.093
Line Orientation	0.20	0.15	0.23	1.34	.193
Word Recognition	0.18	0.13	0.24	1.42	.169
Trail Making B	0.21	0.18	0.19	1.17	.254

3.4.2. SST Mentalisation Stories

Naming, Figure Copy, Word Learning, and Word Delayed Recall were entered as predictors of performance on SST Mentalisation Stories in a multiple linear regression (Table 12). The VIF was less than 10 for all variables. Including the constant, the overall model was significant (R^2 = 0.42, F(4, 26) = 4.62, p = .006). Figure Copy was the only variable which made a significant unique contribution to performance on SST Mentalisation Stories. Being a visual test of perception and construction, it is not immediately obvious why they would be so closely related.

Table 12

Regression Coefficients for SST Mentalisation Stories

Test	B	SE	β (standard)	t	Sig.
Naming	0.21	0.37	0.09	0.56	.583
Figure Copy	0.58	0.22	0.48	2.63	**.014**
Word Learning	0.14	0.21	0.14	0.65	.521
Word Recall	0.10	0.24	0.09	0.41	.683

3.5. Analysis with Female Participants

3.5.1. Participant Characteristics

For female participants (n=4), their ages ranged from 21 to 58, maintaining good coverage of adults of working age. Years of education ranged from 10 to 13. Optimal intellectual ability on the WTAR was slightly lower in female participants than male participants (Table 13). Most female participants reported leaving education without any formal qualifications (75%, n=3) and all reported an employment history in semi-skilled or manual occupations or unpaid or unemployed work (category DE of the 2021

Census). Regarding ethnicity, 75% (*n*=3) self-identified as White British, 25% (*n*=1) self-identified as White Traveller. Half of our female participants (50%, *n*=2) were rough sleeping, with the remaining participants housed in temporary accommodation (50%, *n*=2). One quarter (25%, *n*=1) reported a physical health condition, and half (50%, *n*=2) reported a mental health problem. No female participant reported a current problem with substance misuse or a previous head injury.

Table 13

Female Participant Characteristics

	Mean	SD	Skewness	Kurtosis
Age	40.75	15.20	-0.49	1.55
Years of Education	11.25	1.26	**1.13**	2.23
WTAR Score (Scaled)	7.75	4.27	0.29	-0.68

3.5.2. Statistical Analysis

To understand the additional contribution of sex to the groups' cognitive and social cognitive profile, the analysis was re-run including both male and female primary speakers of English (*n*=35). As one participant was both female and cited English as an additional language, she was excluded from all additional analysis.

A Mann-Whitney U Test was run for all scaled scores to examine if male and female participants differed from each other in their performance on cognition and social cognition measures. Exact significance tests, exploiting the resampling procedures available in SPSS, were used to account for unequal and small sample sizes. Male and female participants did not differ on most cognition or social cognition variables, with the exception of Story Delayed Recall where male participants scored higher than female participants (Exact Sig. = .027). Descriptives and Mann Whitney U statistics can be found in Appendix F.

A re-run of the Wilcoxon signed rank test in this sample revealed no changes to the significance of any cognition or social cognition variable from primary analysis when compared to an expected median of 10.

The Spearman's rho correlations were also re-run, and a breakdown of the correlation matrix for the relationships between social cognition and cognition variables can be found in Appendix G. There were no notable changes to the relationships between social cognition and cognition variables, nor to the correlations amongst the social cognition variables.

Including Digit Span Backward, Line Orientation, Word Recognition and Trail Making B in a multiple linear regression for male and female participants did not alter the overall significance of the model for Affect Naming (R^2 = 0.32, F(4, 29) = 3.00, p = .035). None of the variables made a significant unique contribution to performance on ACS Affect Naming. Digit Span Backwards remained the most influential unique predictor.

Entering Naming, Figure Copy, Word Learning, and Word Delayed Recall into a multiple linear regression for SST Mentalisation Stories also did not alter the overall significance of the model (R^2 = 0.28, F(4, 30) = 2.96, p = .036). No single variable made a significant unique contribution to performance on SST Mentalisation Stories on this occasion. Naming made the greatest unique contribution.

3.6. Analysis with English Additional Language (EAL) Participants

3.6.1. Participant Characteristics

Male participants reporting English as additional language (EAL, n=5) were younger than English primary language speakers, ranging from 23 to 43. Their years of education ranged from 8 to 17. On the WTAR, optimal ability was slightly lower than primary language speakers (Table 14). Over half reported leaving education without formal qualifications (60%, n=3), with the remaining leaving with GCSEs or equivalent (20%,

n=1) and another with an undergraduate degree (20%, *n*=1). Most reported an employment history in semi-skilled occupations (80%, *n*=4), with the remainder working in skilled occupations (20%, *n*=1). The majority of male EAL participants were rough sleeping (60%, *n*=3) with others living in temporary accommodation (40%, *n*=2). Only one participant reported a current physical health problem (20%), whilst over half reported a mental health problem (60%, *n*=3). One participant reported addiction to alcohol, and one reported addiction to cannabis, with the remainder not currently struggling with substance misuse (60%, *n*=3). Over half (60%, *n*=3) reported a history of a head injury.

Table 14

Male EAL Participant Characteristics

	Mean	SD	Skewness	Kurtosis
Age	33.60	7.80	-0.33	-0.81
Years of Education	12.40	3.65	0.14	-1.63
WTAR Score (Scaled)	8.40	0.89	**-1.26**	0.31

Table 15

Male EAL Participant Ethnicity

	Frequency	Percentage
White – Other	3	60%
White – Roma	1	20%
Black African	1	20%

3.6.2. Statistical Analysis

Additional analyses were also re-run for male participants including both primary and additional English language speakers (*n*=36). The Mann Whitney U Test was run on scaled variables and revealed a number of differences between primary and additional

English language speakers. Primary English language speakers scored significantly higher than English additional language speakers on a number of verbal tasks requiring knowledge of the English language or alphabet: Digit Span Forward (Exact Sig. = .006), Digit Span Backward (Exact Sig. = .043), Trail Making A (Exact Sig. = .004), Naming (Exact Sig. = <.001), SST Physical Stories (Exact Sig. = <.001), Story Learning (Exact Sig. = .004), Story Delayed Recall (Exact Sig. = .007), Semantic Fluency (Exact Sig. = <.001), and Action Fluency (Exact Sig. = .012). Descriptives and Mann Whitney U statistics can be found in Appendix H.

A re-run of the Wilcoxon signed rank test including EAL participants revealed only one notable change: whilst previously scoring higher than expected, performance was no longer different from normative samples on language tests (Naming: $W = 152.00$, $Z = 0.06$, $p = .953$, SST Physical Stories: $W = 385.50$, $Z = 0.84$, $p = .400$).

Including EAL participants in the Spearman's rho analysis (correlation matrix in Appendix I) yielded no notable changes to the correlations amongst social cognition variables, nor to their relationships with cognition measures.

Entering Digit Span Backward, Line Orientation, Words Recognition and Trail Making B into a multiple linear regression for Affect Naming did not change the significance of the overall model ($R^2 = 0.40$, $F(4, 30) = 4.90$, $p = .004$). None of the variables made a significant unique contribution to performance on Affect Naming. On this occasion, Line Orientation made the greatest unique contribution.

Including Naming, Figure Copy, Words Learning, and Words Delayed Recall in a multiple linear regression for SST Mentalisation Stories did not alter the overall significance of the model ($R^2 = 0.27$, $F(4, 31) = 2.79$, $p = .043$). Figure Copy remained the only unique predictor of performance.

4. DISCUSSION

It is well established in existing literature that people experiencing homelessness are at greater risk of cognitive impairment than safely homed people due to a number of co-occurring factors such as traumatic brain injury, substance addiction, and poor mental health. Few studies have extended their assessment to include measures of social cognition. The present study aimed to explore the neurocognitive profile of a group of people experiencing homelessness who were accessing support through a day centre. Specifically, the study sought to understand if there were differences between participant performance and normative data on cognition and social cognition measures, and if there were differences, to understand the relationships between these measures and to what extent other cognitive functions contributed to performance on tasks of social cognition.

4.1. Summary of Findings

4.1.1. Group Analysis

The analysis revealed an overall sample weakness on tasks of verbal learning and memory. In contrast, performance on a task of visual memory was in keeping with expected performance in the general population. Ennis et al. (2015) conducted a systematic review of 11 studies which assessed memory performance in people experiencing homelessness. They found participants reliably scored below the mean on measures of verbal memory. Few studies assessed visual memory performance, and those which did often lacked sufficient information to interpret mean performance. Subsequent research has supported the finding that verbal memory performance tends to be lower than the norm in people experiencing homelessness (Maye et al., 2023). One study which did look at visual memory, by Cotman and Sandman (1997), used the Wechsler Memory Scale (Wechsler, 1997) and found performance in their sample resided in the average range. Thus, from known existing literature, memory performance of participants in the present study is in keeping with previous research. Verbal memory appears to have been prioritised in previous cognitive assessments of people

experiencing homelessness, perhaps due to its application to activities of daily life, such as recalling information about complex housing processes and health appointments.

On a group level, participants also performed lower than expected on tasks of attention and working memory. Executive functions as assessed on verbal fluency tasks also indicated performance was significantly lower than expected. This would suggest that participants found it difficult to sustain their attention, generate effective strategies, and hold lots of information in their mind at one time. An exception was found on the Trail Making B test, where participants scored higher than would be expected in the general population. However, one third of participants made sequencing mistakes in this task, and whilst they may have worked quickly, they did so whilst making attentional errors. The norms for this test do not account for errors. It is possible this made a contribution to the high scores on this measure. Existing research is in agreement that attentional-executive functions commonly fall below the mean in people experiencing homelessness (Burra et al., 2009; Gonzalez et al., 2001; Pluck et al., 2015) and this may be especially pronounced for those with TBI (Andersen et al., 2014).

Performance on tasks assessing verbal ability revealed that for participants whose primary language was English, their naming and verbal comprehension were at least in keeping with normative samples. This runs counter to a study by Pluck et al. (2020), who found significantly reduced auditory comprehension and oral expression amongst a population of people experiencing homelessness, who were matched to a control group with similar educational background and socioeconomic status; reading and writing abilities did not significantly differ between the two groups. Mean years of education were 5.82 years for their homeless sample, and 6.75 years for their control sample. Given the sample in the present study had higher average years of education, it is possible that this preserved language ability, as longer time spent in education facilitates increased development of language skills. The RBANS can also be considered to be a relatively easy test of language with many participants scoring close to ceiling on the object naming task.

Participants' performance on visuospatial tasks did not differ from the normative sample. In a study by Mullady et al. (2022), visuospatial deficits were less likely to be self-reported by their homeless participants than other cognitive functions, however their objective assessment identified one third of their sample demonstrated weaknesses in their visuospatial skills. Some research suggests neurocognitive impairment which is localised predominantly in areas associated with visuospatial functions are less strongly associated with risks of becoming homeless, than for example the executive functions, which are localised to the frontal lobe and have implications for emotion regulation, thinking and reasoning (Piña-Escudero et al., 2021).

On the social cognition measures, participants scored below expected on tasks assessing mentalising and emotion perception. This is an important and novel finding; the first to show in a sample of homeless participants the presence of social cognitive difficulties in both cognitive and affective domains. In her study of homeless participants with TBI, Nardini (2023) identified a reduction in mentalising ability, but not in emotion perception. It is possible the smaller sample size in her study did not pick up on difficulties in the affective domain.

Participants' self-reported cognitive and affective empathy showed no differences when compared to normative data. Most research examining empathy within the context of homelessness have considered societal attitudes towards people who are homeless (e.g. Varma, 2019), rather than empathic ability within homeless participants themselves. No existing research is known to indicate that people experiencing homelessness would typically score differently to the general population on such measures.

4.1.2. Relationships Between Variables

The correlation analysis addressed how much performance on one measure was related to performance on other measures. Whilst it does not indicate causality, correlation analysis can be helpful for understanding associations between variables.

Emotion perception and mentalisation were positively correlated with one another. This fits with previous findings (Nardini, 2023; Stone et al., 1998) and suggests the measures tap into similar abilities. As expected, self-reported cognitive and affective empathy were also positively related. Interestingly, the empathy measures were not associated with performance on tests of emotion perception and mentalising. These measures may have assessed separate functions. Mean scores on the self-report measure of empathy and perspective taking were higher than scores on the objective social cognition measures. It is possible that participants were not fully aware of their challenges interpreting the thoughts, feelings, and intentions of others, and therefore self-reported greater ability to do so than was identified in the objective social cognition subtests.

Emotion perception showed correlations with a number of variables. As performance on a task of emotion perception increased, so too did performance on tasks of visuospatial ability, verbal learning and memory, attention and working memory, and executive functions. It is possible that, to some extent, the emotion perception test was picking up on the degree of cognitive impairment in the sample in these functions, given it was consonant with several cognitive functions.

Performance on a mentalisation task was positively correlated with naming ability, visuo-construction, and verbal learning and memory tests. Of note, performance did not correlate with language comprehension (on the physical state stories), suggesting the ability to understand and attribute the mental states of others requires at least some different skills to those involved in verbal reasoning. Further analysis indicated a reliable difference between scores on physical state and mentalisation stories, supporting this conclusion.

Self-reported empathy scores showed fewer associations with cognition measures. Cognitive empathy did not correlate with any cognition variable. Affective empathy scores were correlated with visuo-construction, and some verbal and visual memory subtests. It is not clear why these associations would be found.

4.1.3. Multiple Linear Regressions

Use of multiple linear regressions helped to understand to what extent performance on cognition measures could predict performance on measures of social cognition.

For emotion perception, the four most strongly correlated cognition variables were entered into the regression. No variable made a unique contribution to performance. This did not change when female or English additional language participants were also included in the analysis.

A multiple linear regression for the four cognitive subtests which correlated most strongly with mentalisation revealed the overall model was significant. However, only one variable (visuo-construction) made a unique contribution to performance. This finding held when English additional language speakers were included in the analysis.

4.2. Interpretation of Findings

The current study supports existing literature which shows people experiencing homelessness demonstrate poorer cognitive function than would be expected in the general population (Burra et al., 2009; Solliday-McRoy et al., 2004). The present findings perhaps even extend previous findings in highlighting the particular difficulties in tasks of learning and memory, and in executive functions. Whilst there was a wide range of scaled scores in these functions, overall sample scores were well below expected performance in the general population. This is suggestive of significant difficulties in these cognitive functions in the present sample, which may be unaddressed and have substantial implications for functional skills and activities of daily life. The present study also extends on existing research to highlight an additional area of difficulty in the sample on objective measures of social cognition. Individual test score profiles identified over two thirds of participants scored below the expected mean on a test of emotion perception, and over half were below the mean on the mentalisation task. There are a number of possible explanations for these findings.

Firstly, participants in this study represented a heterogenous group of people with a number of comorbid experiences alongside being homeless. Over half of participants reported having suffered a head injury which caused them to lose consciousness, and one third reported several neurotraumatic events. In a comparison of homeless participants with and without TBI using the RBANS, Andersen et al. (2014) found both groups scored below the norm on tasks of attention, and significantly more so for those with history of TBI. This finding is supported in additional research (McAllister et al., 2004; Topolovec-Vranic et al., 2012). Head injuries tend to have a prominent impact on higher-level cognitive processes such as attention and executive function. It is possible that high rates of TBI is one contributing factor to cognitive performance in the present sample.

A number of additional experiences could have given rise to cognitive and social cognitive impairment in the sample. One third reported a diagnosis of a neurodevelopmental condition, and existing research has highlighted neurodiverse people tend to find it more difficult to understand the thoughts, feelings, and intentions of other people (Baron-Cohen et al., 1985; Uekermann et al., 2010). Housing status of this sample may also be linked with performance, as almost half of participants were rough sleeping, and unsheltered homelessness has been connected to poorer cognitive functioning due to greater associations with severe mental illness and substance use (Foster et al., 2012; Llerena et al., 2018). It was not possible to isolate these variables in the current analysis, as most participants presented with several interacting factors which likely would have contributed to their cognitive and social cognitive profile.

An estimate of the group's optimal level of cognitive functioning (on a reading task) indicated that participants did not differ in their optimal ability from expected performance in normative samples. This fits with existing literature which has estimated premorbid ability in people experiencing homelessness to be in the average range (Depp et al., 2015; Pluck et al., 2015). Participants' average years of education was also in line with the general population (ONS, 2023). Collectively, this indicates that

differences identified on cognitive and social cognitive measures are unlikely to be the result of having a lower baseline optimal ability, and instead are more suggestive of acquired difficulties.

From available data, the multiple regression analyses revealed that other cognitive functions made only a small contribution to participants' performance on objective measures of social cognition. Performance on language tests were not sufficient predictors of mentalisation, suggesting there is unlikely to be a substantial language component to understanding and attributing the mental states of others. It is impossible to entirely isolate a test to ensure that it is a 'pure' assessment of a particular cognitive or social cognitive domain. This is a well-documented issue within the field of neuropsychology, as cognitive functions often involve multiple structures working together (Hebben & Millberg, 2002). For example, a task of mentalisation requires a person to follow the instructions of the task, remember the content of the story, hold in mind and filter relevant information, and communicate an appropriate answer. Nonetheless, the present findings are supportive of the theory that social cognition is domain-specific, in that it is largely reliant on separate neural processes to those involved in general cognition (Gweon et al., 2012).

4.3. Clinical Implications and Recommendations

4.3.1. Importance of Social Cognition

The ability to recognise the thoughts, feelings, and intentions of other people is an evolutionary skill with implications for our functioning within social groups (Adolphs, 1999). Social cognition, as an umbrella term for the skills which help us to understand the mental states of others, is consequently important in facilitating harmonious social living. Poorer social cognitive functioning has the potential to be incredibly disabling to a person's quality of life. The finding that a group of people experiencing homelessness scored significantly lower than would be expected in the general population on social cognition measures perhaps adds context to the finding that relationship breakdown is

the most common immediate trigger to becoming homeless (Pleace et al., 2008). The present research contributes to our understanding of one of the causal mechanisms which may be in operation for people who experience significant life events and go on to become homeless. Social cognitive function has important implications for social relationships, and in turn the likelihood that a person may experience the burden of mental health difficulties, substance addiction, and homelessness. It will be useful to further investigate social cognition in a larger population of people who are homeless and explore whether social cognition is a facilitator and/or barrier to exiting homelessness, as highlighted in previous research exploring its associations with functional outcomes, such as number of days spent homeless, community integration, and resilience (Greenberg et al., 2019; Horan et al., 2020; Llerena et al., 2018).

The stigma which has marginalised people experiencing homelessness often centres around the assumption that homelessness is the result of a series of ‘poor choices’ which ultimately place a person in a situation of their own creation. Based on the present findings and in the previous research, it is possible that people experiencing homelessness have problems navigating personal and professional relationships, in part as a result of poorer cognitive and/or social cognitive functioning, which affects their ability to build and maintain secure relationships. For many, their struggles could begin early in life, with a greater number of adverse childhood experiences reported than would be expected in the general population (Moschion & van Ours, 2021). Consequently, the behaviour of people experiencing homelessness may be interpreted as purposefully difficult or challenging, when it could be reflective of an unidentified or poorly understood cognitive and/or social cognitive impairment. This might also help to explain the presence of ‘revolving door homelessness’, where people find themselves in a cycle of homelessness and eviction from their accommodation (Garvie, 2012). The present research therefore presents us with an opportunity to reframe the narrative that people who are homeless are wholly responsible for their circumstances, and offers a lens of understanding through social cognitive and cognitive function, which may affect a person’s interpretation of their social and material worlds.

4.3.2. Recommendations for Routine Care

It is essential that assessment of cognition and social cognition for people experiencing homelessness is incorporated into routine care for those who consent to it. Current guidelines for supporting the health of people experiencing homelessness in the UK recommend a comprehensive assessment of a person's physical and mental health needs, but with no mention of cognition (NICE, 2022). This is surprising, given the wealth of established evidence which indicates elevated risks for cognitive impairment among people experiencing homelessness. Emerging research is supportive of routine screening for brain injury and cognitive functioning in people who are homeless, which could lead to earlier diagnosis and access to relevant health and disability services (Fearn-Smith et al., 2023). Findings in the present study suggest benefit in including measures which are sensitive enough to pick up even subtle difficulties in learning and memory and executive functions, both in clinical assessments and in future research (for example, using the RBANS).

