

**An Investigation Into The Relationship
Between Psychosocial Factors And
Employment Outcomes In A Population Of
People With Complex Mental Health
Problems Receiving Individual Placement
And Support**

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ABSTRACT

Work is one of the most valued roles in society, offering the opportunity to create self-identity and improve financial and social status. However, people with complex mental health problems (CMHP) are often excluded from this human right. Individual placement and support (IPS) is an effective intervention, supporting just over half of people with CMHP achieve their employment goals. Recently attention has been drawn to the efficiency of services identifying that a positive outcome is most likely to be achieved within a nine-month time frame.

Identifying factors which predict success in attaining employment has been the focus of research. Findings are complex and contradictory. Psychosocial factors influence the successful attainment of employment, but are often poorly defined and overlapping, lacking a theoretical conceptualisation and accurate measurement.

The research questions to be addressed by this study are:

- Can psychosocial variables predict who will obtain employment or education?
- Can psychosocial variables predict who will obtain employment or education within nine months, and who will take an extended period of time?

A prospective cohort study utilising a secondary dataset from an established IPS service was conducted. Multiple logistic regression allowed construction of models which examine the effects of psychosocial predictors on the probability of the outcomes. Interpretation of the analysis was shared and discussed with clinicians, who are experts in their field, to ensure that findings can be considered from both a statistical significance and clinical significance position.

An analysis was performed on data relating to 202 participants of an IPS service. Ability to adapt routines was a significant predictor of both goal attainment and requirement of extended intervention. This study provides evidence that while having strong work-related values are important predictors the translation of these values into lifestyle, expressed through habits and routines, provide stronger predictors of the likelihood of success in IPS.

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GLOSSARY

Adapts Routines to Minimize Difficulties: One item in the habits content area of the Worker Role Interview. Defined as how the person has managed use of time, routine, and habits since the injury or since being out of work (Braveman et al 2005).

Appraises Work Expectations: One item in the roles content area of the Worker Role Interview. Defined as a client's ability to internalize both general and specific expectations of work. General expectations for work have to do with basic responsibilities like being on time, calling in when sick, getting along with others, and so on. Specific expectations may have to do with actual work performance such as the kind of tasks to perform or with issues such as safety or courtesy to customers (Braveman et al 2005).

Assesses Abilities and Limitations: One item in the personal causation content area of the Worker Role Interview. Defined as the individual's capacity to accurately assess his/her abilities and what they mean for work performance (Braveman et al 2005).

Club House Model (CH) an approach to vocational rehabilitation involving training, work experience, peer support and transitional employment. Participants, named members, work with staff running a structure day program.

Commitment to Work: One item in the values content area of the Worker Role Interview. Defined as a client's commitment to work and importance placed on work (Braveman et al 2005).

Daily Routine: One item in the habits content area of the Worker Role Interview. Defined as the degree of organization and routine outside of work (Braveman et al 2005).

Employment Intervention Demonstration Project (EDIP) a federally-funded, multi-site study in the US which examined the effectiveness of different models of supported employment programs in eight sites and with different participant groups.

Enjoys Work: One item in the interests content area of the Worker Role Interview. Defined as the pleasure or enjoyment client finds within work. Client may describe liking work in a variety of ways: opportunity to use skills, challenges, interactions with coworkers, etc (Braveman et al 2005).

Environment: A content area of the of the Worker Role Interview relating to a set of four environmental items: perception of physical work setting; perception of family and peers; perception of boss and/or company; perception of co-workers. Together these are defined as the objects, persons, and events with which a person interacts in normal everyday routines (Braveman et al 2005).

Evidence Based Supported Employment (EBSE) a carefully specified form of supported employment, synonymous with Individual Placement and Support (IPS). The intervention adheres to defined principles including: eligibility based on consumer choice; rapid job search; Competitive employment is the goal; close working between employment and mental health teams; Employment specialists build employer relationships; attention to people's preferred job, their strengths and work experience; ongoing continuous individual support; personalized benefits planning is provided

Expectation of Success in Work: One item in the personal causation content area of the Worker Role Interview. Defined as a client's belief that he/she will be able to work. Overall, raters are guided to consider the general degree of optimism the person has about working. A client's expectation for being able to work is an asset in and of itself, even if it reflects an unrealistic self-appraisal. (The ability to accurately assess potential to work is rated in the assesses abilities and limitations) (Braveman et al 2005).

Habits: A content area of the of the Worker Role Interview relating to a set of three habituation items: work habits; daily routine; adapts routine to minimise difficulties. Together these are defined as images guiding the routine or typical ways in which a person performs various activities. Habits refer both to the organization of behaviour over time and to the style or manner of performance. The degree of organization in work habits and habits outside of work is the degree to which one has a typical use of time that supports competent performance in a variety of roles the client may have (Braveman et al 2005).

Individual Placement and Support (IPS) a carefully specified form of supported employment, synonymous with Evidence Based Supported Employment (EBSE). The intervention adheres to defined principles including: eligibility based on consumer choice; rapid job search; Competitive employment is the goal; close working between employment and mental health teams; Employment specialists build employer relationships; attention to people's preferred job, their strengths and work experience; ongoing continuous individual support; personalized benefits planning is provided

Influence of Other Roles: One item in the roles content area of the Worker Role Interview. Defined as how much other roles in the client's life influence his/her return to work (Braveman et al 2005).

Interests: A content area of the of the Worker Role Interview relating to a set of two volition items: enjoys work; pursues interests. Together these are defined as the pleasure or enjoyment the client finds within and outside of work (Braveman et al 2005).

Model of Human Occupation (MOHO) an occupational therapy theoretical model which seeks to explain how occupation is motivated, patterned, and performed. Volition refers to the motivation for occupation, habituation refers to the process by which occupation is organized into patterns or routines, and performance capacity refers to the physical and mental abilities that underlie skilled occupational performance. Occupation, occurs in physical and social environments.

Perception of Boss and/or Company: One item in the environment content area of the Worker Role Interview. Defined as the influence of boss and/or company on the ability of client to return to previous work or find and keep work (Braveman et al 2005).

Perception of Co-workers: One item in the environment content area of the Worker Role Interview. Defined as co-workers' influence on client's ability to return to previous work and find and keep work (Braveman et al 2005).

Perception of Family and Peers: One item in the environment content area of the Worker Role Interview. Defined as the influence family's and peers' have on the client's ability to return to previous work (Braveman et al 2005).

Perception of Physical Work Setting: One item in the environment content area of the Worker Role Interview. Defined as the physical environment in which the client works, or hopes to work in. The client's impression of how a work environment may support or hinder his/ her return to work or finding and keeping work (Braveman et al 2005).

Personal Causation: A content area of the of the Worker Role Interview relating to a set of three volition items: assesses abilities and limitations; expectation of success in work; takes responsibility. Together these are defined as a collection of beliefs and expectations that a person holds about his/her effectiveness in the work environment (Braveman et al 2005).

Prevocational Training (PVT) a traditional approach to vocational rehabilitation which relies on a a period of preparation (training) in a segregated environment, before trying to place clients in competitive employment.

Pursues Interests: One item in the interests content area of the Worker Role Interview. Defined as the ability of an individual to assess his/her own interests and find ways to use these skills in and/or outside of the work situation. The willingness of the individual to explore opportunities to make work and leisure interesting (Braveman et al 2005).

Roles: A content area of the of the Worker Role Interview relating to a set of two habituation items: appraises work expectations; influence of other roles. Together these are defined as the process of internalizing roles; it involves coming to see one's self as a worker, parent, student, etc. Internalized roles are images that persons hold of themselves as occupying certain statuses or positions in social groups and of obligations or expectations that accompany being in these roles (Braveman et al 2005).