It is important that cognition and social cognition are assessed separately, given the theory and finding that they involve separate but related functions. Due to its absence in current clinical guidelines, it is possible that a number of service providers, particularly non-clinical teams, remain unaware of the prevalence of cognitive and social cognitive difficulties in homeless populations. The charitable sector provides a large proportion of housing, health, and wellbeing support to people experiencing homelessness in the UK. Therefore, healthcare professionals, charitable organisations and policy makers must work collaboratively with those with lived experience to understand peoples' needs and circumstances, and to develop clinical guidelines which support a thorough assessment of cognition and social cognition into standard practice.

4.3.3. Cognitive and Social Cognitive Strategies

Understanding the cognition and social cognition of people experiencing homelessness could pave the way for services to become more accessible. A person experiencing

homelessness might be asked to simultaneously attend meetings with housing officers, social care, welfare services, and multiple healthcare appointments, amongst others. Headway (2018) asked people who had experienced brain injury how they found the process of applying for employment and disability benefits; three quarters reported issues with the process, including not receiving enough information on how to complete long forms, which were often hard to understand. This likely also applies to people experiencing homelessness, given high prevalence of TBI as well as additional barriers which accompany the absence of a stable home address. If services are aware of the cognitive and social cognitive strengths and challenges of people accessing their support, they are in a better position to tailor the delivery of their care and increase its usefulness.

For example, a person who has difficulties with verbal learning and memory functions could be provided with additional time in appointments to encode information, and visual reminders and cues to support with remembering it later. For a person whose assessment indicates working memory difficulties, services could break down information into smaller chunks and refrain from asking a person to hold large amounts of information in mind at once. For a person who is identified to struggle in their social cognitive abilities, they could benefit from a more direct and concrete approach to communication. Further research and clinical guidelines which recommend evidence-based and person-centred strategies could provide a framework for services to incorporate adjustments to their communication and procedures.

4.3.4. Trauma-Informed Approaches

As well as providing tailored communication and strategies to individuals, our understanding of social cognition in people experiencing homelessness must also support service providers and clinical teams in their approaches. The NHS pledged in its Long Term Plan (2019) to improve the provision of trauma-informed care for people accessing its services. At the heart of trauma-informed care are the principles of psychological safety, trust, collaboration, and empowerment (Substance Abuse and

Mental Health Services Administration [SAMHSA], 2014). Attempts have been made to apply these principles to services supporting people experiencing homelessness (Milaney et al., 2020). It is essential that relationship building is at the heart of working with people experiencing homelessness (Cockersell, 2012). As previously mentioned, people experiencing homelessness may be interpreted as ambivalent or resistant to health and housing interventions, if services do not understand their cognitive and social cognitive needs. This has the potential to present barriers to developing and potential for rupture of the therapeutic relationship, and impact on experience of care, health outcomes, and future help-seeking.

It is therefore vital that clinical and non-clinical staff are trained in trauma-informed approaches to care tailored to understanding the lives of people who are homeless. For example, differences in cognition and social cognition could lead to staff observing and interpreting behaviour as socially unacceptable, challenging, or impulsive. Training around what cognition and social cognition means for behaviour and relationships, through a lens of (neuro)trauma-informed care, could support with positive therapeutic relationship building. It could also support in facilitating psychological safety of service users and staff (Cockersell, 2016).

4.3.5. A Whole-Systems Approach

An ecological systems approach is best placed to understand and tackle the issues facing people experiencing homelessness. This model puts forward a position which understands the complex biopsychosocial factors which can lead to and perpetuate a person's experience of homelessness from the microlevel to the macrolevel (Nooe & Patterson, 2010). Cognition and social cognition should form a part of this puzzle, as they underpin how a person will see the world and relate to others, as well as how others relate to and treat them. Unclear or vague communication, as well as the complexity and bureaucracy within service provisions will likely double the burden for those people experiencing homelessness who also present with social cognitive difficulties. It may also place a person at greater risk of vulnerability and exploitation

from others. The intrapersonal and interpersonal difficulties which face homeless populations must therefore be considered within their systemic and legal context, as they have the potential to protect or further oppress vulnerable people (Sample & Ferguson, 2020).

As well as a moral duty to act, there is also an economic argument to widen the scope of assessment and interventions to support people who are homeless. People experiencing homelessness are much more likely to seek support for a health condition at emergency departments rather than primary care settings, yet most of these conditions are treatable in primary care services if care is accessed early enough (Davies & Wood, 2018; Schanzer et al., 2007). Homelessness increases the burden of physical and mental health difficulties, and subsequently costs the NHS an estimated £6,000 per each person who is homeless for more than three months, and an estimated £1 billion collective cost of homelessness to the public sector over the course of one year (Crisis, 2016; Department for Communities and Local Government, 2012). Many people who are homeless report putting off accessing healthcare support due to previous negative encounters and not feeling understood (Becker & Foli, 2022). Therefore, if time and money is invested into further research which leads to the co-production of more nuanced guidelines supporting the needs of people who are homeless, it may facilitate a greater sense of understanding and inclusion within health services. In turn, this could increase the uptake of routine care and reduce long-term costs to the NHS.

4.4. Critical Review

4.4.1. Strengths

A strength of the research is the sample size for a single site, and associated diversity of experiences. The study was able to capture a wide range of experiences in people who are homeless. This included around half of participants who were rough sleeping at the time of participation. People who are unsheltered homeless are much less likely to be involved in research due to challenges in recruitment (Depp et al., 2015). A large

proportion of participants in the present study reported current mental health difficulties, which was much higher than previous figures (Schanzer et al., 2007). Rates of TBI were also high. It is hoped that this study will further our understanding of the multifaceted needs of people experiencing homelessness and be used as contributing evidence in developing clinical guidelines for including cognition and social cognition in standard practice in the future.

In addition, use of the RBANS as a neuropsychological test battery of cognition strengthened an understanding of the cognitive profile of this sample and allowed scope to include additional measures of social cognition. As already mentioned, the RBANS is brief to administer and is less taxing on attention than other neuropsychological test batteries. At the same time, it provides a comprehensive assessment of several cognitive domains using co-normed tests. It is methodologically sound, and we are able to draw more conclusions than would be possible from cognitive screening tools, such as the Mini Mental State Examination (Folstein et al., 1975).

4.4.2. Limitations

4.4.2.1. Sample

The majority of participants were male and primary English language speakers, which reflects official statistics of people who are most likely to be recorded as homeless across the UK (ONS, 2023). Efforts were made to include the results of female and English additional language participants. However, there are limits as to how far we may generalise these findings.

The social cognition literature suggests differences between males and females in their motivations and ability to orient to the thoughts and feelings of another person (Diekman & Schmader, 2021; Martin & Slepian, 2021). Small to moderate sex differences have been recorded on measures of emotion perception (Kirkland et al., 2013) and empathy (Christov-Moore et al., 2014). Further research which prioritises the experience of

females who are homeless is needed, particularly as females tend to represent a greater proportion of the 'hidden homeless' (Bretherton, 2017).

There are also differences in experience between people who are born in the UK and become homeless, and those who find themselves homeless after migration or seeking asylum. For the latter groups, the prevalence of multiple exclusion homelessness (associated with combinations of substance misuse, street culture activities and poor mental health) tend to be lower and if present, begin after moving to the UK (Fitzpatrick et al., 2011). It is consequently possible that the cognitive and social cognitive functioning of participants with English as additional language could differ to what has been reported in the current findings.

4.4.2.2. Measures

As is the case with many neuropsychological tests, the measures used in this study compared participant scores to normative data which has been created and normed in a white western context. This means they are reliant on a comprehensive understanding of the English language, as well as the customs and norms which are at the core of western culture. This limits the cross-cultural generalisability of the materials. For example, one of the questions in the task of language comprehension is about 'Henry', who has separated six eggs to make mayonnaise and does not want to waste any remaining ingredients. Participants are asked why Henry might choose to make meringues. It cannot be expected that participants from different cultural backgrounds will know the answer to this question. Therefore, alternative measures which capture a greater diversity of cultural experience, as well as availability in other languages, will increase the range of application of social cognition research.

A measure of participants' reading ability was used as an estimator of optimal ability. It is important to include an assessment of optimal ability in neuropsychological research in order to understand if any identified weaknesses are the result of developmental or acquired difficulties. A recent study has suggested that reading tests have high predictive accuracy in healthy populations, however this can be more variable in people

with neurological damage (Bright & van der Linde, 2018). Reading ability may also be less reliable as an indicator of optimal ability for executive functions (Suchy et al., 2017). There are several other methods which could have been utilised to estimate premorbid functioning. An alternative approach could have used a person's best performance on a test as an indicator of their optimal ability, based on the assumption that this indicates an 'intact' function (Lezak et al., 2004). Previous studies have also used demographic data (age and years of education) to estimate a person's premorbid functioning (Crawford & Allan, 1997). Given the heterogeneity of the present sample and the exploratory nature of this study, a reading test was employed as one of the most well-researched and understood assessments of optimal ability, and a method which has been used in similar studies exploring cognition and social cognition in people who are homeless (Llerena et al., 2018). The finding that participant's optimal ability did not differ from expected performance in normative data is also in line with the result that participant average years of education were in keeping with the general population. Nonetheless, it could be interesting for future studies to use alternative methods of estimating optimal ability, which could include the addition of demographic data, or utilising 'best' performance, to examine if the present finding holds.

An additional limitation with regards to the measures used in the present study is the absence of an explicit test of planning within executive functions. Understanding the relative components of executive functions is complex, though thought to include planning, set shifting, working memory, and response inhibition (Baggetta & Alexander, 2016). As an exploratory study, it was not possible to extensively cover all components of executive function in the present methodology. Planning is to some extent captured in the existing measures which require an element of strategising, such as in verbal fluency tasks. However, given the extent of observed weakness in most tests of executive function in the present study, it is important to broaden our understanding through use of additional measures of executive function in future research, in order to better recognise the nuance of potential areas of difficulty in homeless populations.

4.4.2.3. Design

The cross-sectional design of the research also presents some limitations. Findings captured cognitive and social cognitive functioning at one timepoint. Participants were universally having to attend to health and/or housing concerns, which may have affected their performance on the day of assessment, particularly for higher-level tasks of attention and executive functioning. Causality also remains unclear: does poorer cognition and social cognition increase the likelihood of a person becoming homeless, or do the experiences of homelessness and its associated burdens have an impact on a person's cognitive and social cognitive functioning? It is possible both statements are true. Further research is required to fully understand directionality of this relationship. Longitudinal monitoring of people over time could help to further understand the nature and course of their cognition and social cognition, as well as supporting with the tailoring of individual strategies.

4.4.2.4. Statistical Analysis

Use of p=0.05 as the threshold for statistical significance is common practice in psychological research. De Winter and Dodou (2015) have identified a surge of p values marginally below the 0.05 threshold (between 0.041 and 0.049) in research completed over a twenty-year period. Lakens (2015) suggest this is the result of increasing Type I errors (a 'false positive' where a true null hypothesis is rejected), in part due to the decrease in average statistical power in recent studies. It is acknowledged that the present study conducted a number of statistical analyses with a relatively high number of variables, consequently increasing the risk of Type I error. Nonetheless, given the exploratory nature of this study, a p value of 0.05 in keeping with existing research was considered appropriate to examine if there was a difference between this sample and the general population. Many of the significant findings in this study would have continued to hold if a more rigorous p value of 0.01 had been used. Future researchers may decide to implement a more stringent threshold for statistical analysis as we better understand the profile of social cognition in people who are homeless.

In addition, it is important to acknowledge the limitations of the conclusions which can be drawn from the multiple regression analyses in light of reduced statistical power.

Including the regression analyses may have also contributed to likelihood of Type I error and affect the reliability of findings. A larger sample size, as recommended for future studies, would increase the statistical power of the analysis and give further weighting to conclusions about the relationship between cognition and social cognition.

4.4.3. Recommendations for Future Research

As our understanding of the processes and mechanisms underpinning social cognition increase, so too will the quality of assessment measures and their norms. Social cognition is a relatively new area, with advances in neuroimaging and other technology occurring only recently and allowing our understanding to improve (Abrams & Hogg, 1999). Further research is needed to develop measures which have clearer applications to daily life. For example, the emotion perception task asks participants to recognise emotions from static photographs of faces. In our daily interactions, we are able to make use of more dynamic information from the face and body to deduce another's emotional state. This task may be harder than it is in real life to perceive emotions in others, and lack context. Use of a measure which allows more dynamic and ecologically valid interpretation, such as from video clips, may advance our understanding of the extent and nature of emotion perception impairments across populations.

Whilst the mentalisation stories involve second-order theory of mind processes (understanding what one person thinks another person is thinking; which involve a higher-level ability to understand the mental states of others), the questions asked about the story could be more specific and relevant to the daily interactions in our lives. Some research has suggested that people may 'pass' advanced theory of mind tasks whilst still encountering problems in social interactions (Scheeren et al., 2013). Therefore, it is possible that the extent of real-life difficulty in understanding the thoughts and intentions of others may not be fully captured in ToM measures, and further research which develops our understanding of the processes involved in mentalising will support with improving the ecological validity of our assessment tools.

In the absence of validated performance-based measures which assess empathy and perspective-taking, a self-report measure of empathy was used in the present study. Scores on this measure showed the fewest associations with cognitive and social cognitive variables. Use of self-report measures of empathy alone limits progress of research in the field, as they may be underpinned by weak psychometric properties and influenced by social desirability bias (Neumann et al., 2015). Some attempts have been made to develop performance-based assessment tools of empathy and perspective taking (Nummenmaa et al., 2008), although further evidence of its reliability and validity is required. Therefore, future research would do well to continue to develop social cognition measures which are more internally and externally valid, mapping onto the reality of our interactions and functional skills.

Currently, assessment of social cognition in adults is rare. Social cognition is not well integrated into existing neuropsychological batteries. This is unlike assessment batteries for children, such as the Neuropsychology Assessment – Second Edition (NEPSY-II; (Korkman et al., 2007), which includes a domain of social perception, assessing emotion recognition and mentalisation. Consequently, there is potentially an unmet need within existing assessment tools used for adults. Future research could contribute toward the co-norming and inclusion of such measures into neuropsychological test batteries to support comprehensive assessment of cognition and social cognition in adults.

4.5. Self-Reflexivity

Reflexivity is important in both qualitative and quantitative research, to consider how we as researchers influence its processes (Jamieson et al., 2022). I was motivated to complete this piece of research due to the beliefs I hold regarding homelessness and its underlying causes. I have always believed that people experiencing homelessness are amongst the most marginalised in our society. To be in a position where you cannot call a place of habitation a stable home, and often without sufficient support to prevent or find a route out of homelessness, presents itself to me as an extremely lonely and distressing existence. Coupled with negative attitudes held toward people experiencing

homelessness in society and the perceptions held about the causes of their situations, I feel deep empathy and compassion toward people who find themselves without a stable place to call home.

With this in mind, my dual position as a trainee clinical psychologist in clinical practice, and as a researcher for the present project, required some juggling and appropriate boundaries in completing this study. I had expected potential participants to be wary or ambivalent about my presence as a 'psychologist' completing research. Although this was the case for some, my continued presence over the few months of data collection allowed me to build relationships with some people in the centre. I heard first- and second-hand about people's past and more recent experiences, which led to them become homeless and affected their mental health. Perhaps due to a combination of my job title and the time I spent there, I felt that I became a person that some felt they could or should open up to. I may have been the closest contact some had to a mental health professional at the time. I was conscious that I had to contain the conversations I had in the clinical interview part of data collection and more widely in the centre. It was important that I did not adopt the 'rescuer' position (Karpman, 1968), and slip into a care coordinating role. I did not encounter or observe distress during or after speaking with participants. Nonetheless, I was careful to ensure a person's state of wellbeing, signpost using the participant debrief sheet, and communicate with the team at the centre who knew these people well and had knowledge of local services.

Another area of reflexivity which was central for me during the research process relates to the ethical implications of its potential findings. My goal of completing research in this topic area was to contribute to a greater understanding of the needs of people experiencing homelessness and dismantle some of the barriers they can face in accessing health and housing services. At the same time, I am conscious that highlighting these additional needs could contribute to further marginalisation if taken out of context. For example, in assessing empathy and perspective-taking, I did not want to imply or suggest that people experiencing homelessness are not motivated or capable to feel for another person. I also did not want to contribute to negative attitudes toward the

abilities of the people who gave up their time to participate. I have tried to balance what is considered appropriate terminology in neuropsychology (e.g. ‘weak’, ‘inefficient’, or ‘impaired’ functions) with more human, person-first language to talk about the people it concerns. The individual feedback reports provided to each participant was prefaced with their strengths, to ensure a more holistic formulation of their abilities, and attempt to reduce the likelihood that any ‘challenges’ identified during the assessment would be internalised and cause distress.

4.6. Concluding Statement

To my knowledge, this study is the first to investigate the social cognitive functioning of a sample of people experiencing homelessness with flexible inclusion criteria. This sample displayed weaknesses in emotion perception and mentalising, alongside (already well-documented) difficulties on a number of cognitive tasks. Crucially, the evidence suggested that these problems may be acquired, rather than being developmental in their origin. Performance on tasks of general cognition made only small contributions to performance on social cognitive measures, supporting a domain-specific theory of social cognition. Further research is needed to understand the causal relationship between homelessness and social cognition, as well as widen the range of this research to include a more diverse demographic. Social cognition is itself a concept which is continuing to evolve over time.

Clinical guidelines for supporting the health of people who are homeless do not currently include recommendations for assessing or supporting cognition and social cognition. People experiencing homelessness should be routinely offered an assessment of their cognition and social cognition in order to identify their strengths, challenges, and individualised package of support. Without it, it is likely that people experiencing homelessness will continue to slip through the cracks of services, with further ruptures to relationships between service providers and service users. The responsibility falls on service providers to adopt a holistic and trauma-informed understanding of people experiencing homelessness in light of their enduring health needs.

Against a background of funding cuts, increasing cost to living, and ongoing marginalisation, homelessness is a persistent and divisive topic in the UK and across the world. It is vital that people experiencing homelessness and the services which support them are invested in. As psychologists, researchers, and health service providers, we must not give up on our contributions to the fight to reduce and eventually eliminate homelessness in modern society.

5. REFERENCES

Abrams, D., & Hogg, M. A. (Eds.). (1999). *Social identity and social cognition* (pp. 196-229). Blackwell.

Adler, N., Nadler, B., Eviatar, Z., & Shamay-Tsoory, S. G. (2010). The relationship between theory of mind and autobiographical memory in high-functioning autism and Asperger syndrome. *Psychiatry Research, 178*(1), 214-216. https://doi.org/10.1016/j.psychres.2009.11.015

Adolphs, R. (1999). Social cognition and the human brain. *Trends in Cognitive Sciences, 3*(12), 469-479. https://doi.org/10.1016/S1364-6613(99)01399-6

Adolphs, R. (2009). The social brain: Neural basis of social knowledge. *Annual Review of Psychology, 60*, 693-716. https://doi.org/10.1146/annurev.psych.60.110707.163514

Adolphs, R., Sears, L., & Piven, J. (2001). Abnormal processing of social information from faces in autism. *Journal of Cognitive Neuroscience, 13*(2), 232-240. https://doi.org/10.1162/089892901564289

Adolphs, R., Tranel, D., & Damasio, A. R. (1998). The human amygdala in social judgment. *Nature, 393*, 470-474. https://doi.org/10.1038/30982

Adolphs, R., Tranel, D., Damasio, H., & Damasio, A. R. (1995). Fear and the human amygdala. *Journal of Neuroscience, 15*(9), 5879-5891. https://doi.org/10.1523/JNEUROSCI.15-09-05879.1995

Adolphs, R., Tranel, D., Hamann, S., Young, A. W., Calder, A. J., Phelps, E. A., Anderson, A., Lee, G. P., & Damasio, A. R. (1999). Recognition of facial emotion in nine individuals with bilateral amygdala damage. *Neuropsychologia, 37*(10), 1111-1117. https://doi.org/10.1016/S0028-3932(99)00039-1

Aggleton, J. P. (2000). *The amygdala: A functional analysis*. Oxford University Press.

Aldridge, R. W., Menezes, D., Lewer, D., Cornes, M., Evans, H., Blackburn, R. M., Byng, R., Clark, M., Denaxas, S., Fuller, J., Hewett, N., Kilmister, A., Luchenski, S., Manthorpe, J., McKee, M., Neale, J., Story, A., Tinelli, M., Whiteford, M., Wurie, F., & Hayward, A. C. (2019). Causes of death among homeless people: A population-based cross-sectional study of linked hospitalisation and mortality data in England. *Wellcome Open Research, 4*(49), 1-17. https://doi.org/10.12688/wellcomeopenres.15151.1

Andersen, J., Kot, N., Ennis, N., Colantonio, A., Ouchterlony, D., Cusimano, M. D., & Topolovec-Vranic, J. (2014). Traumatic brain injury and cognitive impairment in men who are homeless. *Disability and Rehabilitation, 36*(26), 2210-2215. https://doi.org/10.3109/09638288.2014.895870

Anderson, I., & Christian, J. (2003). Causes of homelessness in the UK: A dynamic analysis. *Journal of Community & Applied Social Psychology, 13*(2), 105-118. https://doi.org/10.1002/casp.714

Anderson, S. W., Bechara, A., Damasio, H., Tranel, D., & Damasio, A. R. (1999). Impairment of social and moral behavior related to early damage in human prefrontal cortex. *Nature Neuroscience, 2*, 1032-1037. https://doi.org/10.1038/14833

Anderson, S. W., Damasio, H., Tranel, D., & Damasio, A. R. (2000). Long-term sequelae of prefrontal cortex damage acquired in early childhood. *Developmental Neuropsychology, 18*(3), 281-296. https://doi.org/10.1207/S1532694202Anderson

Annand, P. J., Platt, L., Rathod, S. D., Hosseini, P., & Guise, A. (2022). 'Progression capitals': How homeless health peer advocacy impacts peer advocates. *Social Science & Medicine, 298*, 1-9. https://doi.org/10.1016/j.socscimed.2022.114770

Antaki, C. (2004). Reading minds or dealing with interactional implications? *Theory & Psychology, 14*(5), 667-683. https://doi.org/10.1177/0959354304046178

Armitage, C. J., & Christian, J. (2003). From attitudes to behaviour: Basic and applied research on the theory of planned behaviour. *Current Psychology, 22*, 187-195. https://doi.org/10.1007/s12144-003-1015-5

Asana, O. O., Ayvaci, E. R., Pollio, D. E., Hong, B. A., & North, C. S. (2018). Associations of alcohol use disorder, alcohol use, housing, and service use in a homeless sample of 255 individuals followed over 2 years. *Substance Abuse, 39*(4), 497-504. https://doi.org/10.1080/08897077.2018.1449169

Asgary, R. (2018). Cancer screening in the homeless population. *The Lancet Oncology, 19*(7), 344-350. https://doi.org/10.1016/S1470-2045(18)30200-6

Backer, T. E., & Howard, E. A. (2007). Cognitive impairments and the prevention of homelessness: Research and practice review. *The Journal of Primary Prevention, 28*, 375-388. https://doi.org/10.1007/s10935-007-0100-1

Baez, S., Herrera, E., Villarin, L., Theil, D., Gonzalez-Gadea, M. L., Gomez, P., Mosquera, M., Huepe, D., Strejilevich, S., Viglieca, N. S., Matthäus, F., Decety, J., Manes, F., & Ibañez, A. M. (2013). Contextual social cognition impairments in schizophrenia and bipolar disorder. *PloS One, 8*(3), e57664, 1-13. https://doi.org/10.1371/journal.pone.0057664

Baggetta, P., & Alexander, P. A. (2016). Conceptualization and operationalization of executive function. *Mind, Brain, and Education, 10*(1), 10-33. https://doi.org/10.1111/mbe.12100

Bainbridge, J., & Carrizales, T. J. (2017). Global homelessness in a post-recession world. *Journal of Public Management & Social Policy, 24*(1), 71-90. https://digitalscholarship.tsu.edu/jpmsp/vol24/iss1/6

Barker, C., Pistrang, N., & Elliott, R. (2016). *Research methods in clinical psychology: An introduction for students and practitioners*. John Wiley & Sons.

Barnea-Goraly, N., Menon, V., Eckert, M., Tamm, L., Bammer, R., Karchemskiy, A., Dant, C. C., & Reiss, A. L. (2005). White matter development during childhood and adolescence: A cross-sectional diffusion tensor imaging study. *Cerebral Cortex, 15*(12), 1848-1854. https://doi.org/10.1093/cercor/bhi062

Baron-Cohen, S. (1987). Autism and symbolic play. *British Journal of Developmental Psychology, 5*(2), 139-148. https://doi.org/10.1111/j.2044-835X.1987.tb01049.x

Baron-Cohen, S. (1989a). The autistic child's 'theory of mind': A case of specific developmental delay. *Journal of Child Psychology and Psychiatry, 30*, 285-297. https://doi.org/10.1111/j.1469-7610.1989.tb00241.x

Baron-Cohen, S. (1992). Out of sight or out of mind? Another look at deception in autism. *Journal of Child Psychology and Psychiatry, 33*(7), 1141-1155. https://doi.org/10.1111/j.1469-7610.1992.tb00934.x

Baron-Cohen, S. (1999). The evolution of a theory of mind. In M. C. Corballis & S. E. G. Lea (Eds.), *The descent of mind: Psychological perspectives on hominid evolution* (pp. 261–277). Oxford University Press.

Baron-Cohen, S., Campbell, R., Karmiloff-Smith, A., Grant, J., & Walker, J. (1995). Are children with autism blind to the mentalistic significance of the eyes?. *British Journal of Developmental Psychology, 13*(4), 379-398. https://doi.org/10.1111/j.2044-835X.1995.tb00687.x

Baron-Cohen, S., Jolliffe, T., Mortimore, C., & Robertson, M. (1997a). Another advanced test of theory of mind: Evidence from very high functioning adults with autism or Asperger syndrome. *Journal of Child psychology and Psychiatry, 38*(7), 813-822. https://doi.org/10.1111/j.1469-7610.1997.tb01599.x

Baron-Cohen, S., Leslie, A. M., & Frith, U. (1985). Does the autistic child have a “theory of mind”?. *Cognition, 21*(1), 37-46. https://doi.org/10.1016/0010-0277(85)90022-8

Baron-Cohen, S., Ring, H., Moriarty, J., Schmitz, B., Costa, D., & Ell, P. (1994). Recognition of mental state terms: Clinical findings in children with autism and a functional neuroimaging study of normal adults. *British Journal of Psychiatry, 165*(5), 640-649. https://doi.org/10.1192/bjp.165.5.640.

Baron-Cohen, S., Spitz, A., & Cross, P. (1993). Do children with autism recognise surprise? A research note. *Cognition & Emotion, 7*(6), 507-516. https://doi.org/10.1080/02699939308409202

Baron-Cohen, S., & Wheelwright, S. (2004). The empathy quotient: An investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. *Journal of Autism and Developmental Disorders, 34*, 163-175. https://doi.org/10.1023/B:JADD.0000022607.19833.00

Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The "Reading the Mind in the Eyes" Test revised version: A study with normal adults, and adults with Asperger syndrome or high-functioning autism. *The Journal of Child Psychology and Psychiatry and Allied Disciplines, 42*(2), 241-251. https://doi.org/10.1017/S0021963001006643

Barrash, J., Tranel, D., & Anderson, S. W. (2000). Acquired personality disturbances associated with bilateral damage to the ventromedial prefrontal region. *Developmental Neuropsychology, 18*(3), 355-381. https://doi.org/10.1207/S1532694205Barrash

Barrera Valencia, M., & Calderón Delgado, L. (2013). Notes for supporting an epistemological neuropsychology: Contributions from three perspectives. *International Journal of Psychological Research, 6*(2), 107-118. https://www.redalyc.org/pdf/4235/423539529005.pdf

Bax, A., & Middleton, J. (2019). Healthcare for people experiencing homelessness. *The British Medical Journal, 364*, 1022-1023. https://doi.org/10.1136/bmj.l1022

Bechara, A., Damasio, A. R., Damasio, H., & Anderson, S. W. (1994). Insensitivity to future consequences following damage to human prefrontal cortex. *Cognition, 50*(1-3), 7-15. https://doi.org/10.1016/0010-0277(94)90018-3

Becker, J. N., & Foli, K. J. (2022). Health-seeking behaviours in the homeless population: A concept analysis. *Health & Social Care in the Community, 30*(2), 278-286. https://doi.org/10.1111/hsc.13499

Beijer, U., Wolf, A., & Fazel, S. (2012). Prevalence of tuberculosis, hepatitis C virus, and HIV in homeless people: A systematic review and meta-analysis. *The Lancet Infectious Diseases, 12*(11), 859-870. https://doi.org/10.1016/S1473-3099(12)70177-9

Bogart, K. R., & Matsumoto, D. (2010). Living with Moebius syndrome: Adjustment, social competence, and satisfaction with life. *The Cleft Palate-Craniofacial Journal, 47*(2), 134-142. https://doi.org/10.1597/08-257_1

Bora, E., Walterfang, M., & Velakoulis, D. (2015). Theory of mind in Parkinson's disease: A meta-analysis. *Behavioural Brain Research, 292*, 515-520. https://doi.org/10.1016/j.bbr.2015.07.012

Bousman, C. A., Twamley, E. W., Vella, L., Gale, M., Norman, S. B., Judd, P., Everall, I., & Heaton, R. K. (2010). Homelessness and neuropsychological impairment: Preliminary analysis of adults entering outpatient psychiatric treatment. *The Journal of Nervous and Mental Disease, 198*(11), 790-794. https://doi.org/10.1097/NMD.0b013e3181f97dff

Bowie, C. R., & Harvey, P. D. (2006). Administration and interpretation of the Trail Making Test. *Nature Protocols, 1*(5), 2277-2281. https://doi.org/10.1038/nprot.2006.390

Bowpitt, G., Dwyer, P., Sundin, E., & Weinstein, M. (2011). Comparing men's and women's experiences of multiple exclusion homelessness. *Social Policy and Society, 10*(4), 537-546. https://doi.org/10.1017/S1474746411000285

Bramley, G., & Fitzpatrick, S. (2018). Homelessness in the UK: Who is most at risk?. *Housing Studies, 33*(1), 96-116. https://doi.org/10.1080/02673037.2017.1344957

Brass, M., Schmitt, R. M., Spengler, S., & Gergely, G. (2007). Investigating action understanding: Inferential processes versus action simulation. *Current Biology, 17*(24), 2117-2121. https://doi.org/10.1016/j.cub.2007.11.057

Bretherton, J. (2017). Reconsidering gender in homelessness. *European Journal of Homelessness, 11*(1), 1-22. https://www.feantsaresearch.org/download/feantsa-ejh-11-1_a1-v045913941269604492255.pdf

Bright, P., & van der Linde, I. (2018). Comparison of methods for estimating premorbid intelligence. *Neuropsychological Rehabilitation*, 30(1), 1–14. https://doi.org/10.1080/09602011.2018.1445650

British Psychological Society. (2017). *Standards for the accreditation of Doctoral programmes in clinical psychology*. BPS Partnership and Accreditation Team.

British Psychological Society. (2021). *BPS code of human research ethics*. BPS Working Party on Ethical Guidelines for Psychological Research.

Broadway. (2011). *Street to home annual report: 1st April 2010 to 31st March 2011*. Broadway.

Brown, L. M., Bradley, M. M., & Lang, P. J. (2006). Affective reactions to pictures of ingroup and outgroup members. *Biological Psychology, 71*(3), 303-311. https://doi.org/10.1016/j.biopsycho.2005.06.003

Burra, T. A., Stergiopoulos, V., & Rourke, S. B. (2009). A systematic review of cognitive deficits in homeless adults: Implications for service delivery. *The Canadian Journal of Psychiatry, 54*(2), 123-133. https://doi.org/10.1177/070674370905400210

Busch-Geertsema, V., & Fitzpatrick, S. (2008). Effective homelessness prevention? Explaining reductions in homelessness in Germany and England. *European Journal of Homelessness, 2*, 69-95. https://www.feantsaresearch.org/download/article-31841217355845842446.pdf

Butler, L. (2016). *Social cognition and HIV: Exploring the profile of cognitive impairments in HIV-associate neurocognitive disorders (HAND)* [Unpublished doctoral thesis]. University of East London.

Campbell, D. T., & Cook, T. D. (1979). *Quasi-experimentation: Design and analysis issues for field settings*. Rand McNally.

Carpenter, M., Nagell, K., Tomasello, M., Butterworth, G., & Moore, C. (1998). Social cognition, joint attention, and communicative competence from 9 to 15 months of age. *Monographs of the Society for Research in Child Development,* 63(4), 1-174. https://doi.org/10.2307/1166214

Castelli, F. (2005). Understanding emotions from standardized facial expressions in autism and normal development. *Autism, 9*(4), 428-449. https://doi.org/10.1177/1362361305056082

Chaitin, J., & Steinberg, S. (2008). “You should know better”: Expressions of empathy and disregard among victims of massive social trauma. *Journal of Aggression, Maltreatment & Trauma, 17*(2), 197-226. https://doi.org/10.1080/10926770802344851

Chartrand, T. L., & Bargh, J. A. (1999). The chameleon effect: The perception–behavior link and social interaction. *Journal of Personality and Social Psychology, 76*(6), 893-910. https://doi.org/10.1037/0022-3514.76.6.893

Chau, S., Chin, M., Chang, J., Luecha, A., Cheng, E., Schlesinger, J., Rao, V., Huang, D., Maxwell, A. E., Usatine, R., Bastani, R., & Gelberg, L. (2002). Cancer risk behaviors and screening rates among homeless adults in Los Angeles County. *Cancer Epidemiology Biomarkers & Prevention, 11*(5), 431-438. https://aacrjournals.org/cebp/article/11/5/431/166597/Cancer-Risk-Behaviors-and-Screening-Rates-Among

Cheallaigh, C. N., Cullivan, S., Sears, J., Lawlee, A. M., Browne, J., Kieran, J., Segurado, R., O'Carroll, A., O'Reilly, F., Creagh, D., Bergin, C., Kenny, R. A., & Byrne, D. (2017). Usage of unscheduled hospital care by homeless individuals in Dublin, Ireland: A cross-sectional study. *BMJ Open, 7*(11), 1-7. https://doi.org/10.1136/bmjopen-2017-016420

Christov-Moore, L., Simpson, E. A., Coudé, G., Grigaityte, K., Iacoboni, M., & Ferrari, P. F. (2014). Empathy: Gender effects in brain and behavior. *Neuroscience & Biobehavioral Reviews, 46*, 604-627. https://doi.org/10.1016/j.neubiorev.2014.09.001

Clifford, B., Wilson, A., & Harris, P. (2019). Homelessness, health and the policy process: A literature review. *Health Policy, 123*(11), 1125-1132. https://doi.org/10.1016/j.healthpol.2019.08.011

Cockersell, P. (2012), Homelessness, complex trauma and recovery. In R. Johnson, & R. Haigh. (Eds.), *Complex trauma and its effects* (pp. 169-80). Pavilion.

Cockersell, P. (2016). PIEs five years on. *Mental Health and Social Inclusion, 20*(4), 221-230. https://doi.org/10.1108/MHSI-08-2016-0022

Cohen, J. (1988). *Statistical power analysis* (2nd ed.). Routledge. https://doi.org/10.4324/9780203771587

Cornes, M., Joly, L., O'Halloran, S., & Manthorpe, J. (2011). *Rethinking multiple exclusion homelessness: Implications for workforce development and interprofessional practice: Summary of findings*. Social Care Workforce Research Unit.

Cotman, A., & Sandman, C. (1997). Cognitive deficits and their remediation in the homeless. *Journal of Cognitive Rehabilitation, 15*(1), 16-23.

Craig, A. D. (2002). How do you feel? Interoception: The sense of the physiological condition of the body. *Nature Reviews Neuroscience, 3*(8), 655-666. https://doi.org/10.1038/nrn894

Craig, A. D. (2008). Interoception and emotion: A neuroanatomical perspective. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of emotions* (pp. 272-288). The Guilford Press.

Crane, M., Byrne, K., Fu, R., Lipmann, B., Mirabelli, F., Rota-Bartelink, A., Ryan, M., Shea, R., Watt., H. & Warnes, A. M. (2005). The causes of homelessness in later life: Findings from a 3-nation study. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 60*(3), 152-159. https://doi.org/10.1093/geronb/60.3.S152

Crawford, J. R., & Allan, K. M. (1997). Estimating premorbid WAIS-R IQ with demographic variables: Regression equations derived from a UK sample. *The Clinical Neuropsychologist*, *11*(2), 192-197. https://doi.org/10.1080/13854049708407050

Cray, A., Miller, K., & Durso, L. E. (2013, September 26). *Seeking shelter: The experiences and unmet needs of LGBT homeless youth*. Center for American Progress. https://www.americanprogress.org/wp-content/uploads/sites/2/2013/09/LGBTHomelessYouth.pdf

Crisis. (2016). *Cost of homelessness*. https://www.crisis.org.uk/ending-homelessness/homelessness-knowledge-hub/cost-of-homelessness/

Crisis. (2022, February). *The homelessness monitor: England 2022*. https://www.crisis.org.uk/media/246994/the-homelessness-monitor-england-2022_report.pdf

Cronley, C. (2010). Unraveling the social construction of homelessness. *Journal of Human Behavior in the Social Environment, 20*(2), 319-333. https://doi.org/10.1080/10911350903269955

Cusi, A., MacQueen, G. M., & McKinnon, M. C. (2010). Altered self-report of empathic responding in patients with bipolar disorder. *Psychiatry Research, 178*(2), 354-358. https://doi.org/10.1016/j.psychres.2009.07.009

Daiski, I. (2007). Perspectives of homeless people on their health and health needs priorities. *Journal of Advanced Nursing, 58*(3), 273-281. https://doi.org/10.1111/j.1365-2648.2007.04234.x

Damasio, A. R., Tranel, D., & Damasio, H. (1990). Individuals with sociopathic behavior caused by frontal damage fail to respond autonomically to social stimuli. *Behavioural Brain Research, 41*(2), 81-94. https://doi.org/10.1016/0166-4328(90)90144-4

Damasio, H., Grabowski, T., Frank, R., Galaburda, A. M., & Damasio, A. R. (1994). The return of Phineas Gage: Clues about the brain from the skull of a famous patient. *Science, 264*(5162), 1102-1105. https://doi.org/10.1126/science.8178168

Data Protection Act 2018, c. 12. https://www.legislation.gov.uk/ukpga/2018/12/contents/enacted

Davies, A., & Wood, L. J. (2018). Homeless health care: Meeting the challenges of providing primary care. *Medical Journal of Australia, 209*(5), 230-234. https://doi.org/10.5694/mja17.01264

De Sousa, A., McDonald, S., Rushby, J., Li, S., Dimoska, A., & James, C. (2011). Understanding deficits in empathy after traumatic brain injury: The role of affective responsivity. *Cortex, 47*(5), 526-535. https://doi.org/10.1016/j.cortex.2010.02.004

De Vignemont, F., & Singer, T. (2006). The empathic brain: How, when and why?. *Trends in Cognitive Sciences, 10*(10), 435-441. https://doi.org/10.1016/j.tics.2006.08.008

Decety, J. (2010). The neurodevelopment of empathy in humans. *Developmental Neuroscience, 32*(4), 257-267. https://doi.org/10.1159/000317771

Decety, J., & Michalska, K. J. (2010). Neurodevelopmental changes in the circuits underlying empathy and sympathy from childhood to adulthood. *Developmental Science, 13*(6), 886-899. https://doi.org/10.1111/j.1467-7687.2009.00940.x

Decety, J., Norman, G. J., Berntson, G. G., & Cacioppo, J. T. (2012). A neurobehavioral evolutionary perspective on the mechanisms underlying empathy. *Progress in Neurobiology, 98*(1), 38-48. https://doi.org/10.1016/j.pneurobio.2012.05.001

Decety, J., & Svetlova, M. (2012). Putting together phylogenetic and ontogenetic perspectives on empathy. *Developmental Cognitive Neuroscience, 2*(1), 1-24. https://doi.org/10.1016/j.dcn.2011.05.003

Dell, K. C., Staph, J., & Hillary, F. G. (2021). Traumatic brain injury in the homeless: Health, injury mechanisms, and hospital course. *Brain Injury, 35*(10), 1192-1200. https://doi.org/10.1080/02699052.2021.1958009

Department for Communities and Local Government. (2012). *Evidence review of the costs of homelessness*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7596/2200485.pdf

Department for Levelling Up, Housing and Communities. (2022). *Ending rough sleeping for good*. https://www.gov.uk/government/publications/ending-rough-sleeping-for-good

Depp, C. A., Vella, L., Orff, H. J., & Twamley, E. W. (2015). A quantitative review of cognitive functioning in homeless adults. *The Journal of Nervous and Mental Disease, 203*(2), 126-131. https://doi.org/10.1097/NMD.0000000000000248

Diekman, A. B., & Schmader, T. (2021). Gender as embedded social cognition. In D. Carlston, K. Johnson, & K. Hugenberg (Eds.), *The Oxford handbook of social cognition*. Oxford Library of Psychology.