Takes Responsibility: One item in the personal causation content area of the Worker Role Interview. Defined as how much responsibility a client takes for his/her work actions and their consequences. A client who initiates action and positively responds to obstacles and challenges by taking action, exerts control over his/her own work situation. This has been described as internal control as opposed to external control, the case of a client allowing the course of his/her work to be determined by outside agents (i.e., other people or events) (Braveman et al 2005).

Traditional Vocational Rehabilitation (US) (TVR) relies on prevocational training and collaborative work with federally provided vocational rehabilitation specialists.

Values: A content area of the of the Worker Role Interview relating to a set of two volition items: commitment to work; work-related goals. Together these are defined as a client's images of what is good, right, and/or important in his/her job and about being a worker (Braveman et al 2005).

Work Habits: One item in the habits content area of the Worker Role Interview. Defined as the degree of organization and routine in work (Braveman et al 2005).

Work-Related Goals: One item in the values content area of the Worker Role Interview. Defined as the client's ability to set and attain goals at his/her work setting. Evidence of setting and attaining goals can be found in a history of setting and meeting productivity goals (e.g., amount of piecework completed, level of sales) and in efforts to get training, promotion, putting in time for seniority, taking additional exams, or training to advance to another level of competency (Braveman et al 2005).

Worker Role Interview; is a semi-structured interview and 16 item rating scale which identified psychosocial factors that influence a client's ability to return to work, obtain or maintain employment (Braveman et al 2005).

CHAPTER 1: INTRODUCTION

1.1 THE RIGHT TO WORK

Article 23 of the Universal Declaration of Human Rights (United Nations 1948) establishes the entitlement of everyone to work and fair remuneration. Work is highly valued by society, offering the opportunity for self-identity and improved financial and social status (Mueser & Cook 2016). However, international studies have demonstrated that people with complex mental health problems (CMHP) are excluded from this human right (Marwaha et al. 2007; Salkever et al. 2007; Waghorn et al. 2009; Perkins & Farmer 2009).

1.1.1 Exclusion from the Right to Work

United Kingdom (UK) employment statistics compare unfavourably with other European countries, the USA and Australia (Table 1.1). Notably, people with complex long-term mental health problems (such as schizophrenia and bipolar disorder) also experience greater exclusion from the workplace when compared to other disability groups (Table 1.2).

Table 1.1: International Employment Statistics for People with Mental Health Problems

Country	General Population Employment Rate	Employment Rate People with CMHP	Reference
UK	71%	12.9%	(Marwaha et al. 2007)
Germany	65.4%	30.3%	(Marwaha et al. 2007)
France	62.2%	11.5%	(Marwaha et al. 2007)
USA	63%	17.2%	(Salkever et al. 2007)
Australia	73.9%	15.9%	(Waghorn, Chant, et al. 2009)

Table 1.2 UK Employment Rates for Disability Groups

Population Group	Employment Rate	Reference
General Population	74%	(Perkins & Farmer 2009)
People with a declared disability	47%	(Perkins & Farmer 2009)
People with mental health condition	21%	(Perkins & Farmer 2009)
People with a CMHP	12.9%	(Marwaha et al. 2007)

1.1.2 The Impact of Exclusion on the Individual and Society

A strong relationship has been established between employment and good health (Waddell & Burton 2006; Herbig et al. 2013; Litchfield et al. 2016); in particular, good mental health (Lelliott et al. 2008; HM Government 2009; Perkins & Farmer 2009; Paul & Moser 2009). Thus the exclusion of any individual from work must be a matter of concern for healthcare services. Employment has been demonstrated to have a positive impact on the health of those with complex mental health problems (Mueser et al. 2004), who experience fewer symptoms, less reliance on illicit drugs and alcohol, and fewer admissions to hospital (Modini et al. 2016). Additionally, improvements are found in general health and quality of life, including living situations, role identity and social functioning (Modini et al. 2016). Recognition of these positive outcomes has led to international policy directives for health and social services to support people into employment (Organisation for Economic Co-operation and Development 2014; Organisation for Economic Co-operation and Development 2015a).

Beyond the health and wellbeing benefits for the individual, policies are influenced by government concerns for fiscal responsibility. Mental health conditions have been calculated to contribute 22% of total disability-adjusted life years worldwide (Prince et al. 2007). One mental health condition, schizophrenia, comprises just 2%; however, the costs associated with this long-term, complex condition are considerable. In England alone, Mangalore & Knapp (2007) have estimated the total societal costs of schizophrenia over one fiscal year at £6.7 billion. These costs incorporate treatment and care (£2 billion); informal care borne by families (£615 million); lost productivity

of individuals and carers (£3.7 billion); criminal justice (£1 million); welfare payments and administration (£584 million).

Exclusion from employment can, therefore, be seen to have a considerable impact on the health and wellbeing of the individual and on financial implications for the economy. Addressing this exclusion, thereby lessening these impacts, must be a priority for healthcare providers, governments and society (Bush et al. 2009; Schneider et al. 2009; Kilian et al. 2012).

1.2 AN EFFECTIVE INTERVENTION TO ADDRESS THE PROBLEM

It is evident that with the right support, people with complex mental health problems can successfully achieve employment (Bond et al. 2008; Burns et al. 2015). Individual placement and support IPS (synonymous with Evidence-Based Supported Employment (EBSE)) is a standardised approach to vocational rehabilitation, definable by fidelity to established principles detailed in Table 1.3 (Bond et al. 2011). This standardisation and ability to appraise intervention fidelity has allowed replication, leading to multiple and international randomised controlled trials. All such trials have concluded that IPS is the best available vocational rehabilitation intervention (Mueser et al. 2004; Gold et al. 2006; Latimer et al. 2006; Bond et al. 2007; Burns et al. 2007; Bond et al. 2008; Killackey et al. 2008; Davis et al. 2012; Nuechterlein et al. 2012; Twamley et al. 2012; Areberg & Bejerholm 2013; Bond 2013; Knapp et al. 2013; Hoffmann et al. 2014; Michon et al. 2014; Oshima et al. 2014; Waghorn et al. 2014; Bejerholm et al. 2015; Burns et al. 2015). Meta-analysis of such studies by the Cochrane collaboration confirm that IPS is superior to all comparison interventions (Crowther et al. 2001; Kinoshita et al. 2013).

Table 1.3 Principles of Individual Placement and Support (Bond et al. 2011)

Principles of Individual Placement and Support
Eligibility is based on consumer choice
Competitive employment is the goal
Supported employment is integrated with treatment
Personalized benefits planning is provided
Rapid job search is encouraged
Employment specialists build employer relationships
Follow-along supports are continuous
Consumer preferences are important

1.3 THE RESEARCHER AND THE RESEARCH CONTEXT

1.3.1 The researcher

The researcher is an Occupational Therapist (OT), who has worked in a mental health context for over 20 years: in clinical practice, with people experiencing complex mental health problems; and more recently, in a research team partnering with services for the same population.

1.3.2 The research partnership

The partnership is best described as a scholarship of practice partnership (Forsyth et al. 2005; Taylor 2017c) between the university and local health provider. The researcher leads one component of the partnership, working with a Vocational Rehabilitation Service (VRS). This partnership commenced with an professionalising action research (Hart & Bond 1995; Hall 2006) initiative, which utilised a participatory

approach (Taylor et al. 2017c) to redesign traditional vocational rehabilitation services into an evidence-based service. This change project was successful, cited as an example of good practice in government policy documents (Scottish Government 2012; National Allied Health Professional Mental Health Clinical Leads Group 2012), and is described in publications (Baxter et al. 2012; Maciver et al. 2013; Prior et al. 2013). This action research provided the focus of modules on the Professional Doctorate Programme – Advancing Professional Practice A & B.