Dunbar, R. I. (1998). The social brain hypothesis. *Evolutionary Anthropology: Issues, News, and Reviews, 6*(5), 178-190. https://doi.org/10.1002/(SICI)1520-6505(1998)6:5<178::AID-EVAN5>3.0.CO;2-8

Dvash, J., & Shamay-Tsoory, S. G. (2014). Theory of mind and empathy as multidimensional constructs: Neurological foundations. *Topics in Language Disorders, 34*(4), 282-295. https://doi.org/10.1097/TLD.0000000000000040

Edidin, J. P., Ganim, Z., Hunter, S. J., & Karnik, N. S. (2012). The mental and physical health of homeless youth: A literature review. *Child Psychiatry & Human Development, 43*, 354-375. https://doi.org/10.1007/s10578-011-0270-1

Eidenmueller, K., Grimm, F., Montag, C., Dziobek, I., & Kiefer, F. (2021). Exploring influences on theory of mind impairment in opioid dependent patients. *Frontiers in Psychiatry, 12*, 721690. https://doi.org/10.3389/fpsyt.2021.721690

Ekman, P., & Friesen, W. V. (1971). Constants across cultures in the face and emotion. *Journal of Personality and Social Psychology, 17*(2), 124-129. https://doi.org/10.1037/h0030377

Ekman, P., & Friesen, W. V. (1976). *Pictures of facial affect*. Consulting Psychologists Press.

Elgar, K., Campbell, R., & Skuse, D. (2002). Are you looking at me? Accuracy in processing line-of-sight in Turner syndrome. *Proceedings of the Royal Society of London. Series B: Biological Sciences, 269*(1508), 2415-2422. https://doi.org/10.1098/rspb.2002.2173

Emery, N. J., & Amaral, D. G. (2000). The role of the amygdala in primate social cognition. In R. D. Lane & L. Nadel (Eds.), *Cognitive neuroscience of emotion* (pp. 156-191). Oxford University Press.

Ennis, N., Roy, S., & Topolovec-Vranic, J. (2015). Memory impairment among people who are homeless: A systematic review. *Memory, 23*(5), 695-713. https://doi.org/10.1080/09658211.2014.921714

Eres, R., Decety, J., Louis, W. R., & Molenberghs, P. (2015). Individual differences in local gray matter density are associated with differences in affective and cognitive empathy. *NeuroImage, 117*, 305-310. https://doi.org/10.1016/j.neuroimage.2015.05.038

Fazel, S., Geddes, J. R., & Kushel, M. (2014). The health of homeless people in high-income countries: Descriptive epidemiology, health consequences, and clinical and policy recommendations. *The Lancet, 384*(9953), 1529-1540. https://doi.org/10.1016/S0140-6736(14)61132-6

Fazel, S., Khosla, V., Doll, H., & Geddes, J. (2008). The prevalence of mental disorders among the homeless in western countries: Systematic review and meta-regression analysis. *PLoS Medicine, 5*(12), 1670-1681. https://doi.org/10.1371/journal.pmed.0050225

Fearn-Smith, E. M., Scanlan, J. N., & Hancock, N. (2023). Exploring and mapping screening tools for cognitive impairment and traumatic brain injury in the homelessness context: A scoping review. *International Journal of Environmental Research and Public Health, 20*(4), 3440. https://doi.org/10.3390/ijerph20043440

Feinstein, R., Greenblatt, A., Hass, L., Kohn, S., & Rana, J. (2001). *Justice for all? A report on lesbian, gay, bisexual and transgendered youth in the New York juvenile justice system*. Urban Justice Center. https://files.eric.ed.gov/fulltext/ED471676.pdf

Field, H., Hudson, B., Hewett, N., & Khan, Z. (2019). Secondary care usage and characteristics of hospital inpatients referred to a UK homeless health team: A retrospective service evaluation. *BMC Health Services Research, 19*, 1-15. https://doi.org/10.1186/s12913-019-4620-1

Fine, D. R., Joyce, A., Chang, Y., Lewis, E., Weinstock, K., Wright, J., Gaeta, J., Song, Z., & Baggett, T. P. (2023). Health care utilization among homeless-experienced adults who were seen by a mobile addiction health clinic in Boston, Massachusetts: A quasi-experimental study. *Substance Use & Misuse, 58*(9), 1115-1120. https://doi.org/10.1080/10826084.2023.2212279

Fiske, S. T., Cuddy, A. J., & Glick, P. (2007). Universal dimensions of social cognition: Warmth and competence. *Trends in Cognitive Sciences, 11*(2), 77-83. https://doi.org/10.1016/j.tics.2006.11.005

Fitzpatrick, S. (2000). *Young homeless people*. Macmillan.

Fitzpatrick, S. (2005). Explaining homelessness: A critical realist perspective. *Housing, Theory and Society, 22*(1), 1-17. https://doi.org/10.1080/14036090510034563

Fitzpatrick, S., Bramley, G., & Johnsen, S. (2013). Pathways into multiple exclusion homelessness in seven UK cities. *Urban Studies, 50*(1), 148-168. https://doi.org/10.1177/0042098012452329

Fitzpatrick, S., Johnsen, S., & White, M. (2011). Multiple exclusion homelessness in the UK: Key patterns and intersections. *Social Policy and Society, 10*(4), 501-512. https://doi.org/10.1017/S147474641100025X

Fitzpatrick, S., Pawson, H., Bramley, G., Wilcox, S., & Watts, B. (2012). *The homelessness monitor: Scotland 2012*. Heriot-Watt University.

Fitzpatrick, S., & Stephens, M. (2007). *An international review of homelessness and social housing policy*. Department for Communities and Local Government.

Flavell, J. H., Flavell, E. R., Green, F. L., & Wilcox, S. A. (1981). The development of three spatial perspective-taking rules. *Child Development, 52*(1), 356-358. https://doi.org/10.2307/1129250

Fletcher-Watson, S., & Bird, G. (2020). Autism and empathy: What are the real links? *Autism, 24*(1), 3-6. https://doi.org/10.1177/1362361319883506

Folsom, D., & Jeste, D. V. (2002). Schizophrenia in homeless persons: A systematic review of the literature. *Acta Psychiatrica Scandinavica, 105*(6), 404-413. https://doi.org/10.1034/j.1600-0447.2002.02209.x

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). “Mini-mental state”: A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research, 12*(3), 189-198.

Forchuk, C., MacClure, S. K., Van Beers, M., Smith, C., Csiernik, R., Hoch, J., & Jensen, E. (2008). Developing and testing an intervention to prevent homelessness among individuals discharged from psychiatric wards to shelters and ‘No Fixed Address’. *Journal of Psychiatric and Mental Health Nursing, 15*(7), 569-575. https://doi.org/10.1111/j.1365-2850.2008.01266.x

Forrest, R., & Hirayama, Y. (2009). The uneven impact of neoliberalism on housing opportunities. *International Journal of Urban and Regional Research, 33*(4), 998-1013. https://doi.org/10.1111/j.1468-2427.2009.00903.x

Foster, A., Gable, J., & Buckley, J. (2012). Homelessness in schizophrenia. *Psychiatric Clinics, 35*(3), 717-734. https://doi.org/10.1016/j.psc.2012.06.010

Fraser, B., Pierse, N., Chisholm, E., & Cook, H. (2019). LGBTIQ+ homelessness: A review of the literature. *International Journal of Environmental Research and Public Health, 16*(15), 2677-2689. https://doi.org/10.3390/ijerph16152677

Frith, C. D., & Frith, U. (2006b). The neural basis of mentalizing. *Neuron, 50*(4), 531-534. https://doi.org/10.1016/j.neuron.2006.05.001

Frith, C. D., & Frith, U. (2007). Social cognition in humans. *Current Biology, 17*(16), 724-732. https://doi.org/10.1016/j.cub.2007.05.068

Frith, U., & Frith, C. D. (2003). Development and neurophysiology of mentalizing. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences, 358*(1431), 459-473. https://doi.org/10.1098/rstb.2002.1218

Frith, U., Morton, J., & Leslie, A. M. (1991). The cognitive basis of a biological disorder: Autism. *Trends in Neurosciences, 14*(10), 433-438. https://doi.org/10.1016/0166-2236(91)90041-R

Gaetz, S. (2012). *The real cost of homelessness*. Canadian Homelessness Research Network Press.

Gallese, V., Keysers, C., & Rizzolatti, G. (2004). A unifying view of the basis of social cognition. *Trends in Cognitive Sciences, 8*(9), 396-403. https://doi.org/10.1016/j.tics.2004.07.002

Garrett, D. G. (2012). The business case for ending homelessness: Having a home improves health, reduces healthcare utilization and costs. *American Health & Drug Benefits, 5*(1), 17-19. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4046466/

Garvie, D. (2012, November 9). *A return to revolving-door homelessness?.* Shelter. https://blog.shelter.org.uk/2012/11/a-return-to-revolving-door-homelessness/

Gergely, G., Egyed, K., & Király, I. (2007). On pedagogy. *Developmental Science, 10*(1), 139-146. https://doi.org/10.1111/j.1467-7687.2007.00576.x

Ghabanchi, Z., & Rastegar, R. E. (2014). The correlation of IQ and emotional intelligence with reading comprehension. *Reading, 14*(2), 135-144. https://mail.readingmatrix.com/files/11-19j6t3o1.pdf

Giano, Z., Williams, A., Hankey, C., Merrill, R., Lisnic, R., & Herring, A. (2020). Forty years of research on predictors of homelessness. *Community Mental Health Journal, 56*(4), 692-709. https://doi.org/10.1007/s10597-019-00530-5

Glasser, I., & Bridgman, R. (1999). *Braving the street: The anthropology of homelessness*. Berghahn Books.

Goertz, G., & Mahoney, J. (2012). *A tale of two cultures: Qualitative and quantitative research in the social sciences*. Princeton University Press.

Golan, O., Baron-Cohen, S., Hill, J. J., & Golan, Y. (2006). The “reading the mind in films” task: Complex emotion recognition in adults with and without autism spectrum conditions. *Social Neuroscience,, 1*(2), 111-123. https://doi.org/10.1080/17470910600980986

Golarai, G., Ghahremani, D. G., Whitfield-Gabrieli, S., Reiss, A., Eberhardt, J. L., Gabrieli, J. D., & Grill-Spector, K. (2007). Differential development of high-level visual cortex correlates with category-specific recognition memory. *Nature Neuroscience, 10*(4), 512-522. https://doi.org/10.1038/nn1865

Goldberg, T. E., & Green, M. F. (2002). Neurocognitive functioning in patients with schizophrenia: An overview. In K. L. Davis, D. Charney, J. T. Coyle, & C. Nemeroff (Eds.), *Neuropsychopharmacology: The fifth generation of progress* (pp. 1245-1257). Lippincott Williams and Wilkins.

Gonzalez, E. A., Dieter, J. N., Natale, R. A., & Tanner, S. L. (2001). Neuropsychological evaluation of higher functioning homeless persons: A comparison of an abbreviated test battery to the mini-mental state exam. *The Journal of Nervous and Mental Disease, 189*(3), 176-181. https://doi.org/10.1097/00005053-200103000-00006

Gopal, Y. V., & Variend, H. (2005). First-episode schizophrenia: Review of cognitive deficits and cognitive remediation. *Advances in Psychiatric Treatment, 11*(1), 38-44. https://doi.org/10.1192/apt.11.1.38

Green, M. F., Wynn, J. K., Gabrielian, S., Hellemann, G., Horan, W. P., Kern, R. S., Lee, J., Marder, S. R., & Sugar, C. A. (2022). Motivational and cognitive factors linked to community integration in homeless veterans: Study 1 – individuals with psychotic disorders. *Psychological Medicine, 52*(1), 169-177. https://doi.org/10.1017/S0033291720001889

Green, R. E., Melo, B., Christensen, B., Ngo, L. A., Monette, G., & Bradbury, C. (2008). Measuring premorbid IQ in traumatic brain injury: An examination of the validity of the Wechsler Test of Adult Reading (WTAR). *Journal of Clinical and Experimental Neuropsychology, 30*(2), 163-172. https://doi.org/10.1080/13803390701300524

Greenberg, D. M., Baron-Cohen, S., Rosenberg, N., Fonagy, P., & Rentfrow, P. J. (2018). Elevated empathy in adults following childhood trauma. *PLoS One, 13*(10), 1-13. https://doi.org/10.1371/journal.pone.0203886

Greenberg, J. M., Wynn, J. K., Lee, J., Hellemann, G., Gabrielian, S., & Green, M. F. (2019). Resilience in homeless veterans: Clinical and cognitive correlates. *Psychiatric Rehabilitation Journal, 42*(3), 314-322. https://doi.org/10.1037/prj0000333

Guay, A. H. (2004). Access to dental care: Solving the problem for underserved populations. *The Journal of the American Dental Association, 135*(11), 1599-1605. https://doi.org/10.14219/jada.archive.2004.0088

Gweon, H., Dodell-Feder, D., Bedny, M., & Saxe, R. (2012). Theory of mind performance in children correlates with functional specialization of a brain region for thinking about thoughts. *Child Development, 83*(6), 1853-1868. https://doi.org/10.1111/j.1467-8624.2012.01829.x

Hackman, D. A., & Farah, M. J. (2009). Socioeconomic status and the developing brain. *Trends in Cognitive Sciences, 13*(2), 65-73. https://doi.org/10.1016/j.tics.2008.11.003

Hanscombe, K. B., Trzaskowski, M., Haworth, C. M., Davis, O. S., Dale, P. S., & Plomin, R. (2012). Socioeconomic status (SES) and children's intelligence (IQ): In a UK-representative sample SES moderates the environmental, not genetic, effect on IQ. *PloS One, 7*(2), 1-16. https://doi.org/10.1371/journal.pone.0030320

Happé, F. G. (1994). An advanced test of theory of mind: Understanding of story characters' thoughts and feelings by able autistic, mentally handicapped, and normal children and adults. *Journal of Autism and Developmental Disorders, 24*(2), 129-154. https://doi.org/10.1007/BF02172093

Happé, F. G. (1995). The role of age and verbal ability in the theory of mind task performance of subjects with autism. *Child Development, 66*(3), 843-855. https://doi.org/10.1111/j.1467-8624.1995.tb00909.x

Happé, F. G., & Frith, U. (2014). Annual research review: Towards a developmental neuroscience of atypical social cognition. *Journal of Child Psychology and Psychiatry, 55*(6), 553-577. https://doi.org/10.1111/jcpp.12162

Harrell, F. E. (2015). *Regression modeling strategies: With applications to linear models, logistic and ordinal regression, and survival analysis* (2nd ed.). Springer.

Hart, J. T. (1971). The inverse care law. *The Lancet, 297*(7696), 405-12.

Hauff, A. J., & Secor-Turner, M. (2014). Homeless health needs: Shelter and health service provider perspective. *Journal of Community Health Nursing, 31*(2), 103-117. https://doi.org/10.1080/07370016.2014.901072

Headway. (2018). *Experiences of employment and support allowance (ESA) and personal independence payment (PIP) after brain injury*. Headway.

Hebben, N., & Milberg, W. (2002). *Essentials of neuropsychological assessment*. John Wiley & Sons Inc.

Henry, J. D., Phillips, L. H., Crawford, J. R., Ietswaart, M., & Summers, F. (2006). Theory of mind following traumatic brain injury: The role of emotion recognition and executive dysfunction. *Neuropsychologia, 44*(10), 1623-1628. https://doi.org/10.1016/j.neuropsychologia.2006.03.020

Henwood, B. F., Byrne, T., & Scriber, B. (2015). Examining mortality among formerly homeless adults enrolled in Housing First: An observational study. *BMC Public Health, 15*, 1-8. https://doi.org/10.1186/s12889-015-2552-1

Hewett, N., Halligan, A., & Boyce, T. (2012). A general practitioner and nurse led approach to improving hospital care for homeless people. *BMJ, 345*, 1-6. https://doi.org/10.1136/bmj.e5999

Himsworth, C., Paudyal, P., & Sargeant, C. (2020). Risk factors for unplanned hospital admission in a specialist homeless general practice population: Case–control study to investigate the relationship with tri-morbidity. *British Journal of General Practice, 70*(695), 406-411. https://doi.org/10.3399/bjgp20X710141

Hobson, R. P., Ouston, J., & Lee, A. (1988). What's in a face? The case of autism. *British Journal of Psychology, 79*(4), 441-453. https://doi.org/10.1111/j.2044-8295.1988.tb02745.x

Homeless Link. (2014). *The unhealthy state of homelessness: Health audit results 2014*. https://policycommons.net/artifacts/3085029/the_unhealthy_state_of_homelessness_final_1/3885842/

Homelessness Reduction Act 2017, c. 13. https://www.legislation.gov.uk/ukpga/2017/13/contents/enacted

Horan, W. P., Reise, S. P., Kern, R. S., Lee, J., Penn, D. L., & Green, M. F. (2015). Structure and correlates of self-reported empathy in schizophrenia. *Journal of Psychiatric Research, 66*, 60-66. https://doi.org/10.1016/j.jpsychires.2015.04.016

Horan, W. P., Wynn, J. K., Gabrielian, S., Glynn, S. M., Hellemann, G. S., Kern, R. S., Lee, J., Marder, S. R., Sugar, C. A., & Green, M. F. (2020). Motivational and cognitive correlates of community integration in homeless veterans entering a permanent supported housing program. *American Journal of Orthopsychiatry, 90*(2), 181-192. https://doi.org/10.1037/ort0000420

Housing Act 1996, c. 52. https://www.legislation.gov.uk/ukpga/1996/52/contents

Hwang, S. W. (2002). Is homelessness hazardous to your health? Obstacles to the demonstration of a causal relationship. *Canadian Journal of Public Health, 93*, 407-410. https://doi.org/10.1007/BF03405026

Itier, R. J., & Batty, M. (2009). Neural bases of eye and gaze processing: The core of social cognition. *Neuroscience & Biobehavioral Reviews, 33*(6), 843-863. https://doi.org/10.1016/j.neubiorev.2009.02.004

Jamieson, M. K., Govaart, G. H., & Pownall, M. (2023). Reflexivity in quantitative research: A rationale and beginner's guide. *Social and Personality Psychology Compass, 17*(4), e12735. https://doi.org/10.1111/spc3.12735

Järvinen-Pasley, A., Bellugi, U., Reilly, J., Debra, L., Galaburda, A., Reiss, A. L., & Korenberg, J. R. (2008). Defining the social phenotype in Williams syndrome: A model for linking gene, the brain, and behavior. *Development and Psychopathology, 20*(1), 1-35. https://doi.org/10.1017/S0954579408000011

Johnsen, S., & Watts, B. (2014). *Homelessness and poverty: Reviewing the links*. Heriot-Watt University.

Johnson, G., & Chamberlain, C. (2008). Homelessness and substance abuse: Which comes first?. *Australian Social Work, 61*(4), 342-356. https://doi.org/10.1080/03124070802428191

Johnson, M. H., Griffin, R., Csibra, G., Halit, H., Farroni, T., de Haan, M., Tucker, L. A, Baron-Cohen, S., & Richards, J. (2005). The emergence of the social brain network: Evidence from typical and atypical development. *Development and Psychopathology, 17*(3), 599-619. https://doi.org/10.1017/S0954579405050297

Jolliffe, T., & Baron-Cohen, S. (1999). The strange stories test: A replication with high-functioning adults with autism or Asperger syndrome. *Journal of Autism and Developmental Disorders, 29*, 395-406. https://doi.org/10.1023/A:1023082928366

Jones, C. R., Pickles, A., Falcaro, M., Marsden, A. J., Happé, F., Scott, S. K., Sauter, D., Tregay, J., Phillips, R. J., Baird, G., Simonoff, E., & Charman, T. (2011). A multimodal approach to emotion recognition ability in autism spectrum disorders. *Journal of Child Psychology and Psychiatry, 52*(3), 275-285. https://doi.org/10.1111/j.1469-7610.2010.02328.x

Jovanović, G. (2010). Historizing epistemology in psychology. *Integrative Psychological and Behavioral Science, 44*, 310-328. https://doi.org/10.1007/s12124-010-9132-9

Kaland, N., Callesen, K., Møller-Nielsen, A., Mortensen, E. L., & Smith, L. (2008). Performance of children and adolescents with Asperger syndrome or high-functioning autism on advanced theory of mind tasks. *Journal of Autism and Developmental Disorders, 38*, 1112-1123. https://doi.org/10.1007/s10803-007-0496-8

Kandalaft, M. R., Didehbani, N., Cullum, C. M., Krawczyk, D. C., Allen, T. T., Tamminga, C. A., & Chapman, S. B. (2012). The Wechsler ACS social perception subtest: A preliminary comparison with other measures of social cognition. *Journal of Psychoeducational Assessment, 30*(5), 455-465. https://doi.org/10.1177/0734282912436411

Kanwisher, N., Woods, R. P., Iacoboni, M., & Mazziotta, J. C. (1997). A locus in human extrastriate cortex for visual shape analysis. *Journal of Cognitive Neuroscience, 9*(1), 133-142. https://doi.org/10.1162/jocn.1997.9.1.133

Karmiloff-Smith, A. (1990). Constraints on representational change: Evidence from children's drawing. *Cognition, 34*(1), 57-83. https://doi.org/10.1016/0010-0277(90)90031-E

Karmiloff-Smith, A., Broadbent, H., Farran, E. K., Longhi, E., D'Souza, D., Metcalfe, K., Tassabehji, M., Wu, R., Senju, A., Happé, F., Turnpenny, P., & Sansbury, F. (2012). Social cognition in Williams syndrome: Genotype/phenotype insights from partial deletion patients. *Frontiers in Psychology, 3*, 1-8. https://doi.org/10.3389/fpsyg.2012.00168

Karpman, S. (1968). Fairy tales and script drama analysis. *Transactional Analysis Bulletin, 7*(26), 39-43. https://www.karpmandramatriangle.com/pdf/DramaTriangle.pdf

Kennedy, D. P., & Adolphs, R. (2012). The social brain in psychiatric and neurological disorders. *Trends in Cognitive Sciences, 16*(11), 559-572. https://doi.org/10.1016/j.tics.2012.09.006

Kershaw, A., Singleton, N., & Meltzer, H. (2003). Survey of the health and well-being of homeless people in Glasgow. *International Review of Psychiatry, 15*(1-2), 141-143. https://doi.org/10.1080/0954026021000046065

Kidd, S. A. (2007). Youth homelessness and social stigma. *Journal of Youth and Adolescence, 36*(3), 291-299. https://doi.org/10.1007/s10964-006-9100-3

Kilford, E. J., Garrett, E., & Blakemore, S. J. (2016). The development of social cognition in adolescence: An integrated perspective. *Neuroscience & Biobehavioral Reviews, 70*, 106-120. https://doi.org/10.1016/j.neubiorev.2016.08.016

Kinzler, K. D., Corriveau, K. H., & Harris, P. L. (2011). Children's selective trust in native-accented speakers. *Developmental Science, 14*(1), 106-111. https://doi.org/10.1111/j.1467-7687.2010.00965.x

Kirkland, R. A., Peterson, E., Baker, C. A., Miller, S., & Pulos, S. (2013). Meta-analysis reveals adult female superiority in "Reading the Mind in the Eyes Test". *North American Journal of Psychology, 15*(1), 121-146.

Klinnert, M. D., Emde, R. N., Butterfield, P., & Campos, J. J. (1986). Social referencing: The infant's use of emotional signals from a friendly adult with mother present. *Developmental Psychology, 22*(4), 427-432. https://doi.org/10.1037/0012-1649.22.4.427

Klüver, H., & Bucy, P. C. (1939). Preliminary analysis of functions of the temporal lobes in monkeys. *Archives of Neurology & Psychiatry, 42*(6), 979-1000. https://doi.org/10.1001/archneurpsyc.1939.02270240017001

Koenigs, M., Young, L., Adolphs, R., Tranel, D., Cushman, F., Hauser, M., & Damasio, A. (2007). Damage to the prefrontal cortex increases utilitarian moral judgements. *Nature, 446*(7138), 908-911. https://doi.org/10.1038/nature05631

Korkman, M., Kirk, U., & Kemp, S. (2007). *NEPSY–Second Edition (NEPSY-II)*. Harcourt Assessment.

Kosmidis, M. H., Aretouli, E., Bozikas, V. P., Giannakou, M., & Ioannidis, P. (2008). Studying social cognition in patients with schizophrenia and patients with frontotemporal dementia: Theory of mind and the perception of sarcasm. *Behavioural Neurology, 19*(1-2), 65-69. https://downloads.hindawi.com/journals/bn/2008/157356.pdf

Lamm, C., Decety, J., & Singer, T. (2011). Meta-analytic evidence for common and distinct neural networks associated with directly experienced pain and empathy for pain. *Neuroimage, 54*(3), 2492-2502. https://doi.org/10.1016/j.neuroimage.2010.10.014

Lanham, J. S., White, P., & Gaffney, B. (2022). Care of people experiencing homelessness. *American Family Physician, 106*(6), 684-693. https://www.aafp.org/pubs/afp/issues/2022/1200/homelessness.html

LeDoux, J. (1996). Emotional networks and motor control: A fearful view. *Progress in Brain Research, 107*, 437-446. https://doi.org/10.1016/S0079-6123(08)61880-4

LeDoux, J. (2003). The emotional brain, fear, and the amygdala. *Cellular and Molecular Neurobiology, 23*, 727-738. https://doi.org/10.1023/A:1025048802629

Lee, K., Eskritt, M., Symons, L. A., & Muir, D. (1998). Children's use of triadic eye gaze information for “mind reading". *Developmental Psychology, 34*(3), 525-539. https://doi.org/10.1037/0012-1649.34.3.525

Legerstee, M. (1992). A review of the animate-inanimate distinction in infancy: Implications for models of social and cognitive knowing. *Early Development and Parenting, 1*(2), 59-67. https://doi.org/10.1002/edp.2430010202

Leslie, A. M. (1987). Pretense and representation: The origins of "theory of mind". *Psychological Review, 94*(4), 412-426. https://doi.org/10.1037/0033-295X.94.4.412

Leudar, I., Costall, A. (2009). Introduction: Against 'theory of mind'. In I. Leudar & A. Costall (Eds.), *Against theory of mind* (pp. 1-16). Palgrave Macmillan. https://doi.org/10.1057/9780230234383_1

Leudar, I., Costall, A., & Francis, D. (2004). Theory of mind: A critical assessment. *Theory & Psychology, 14*(5), 571-578. https://doi.org/10.1177/0959354304046173

Lezak, M. D., Howieson, D. B., Loring, D. W., Hannay, H. J., & Fischer, J. S. (2004). *Neuropsychological assessment* (4th ed.). Oxford University Press.

Liu, M., Koh, K. A., Hwang, S. W., & Wadhera, R. K. (2022). Mental health and substance use among homeless adolescents in the US. *JAMA, 327*(18), 1820-1822. https://doi.org/10.1001/jama.2022.4422

Llerena, K., Gabrielian, S., & Green, M. F. (2018). Clinical and cognitive correlates of unsheltered status in homeless persons with psychotic disorders. *Schizophrenia Research, 197*, 421-427. https://doi.org/10.1016/j.schres.2018.02.023

Luria, A. R. (1970). *Traumatic aphasia: Its syndromes, psychology and treatment*. Mouton.

Mackelprang, J. L., Harpin, S. B., Grubenhoff, J. A., & Rivara, F. P. (2014). Adverse outcomes among homeless adolescents and young adults who report a history of traumatic brain injury. *American Journal of Public Health, 104*(10), 1986-1992. https://doi.org/10.2105/AJPH.2014.302087

Maguire, N. (2017). Towards an integrative theory of homelessness and rough sleeping. In A. Bonner (Ed.), *Social determinants of health: An interdisciplinary approach to social inequality and wellbeing* (pp. 227-240). Policy Press.

Mandel, D. R., Jusczyk, P. W., & Pisoni, D. B. (1995). Infants' recognition of the sound patterns of their own names. *Psychological Science, 6*(5), 314-317. https://doi.org/10.1111/j.1467-9280.1995.tb00517.x

Manthorpe, J., Cornes, M., O'Halloran, S., & Joly, L. (2015). Multiple exclusion homelessness: The preventive role of social work. *The British Journal of Social Work, 45*(2), 587-599. https://doi.org/10.1093/bjsw/bct136

Marmot, M. (2015). The health gap: The challenge of an unequal world. *The Lancet*, *386*(10011), 2442-2444. https://doi.org/10.1016/S0140-6736(15)00150-6

Marsh, D., & Rhodes, R. A. W. (1992). *Implementing Thatcherite policies: Audit of an era*. Open University Press.

Martin, A. E., & Slepian, M. L. (2021). The primacy of gender: Gendered cognition underlies the big two dimensions of social cognition. *Perspectives on Psychological Science, 16*(6), 1143-1158. https://doi.org/10.1177/1745691620904961

Maye, J. E., Van Patten, R., Lykins, H. C., Vella, L., Mahmood, Z., Clark, J. M., & Twamley, E. W. (2023). Memory, fluid reasoning, and functional capacity in adults experiencing homelessness. *The Clinical Neuropsychologist, 37*(7), 1441-1454. https://doi.org/10.1080/13854046.2022.2125906

Mayer, J. D., Salovey, P., Caruso, D. R., & Sitarenios, G. (2003). Measuring emotional intelligence with the MSCEIT V2. 0. *Emotion, 3*(1), 97-105. https://doi.org/10.1037/1528-3542.3.1.97

McAllister, T. W., Flashman, L. A., Sparling, M. B., & Saykin, A. J. (2004). Working memory deficits after traumatic brain injury: Catecholaminergic mechanisms and prospects for treatment—a review. *Brain Injury, 18*(4), 331-350. https://doi.org/10.1080/02699050310001617370

McDonald, S., Flanagan, S., and Rollins, J. (2002). *The Awareness of Social Inference Test*. Thames Valley Test Company.

McMillan, T. M., Laurie, M., Oddy, M., Menzies, M., Stewart, E., & Wainman-Lefley, J. (2015). Head injury and mortality in the homeless. *Journal of Neurotrauma, 32*(2), 116-119. https://doi.org/10.1089/neu.2014.3387

McNeill, S., O'Donovan, D., & Hart, N. (2022). Access to healthcare for people experiencing homelessness in the UK and Ireland: A scoping review. *BMC Health Services Research, 22*(1), 910-922. https://doi.org/10.1186/s12913-022-08265-y

McVicar, D., Moschion, J., & Van Ours, J. C. (2015). From substance use to homelessness or vice versa?. *Social Science & Medicine, 136*, 89-98. https://doi.org/10.1016/j.socscimed.2015.05.005

Meyer-Lindenberg, A., & Weinberger, D. R. (2006). Intermediate phenotypes and genetic mechanisms of psychiatric disorders. *Nature Reviews Neuroscience, 7*(10), 818-827. https://doi.org/10.1038/nrn1993

Milaney, K., Williams, N., Lockerbie, S. L., Dutton, D. J., & Hyshka, E. (2020). Recognizing and responding to women experiencing homelessness with gendered and trauma-informed care. *BMC Public Health, 20*, 1-6. https://doi.org/10.1186/s12889-020-8353-1

Miller, S. A. (2012). *Theory of mind: Beyond the preschool years*. Psychology Press.

Moschion, J., & van Ours, J. C. (2021). Do transitions in and out of homelessness relate to mental health episodes? A longitudinal analysis in an extremely disadvantaged population. *Social Science & Medicine, 279*, 1-10. https://doi.org/10.1016/j.socscimed.2020.113667

Mullady, S. S. S., Castellanos, S., Lopez, L., Aguirre, G., Weeks, J., King, S., Valle, K., Goode, C., Tsoy, E., Possin, K., Miller, B., Kushel, M., & Lanata, S. (2022). Neurocognitive health of older adults experiencing homelessness in Oakland, California. *Frontiers in Neurology, 13*, 905779. https://doi.org/10.3389/fneur.2022.905799

Nardini, B. (2023). *Investigating homelessness and social cognition* [Unpublished doctoral thesis]. University of East London.

National Institute for Health and Care Excellence. (2022). *Integrated health and social care for people experiencing homelessness* (NICE guideline NG214). https://www.nice.org.uk/guidance/ng214

Neumann, D. L., Chan, R. C., Boyle, G. J., Wang, Y., & Westbury, H. R. (2015). Measures of empathy: Self-report, behavioral, and neuroscientific approaches. *Measures of Personality and Social Psychological Constructs*, 257-289. https://doi.org/10.1016/B978-0-12-386915-9.00010-3

NHS England (2019, January). *The NHS Long Term Plan*. https://www.longtermplan.nhs.uk/wp-content/uploads/2019/08/nhs-long-term-plan-version-1.2.pdf

Nooe, R. M., & Patterson, D. A. (2010). The ecology of homelessness. *Journal of Human Behavior in the Social Environment, 20*(2), 105-152. https://doi.org/10.1080/10911350903269757

Nummenmaa, L., Hirvonen, J., Parkkola, R., & Hietanen, J. K. (2008). Is emotional contagion special? An fMRI study on neural systems for affective and cognitive empathy. *Neuroimage, 43*(3), 571-580. https://doi.org/10.1016/j.neuroimage.2008.08.014

O'Keeffe, F. M., Murray, B., Coen, R. F., Dockree, P. M., Bellgrove, M. A., Garavan, H., Lynch, T., & Robertson, I. H. (2007). Loss of insight in frontotemporal dementia, corticobasal degeneration and progressive supranuclear palsy. *Brain, 130*(3), 753-764. https://doi.org/10.1093/brain/awl367

Office for National Statistics. (2023, August 17). *Approximated social grade, England and Wales: Census 2021*. https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/approximatedsocialgradeenglandandwales/census2021

Office for National Statistics. (2023, December 6). *People experiencing homelessness, England and Wales: Census 2021*. https://www.ons.gov.uk/peoplepopulationandcommunity/housing/articles/peopleexperiencinghomelessnessenglandandwales/census2021

Ogden, J. (2003). Some problems with social cognition models: A pragmatic and conceptual analysis. *Health Psychology, 22*(4), 424-428. https://doi.org/10.1037/0278-6133.22.4.424

Ogden, K. (2023, November 24). *What does the Autumn Statement mean for local government and public service spending?*. Institute for Fiscal Studies. https://ifs.org.uk/articles/what-does-autumn-statement-mean-local-government-and-public-service-spending

Okamoto, Y. (2007). A comparative study of homelessness in the United Kingdom and Japan. *Journal of Social Issues, 63*(3), 525-542. https://doi.org/10.1111/j.1540-4560.2007.00522.x

Olivet, J., Dones, M., Richard, M. (2019). The Intersection of Homelessness, Racism, and Mental Illness. In: M. Medlock, D. Shtasel, N. H. Trinh, & D. Williams. (Eds.), *Racism and Psychiatry: Contemporary Issues and Interventions*. Humana Press. https://doi.org/10.1007/978-3-319-90197-8_4

Olsson, A., Nearing, K. I., & Phelps, E. A. (2007). Learning fears by observing others: The neural systems of social fear transmission. *Social Cognitive and Affective Neuroscience, 2*(1), 3-11. https://doi.org/10.1093/scan/nsm005

Onuoha, R. C., Quintana, D. S., Lyvers, M., & Guastella, A. J. (2016). A meta-analysis of theory of mind in alcohol use disorders. *Alcohol and Alcoholism, 51*(4), 410-415. https://doi.org/10.1093/alcalc/agv137

Oram, M. W., Földiák, P., Perrett, D. I., & Sengpiel, F. (1998). The 'Ideal Homunculus': Decoding neural population signals. *Trends in Neurosciences, 21*(6), 259-265. https://doi.org/10.1016/S0166-2236(97)01216-2

Otte, J. (2023, November 4). Suella Braverman says rough sleeping is 'lifestyle choice'. *The Guardian*. https://www.theguardian.com/society/2023/nov/04/suella-braverman-says-rough-sleeping-is-lifestyle-choice

Ozonoff, S., Pennington, B. F., & Rogers, S. J. (1990). Are there emotion perception deficits in young autistic children?. *Journal of Child Psychology and Psychiatry, 31*(3), 343-361. https://doi.org/10.1111/j.1469-7610.1990.tb01574.x

Panchal, H., Paholpak, P., Lee, G., Carr, A., Barsuglia, J. P., Mather, M., Jiminez, E., & Mendez, M. F. (2016). Neuropsychological and neuroanatomical correlates of the social norms questionnaire in frontotemporal dementia versus Alzheimer's disease. *American Journal of Alzheimer's Disease & Other Dementias, 31*(4), 326-332. https://doi.org/10.1177/1533317515617722

Parnell, T. (2023). 'A tide of homeless, drug-addicted and mentally ill people': Representing homeless people in MailOnline content. *Journal of Corpora and Discourse Studies, 6*, 1-24. https://doi.org/10.18573/jcads.97

Pearson, N. (2009). *Advanced clinical solutions for WAIS-IV and WMS-IV: Administration and scoring manual*. The Psychological Corporation.

Pedreño, C., Pousa, E., Navarro, J. B., Pàmias, M., & Obiols, J. E. (2017). Exploring the components of advanced theory of mind in autism spectrum disorder. *Journal of Autism and Developmental Disorders, 47*, 2401-2409. https://doi.org/10.1007/s10803-017-3156-7

Periáñez, J. A., Ríos-Lago, M., Rodríguez-Sánchez, J. M., Adrover-Roig, D., Sánchez-Cubillo, I., Crespo-Facorro, B. E. E. A., Quemada, J. I., & Barceló, F. (2007). Trail Making Test in traumatic brain injury, schizophrenia, and normal ageing: Sample comparisons and normative data. *Archives of Clinical Neuropsychology, 22*(4), 433-447. https://doi.org/10.1016/j.acn.2007.01.022

Perry, J., & Craig, T. K. (2015). Homelessness and mental health. *Trends in Urology & Men's Health, 6*(2), 19-21. https://doi.org/10.1002/tre.445

Phillips, W., Baron-Cohen, S., & Rutter, M. (1992). The role of eye contact in goal detection: Evidence from normal infants and children with autism or mental handicap. *Development and Psychopathology, 4*(3), 375-383. https://doi.org/10.1017/S0954579400000845

Piatt, A. L., Fields, J. A., Paolo, A. M., & Tröster, A. I. (1999). Action (verb naming) fluency as an executive function measure: Convergent and divergent evidence of validity. *Neuropsychologia, 37*(13), 1499-1503. https://doi.org/10.1016/S0028-3932(99)00066-4

Piña-Escudero, S. D., López, L., Sriram, S., Longoria Ibarrola, E. M., Miller, B., & Lanata, S. (2021). Neurodegenerative disease and the experience of homelessness. *Frontiers in Neurology, 11*, 562218. https://doi.org/10.3389/fneur.2020.562218

Pleace, N., Fitzpatrick, S., Johnsen, S., Quilgars, D. J., & Sanderson, D. (2008). *Statutory homelessness in England: The experience of families and 16-17 year olds*. Department for Communities and Local Government.