1.3.3 Scholarship of Practice

The scholarship of practice partnership, which provides the context of this study, is typical of the definition provided by Forsyth et al. (2005) and Taylor (2017c) in that research questions emerge in clinical practice. OTs can and do provide evidence-based vocational rehabilitation services. We are interested in exploring the unique contribution which OT theory and practice offers the field. The research partnership has previously considered this question from a qualitative point of view in an MSc study programme (Baxter et al. 2012). This study adopts a quantitative approach, utilising data derived from practice. Practitioners had an active role in reviewing and interpreting findings. Outcomes of the study will be integrated back into practice, and the ongoing research partnership will continue. This ensures that research in an applied context generates findings which continue to refine and improve theory, and recognises that new knowledge will be subject to further refinement in the future (Robson & McCartan 2016).

1.3.4 Focus of the research

Results from the many IPS RCTs indicate that around 60% of people successfully gain employment in IPS. While this is laudable, it is important that research and practice attend to the large number of people (40%) whose goal is to attain employment and who do not succeed in IPS. Priority must, therefore, be given to developing refinements and augmentation to IPS (Boycott et al. 2012; Kinoshita et al. 2013; Burns et al. 2015). Burns et al (2015) propose a simple version of IPS with time limited intervention ceasing at nine months, dropping one principle of time unlimited support. They argue that a majority of people who are going to attain employment will do so

within this period. To ensure best use of resources, it is also important to understand who may benefit from simple IPS and who requires a more complex intervention (Tsang et al. 2010).

This research seeks to understand the value of psychosocial variables, as defined in OT theory (Taylor 2017, 2017b) and measurement tools (Braveman et al. 2005), in predicting who in an IPS intervention programme will attain employment. Further, it is interested in which psychosocial factors may predict who requires a simple or more complex intervention to achieve their vocational goals.

1.4 STRUCTURE OF THE THESIS

Chapter two provides a literature review of factors which may predict successful employment or education outcomes for people with complex mental health problems. The most conclusive factor is access to an IPS service.

Thereafter, the thesis continues in chapter Three with a systematic review of the evidence of efficacy of IPS, drawing on eleven existing meta-analyses. Having concluded that to date, no meta-analysis has been conducted which combines effect sizes of good quality IPS programmes, results of a meta-analysis of twelve studies are shared. The VRS, the context for this study, has been appraised as of good fidelity to IPS principles. Thus this new meta-analysis will allow for comparison of outcomes of a study of VRS with similar programmes. Risk ratio of employment, and the mean difference in time to achieving a first job, are reported.

A conclusion of the systematic review involves the need to explore augmentation to the IPS. Chapter Four articulates the rationale for augmenting IPS with theory-based OT; and provides a justification for the measurement of psychosocial variables of interest to this study.

Chapter Five shares the methods employed, compares univariate analysis of independent variables with dependent outcomes, and follows this with multiple logistic regression to model binary outcomes. Two research questions were employed, to understand if psychosocial variables can predict successful outcome of IPS, and if

these can predict who may take longer than nine months to achieve their vocational goal. Nine months is the time limit suggested for a simple IPS intervention ('IPS Lite') (Burns et al. 2015).

Results of the analysis are presented in Chapter Six and discussed in Chapter Seven. Conclusions are drawn including implications for practice, policy and future research.

CHAPTER 2: LITERATURE REVIEW

2.1 PREDICTORS OF EMPLOYMENT

Considerable academic effort has been invested in attempts to identify factors which predict success in attaining employment for people experiencing mental health problems.

2.1.1 Can demographics predict success?

Demographic factors affecting the likelihood of successfully gaining employment are summarised below in Table 2.1. Factors which predict gaining employment include being of a younger age, being married and higher educational attainment. Research on other demographic factors, such as gender and race, has presented contradictory findings. It must, however, be acknowledged that research on demographic factors which predict success in attaining employment among people with mental health conditions reflects the same predictive factors found in the general population (Burke-Miller et al. 2012).

Table 2.1 Research Finding Predictors of Employment

Predict Greater Success	Likelihood of	Predict Greater Likelihood of Being Unsuccessful	No Correlation Identified
Younger Age (Burke-Miller et al. 2006; Tsang, Leung, et al. 2010; Burke-Miller et al. 2012)			
Being married - established through meta-analysis (Tsang, Leung, et al. 2010)		Being single (Miettunen et al. 2007)	
Higher educational attainment (Rosenheck et al. 2006; Marwaha et al. 2007; Salkever et al. 2007; Tsang, Leung, et al. 2010; Saavedra et al. 2016)			
Being male (Salkever et al. 2007; Saavedra et al. 2016)			Gender - no correlation identified in meta-analysis (Tsang, Leung, et al. 2010)
Black race (Cook 2006) White race (Burke-Miller et al. 2006)		Black race (Rosenheck et al. 2006)	

These items do not offer additional value for the population of interest in this proposed research. Indeed, Zampolini et al. (2007); Campbell et al. (2010) and Corbière et al. (2011); conclude that demographic factors are not sufficient to predict attainment of employment goals for a population of people with complex mental health problems. It is important, though, that this study controls for demographic factors including age, marital status and educational attainment.

2.1.2 Are clinical factors helpful in predicting success?

A second focus area for research into predictors of success has been the clinical presentation. Employment rates for people with mental health conditions are low, so it is unsurprising that a mental health diagnosis decreases the likelihood of attaining paid employment (Catalano et al. 2006; Catty et al. 2008). In particular, Lehman et al. (2002) found that a diagnosis of psychosis is a predictor of unemployment.

Research involving people participating in IPS services has offered complex, contradictory findings in relation to clinical predictors of successful outcome, to the

extent that Austin & Lee (2014) conclude that we cannot rely on clinical factors to predict employment outcomes. Research findings are summarised in Table 2.2.

Negative symptoms cause a withdrawal or lack of function that would be recognised in a healthy person; for example, people with schizophrenia often appear emotionless and flat (NHS Choices 2016). Research has consistently found that negative symptoms are associated with unemployment. However, findings are less conclusive regarding active, positive symptoms, i.e. any change in behaviour or thoughts, such as hallucinations or delusions (NHS Choices 2016). Some studies have found active, positive symptoms are associated with failure to attain employment, while others including a meta-analysis (Tsang et al. 2010) have found no association. A shorter duration of illness is more likely to predict a positive outcome of employment. This, when coupled with the beneficial effect of successful illness management, demonstrates the strong clinical argument for employment support to be provided early intervention services.

This assertive approach to engaging people with complex mental illness early in their treatment is also beneficial, as employment positively improves illness management (Mueser et al. 1997; Burns et al. 2009).

Table 2.2 Clinical Presentation Predictors of Obtaining Employment

Predict Greater Likelihood of Success	Predict Likelihood of Unsuccessful	Greater of Being	No Correlation Identified
	Negative Symptoms (Razzano et al. 2005; Marwaha et al. 2007; Salkever et al. 2007; Tsang et al. 2010)		
	Positive symptoms (Harrow et al. 2004; Rosenheck et al. 2006;)		Positive symptoms (McGurk & Mueser 2006; Tsang et al. 2010)
Shorter duration of illness (Marwaha et al. 2007)			
Successful management of illness (Razzano et al. 2005; Salkever et al. 2007)			

So, clinical factors are helpful in determining that IPS should be offered early in treatment programmes, and the negative association between negative symptoms and failure to attain a job has been established. It is clear, however, that clinical factors alone will not offer a clear prediction of who will attain employment. It is helpful to look at wider psychosocial factors.