Pluck, G., Barajas, B. M., Hernandez-Rodriguez, J. L., & Martínez, M. A. (2020). Language ability and adult homelessness. *International Journal of Language & Communication Disorders, 55*(3), 332-344. https://doi.org/10.1111/1460-6984.12521

Pluck, G., Lee, K.-H., David, R., Spence, S. A., & Parks, R. W. (2012). Neuropsychological and cognitive performance of homeless adults. *Canadian Journal of Behavioural Science, 44*(1), 9-15. https://doi.org/10.1037/a0025382

Pluck, G., Nakakarumai, M., & Sato, Y. (2015). Homelessness and cognitive impairment: An exploratory study in Tokyo, Japan. *East Asian Archives of Psychiatry, 25*(3), 122-127. https://search.informit.org/doi/abs/10.3316/INFORMIT.553161148157914

Plumb, J. D. (1997). Homelessness: Care, prevention, and public policy. *Annals of Internal Medicine, 126*(12), 973-975. https://doi.org/10.7326/0003-4819-126-12-199706150-00007

Polcin, D. L. (2016). Co-occurring substance abuse and mental health problems among homeless persons: Suggestions for research and practice. *Journal of Social Distress and the Homeless, 25*(1), 1-10. https://doi.org/10.1179/1573658X15Y.0000000004

Povinelli, D. J., & Eddy, T. J. (1996). Chimpanzees: Joint visual attention. *Psychological Science, 7*(3), 129-135. https://doi.org/10.1111/j.1467-9280.1996.tb00345.x

Pratt, C., & Bryant, P. (1990). Young children understand that looking leads to knowing (so long as they are looking into a single barrel). *Child Development, 61*(4), 973-982. https://doi.org/10.1111/j.1467-8624.1990.tb02835.x

Preller, K. H., Hulka, L. M., Vonmoos, M., Jenni, D., Baumgartner, M. R., Seifritz, E., Dziobek, I., & Quednow, B. B. (2014). Impaired emotional empathy and related social network deficits in cocaine users. *Addiction Biology, 19*(3), 452-466. https://doi.org/10.1111/adb.12070

Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind?. *Behavioral and Brain Sciences, 1*(4), 515-526. https://doi.org/10.1017/S0140525X00076512

Pribram, K. (1990). *Brain, mind, and consciousness: The science of neuropsychology*. Radford University. https://www.karlpribram.com/wp-content/uploads/pdf/theory/T-177.pdf

Pritchard, C. (2010). *An evaluation of the Devon individualised budget project to encourage rough sleepers into accommodation*. Exeter City Council.

Radhakrishnan, R. K., Vallath, S., de Wit, E. E., Bunders, J. G. F., & Gopikumar, V. (2021). Developing care approaches to address the homelessness, poverty and severe mental illnesses crisis. *World Journal of Psychiatry and Mental Health Research, 5*(1), 1-7.

Rae, B. E., & Rees, S. (2015). The perceptions of homeless people regarding their healthcare needs and experiences of receiving health care. *Journal of Advanced Nursing, 71*(9), 2096-2107. https://doi.org/10.1111/jan.12675

Rains, G. D., Sauer, K., & Kent, C. (1995). Cognitive impairment consistent with left fronto-temporal abnormality in schizophrenia patients. *Journal of Neurotherapy, 1*(1), 44-47. https://doi.org/10.1300/J184v01n01_06

Randolph, C., Tierney, M. C., Mohr, E., & Chase, T. N. (1998). The Repeatable Battery for the Assessment of Neuropsychological Status (RBANS): Preliminary clinical validity. *Journal of Clinical and Experimental Neuropsychology, 20*(3), 310-319. https://doi.org/10.1076/jcen.20.3.310.823

Raphael-Greenfield, E. (2012). Assessing executive and community functioning among homeless persons with substance use disorders using the executive function performance test. *Occupational Therapy International, 19*(3), 135-143. https://doi.org/10.1002/oti.1328

Reeve, K. (2017). Welfare conditionality, benefit sanctions and homelessness in the UK: Ending the 'something for nothing culture' or punishing the poor?. *Journal of Poverty and Social Justice, 25*(1), 65-78. https://doi.org/10.1332/175982717X14842281240539

Reitan, R. M. (1955). The relation of the Trail Making Test to organic brain damage. *Journal of Consulting Psychology, 19*(5), 393–394. https://doi.org/10.1037/h0044509

Reniers, R. L., Corcoran, R., Drake, R., Shryane, N. M., & Völlm, B. A. (2011). The QCAE: A questionnaire of cognitive and affective empathy. *Journal of Personality Assessment, 93*(1), 84-95. https://doi.org/10.1080/00223891.2010.528484

Resch, Z. J., Cerny, B. M., Ovsiew, G. P., Jennette, K. J., Bing-Canar, H., Rhoads, T., & Soble, J. R. (2023). A direct comparison of 10 WAIS-IV Digit Span embedded validity indicators among a mixed neuropsychiatric sample with varying degrees of cognitive impairment. *Archives of Clinical Neuropsychology, 38*(4), 619-632. https://doi.org/10.1093/arclin/acac082

Ritchie, S. J., & Tucker-Drob, E. M. (2018). How much does education improve intelligence? A meta-analysis. *Psychological Science, 29*(8), 1358-1369. https://doi.org/10.1177/0956797618774253

Rizzolatti, G., & Fabbri-Destro, M. (2008). The mirror system and its role in social cognition. *Current Opinion in Neurobiology, 18*(2), 179-184. https://doi.org/10.1016/j.conb.2008.08.001

Roca, M., Torralva, T., Gleichgerrcht, E., Chade, A., Arévalo, G. G., Gershanik, O., & Manes, F. (2010). Impairments in social cognition in early medicated and unmedicated Parkinson disease. *Cognitive and Behavioral Neurology, 23*(3), 152-158. https://doi.org/10.1097/WNN.0b013e3181e078de

Rog, D. J., Marshall, T., Dougherty, R. H., George, P., Daniels, A. S., Ghose, S. S., & Delphin-Rittmon, M. E. (2014). Permanent supportive housing: Assessing the evidence. *Psychiatric Services, 65*(3), 287-294. https://doi.org/10.1176/appi.ps.201300261

Rowntree, J., & Sherwell, A. (1899). *The temperance problem and social reform*. Hodder and Stoughton.

Russolillo, A., Moniruzzaman, A., Parpouchi, M., Currie, L. B., & Somers, J. M. (2016). A 10-year retrospective analysis of hospital admissions and length of stay among a cohort of homeless adults in Vancouver, Canada. *BMC Health Services Research, 16*, 1-10. https://doi.org/10.1186/s12913-016-1316-7

Samame, C., Martino, D. J., & Strejilevich, S. A. (2012). Social cognition in euthymic bipolar disorder: Systematic review and meta-analytic approach. *Acta Psychiatrica Scandinavica, 125*(4), 266-280. https://doi.org/10.1111/j.1600-0447.2011.01808.x

Sample, K., & Ferguson, K. M. (2020). It shouldn't be this hard: Systemic, situational, and intrapersonal barriers to exiting homelessness among homeless young adults. *Qualitative Social Work, 19*(4), 580-598. https://doi.org/10.1177/1473325019836280

Sanvicente-Vieira, B., Romani-Sponchiado, A., Kluwe-Schiavon, B., Brietzke, E., Araujo, R. B., & Grassi-Oliveira, R. (2017). Theory of mind in substance users: A systematic minireview. *Substance Use & Misuse, 52*(1), 127-133. https://doi.org/10.1080/10826084.2016.1212890

Schanzer, B., Dominguez, B., Shrout, P. E., & Caton, C. L. (2007). Homelessness, health status, and health care use. *American Journal of Public Health, 97*(3), 464-469. https://doi.org/10.2105/AJPH.2005.076190

Scheeren, A. M., de Rosnay, M., Koot, H. M., & Begeer, S. (2013). Rethinking theory of mind in high-functioning autism spectrum disorder. *Journal of Child Psychology and Psychiatry, 54*(6), 628-635. https://doi.org/10.1111/jcpp.12007

Scott, F. J., & Baron-Cohen, S. (1996). Imagining real and unreal things: Evidence of a dissociation in autism. *Journal of Cognitive Neuroscience, 8*(4), 371-382. https://doi.org/10.1162/jocn.1996.8.4.371.

Scott-Samuel, A., Bambra, C., Collins, C., Hunter, D. J., McCartney, G., & Smith, K. (2014). The impact of Thatcherism on health and well-being in Britain. *International Journal of Health Services, 44*(1), 53-71. https://doi.org/10.2190/HS.44.1.d

Scutella, R., Johnson, G., Moschion, J., Tseng, Y. P., & Wooden, M. (2013). Understanding lifetime homeless duration: Investigating wave 1 findings from the Journeys Home project. *Australian Journal of Social Issues, 48*(1), 83-110. https://doi.org/10.1002/j.1839-4655.2013.tb00272.x

Seastres, R. J., Hutton, J., Zordan, R., Moore, G., Mackelprang, J., Kiburg, K. V., & Sundararajan, V. (2020). Long-term effects of homelessness on mortality: A 15-year Australian cohort study. *Australian and New Zealand Journal of Public Health, 44*(6), 476-481. https://doi.org/10.1111/1753-6405.13038

Senju, A., Southgate, V., White, S., & Frith, U. (2009). Mindblind eyes: An absence of spontaneous theory of mind in Asperger syndrome. *Science, 325*(5942), 883-885. https://doi.org/10.1126/science.117617

Shamay-Tsoory, S. G., & Aharon-Peretz, J. (2007). Dissociable prefrontal networks for cognitive and affective theory of mind: A lesion study. *Neuropsychologia, 45*(13), 3054-3067. https://doi.org/10.1016/j.neuropsychologia.2007.05.021

Shamay-Tsoory, S. G., Tomer, R., Berger, B. D., & Aharon-Peretz, J. (2003). Characterization of empathy deficits following prefrontal brain damage: The role of the right ventromedial prefrontal cortex. *Journal of Cognitive Neuroscience, 15*(3), 324-337. https://doi.org/10.1162/089892903321593063

Shanker, S., & Stieben, J. (2009). The roots of mindblindness. In I. Leudar & A. Costall (Eds.), *Against theory of mind* (pp. 126-143). Palgrave Macmillan.

Shelter (2018, April). *Briefing: Homelessness Reduction Act 2017*. https://england.shelter.org.uk/professional_resources/policy_and_research/policy_library/briefing_homelessness_reduction_act_2017

Shelton, K. H., Taylor, P. J., Bonner, A., & Van Den Bree, M. (2009). Risk factors for homelessness: Evidence from a population-based study. *Psychiatric Services, 60*(4), 465-472. https://doi.org/10.1176/ps.2009.60.4.465

Shinn, M., & Gillespie, C. (1994). The roles of housing and poverty in the origins of homelessness. *American Behavioral Scientist, 37*(4), 505-521. https://doi.org/10.1177/0002764294037004006

Shulman, C., Hudson, B. F., Low, J., Hewett, N., Daley, J., Kennedy, P., Davis, S., Brophy, N., Howard, D., Vivat, B., & Stone, P. (2018). End-of-life care for homeless people: A qualitative analysis exploring the challenges to access and provision of palliative care. *Palliative Medicine, 32*(1), 36-45. https://doi.org/10.1177/0269216317717101

Shura, R. D., Brearly, T. W., Rowland, J. A., Martindale, S. L., Miskey, H. M., & Duff, K. (2018). RBANS validity indices: A systematic review and meta-analysis. *Neuropsychology Review, 28*(3), 269-284. https://doi.org/10.1007/s11065-018-9377-5

Sodian, B., & Frith, U. (1992). Deception and sabotage in autistic, retarded and normal children. *Journal of Child Psychology and Psychiatry, 33*(3), 591-605. https://doi.org/10.1111/j.1469-7610.1992.tb00893.x

Solliday-McRoy, C., Campbell, T. C., Melchert, T. P., Young, T. J., & Cisler, R. A. (2004). Neuropsychological functioning of homeless men. *The Journal of Nervous and Mental Disease, 192*(7), 471-478. https://doi.org/10.1097/01.nmd.0000131962.30547.26

Stone, B., Dowling, S., & Cameron, A. (2019). Cognitive impairment and homelessness: A scoping review. *Health & Social Care in the Community, 27*(4), 125-142. https://doi.org/10.1111/hsc.12682

Stone, V. E., Baron-Cohen, S., & Knight, R. T. (1998). Frontal lobe contributions to theory of mind. *Journal of Cognitive Neuroscience, 10*(5), 640-656. https://doi.org/10.1162/089892998562942

Stone, V. E., & Gerrans, P. (2006b). What's domain-specific about theory of mind?. *Social Neuroscience, 1*(3-4), 309-319. https://doi.org/10.1080/17470910601029221

Stringfellow, E. J., Kim, T. W., Pollio, D. E., & Kertesz, S. G. (2015). Primary care provider experience and social support among homeless-experienced persons with tri-morbidity. *Addiction Science & Clinical Practice, 10*, 1-2. https://doi.org/10.1186/1940-0640-10-S1-A64

Substance Abuse and Mental Health Services Administration. (SAMHSA, 2014). SAMHSA's concept of trauma and guidance for a trauma-informed approach. *SAMHSA*. https://ncsacw.acf.hhs.gov/userfiles/files/SAMHSA_Trauma.pdf

Suchy, Y., Ziemnik, R. E., & Niermeyer, M. A. (2017). Assessment of executive functions in clinical settings. In E. Goldberg (Ed.), *Executive functions in health and disease* (pp. 551-569). Academic Press.

Surtees, A., Samson, D., & Apperly, I. (2016). Unintentional perspective-taking calculates whether something is seen, but not how it is seen. *Cognition, 148*, 97-105. https://doi.org/10.1016/j.cognition.2015.12.010

Swanson, L. W., & Petrovich, G. D. (1998). What is the amygdala?. *Trends in Neurosciences, 21*(8), 323-331. https://doi.org/10.1016/S0166-2236(98)01265-X

Tenhula, W. N., Nezu, A. M., Nezu, C. M., Stewart, M. O., Miller, S. A., Steele, J., & Karlin, B. E. (2014). Moving forward: A problem-solving training program to foster veteran resilience. *Professional Psychology: Research and Practice, 45*(6), 416-424. https://doi.org/10.1037/a0037150

To, M. J., O'Brien, K., Palepu, A., Hubley, A. M., Farrell, S., Aubry, T., Gogosis, E., Muckle, W., & Hwang, S. W. (2015). Healthcare utilization, legal incidents, and victimization following traumatic brain injury in homeless and vulnerably housed individuals: A prospective cohort study. *The Journal of Head Trauma Rehabilitation, 30*(4), 270-276. https://doi.org/10.1097/HTR.0000000000000044

Tomasello, M., Carpenter, M., & Liszkowski, U. (2007). A new look at infant pointing. *Child Development, 78*(3), 705-722. https://doi.org/10.1111/j.1467-8624.2007.01025.x

Tombaugh, T. N. (2004). Trail Making Test A and B: Normative data stratified by age and education. *Archives of Clinical Neuropsychology*, 19(2), 203-214. https://doi.org/10.1016/S0887-6177(03)00039-8

Topolovec-Vranic, J., Ennis, N., Colantonio, A., Cusimano, M. D., Hwang, S. W., Kontos, P., Ouchterlony, D., & Stergiopoulos, V. (2012). Traumatic brain injury among people who are homeless: A systematic review. *BMC Public Health, 12*, 1-8. https://doi.org/10.1186/1471-2458-12-1059

Toro, P. A., Tompsett, C. J., Lombardo, S., Philippot, P., Nachtergael, H., Galand, B., Schlienz, N., Stammel, N., Yabar, Y., Blume, M., MacKay, L., & Harvey, K. (2007). Homelessness in Europe and the United States: A comparison of prevalence and public opinion. *Journal of Social Issues, 63*(3), 505-524. https://doi.org/10.1111/j.1540-4560.2007.00521.x

Tsai, J., Mares, A. S., & Rosenheck, R. A. (2012). Do homeless veterans have the same needs and outcomes as non-veterans?. *Military Medicine, 177*(1), 27-31. https://doi.org/10.7205/MILMED-D-11-00128

Tsai, J., O'Toole, T., & Kearney, L. K. (2017). Homelessness as a public mental health and social problem: New knowledge and solutions. *Psychological Services, 14*(2), 113-117. https://doi.org/10.1037/ser0000164

Uekermann, J., Kraemer, M., Abdel-Hamid, M., Schimmelmann, B. G., Hebebrand, J., Daum, I., Wiltfang, J., & Kis, B. (2010). Social cognition in attention-deficit hyperactivity disorder (ADHD). *Neuroscience & Biobehavioral Reviews, 34*(5), 734-743. https://doi.org/10.1016/j.neubiorev.2009.10.009

Vallesi, S., Tuson, M., Davies, A., & Wood, L. (2021). Multimorbidity among people experiencing homelessness—insights from primary care data. *International Journal of Environmental Research and Public Health, 18*(12), 1-16. https://doi.org/10.3390/ijerph18126498

van der Kolk, B. A. (2014). *The body keeps the score: Brain, mind, and body in the healing of trauma.* Viking.

Varma, A. (2019). When empathy is not enough: The possibilities for solidarity in the San Francisco homeless project. *Journalism Practice, 13*(1), 105-121. https://doi.org/10.1080/17512786.2017.1394210

Walle, E. A., & Campos, J. J. (2012). Interpersonal responding to discrete emotions: A functionalist approach to the development of affect specificity. *Emotion Review, 4*(4), 413-422. https://doi.org/10.1177/1754073912445812

Wechsler, D. (1997). *WMS-III administration and scoring manual*. The Psychological Corporation.

Wechsler, D. (2001). *Wechsler Test of Adult Reading: WTAR*. The Psychological Corporation.

Wechsler, D. (2008a). *Wechsler Adult Intelligence Scale - Fourth Edition*. Pearson Assessment.

Wells, J. (2021). *Consensus based good practice guidelines for Clinical Psychologists working in and with homelessness: A Delphi study* [Unpublished doctoral thesis]. University of Nottingham.

Wellman, H. M., Cross, D., & Watson, J. (2001). Meta-analysis of theory-of-mind development: The truth about false belief. *Child Development, 72*(3), 655-684. https://doi.org/10.1111/1467-8624.00304

Wen, C. K., Hudak, P. L., & Hwang, S. W. (2007). Homeless people's perceptions of welcomeness and unwelcomeness in healthcare encounters. *Journal of General Internal Medicine, 22*, 1011-1017. https://doi.org/10.1007/s11606-007-0183-7

White, S., Hill, E., Happé, F., & Frith, U. (2009). Revisiting the strange stories: Revealing mentalizing impairments in autism. *Child Development, 80*(4), 1097-1117. https://doi.org/10.1111/j.1467-8624.2009.01319.x

Whiten, A. (Ed.). (1991). *Natural theories of mind: Evolution, development and simulation of everyday mindreading*. Blackwell.

Whitney, K. A., Shepard, P. H., Mariner, J., Mossbarger, B., & Herman, S. M. (2010). Validity of the Wechsler Test of Adult Reading (WTAR): Effort considered in a clinical sample of US military veterans. *Applied Neuropsychology, 17*(3), 196-204. https://doi.org/10.1080/09084282.2010.499787

Willig, C. (2013). *Introducing qualitative research in psychology*. McGraw-Hill Education.

Wolstencroft, J., Mandy, W., & Skuse, D. (2018). Autism spectrum disorders in girls and women with turner syndrome. *Archives of Disease in Childhood, 103*(Suppl 2), A16. https://doi.org/10.1136/goshabs.40

Wood, L., Vallesi, S., Kragt, D., Flatau, P., Wood, N., Gazey, A., & Lester, L. (2017). *50 Lives 50 Homes: A housing first response to homelessness*. Centre for Social Impact.

Woods, S. P., Scott, J. C., Sires, D. A., Grant, I., Heaton, R. K., Tröster, A. I., & HIV Neurobehavioral Research Center (HNRC) Group. (2005). Action (verb) fluency: Test–retest reliability, normative standards, and construct validity. *Journal of the International Neuropsychological Society, 11*(4), 408-415. https://doi.org/10.1017/S1355617705050460

Worthington, A., Edwards, L., & Joiner, L. (2020). Homelessness and head injury: Health, well-being and social integration in referrals to a neurocase management service. *The Neuropsychologist, 7*, 47-54.

Wynn, J. K., Gabrielian, S., Hellemann, G., Horan, W. P., Kern, R. S., Lee, J., Marder, S. R., Sugar, C. A., & Green, M. F. (2020). Motivational and cognitive factors linked to community integration in homeless veterans: Study 2 – clinically diverse sample. *Psychological Medicine, 51*(16), 2915-2922. https://doi.org/10.1017/S0033291720001609

Wynn, J. K., Lee, J., Horan, W. P., & Green, M. F. (2008). Using event related potentials to explore stages of facial affect recognition deficits in schizophrenia. *Schizophrenia Bulletin, 34*, 679–687. https://doi.org/10.1093/schbul/sbn047

Zaki, J., Bolger, N., & Ochsner, K. (2008). It takes two: The interpersonal nature of empathic accuracy. *Psychological Science, 19*(4), 399-404. https://doi.org/10.1111/j.1467-9280.2008.02099.x

Zarbatany, L., & Lamb, M. E. (1985). Social referencing as a function of information source: Mothers versus strangers. *Infant Behavior and Development, 8*(1), 25-33. https://doi.org/10.1016/S0163-6383(85)80014-X

Zerger, S., Doblin, B., & Thompson, L. (2009). Medical respite care for homeless people: A growing national phenomenon. *Journal of Health Care for the Poor and Underserved, 20*(1), 36-41. https://doi.org/10.1353/hpu.0.0098

APPENDICES

Appendix A

Ethical Approval Decision Letter from University of East London School of Psychology Ethics Committee

University of East London

School of Psychology Ethics Committee

NOTICE OF ETHICS REVIEW DECISION LETTER

For research involving human participants

BSc/MSc/MA/Professional Doctorates in Clinical, Counselling and Educational Psychology

Reviewer: Please complete sections in **blue** | **Student:** Please complete/read sections in **orange**

Details	
Reviewer:	Please type your full name **Federica Alberton**
Supervisor:	Please type supervisor's full name **Matthew Jones Chesters**
Student:	Please type student's full name **Hannah Reene**
Course:	Please type course name **Prof Doc Clinical in Psychology**
Title of proposed study:	**Exploring the relationship between experiences of homelessness with cognitive and social cognitive functioning**

Checklist (Optional)			
	YES	**NO**	**N/A**
Concerns regarding study aims (e.g., ethically/morally questionable, unsuitable topic area for level of study, etc.)	☐	☒	☐
Detailed account of participants, including inclusion and exclusion criteria	☒	☐	☐
Concerns regarding participants/target sample	☐	x☐	☐
Detailed account of recruitment strategy	☒	☐	☐
Concerns regarding recruitment strategy	☐	☐x	☐

All relevant study materials attached (e.g., freely available questionnaires, interview schedules, tests, etc.)	☒	☐	☐
Study materials (e.g., questionnaires, tests, etc.) are appropriate for target sample	☐x	☐	☐
Clear and detailed outline of data collection	☒	☐	☐
Data collection appropriate for target sample	x☐	☐	☐
If deception being used, rationale provided, and appropriate steps followed to communicate study aims at a later point	☐	☐	☒
If data collection is not anonymous, appropriate steps taken at later stages to ensure participant anonymity (e.g., data analysis, dissemination, etc.) – anonymisation, pseudonymisation	☐	☐	☒
Concerns regarding data storage (e.g., location, type of data, etc.)	☐	☒	☐
Concerns regarding data sharing (e.g., who will have access and how)	☐	☒	☐
Concerns regarding data retention (e.g., unspecified length of time, unclear why data will be retained/who will have access/where stored)	☐	☒	☐
If required, General Risk Assessment form attached	x☐	☐	☐
Any physical/psychological risks/burdens to participants have been sufficiently considered and appropriate attempts will be made to minimise	☐x	☐	☐
Any physical/psychological risks to the researcher have been sufficiently considered and appropriate attempts will be made to minimise	☒	☐	☐
If required, Country-Specific Risk Assessment form attached	☐	☐	☒
If required, a DBS or equivalent certificate number/information provided	☐x	☐	☐
If required, permissions from recruiting organisations attached (e.g., school, charity organisation, etc.)	☐	☐	x☐
All relevant information included in the participant information sheet (PIS)	☐x	☐	☐
Information in the PIS is study specific	☐x	☐	☐
Language used in the PIS is appropriate for the target audience	x☐	☐	☐
All issues specific to the study are covered in the consent form	☐x	☐	☐
Language used in the consent form is appropriate for the target audience	☐x	☐	☐
All necessary information included in the participant debrief sheet	☐x	☐	☐
Language used in the debrief sheet is appropriate for the target audience	☐x	☐	☐
Study advertisement included	☐x	☐	☐
Content of study advertisement is appropriate (e.g., researcher's personal contact details are not shared, appropriate language/visual material used, etc.)	☐x	☐	☐

Decision options	
APPROVED	Ethics approval for the above-named research study has been granted from the date of approval (see end of this notice), to the date it is submitted for assessment.
APPROVED - BUT MINOR AMENDMENTS ARE REQUIRED BEFORE THE RESEARCH COMMENCES	In this circumstance, the student must confirm with their supervisor that all minor amendments have been made **before** the research commences. Students are to do this by filling in the confirmation box at the end of this form once all amendments have been attended to and emailing a copy of this decision notice to the supervisor. The supervisor will then forward the student's confirmation to the School for its records. **Minor amendments guidance:** typically involve clarifying/amending information presented to participants (e.g., in the PIS, instructions), further detailing of how data will be securely handled/stored, and/or ensuring consistency in information presented across materials.
NOT APPROVED - MAJOR AMENDMENTS AND RE-SUBMISSION REQUIRED	In this circumstance, a revised ethics application **must** be submitted and approved **before** any research takes place. The revised application will be reviewed by the same reviewer. If in doubt, students should ask their supervisor for support in revising their ethics application. **Major amendments guidance:** typically insufficient information has been provided, insufficient consideration given to several key aspects, there are serious concerns regarding any aspect of the project, and/or serious concerns in the candidate's ability to ethically, safely and sensitively execute the study.

Decision on the above-named proposed research study	
Please indicate the decision:	**APPROVED - MINOR AMENDMENTS ARE REQUIRED BEFORE THE RESEARCH COMMENCES**

Minor amendments
Please clearly detail the amendments the student is required to make

Some considerations to the language used in the PIS, Participant Debrief Sheet and Study advertisement. It may be helpful to simplify it even further and consistently across documents. For example, Terms like "cognitive and social cognitive functioning".

PIS- What is the purpose of the research? Might be a bit too wordy and complex to read.

PIS- refers to language criteria as Proficient in English- how would someone be able to assess this level- Might be sufficient to say be fluent? Are you assessing this?

Length of Assessment- 90 mins to 2hrs feels quite a significant amount of time for this population. I am aware that breaks are offered but feels might be a disadvantage at start. Can they be offered 2 sessions in the event they are experiencing difficulties with being fully engaged for the whole two hours? Or maybe the history can be taken separately from the cognitive testing?

Criteria of being abstinent from substances- is this clear in the PIS? How would you know?

Risk Assessment Form- If participant was to present with any distress/risk (to self or others)- how is this managed? Can this be clearer in the RISK assessment? I would add on pag 25 of risk assessment – Risk protocols/Procedures and clarity if there is a number/person to contact (needs to be more specific). This is in addition to the lone worker policy.

I hope the above suggestions feel helpful.
Regards

Major amendments

Please clearly detail the amendments the student is required to make

Assessment of risk to researcher

Has an adequate risk assessment been offered in the application form?	**YES** ☐x	**NO** ☐
	If no, please request resubmission with an **adequate risk assessment.**	
If the proposed research could expose the researcher to any kind of emotional, physical or health and safety hazard, please rate the degree of risk:		

HIGH	Please **do not approve a high-risk** application. Travel to countries/provinces/areas deemed to be high risk should not be permitted and an application not be approved on this basis. If unsure, please refer to the Chair of Ethics.	☐
MEDIUM	Approve but include appropriate recommendations in the below box.	☐
LOW	Approve and if necessary, include any recommendations in the below box.	x☐
Reviewer recommendations in relation to risk (if any):	**Ensuring Risk Assessment for participants and Risk Protocols are in place and clear to follow in case of any risks during testing**	

Reviewer's signature	
Reviewer: (Typed name to act as signature)	**Federica Alberton**
Date:	**07/08/2023**
This reviewer has assessed the ethics application for the named research study on behalf of the School of Psychology Ethics Committee	
RESEARCHER PLEASE NOTE For the researcher and participants involved in the above-named study to be covered by UEL's Insurance, prior ethics approval from the School of Psychology (acting on behalf of the UEL Ethics Committee), and confirmation from students where minor amendments were required, must be obtained before any research takes place. For a copy of UEL's Personal Accident & Travel Insurance Policy, please see the Ethics Folder in the Psychology Noticeboard.	

Confirmation of minor amendments (Student to complete)	
I have noted and made all the required minor amendments, as stated above, before starting my research and collecting data	
Student name: (Typed name to act as signature)	**Hannah Reene**
Student number:	**2195628**
Date:	**25/10/2023**
Please submit a copy of this decision letter to your supervisor with this box completed if minor amendments to your ethics application are required	

Appendix B
Participant Information Sheet

Version: 2
Date: 25/10/2023

PARTICIPANT INFORMATION SHEET

Exploring the relationship between experiences of homelessness with cognitive and social cognitive functioning

Contact person: Hannah Reene

Email: u2195628@uel.ac.uk

You are being invited to participate in a research study. Before you decide whether to take part or not, please carefully read through the following information which outlines what your participation would involve. Feel free to talk with others about the study before making your decision. If anything is unclear or you have any questions, please do not hesitate to contact me on the above email or in person at the centre.

Who am I?

My name is Hannah Reene. I am a Trainee Clinical Psychologist based in the School of Psychology at the University of East London (UEL) and am studying for a Doctorate in Clinical Psychology. As part of my studies, I am conducting the research that you are being invited to participate in.

What is the purpose of the research?

I am conducting research into cognitive function (mental abilities such as attention, learning, and memory) and social cognition (how we manage social situations) in people who are experiencing homelessness. Research suggests there is a link between experiencing homelessness and differences in cognition. However, this research has not specifically looked at social cognition, which affects how we understand and communicate with other people. Research is needed to examine if there is a link between homelessness and social cognition, as this could influence how services should adapt their approach and support for people who have experienced homelessness.

This research has been approved by the School of Psychology Research Ethics Committee. This means that my research follows the standard of research ethics set by the British Psychological Society.

Why have I been invited to take part?
To address the study aims, I am inviting people currently affected by homelessness to take part in my research. If you are aged over 18 and fluent in English, you may be eligible to take part in the study. It is entirely up to you whether you take part or not, participation is voluntary.

What will I be asked to do if I agree to take part?

If you agree to take part, you will be asked to meet with me in person at the centre. This is a one-off meeting which should take approximately one hour. You will be asked to provide some information about yourself, for example your age, education, health history. You will then be asked to complete a range of tests which cover learning and memory, attention, and problem-solving.

Afterwards, you will be provided with a debrief sheet which further explains the study and given the opportunity to ask questions. You will be paid a £10 voucher as an appreciation for your time. You will receive a brief report explaining how you did in the tasks. Your time will be very valuable in further understanding the needs and experiences that homeless people may currently face.

Can I change my mind?

Yes, you can change your mind at any time and withdraw without explanation, disadvantage or consequence. If you would like to withdraw from the study, you can do so by letting the researcher know. You may withdraw at any point before or during the study, and up to three weeks after you have participated in the research. If you withdraw, your data will not be used as part of the research.

You can also request to withdraw your data from being used even after you have taken part in the study, provided that this request is made within three weeks of the data being collected (after which point the data analysis will begin, and withdrawal will not be possible).

Are there any disadvantages to taking part?

Cognitive tests require effort and can feel like they take a long time. The researcher will offer your short breaks throughout, and we encourage you to take these if you feel tired. Although we will be asking you about your history (including mental health history), we will not ask you to disclose any difficult previous experiences in any detail. Sometimes, cognitive tests can identify an area of clinical concern. In the unlikely event that the test shows an area of clinical concern, the principal researcher will communicate this with you in a clear and sensitive way and advise you how to proceed with this.

How will the information I provide be kept secure and confidential?

All identifiable information will be kept securely, with hard copies stored in a locked cabinet on site and electronic data encrypted with a password. Identifiable information will be destroyed at the end of the study data collection, with anonymised electronic data kept for up to two years post study, for publication purposes. We will be able to provide a summary of your individual scores and the group results on request. The results of the study are planned to be published, with only anonymised information included. Published anonymised data will be readily accessible to the public.

For the purposes of data protection, the University of East London is the Data Controller for the personal information processed as part of this research project. The University processes this information under the ‘public task’ condition contained in the General Data Protection Regulation

(GDPR). Where the University processes particularly sensitive data (known as 'special category data' in the GDPR), it does so because the processing is necessary for archiving purposes in the public interest, or scientific and historical research purposes or statistical purposes. The University will ensure that the personal data it processes is held securely and processed in accordance with the GDPR and the Data Protection Act 2018. For more information about how the University processes personal data please see www.uel.ac.uk/about/about-uel/governance/information-assurance/data-protection

What will happen to the results of the research?

The research will be written up as a thesis and submitted for assessment. The thesis will be publicly available on UEL's online Registry of Open Access Repositories. Findings will also be disseminated to a range of audiences (e.g., academics, clinicians, public, etc.) through journal articles, conference presentations, talks, magazine articles, and blogs. In all material produced, your identity will remain anonymous, in that, it will not be possible to identify you personally.

You will be given the option to receive a summary of the research findings once the study has been completed for which relevant contact details will need to be provided.

Anonymised research data will be securely stored by Dr Matthew Jones Chesters for a maximum of three years, following which all data will be deleted.

Who has reviewed the research?

My research has been approved by the School of Psychology Ethics Committee. This means that the Committee's evaluation of this ethics application has been guided by the standards of research ethics set by the British Psychological Society.

Who can I contact if I have any questions/concerns?

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

Principal Investigator: Hannah Reene

Email: u2195628@uel.ac.uk

If you have any questions or concerns about how the research has been conducted, please contact my research supervisor: Dr Matthew Jones Chesters, School of Psychology, University of East London, Water Lane, London E15 4LZ,

Email: m.h.jones-chesters@uel.ac.uk

or

Chair of School Ethics Committee: Dr Trishna Patel, School of Psychology, University of East London, Water Lane, London E15 4LZ.

(Email: t.patel@uel.ac.uk)

Thank you for taking the time to read this information sheet

Appendix C
Participant Consent Form

CONSENT TO PARTICIPATE IN A RESEARCH STUDY
Exploring the relationship between experiences of homelessness with cognitive and social cognitive functioning

Contact person: Hannah Reene
Email: u2195628@uel.ac.uk

	Please initial
I confirm that I have read the participant information sheet dated 16/06/2023 (version 1) for the above study and that I have been given a copy to keep.	
I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	
I understand that my participation in the study is voluntary and that I may withdraw at any time, without explanation or disadvantage.	
I understand that if I withdraw during the study, my data will not be used.	
I understand that I have three weeks from the date of taking part in the study to withdraw my data from the study.	
I understand that my personal information and data from the research will be securely stored and remain confidential. Only the research team will have access to this information, to which I give my permission.	
It has been explained to me what will happen to the data once the research has been completed.	
I understand that some generic group level data may be used in material such as conference presentations, reports, articles in academic journals resulting from the study and that these will not personally identify me.	
I would like to receive a summary of the research findings once the study has been completed and am willing to provide contact details for this to be sent to.	
I agree to take part in the above study.	

Participant's Name (BLOCK CAPITALS)

……

Participant's Signature

……

Researcher's Name (BLOCK CAPITALS)

……

Researcher's Signature

……

Date

……..……

Appendix D
Participant Debrief Sheet

PARTICIPANT DEBRIEF SHEET

Exploring the relationship between experiences of homelessness with cognitive and social cognitive functioning

Contact person: Hannah Reene
Email: u2195628@uel.ac.uk

Thank you for participating in my research study investigating the cognitive functioning and social cognition in a population of homeless people in London. This document offers information that may be relevant in light of you having now taken part.

How will my data be managed?
The University of East London is the Data Controller for the personal information processed as part of this research project. The University will ensure that the personal data it processes is held securely and processed in accordance with the GDPR and the Data Protection Act 2018. More detailed information is available in the Participant Information Sheet, which you received when you agreed to take part in the research.

What will happen to the results of the research?
The research will be written up as a thesis and submitted for assessment. The thesis will be publicly available on UEL's online Repository. Findings will also be disseminated to a range of audiences (e.g., academics, clinicians, public, etc.) through journal articles, conference presentations, talks, magazine articles, and blogs. In all material produced, your identity will remain anonymous, in that, it will not be possible to identify you personally.

You will be given the option to receive a summary of the research findings once the study has been completed for which relevant contact details will need to be provided.

Anonymised research data will be securely stored by Dr Matthew Jones Chesters for a maximum of three years, following which all data will be deleted.

What if I 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 distress or harm of any kind. Nevertheless, it is 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 resources/services helpful in relation to obtaining information and support:

[Recruitment Base]
Please speak with a member of the team who can provide further information or advice.

Crisis
Please speak with somebody at Crisis, and they can provide advice relating to wellbeing and housing.
Tel: 0300 636 1967 (available 9:30am – 4:30pm)
Email: london@crisis.org.uk
Address: 66 Commercial Street, London, E1 6LT

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: jo@samaritans.org

Mind
Mind are a charity who provide information and support on mental health issues.
Tel: 0300 123 3393 (available 9:00am to 6:00pm, Monday - Friday, except bank holidays)
Email: info@mind.org.uk
Text: 86463

Who can I contact if I have any questions/concerns?
If you would like further information about my research or have any questions or concerns, please do not hesitate to contact me.