2.1.3 Values, attitudes and motivation towards employment

Researchers have considered a range of factors related to attitudes, values and motivation. Across health conditions, a strong 'work ethic' predicts employment success (Brouwer et al. 2010; Holmgren et al. 2013; Ekbladh & Sandqvist 2015), as does an expressed desire to work (Shames et al. 2007). The latter is particularly recognised as a positive predictor of success in attaining employment when a person with complex mental health problems is engaged in IPS services (Kirsh 2000; Campbell et al. 2011).

Self-esteem – someone's general confidence in their worth or abilities - has been measured using the Rosenberg Self Esteem Scale (Rosenberg 1979). It was found not to be predictive of employment by Catty et al. (2008); but a more recent study, Evensen et al. (2016), found a significant correlation with successful outcome. Self-efficacy, someone's confidence in their worth or abilities in a specific context (in this case, gaining employment) has been identified as an important factor in predicting attaining a job (Eklund et al. 1991; Wästberg et al. 2009; Burke-Miller et al. 2012; Kirsh 2016): but each study defines self-efficacy differently. Only one (Corbière et al. 2011) has looked at the inter-relationship of self-esteem and self-efficacy and the effect these have on motivation for employment, which they established as a predictor of employment (Corbière et al. 2011).

Conversely, Shames et al. (2007) suggest that if an individual doubts their ability to achieve a goal, or if their self-awareness is limited or impaired, the outcome will be impacted. Lohss et al. (2012) similarly find that limited insight into abilities, as manifested in people with complex mental health problems, may be a limiting factor in attaining employment. In relation to employment sought, type of work seems to be important (Shames et al. 2007): success increases when jobs match interests and values (Ekbladh & Sandqvist 2015).

To date, research in this area has mainly considered the relevance of individual factors related to values, attitudes and motivation in predicting attainment of employment. Research on return to work from sickness absence has adopted a theoretical perspective, which understands these factors as inter-related (Eklund et al. 1991; Wästberg et al. 2009; Ekbladh, Thorell & Haglund 2010a; Ekbladh & Sandqvist 2015). It would be valuable to understand these interconnected factors in a population with complex mental health problems seeking employment.

2.1.4 Habits and routines which support successful outcomes

Beyond intra-psychic factors, researchers have also considered the influence of behavioural habits and routine on employment outcomes. Maintaining habits that reflect a working life helps an individual achieve employment goals when absent from work (Ekbladh, Thorell & Haglund 2010a; Ekbladh & Sandqvist 2015) and when unemployed (Corbière et al. 2011). It is suggested that this is because active job seeking and preparation activities are more easily incorporated into daily routine (Corbière et al. 2011).

In considering historical habits and routines, experience of a working role has been established as a positive indicator of future success (Gollaher et al. 1998; Fleming et al. 1999; Gioia 2005). This finding has been confirmed within IPS services (Catty et al. 2008; Tsang et al. 2010; Campbell et al. 2011; Kirsh 2016): with it more specifically (Burke-Miller et al. 2006; Corbière et al. 2011) identified that recency of employment is important. Waghorn et al. (2007) suggest that a previous working role provides real experience to reflect upon; and appraise in terms of self-efficacy when considering future employment goals. Yet people with complex mental health problems may have only distant work experience or no experience at all.

Research which has focused on returning to work from sickness absence has considered the relevance of habits and routines together with values, attitudes and motivation (Ekbladh et al. 2004; 2010b). A similar approach which considers the inter-related nature of these factors would be valuable regarding people with complex mental health problems seeking employment.

2.1.5 Capacity for work: skills for the job

Researchers have also considered functional ability in relation to work outcomes. Global working performance tends to be poorly defined but has been identified as important in predicting employment success (Fleming et al. 1999). However, Hansen et al. (2006) did not identify performance as a predicting factor. More specifically, Haslam et al. (2010), conducting OT research, found that process skills as measured by the Assessment of Motor and Process Skills (Fisher & Jones 2010) was helpful in predicting success.

Psychology researchers have investigated the influence of cognitive skills on securing employment, concluding that global deficits diminish success (Fleming et al. 1999; Tsang et al. 2000; McGurk & Mueser 2006; Rosenheck et al. 2006; Holthausen et al. 2007; Shames et al. 2007; Lim et al. 2014). With greater specificity, Bryson et al. (1998) identified the importance of 'verbal learning and memory' and 'working memory' in predicting employment outcomes. Tan (2009); and Saavedra et al. (2016) focused on the importance of attention. Social cognition has also been identified by Tan (2009); and Lexén et al. (2016). The manifestation of social cognitive skills in communication and interactional skills (Fett et al. 2011) are also recognised as influencing employment outcomes (Michon et al. 2005; Kirsh 2016; Lexén et al. 2016; Saavedra et al. 2016).

A systematic review focused on populations with mental health problems concluded that global working performance was predictive of employment attainment (Michon et al. 2005). However, this was defined differently in every study; in one case, the inter-related nature of concepts included self-efficacy as a distal measure of work performance. It is therefore important that future research should consider capacity for work within a model integrating intra-psychic factors.

2.2 PSYCHOSOCIAL FACTORS ARE INTER-RELATED

Research to date has recognised the importance of psychosocial factors in predicting attainment of employment among people with complex mental health problems. However, research has primarily considered individual psychosocial factors in isolation as predictors. A meta-analysis of demographic factors critiqued the a-theoretical position of most vocational rehabilitation research (Wewiorski & Fabian 2004), calling on future work to adopt a theoretical position when selecting variables for investigation. Related return to work research involving a population on sick leave from employment recognises the inter-related nature of psychosocial factors, and adopts a theoretical model which acknowledges the influence of each factor working together (Eklund et al. 1991; Ekbladh et al. 2004; Wästberg et al. 2009; Ekbladh et al. 2010b) . A similar approach is required for a population who are unemployed and seeking work.

To date, only Corbière et al. (2011) have conducted research which integrates self-efficacy, with social encouragement, perceived barriers and work ethic (adapted from theoretical constructs from the theory of planned behaviour (Ajzen 2011)). To these theoretically-based variables, additional items were identified from literature (Table 2.3). Each additional factor is recognised as holding predictive value in previous studies; however, these are inconsistently defined by them.

Table 2.3 Corbiere et al (2011) Theoretical and A-theoretical Variables investigated as predictors of obtainment of paid employment

	CLEARLY DEFINED THEORETICAL CONCEPT ADAPTED FROM TPB (Ajzen 2011)	A-THEORETICAL CONCEPTS DEFINED DIFFERENTLY OR POORLY IN DIFFERENT STUDIES
Values and Attitudes	Self-efficacy work ethic	Self-esteem
Habits and Routines		time absent from work; preparatory and active work behaviours
Skills	Missing	Missing
Environment	perceived barriers social encouragement	social support

While this study reponds to the recommendation of Wewiorski & Fabian (2004) to apply a theoretical stance to considering predictive variables the selected theory has been criticised. Corbière et al. (2011) selected the theory of planned behaviour as their framework, this model has been criticised, due to its over-simplification of the factors explaining behaviour (Sniehotta et al. 2013; Armitage 2015; Ogden 2015). This is perhaps reflected in the need for Corbière et al. (2011) to integrate supplementary factors.

Ekbladh et al. (1991, 2004, 2010b); and Wästberg et al. (2009); adopted a dynamic systems model, comprising theoretical concepts which more comprehensively integrate values and attitudes; habits, routines and environment (Table 2.4). This model has led to the development of an associated measurement tool, the Worker Role Interview (WRI): which allows measurement of clearly defined items within each theoretical construct (Table 2.3). Complementary measurement tools allow skill items to be appropriately assessed through observation: the AMPS (Fisher & Jones 2010), and the Assessment of Communication and Interactional Skills (ACIS) (Forsyth et al. 1998). There is an opportunity to investigate a comprehensive set of theoretically derived, well-defined, independent but inter-related psychosocial variables, with a population of people experiencing complex mental health problems who are seeking employment.

Table 2.4 Theoretical Variables investigated as predictors of return to work from sick leave (Ekbladh et al, 1991, 2004, 2010; Wastberg et al, 2009); and as predictors of obtainment of paid employment (Haslam et al 2010; Lexen and Bejerholm 2016).

	CLEARLY DEFINED THEORETICAL CONCEPT FROM MOHO (Keilhofner 2008)	CLEARLY DEFINED MEASUREMENT ITEM DERIVED FROM THEORY (Keilhofner 2008)
Values and Attitudes	Personal Causation	Assesses abilities and limitations; Expectation of job success; Takes responsibility
	Values	Commitment to work; Work-related goals
	Interests	Enjoys work; Pursues interests;
Habits and Routines	Roles	Appraises work expectations; Influence of other roles;
	Habits	Work Habits; Daily Routine; Adapts routines to minimize difficulties;
Skills	Performance Capacity	Motor Skills Process Skills Interaction and Communication Skills
Environment	Environment	Perception of physical work setting; Perception of family and peers; Perception of boss and/or company; Perception of co-workers

CHAPTER 3: META-ANALYSES OF IPS

3.1 SYSTEMATIC REVIEW OF PUBLISHED META-ANALYSES

Individual Placement and Support (IPS), synonymous with Evidence-Based Supported Employment (EBSE), has a substantial evidence base. Originally developed from supported employment, this rigorously tested intervention has now amassed more than 60 RCTs since its early development in the 1990s. Early trials investigated the efficacy of supported employment and led to the publication of underpinning principles of IPS (Bond 2004). These principles have allowed replicability of a more refined intervention. Adherence to the principles can be assessed using a fidelity measurement tool (Bond et al. 1997; Becker et al. 2008) with established validity and reliability (Bond et al. 2011; Knaeps et al. 2012; Bond et al. 2012; Kim et al. 2015). The original fidelity scale was published two decades ago (Bond et al. 1997), subsequently developed to a more detailed current version (Becker et al. 2008).

The intervention has been established in the US, European nations, China, Japan, Australia and New Zealand. Most trials have focused on populations with severe mental illness. More recent developments have included affective mental health conditions (Bejerholm et al. 2017), post-traumatic stress disorder (Davis et al. 2012), and autism (McLaren et al. 2017). The preponderance of randomised controlled trials have led to meta-analyses of these, allowing researchers to combine results across multiple similar studies. This aggregation of data enables greater power in statistical analysis and therefore a better estimate of effect size (Higgins & Green 2011). To establish the contemporary evidence base, an initial review of meta-analysis was conducted.

3.1.1 Search Procedure

A systematic review of electronic peer-reviewed databases was conducted through the EBSCO host. This included: Medline (1996-2018); PsycINFO (1995-2017); and

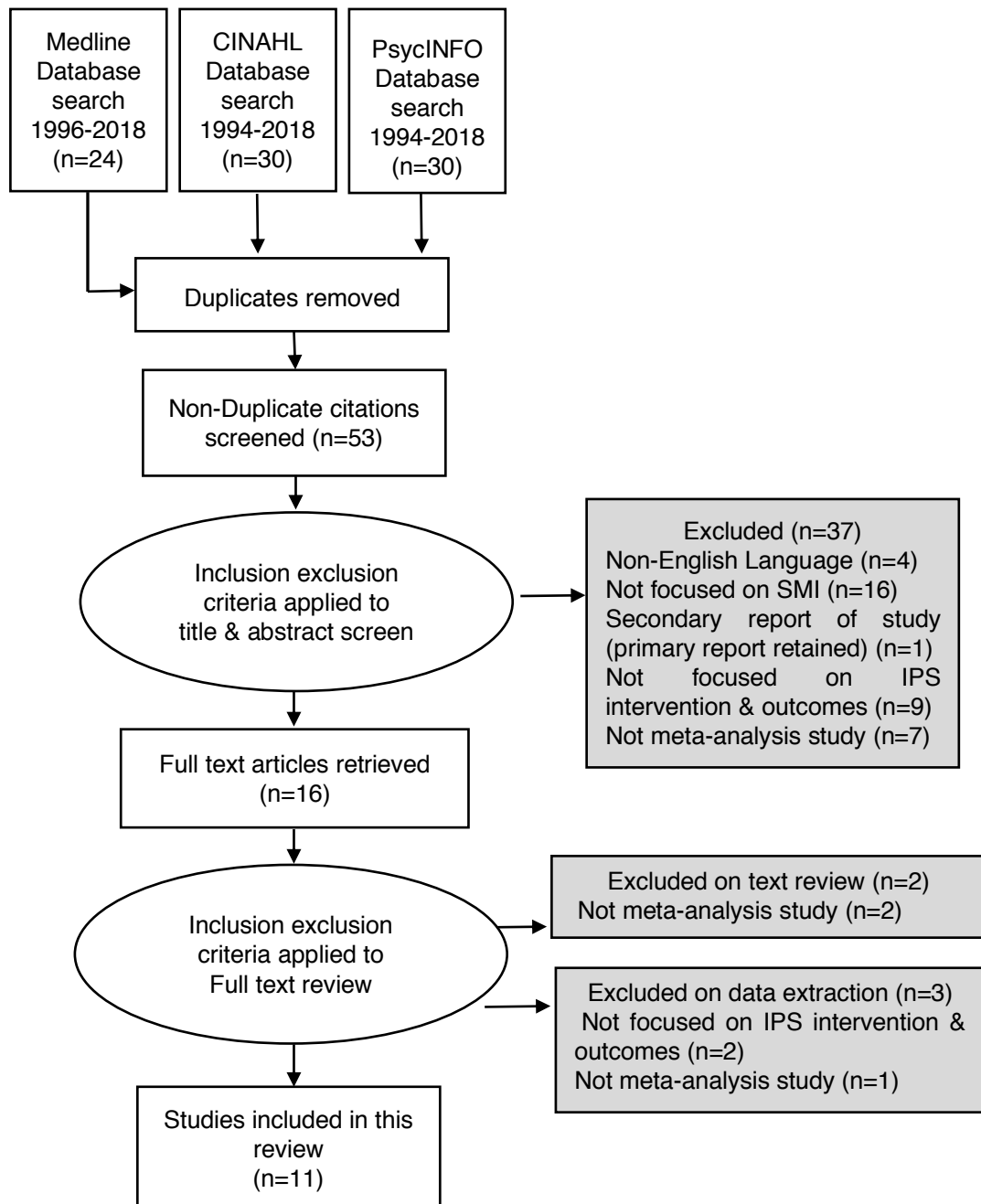
CINAHL (1994-2018). Searches were conducted using terms relevant to evidence-based supported employment (vocational rehabilitation; supported employment; evidence-based supported employment), and meta-analysis (meta-analysis; network meta-analysis). Full details of the search strategy are provided in Table 3.1. Meta-analysis studies published in English in peer-reviewed journals were included.