Principal Investigator: Hannah Reene
Email: u2195628@uel.ac.uk

If you have any questions or concerns about how the research has been conducted, please contact my research supervisor Dr Matthew Jones Chesters, School of Psychology, University of East London, Water Lane, London E15 4LZ,
Email: m.h.jones-chesters@uel.ac.uk

or

Chair of School Ethics Committee: Dr Trishna Patel, School of Psychology, University of East London, Water Lane, London E15 4LZ.
(Email: t.patel@uel.ac.uk)

Thank you for taking part in my study

Appendix E

Spearman's Rho Correlation Matrix for Primary Analysis (Male EFL n=31)

For the purposes of presenting Appendix E, variables are coded in the correlation matrix as follows:

1	WTAR
2	Digit Span Forward
3	Digit Span Backward
4	Coding
5	Trail Making A
6	Naming
7	SST Physical Stories
8	Line Orientation
9	Figure Copy
10	Words Learning
11	Words Delayed Recall
12	Words Recognition
13	Story Learning
14	Story Delayed Recall
15	Figure Delayed Recall
16	Semantic Fluency
17	Action Fluency
18	Trail Making B
19	Affect Naming
20	SST Mentalisation Stories
21	Cognitive Empathy
22	Affective Empathy

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	r	1.00	**0.41**	**0.65**	0.10	0.21	0.01	-0.13	0.24	0.05	**0.44**	0.30	**0.40**	**0.57**	**0.45**	0.25	0.17	0.29	0.26	**0.39**	0.11	-0.04	0.17
	Sig		.026	<.001	.583	.259	.974	.505	.197	.812	.014	.109	.028	.001	.012	.187	.356	.122	.164	.031	.552	.825	.376
	N	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
2	r	**0.41**	1.00	0.24	0.22	0.20	0.08	0.33	0.30	0.08	0.26	0.20	-0.18	0.34	**0.37**	0.21	0.25	0.34	0.30	0.15	0.07	-0.13	-0.10
	Sig	.026		.208	.239	.276	.664	.067	.107	.669	.166	.288	.339	.061	.043	.255	.177	.065	.104	.426	.693	.476	.595
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
3	r	**0.65**	0.24	1.00	0.17	0.16	-0.01	0.03	0.28	0.22	**0.43**	0.29	**0.5**	**0.47**	**0.39**	**0.38**	-0.01	0.27	0.20	**0.47**	**0.38**	0.22	0.26
	Sig	<.001	.208		.358	.390	.949	.892	.139	.248	.017	.123	.005	.009	.035	.038	.951	.145	.277	.009	.039	.244	.162
	N	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
4	r	0.10	0.22	0.17	1.00	**0.63**	**0.61**	0.26	**0.57**	**0.43**	**0.4**	0.34	0.12	0.13	0.11	**0.41**	**0.49**	0.29	**0.64**	**0.44**	0.32	0.12	0.13
	Sig	.583	.239	.358		<.001	<.001	.159	.001	.017	.027	.058	.505	.479	.550	.022	.005	.111	<.001	.015	.080	.514	.485
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
5	r	0.21	0.20	0.16	**0.63**	1.00	**0.46**	0.19	**0.54**	-0.07	**0.55**	0.23	0.26	-0.04	-0.02	0.34	0.24	0.06	**0.73**	0.233	0.116	-0.069	0.161
	Sig	.259	.276	.390	<.001		.009	.307	.002	.700	.001	.213	.150	.819	.913	.065	.200	.752	<.001	.208	.535	.713	.388
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
6	r	0.01	0.08	-0.01	**0.61**	**0.46**	1.00	0.18	0.34	**0.52**	**0.40**	0.24	0.20	-0.01	-0.01	0.31	**0.45**	0.04	**0.56**	0.29	**0.46**	0.13	0.13
	Sig	.974	.664	.949	<.001	.009		.344	.058	.003	.026	.198	.292	.962	.946	.091	.010	.815	.001	.120	.010	.480	.484
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31

7	r	-0.13	0.33	0.03	0.26	0.19	0.18	1.00	0.05	-0.07	0.17	0.07	-0.11	-0.02	0.10	0.11	**0.46**	0.10	0.02	-0.04	0.20	-0.17	-0.07
	Sig	.505	.067	.892	.159	.307	.344		.771	.691	.360	.710	.541	.934	.586	.563	.010	.590	.916	.820	.276	.353	.724
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
8	r	0.24	0.30	0.28	**0.57**	**0.54**	0.34	0.05	1.00	**0.36**	**0.56**	**0.60**	**0.36**	0.27	0.22	**0.65**	0.35	**0.38**	**0.49**	**0.49**	**0.37**	-0.05	**0.47**
	Sig	.197	.107	.139	.001	.002	.058	.771		.048	.001	<.001	.046	.139	.224	<.002	.054	.034	.005	.005	.042	.777	.008
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
9	r	0.05	0.08	0.22	**0.43**	-0.07	**0.52**	-0.07	**0.36**	1.00	0.24	**0.47**	0.30	0.15	0.24	0.31	0.13	0.17	0.21	**0.37**	**0.52**	0.21	0.11
	Sig	.812	.669	.248	.017	.700	.003	.691	.048		.197	.008	.098	.414	.201	.095	.495	.369	.260	.043	.003	.249	.565
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
10	r	**0.44**	0.26	**0.43**	**0.4**	**0.55**	**0.4**	0.17	**0.56**	0.24	1.00	**0.61**	**0.42**	**0.36**	**0.42**	**0.56**	0.25	0.01	**0.56**	**0.41**	**0.44**	-0.10	0.25
	Sig	.014	.166	.017	.027	.001	.026	.360	.001	.197		<.001	.019	.048	.018	.001	.181	.950	.001	.023	.014	.599	.168
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
11	r	0.30	0.20	0.29	0.34	0.23	0.24	0.07	**0.60**	**0.47**	**0.61**	1.00	0.31	0.24	0.33	**0.69**	0.09	0.26	0.24	**0.39**	**0.45**	-0.03	**0.49**
	Sig	.109	.288	.123	.058	.213	.198	.710	<.001	.008	<.001		.085	.189	.072	<.001	.613	.165	.190	.030	.012	.889	.005
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
12	r	**0.40**	-0.18	**0.50**	0.12	0.26	0.20	-0.11	**0.36**	0.30	**0.42**	0.31	1.00	0.34	0.21	0.26	0.10	0.11	0.16	**0.56**	0.35	-0.05	0.21
	Sig	.028	.339	.005	.505	.150	.292	.541	.046	.098	.019	.085		.062	.250	.165	.607	.540	.399	.001	.054	.782	.261
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31

13	r	**0.57**	0.34	**0.47**	0.13	-0.04	-0.01	-0.02	0.27	0.15	**0.36**	0.24	0.34	1.00	**0.78**	0.15	0.12	0.20	0.20	**0.43**	0.20	0.00	0.20
	Sig	.001	.061	.009	.479	.819	.962	.934	.139	.414	.048	.189	.062		<.001	.435	.535	.284	.278	.015	.273	.989	.271
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
14	r	**0.45**	**0.37**	**0.39**	0.11	-0.02	-0.01	0.10	0.22	0.24	**0.42**	0.33	0.21	**0.78**	1.00	0.12	-0.03	0.12	0.21	0.33	0.33	-0.25	0.02
	Sig	.012	.043	.035	.550	.913	.946	.586	.224	.201	.018	.072	.250	<.001		.534	.859	.530	.267	.070	.071	.171	.919
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
15	r	0.25	0.21	**0.38**	**0.41**	0.34	0.31	0.11	**0.65**	0.31	**0.56**	**0.69**	0.26	0.15	0.12	1.00	0.17	0.11	0.35	**0.38**	0.30	0.07	**0.5**
	Sig	.187	.255	.038	.022	.065	.091	.563	<.001	.095	.001	<.001	.165	.435	.534		.365	.552	.051	.036	.098	.704	.005
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
16	r	0.17	0.25	-0.01	**0.49**	0.24	**0.45**	**0.45**	0.35	0.13	0.25	0.09	0.10	0.12	-0.03	0.17	1.00	0.34	0.16	0.21	0.27	-0.01	0.08
	Sig	.356	.177	.951	.005	.200	.010	.010	.054	.495	.181	.613	.607	.535	.859	.365		.060	.399	.250	.147	.976	.658
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
17	r	0.29	0.34	0.27	0.29	0.06	0.04	0.10	**0.38**	0.17	0.01	0.26	0.11	0.20	0.12	0.11	0.34	1.00	0.13	**0.42**	**0.36**	0.19	0.12
	Sig	.122	.065	.145	.111	.752	.815	.590	.034	.369	.950	.165	.540	.284	.530	.552	.060		.469	.020	.047	.304	.511
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
18	r	0.26	0.30	0.20	**0.64**	**0.73**	**0.56**	0.02	**0.49**	0.21	**0.56**	0.24	0.16	0.20	0.21	0.35	0.16	0.13	1.00	**0.44**	0.26	0.18	0.19
	Sig	.164	.104	.277	<.001	<.001	.001	.916	.005	.260	.001	.190	.399	.278	.267	.051	.399	.469		.013	.158	.345	.295
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
19	r	**0.39**	0.15	**0.47**	**0.44**	0.23	0.29	-0.04	**0.49**	**0.37**	**0.41**	**0.39**	**0.56**	**0.43**	0.33	**0.38**	0.21	**0.42**	**0.44**	1.00	**0.47**	0.24	0.27

	Sig	.031	.426	.009	.015	.208	.120	.820	.005	.043	.023	.030	.001	.015	.070	.036	.250	.020	.013		.008	.200	.141
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
20	r	0.11	0.07	**0.38**	0.32	0.12	**0.46**	0.20	**0.37**	**0.52**	**0.44**	**0.45**	0.35	0.20	0.33	0.30	0.27	**0.36**	0.26	**0.47**	1.00	0.13	0.23
	Sig	.552	.693	.039	.080	.535	.010	.276	.042	.003	.014	.012	.054	.273	.071	.098	.147	.047	.158	.008		.494	.217
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
21	r	-0.04	-0.13	0.22	0.12	-0.07	0.13	-0.17	-0.05	0.21	-0.10	-0.03	-0.05	0.00	-0.25	0.07	-0.01	0.19	0.18	0.24	0.13	1.00	**0.48**
	Sig	.825	.476	.244	.514	.713	.480	.353	.777	.249	.599	.889	.782	.989	.171	.704	.976	.304	.345	.200	.494		.006
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
22	r	0.17	-0.10	0.26	0.13	0.16	0.13	-0.07	**0.47**	0.11	0.25	**0.49**	0.21	0.20	0.02	**0.50**	0.08	0.12	0.19	0.27	0.23	**0.48**	1.00
	Sig	.376	.595	.162	.485	.388	.484	.724	.008	.565	.168	.005	.261	.271	.919	.005	.658	.511	.295	.141	.217	.006	
	N	30	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31

Appendix F

Mann Whitney U Test (Male and Female EFL n=35)

Subtest	Male		Female		Mann-Whitney U	Z	Exact Sig.
	Mean	SD	Mean	SD			
WTAR	9.10	3.92	7.75	4.27	48.50	-0.62	.553
Digits Forward	8.23	2.67	9.25	4.65	49.00	-0.69	.531
Digits Backward	6.43	1.87	4.75	2.36	34.00	-1.42	.180
Coding	5.87	3.16	4.00	0.82	42.50	-1.02	.326
Trail Making A	10.03	2.81	9.00	0.82	43.00	-0.99	.352
Naming	10.81	1.45	10.00	1.41	37.00	-1.42	.213
Physical Stories	10.71	1.66	8.00	4.76	37.00	-1.34	.213
Line Orientation	10.42	3.25	8.25	2.99	35.00	-1.41	.176
Figure Copy	10.81	2.63	10.00	3.56	52.00	-0.54	.635
Words Learning	6.13	3.14	5.50	2.65	56.50	-0.29	.783
Words Recall	7.77	2.85	5.00	2.71	29.00	-1.73	.093
Words Recognition	7.90	3.86	6.00	3.83	44.00	-0.95	.379
Story Learning	6.84	3.57	5.00	4.83	37.50	-1.28	.213
Story Recall	7.32	2.59	4.25	1.71	20.00	-2.20	**.027**
Figure Recall	8.97	3.49	8.00	3.46	52.00	-0.52	.635
Semantic Fluency	7.03	2.71	7.25	4.03	58.50	-0.18	.816
Action Fluency	8.55	2.66	9.25	3.20	57.00	-0.26	.822
Trail Making B	11.65	2.47	8.75	4.72	32.00	-1.59	.130
Affect Naming	7.68	2.82	8.50	2.52	50.50	-0.60	.565
Mental Stories	8.06	3.15	7.00	3.83	52.00	-0.53	.635
Cognitive Empathy	10.19	2.98	12.50	5.20	34.00	-1.46	.160
Affective Empathy	9.90	3.42	10.50	4.12	58.50	-0.18	.861

Appendix G

Spearman's Rho Correlation Matrix (Male and Female EFL n=35)

		Affect Naming	SST Mentalisation Stories	Cognitive Empathy	Affective Empathy
WTAR	r	**0.36**	0.08	-0.06	0.12
	Sig.	.035	.649	.721	.509
	N	34	34	34	34
Digits Forward	r	0.14	0.08	-0.12	-0.11
	Sig.	.439	.655	.500	.545
	N	35	35	35	35
Digits Backward	r	**0.41**	0.28	0.13	0.18
	Sig.	.015	.113	.457	.318
	N	34	34	34	34
Coding	r	**0.37**	**0.36**	0.08	0.16
	Sig.	.027	.036	.666	.370
	N	35	35	35	35
Trail Making A	r	0.18	0.15	-0.10	0.17
	Sig.	.310	.403	.584	.323
	N	35	35	35	35
Naming	r	0.14	**0.49**	0.11	0.21
	Sig.	.419	.003	.512	.225
	N	35	35	35	35
SST Physical Stories	r	-0.09	0.25	-0.16	-0.02
	Sig.	.588	.146	.370	.928
	N	35	35	35	35
Line Orientation	r	**0.36**	**0.43**	-0.11	**0.45**
	Sig.	.032	.010	.524	.006
	N	35	35	35	35
Figure Copy	r	**0.41**	**0.39**	0.02	-0.04
	Sig.	.015	.022	.912	.840
	N	35	35	35	35
Words Learning	r	**0.36**	0.31	-0.02	0.24
	Sig.	.032	.072	.915	.172
	N	35	35	35	35
Words Recall	r	**0.36**	**0.37**	-0.17	**0.37**
	Sig.	.037	.030	.336	.030
	N	35	35	35	35
Words Recognition	r	**0.47**	0.30	-0.03	0.21

	Sig.	.005	.077	.853	.226
	N	35	35	35	35
Story Learning	r	**0.36**	0.09	-0.01	0.13
	Sig.	.032	.614	.949	.453
	N	35	35	35	35
Story Recall	r	0.26	0.25	-0.30	-0.04
	Sig.	.124	.144	.078	.822
	N	35	35	35	35
Figure Recall	r	0.32	0.22	0.10	**0.47**
	Sig.	.059	.209	.580	.005
	N	35	35	35	35
Semantic Fluency	r	0.23	0.19	-0.01	0.04
	Sig.	.175	.273	.969	.798
	N	35	35	35	35
Action Fluency	r	**0.39**	0.27	0.21	0.10
	Sig.	.020	.117	.226	.581
	N	35	35	35	35
Trail Making B	r	**0.40**	0.25	-0.08	0.07
	Sig.	.019	.162	.633	.676
	N	35	35	35	35
Affect Naming	r	1.00	---	---	---
	Sig.		---	---	---
	N	35	---	---	---
SST Mental Stories	r	**0.35**	1.00	---	---
	Sig.	.042		---	---
	N	35	35	---	---
Cognitive Empathy	r	0.13	0.07	1.00	---
	Sig.	.463	.679		---
	N	35	35	35	---
Affective Empathy	r	0.16	0.27	**0.52**	1.00
	Sig.	.365	.124	.002	
	N	35	35	35	35

Appendix H

Mann Whitney U Test (Male EFL and EAL n=36)

Subtest	Male EFL		Male EAL		Mann-Whitney U	Z	Exact Sig.
	Mean	SD	Mean	SD			
WTAR	9.10	3.92	8.40	0.90	59.50	-0.74	.477
Digits Forward	8.23	2.67	4.60	2.30	20.00	-2.68	**.006**
Digits Backward	6.43	1.87	3.60	2.79	32.00	-2.06	**.043**
Coding	5.87	3.16	3.20	2.59	37.00	-1.86	.066
Trail Making A	10.03	2.81	4.80	3.49	18.50	-2.72	**.004**
Naming	10.81	1.45	4.00	2.45	1.00	-3.74	**<.001**
SST Physical Stories	10.71	1.66	7.20	1.64	11.00	-3.11	**<.001**
Line Orientation	10.42	3.25	9.00	3.81	59.00	-0.85	.422
Figure Copy	10.81	2.63	8.60	4.98	54.00	-1.13	.303
Words Learning	6.13	3.14	4.60	2.97	59.00	-0.85	.422
Words Recall	7.77	2.85	7.20	3.19	70.00	-0.35	.756
Words Recognition	7.90	3.86	5.80	3.90	52.00	-1.18	.262
Story Learning	6.84	3.57	2.80	1.64	18.50	-2.72	**.004**
Story Recall	7.32	2.59	3.80	2.17	21.00	-2.61	**.007**
Figure Recall	8.97	3.49	10.00	3.46	61.00	-0.76	.476
Semantic Fluency	7.03	2.71	1.20	0.45	0.50	-3.55	**<.001**
Action Fluency	8.55	2.66	5.40	0.55	24.00	-2.48	**.012**
Trail Making B	11.65	2.47	8.00	4.58	35.00	-1.98	.053
Affect Naming	7.68	2.82	7.20	5.12	68.50	-0.42	.690
SST Mental Stories	8.06	3.15	6.80	1.64	49.50	-1.30	.207
Cognitive Empathy	10.19	2.98	10.40	3.29	70.00	-0.35	.756
Affective Empathy	9.90	3.42	12.40	2.89	44.00	-1.54	.134

Appendix I

Spearman's Rho Correlation Matrix (Male EFL and EAL n=36)

		Affect Naming	SST Mentalisation Stories	Cognitive Empathy	Affective Empathy
WTAR	r	**0.36**	0.11	-0.03	0.12
	Sig.	.032	.515	.850	.481
	N	35	35	35	35
Digits Forward	r	0.16	0.21	-0.05	-0.18
	Sig.	.362	.219	.758	.297
	N	36	36	36	36
Digits Backward	r	**0.41**	**0.39**	0.16	0.20
	Sig.	.015	.021	.352	.254
	N	35	35	35	35
Coding	r	**0.43**	**0.35**	0.01	-0.04
	Sig.	.009	.039	.971	.830
	N	36	36	36	36
Trail Making A	r	0.26	0.18	-0.11	-0.02
	Sig.	.122	.306	.513	.907
	N	36	36	36	36
Naming	r	0.25	**0.48**	0.03	-0.10
	Sig.	.136	.003	.866	.558
	N	36	36	36	36
SST Physical Stories	r	-0.02	0.28	-0.16	-0.19
	Sig.	.900	.093	.352	.267
	N	36	36	36	36
Line Orientation	r	**0.51**	0.33	-0.19	0.31
	Sig.	.002	.051	.279	.068
	N	36	36	36	36
Figure Copy	r	**0.39**	**0.49**	0.07	0.02
	Sig.	.020	.002	.690	.904
	N	36	36	36	36
Words Learning	r	**0.41**	**0.34**	-0.19	0.12
	Sig.	.013	.043	.266	.489
	N	36	36	36	36
Words Recall	r	**0.42**	**0.34**	-0.15	**0.34**
	Sig.	.012	.041	.389	.045
	N	36	36	36	36

Words Recognition	r	**0.54**	0.28	-0.16	0.07
	Sig.	.001	.095	.366	.664
	N	36	36	36	36
Story Learning	r	**0.35**	0.26	-0.06	0.05
	Sig.	.038	.131	.733	.765
	N	36	36	36	36
Story Recall	r	0.27	**0.36**	-0.23	-0.08
	Sig.	.115	.031	.168	.631
	N	36	36	36	36
Figure Recall	r	**0.42**	0.24	-0.03	**0.45**
	Sig.	.011	.151	.845	.006
	N	36	36	36	36
Semantic Fluency	r	0.18	**0.35**	-0.04	-0.10
	Sig.	.283	.035	.795	.549
	N	36	36	36	36
Action Fluency	r	**0.37**	**0.41**	0.14	0.00
	Sig.	.045	.013	.416	.991
	N	36	36	36	36
Trail Making B	r	**0.44**	0.30	0.15	0.03
	Sig.	.007	.072	.382	.867
	N	36	36	36	36
Affect Naming	r	1.00	**0.38**	0.06	0.13
	Sig.		.022	.744	.447
	N	36	36	36	36
SST Mental Stories	r	**0.38**	1.00	0.12	0.17
	Sig.	.022		.477	.328
	N	36	36	36	36
Cognitive Empathy	r	0.06	0.12	1.00	**0.47**
	Sig.	.744	.477		.004
	N	36	36	36	36
Affective Empathy	r	0.13	0.17	**0.47**	1.00
	Sig.	.447	.328	.004	
	N	36	36	36	36