Table 3.1 Search Terms for Review of Meta-Analyses

Medline 1996 - 2017		Conducted 28/02/18
1	MH "Employment, Supported"	
2	MH "Rehabilitation, Vocational"	
3	"Individual Placement and Support"	
4	"Evidence Based Supported Employment"	
5	1 "OR" 2 "OR" 3 "OR" 4	
6	MH "Meta-Analysis"	
7	MH "Network Meta Analysis"	
8	"Meta Analysis"	
9	"Meta-Analysis"	
10	6 "OR" 7 "OR" 8 "OR" 9	
10	5 "AND" 10	
PsychINFO 1995 -2017		Conducted 28/02/18
1	DE "Supported Employment"	
2	DE "Vocational Rehabilitation"	
3	"Individual Placement and Support"	
4	"Evidence Based Supported Employment"	
5	1 "OR" 2 "OR" 3 "OR" 4	
6	DE "Meta Analysis"	
7	"Meta Analysis"	
8	"Meta-Analysis"	
9	6 "OR" 7 "OR" 8	
10	5 "AND" 9	
CINAHL 1994 - 2017		Conducted 28/02/18
1	MH "Employment, Supported"	
2	MH "Rehabilitation, Vocational"	
3	"Individual Placement and Support"	
4	"Evidence Based Supported Employment"	
5	1 "OR" 2 "OR" 3 "OR" 4	
6	MH "Meta Analysis"	
7	"Meta Analysis"	
8	"Meta-Analysis"	
9	6 "OR" 7 "OR" 8	
10	5 "AND" 9	

Full details of the search are provided in a PRISMA diagram (Figure 3.1). Titles and abstracts of all identified articles were reviewed against inclusion criteria. Subsequently, this process was repeated, reviewing full papers. This resulted in 11 meta-analytical studies being included in this review.

Figure 3.1 PRISMA diagram: Summarising Search Results MA Review



3.2 RESULTS OF SYSTEMATIC REVIEW OF META-ANALYSES

Initially, titles and abstracts were reviewed, applying the inclusion /exclusion criteria. Four excluded articles were not published in English. The population of interest to this study (complex mental health) was not the focus of a further 16 excluded articles which focused on muscle-skeletal conditions, pain and learning disabilities. IPS is the intervention relevant to this study; nine articles were excluded which focus on alternative interventions. This review's purpose is to examine studies using meta-analysis; thus an additional seven studies were excluded, as they did not use this methodology or only referred to meta-analysis. A further paper was eliminated, as it was a secondary report of a Cochrane Review.

Afterwards, the same criteria were applied to reviewing the full text of articles; five further articles were excluded. Three articles did not report meta-analysis; one was not focused on the IPS and the outcomes of the intervention. The application of inclusion-exclusion criteria resulted in a final count of 11 meta-analysis studies being included: three of which were full Cochrane reviews, eight of which were peer-reviewed publications. Appendix A, included at the end of this report, details the studies which were included; Appendix B, those which were excluded.

3.2.1 Categorisation of Studies

Two categories of studies were identified within the 14 included articles; those which focused on the effectiveness of IPS as an intervention and those which considered moderators to the effectiveness of IPS.

3.2.1.1 The effectiveness of IPS as an Intervention

The majority, eight, focused on the effectiveness of IPS as an intervention compared with alternative approaches of vocational rehabilitation. One study considers the effectiveness of an augmented form of IPS; one further study focused on the importance of principles underpinning IPS. An additional study considered the effectiveness of IPS for a sub-group population of younger people.

3.2.1.2 Moderators to the effectiveness of IPS

Three studies considered moderators of the effectiveness of IPS, including individual participant and environmental moderators.

3.2.2 Results: Cochrane Reviews

Three separate Cochrane reviews were included. Cochrane reviews are recognised as the most rigorous, routinely updated systematic reviews and meta-analyses (Grimshaw 2004) due to their standardised methodologies; and are a vital reference for clinical decision-making.

The earliest Cochrane review (Crowther et al. 2001), sought to compare pre-vocational training and supported employment against each other and with standard care. Pre-vocational training focuses on a 'train then place' approach, while supported employment adopts a 'place then train' approach to vocational rehabilitation. Additionally, this study considered enhancements to either approach which increased effectiveness. Most comparable is the most recent Cochrane review (Suijkerbuijk et al. 2017), which compared the efficacy of a range of vocational rehabilitation interventions to facilitate competitive employment.

The final Cochrane review (Kinoshita et al. 2013) looked specifically at comparing IPS to alternative approaches and aimed to establish if fidelity to principles affects outcomes. It also considered the efficacy of augmentations to IPS. As required by a Cochrane collaboration (Higgins & Green 2011), all these reviews conducted a robust search strategy, provided detailed accounts of excluded studies and were rigorous in appraising the quality of included works.

The research team (Kinoshita et al. 2013) provided a greater focus on IPS. This study included 14 randomised controlled trials, providing a pooled sample of 2265 participants. Statistically significant heterogeneity required the use of random effect models across most comparisons. Their findings concluded that the relative risk (95% CI) of obtaining any job favoured IPS RR 2.62 (2.18 to 3.16). Considering duration of employment, the mean number of days in employment for IPS was 70.63 (43.22-98.04), compared to 16.85 for other approaches; and regarding tenure, weeks in competitive employment also favoured IPS (Mn 9.86 weeks (5.36-14.36) over an

alternative approach (Mn 2.5 weeks). Attainment of employment was also accelerated in IPS: the mean time to first employment for IPS was 161.6 days (225.73-97.47), compared to 396.42 days. Participants receiving IPS also had higher earnings than those in control groups.

The meta-analysis found no evidence that improvements in quality of life, social functioning or a decrease in hospital admissions were affected to a greater extent by either approach. Higher fidelity to IPS principles was associated with more days in employment, but not with tenure. However, while the evidence strongly favours IPS across a range of indicators, the quality of studies was considered very low, and data are often skewed. A particular area of concern is of lack of blinding of participant and personnel to the intervention; researchers acknowledged that blinding participants is impossible in psychosocial intervention, and few studies had taken steps to blind assessors. High attrition rates also compromise many studies.

The findings of the Kinoshita study advanced those of Crowther et al. (2001), which also concluded that supported employment was more effective than pre-vocational training. Many of the 18 randomised controlled trials in this study pre-dated the introduction of IPS principles and fidelity measures. While the authors acknowledged the potential impact of many of the same elements of potential bias, they did not conclude that the evidence was low quality. This is perhaps reflective of the early date of the study and introduction of a more rigorous approach to Cochrane reviews over time.

The most recent Cochrane review (Suijkerbuijk et al. 2017) adopted the more extensive inclusion criteria of Crowther et al. (2001), and aimed to rank the effectiveness of a range of vocational rehabilitation approaches. They determined effectiveness to be a range of competitive employment outcomes. They include studies from 1970 until 2016. Research attention is demonstrated by the inclusion of 48 randomised controlled trials, with a pooled sample of 8743 participants.

As over time, some RCTs have compared more than two interventions, in addition to standard direct comparison, the study adopted a network meta-analysis approach where necessary (Higgins & Green 2011). Dichotomous data relevant to employment outcomes (e.g. did/did not attain employment) were expressed as risk ratios, with 95% confidence intervals. For continuous data (e.g. days in employment) they reported mean difference where possible, and standardised mean differences where different

scales of measurement were used. In findings focused on supported employment, they determined that in cases of short-term follow-up, supported employment was more effective than both prevocational training (RR 2.52, 95% CI 1.21 to 5.24) and transitional employment (RR 3.49, 95% CI 1.77 to 6.89).

The effect lessened to some extent in cases of longer-term follow-up: Suijkerbuijk et al. (2017) found supported employment was more effective than pre-vocational training (RR 2.31, 95% CI 1.85 to 2.89) and transitional employment (RR 3.28, 95% CI 2.13 to 5.04). In this most recent meta-analysis, it was possible to include RCTs of augmentations to IPS: for example, IPS plus cognitive remediation, social skills training and motivational interviewing (Suijkerbuijk et al. 2017). Augmented supported employment was more effective than supported employment (RR 1.94, 95% CI 1.03 to 3.65), transitional employment (RR 2.45, 95% CI 1.69 to 3.55), and prevocational training (RR 5.42, 95% CI 1.08 to 27.11).

With regards to the network meta-analysis, comparing interventions to standard care (Suijkerbuijk et al. 2017) confirmed that augmented supported employment was the most effective intervention (RR 3.81, 95% CI 1.99 to 7.31), followed by supported employment (RR 2.72 95% CI 1.55 to 4.76). It is important to acknowledge that the difference between augmented and standard supported employment was not significant. However, the studies of augmented SE provided moderate evidence, while the SE studies were weaker. When comparing tenure of employment, the same rankings favouring augmented supported employment over supported employment were identified.

3.2.3 Summary of Cochrane Reviews

In summary, the Cochrane reviews (Crowther et al. 2001; Kinoshita et al. 2013; Suijkerbuijk et al. 2017) completed over the last two decades have all confirmed that supported employment is the most effective intervention in supporting individuals with severe mental illness to obtain employment. However, the reviews have all acknowledged potential biases, and therefore caution that the evidence is of low quality. Kinoshita et al. (2013) confirmed that supported employment adhering to principles of IPS achieves better competitive employment outcomes than interventions with low fidelity. Most recently, Suijkerbuijk et al. (2017) identified

advancements in study methodology in RCTs which offer augmented forms of IPS: providing moderate quality evidence that augmentations strengthen the efficacy of IPS.

3.2.4 Peer-Reviewed Publications

An additional eight meta-analyses were identified in peer-reviewed publications, which had a variety of focus in their secondary analysis of randomised, controlled trials. An early study contemporaneous with the Crowther review (Twamley et al. 2003) asked a similar but more limited question, comparing supported employment and traditional vocational rehabilitation. This yielded 11 randomised controlled trials: five of which were included in the direct comparison of SE/IPS and traditional vocational rehabilitation. 51% of the participants receiving IPS/SE worked competitively, versus 18% in traditional vocational rehabilitation (weighted mean effect size 0.79). IPS/SE participants were about four times more likely than control group participants to obtain competitive work (summary odds ratio of 4.14, 95% CI 1.73 to 9.93).

3.2.5 Moderators of Outcome

Having established at the beginning of the millennium (Crowther et al. 2001; Twamley et al. 2003) that supported employment was more effective than other approaches, but only for 34% (Crowther et al. 2001) and 51% of participants (Twamley et al. 2003) respectively, researchers became interested in identifying moderators which might be helpful in understanding who would best benefit from supported employment. Two studies have considered characteristics of the individual (Campbell et al. 2011; Carmona et al. 2017); while the context regarding labour and welfare have been investigated by Modini et al. (2016); Metcalfe et al. (2016); and Carmona et al. (2017).

It has been concluded that no characteristics of participants could be identified as moderators. Comparisons were mostly not possible due to small numbers of studies reporting homogeneous factors; and where they were possible, no effect on competitive employment outcomes was identified (Carmona et al. 2017). Factors which can be compared included work history, socio-demographic and clinical factors,

none of which seem to influence the effect of IPS (Campbell et al. 2011). However, a more recent study has concluded that the economic context does act as a moderator; weaker employment legislation and less generous disability benefits improve the effect of IPS, thought to be linked to greater financial pressure on individuals to earn wages, and employers being more willing to take risks in a less litigious environment.

3.2.6 IPS as an Early Intervention

Bond et al. (2016) investigated the efficacy of supported employment for young people in the first episode of psychosis. Four studies provided a pooled sample of 109 young adults. IPS participants were significantly more likely than the control group to secure employment and work for a more extended period. Bond et al. (2016) contend that securing employment through IPS has the potential to help an individual avoid becoming stuck in a cycle of disability and playing a patient's role.

3.2.7 Improvements and Augmentations of IPS

Other investigations have focused on improvement to the intervention of supported employment. Lockett et al. (2016) reviewed how adherence to the fidelity of IPS principles influences effectiveness: concluding that VRS reaching a good level of fidelity has the potential to achieve better outcomes than those appraised as fair levels of fidelity or less.

Chan et al. (2015) combined nine randomised controlled trials, pooling a sample of 740 participants; and concluded that augmented supported employment combined with cognitive remediation improved outcomes. This finding was in line with Suijkerbuijk et al. (2017).

3.2.8 Summary of Meta-Analyses

In summary, all meta-analyses have concluded that IPS is the most effective intervention to support people with complex mental health problems back to work. However, RCTs in this intervention pose challenges to methodological rigour. Blinding participants to intervention is not possible; there is often a high attrition rate within

studies; and evidence of publication bias. There is some evidence that augmentation to IPS may improve outcomes: the Cochrane review did not identify significant improvement, although smaller scale peer-reviewed publications found that computerised cognitive remediation was significantly more effective.

There is some evidence from a small-scale meta-analysis that it is effective when situated within early intervention services, with young people experiencing a first episode of psychosis. No individual moderators have been identified that influence outcomes, but a recent study has found that political context may make a difference. Low welfare benefits and weak employment rights improve the likelihood of attaining employment.

3.2.9 Recommended future studies

The influence of motivation for a return to work has been highlighted as an issue for investigation in the future (Suijkerbuijk et al. 2017; Carmona et al. 2017). By enhancing our understanding of individual characteristics, future augmentations of IPS can be targeted to best effect. To date, meta-analyses have provided the most persuasive evidence of attainment of competitive employment. Future randomised controlled trials must offer improved measures of employment tenure as well as identify efficacy in terms of improvement in health and wellbeing (Kinoshita et al. 2013). Such studies should also include economic evaluations (Suijkerbuijk et al. 2017).

3.3 SYSTEMATIC REVIEW OF GOOD FIDELITY IPS

3.3.1 Purpose of Review

Following a review of the meta-analysis studies, a search was conducted to identify all randomised controlled trials of IPS. This included studies already subject to meta-analysis. The new search strategy had the purpose of including all relevant trials identified in existing meta-analysis as 'not yet assessed' or 'study ongoing' (Higgins & Green 2011); and those published after the meta-analysis, but had not been previously identified. Studies were then cross-referenced with the existing meta-analysis to determine if new evidence existed that should be integrated into a refreshed meta-analysis of effect.

In addition to understanding current state of the art IPS research and the context in which it has developed, the aim of this systematic review was multi-fold:

- To focus on RCT research on IPS which has been appraised as of good fidelity or better, comparable with the service included in this study.
- To understand the population who participate in good fidelity IPS RCTs, for comparison with the population included in this cohort study.
- To use a meta-analysis methodology to estimate the pooled risk ratio of attaining employment in good fidelity IPS, compared to the control.
- To use a meta-analysis methodology to calculate the mean difference in time to first employment in good fidelity IPS, compared to the control.

3.3.2 Systematic Review - Search Strategy

A systematic review of electronic peer-reviewed databases was conducted through EBSCO. This included: Medline (1996-2018); PsycINFO (1995-2017); and CINAHL (1994-2018). Searches were conducted using terms relevant to IPS (vocational rehabilitation; supported employment; evidence-based supported employment) and focused on randomised controlled trials. Full details of the search strategy are provided in Table 3.2.

This search was widened to include a hand search. Recognising the robust search strategies adopted by a meta-analysis conducted under the auspices of a Cochrane

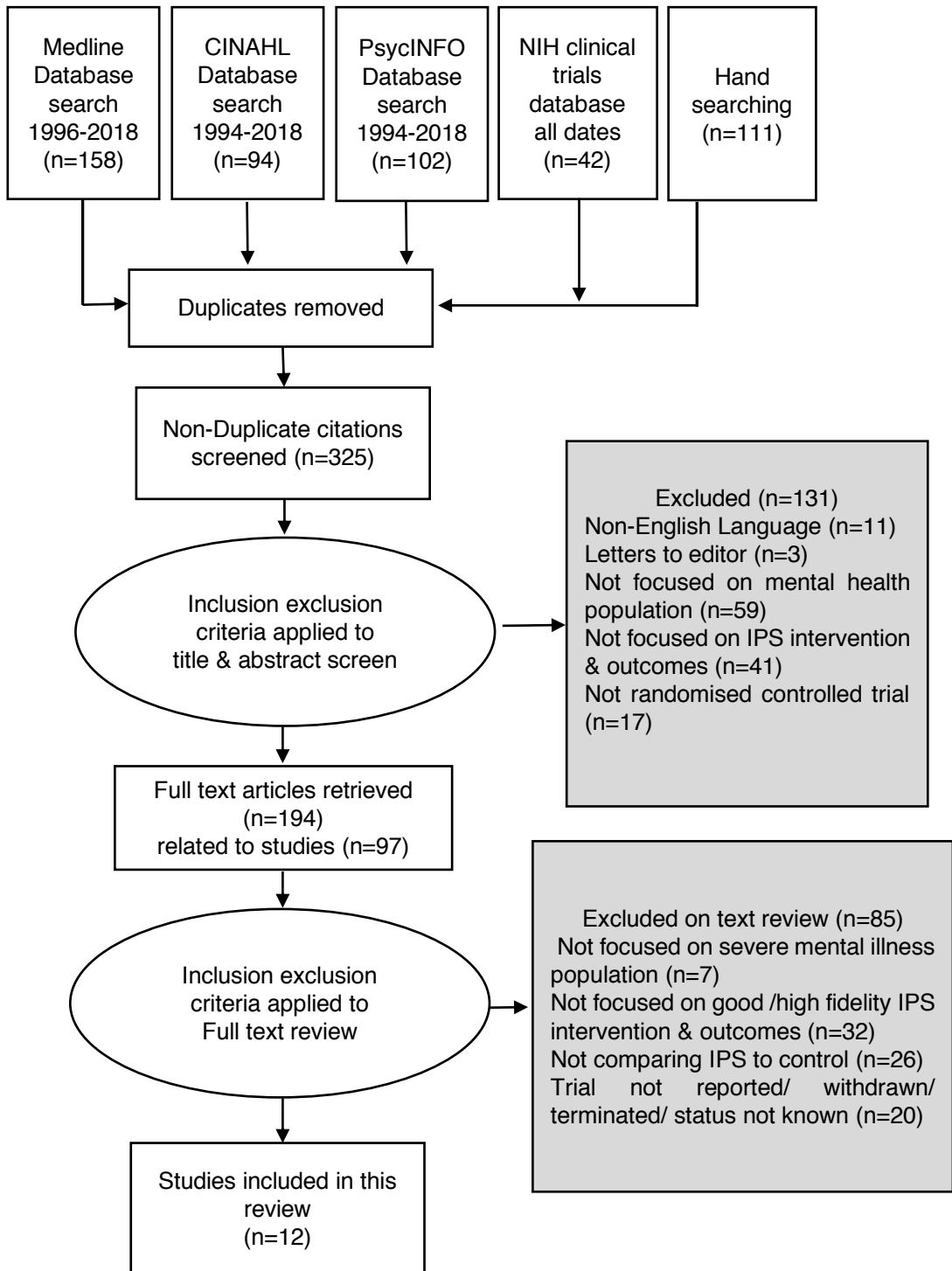
collaboration, a hand search based on the results of the three relevant Cochrane collaboration meta-analyses was conducted: yielding an additional 111 citations.

Finally, a search of the National Institute of Health clinical trials database was conducted, to identify research since the Cochrane collaboration studies. 42 relevant studies were identified. Searches were conducted using terms relevant to evidence-based supported employment (vocational rehabilitation; supported employment; evidence-based supported employment) and severe mental illness. Randomised controlled trials published in English in peer-reviewed journals were included. Full details of the search are provided in the PRISMA diagram (Figure 3.2).

Table 3.2 Search Terms for Good Fidelity IPS Meta-Analyses

Medline 1996 - 2017		Conducted 09/04/18
1	MH "Employment, Supported"	
2	MH "Rehabilitation, Vocational"	
3	"Individual Placement and Support"	
4	"Evidence Based Supported Employment"	
5	1 "OR" 2 "OR" 3 "OR" 4	
6	MH "Randomised Controlled Trial"	
7	5 "AND" 6	
PsychINFO 1995 -2017		Conducted 09/04/18
1	DE "Supported Employment"	
2	DE "Vocational Rehabilitation"	
3	"Individual Placement and Support"	
4	"Evidence Based Supported Employment"	
5	1 "OR" 2 "OR" 3 "OR" 4	
6	DE "Randomised Controlled Trial"	
7	5 "AND" 6	
CINAHL 1994 - 2017		Conducted 09/04/18
1	MH "Employment, Supported"	
2	MH "Rehabilitation, Vocational"	
3	"Individual Placement and Support"	
4	"Evidence Based Supported Employment"	
5	1 "OR" 2 "OR" 3 "OR" 4	
6	MH "Randomised Controlled Trial"	
7	5 "AND" 6	

Figure 3.2 PRISMA diagram: Summarising Search Results Systematic Review



3.3.3 Application of Inclusion-Exclusion Criteria

Titles and abstracts of all identified articles were appraised against exclusion criteria: comprising, at this stage, non-English language, letters to editors, not focused on mental health, not focused on supported employment, and non-randomised controlled trials. Subsequently, this process was repeated when reviewing full papers.

Articles were grouped by studies. Researchers have often published more than one article based on one randomised controlled trial. Review of articles by authorship groupings allowed identification of articles which focused on a single randomised controlled trial, including the same sample, or studies which reported early findings and later published findings based an expansion (larger sample) or extension of follow-up period of the initial cohort. This process resulted in 97 studies (reflecting 194 articles included in this review). A coding system was developed to group articles and should be referenced for all further tables within this Chapter (Appendix C). Each study was then reviewed, and additional exclusion criteria applied.

Ensuring the consistent implementation of an evidence-based intervention requires that it must be delivered as the programme developers intended, and conform to the intervention model (Breitenstein et al. 2010). In this instance, original developers, Bond Becker and Drake, have developed tools to measure fidelity to IPS principles (Bond et al. 1997; Becker et al. 2008). The implementation of IPS can be measured for fidelity using one of two versions of a psychometrically tested (Bond et al. 2012) assessment tool.

The original fidelity measure included 15 items and measured a range of 15-75; published guidelines rank fidelity to model; 15-56 was not considered to meet the minimum standard of IPS principles; 56-65 is defined as fair fidelity; 66-75 is identified as good fidelity. The most recent version of the tool (Becker et al. 2008) has 25 items and a range of 25-125. Published guidelines rank fidelity to model; 25-73 is not considered to meet the minimum standard of IPS principles; 74-99 is defined as fair fidelity; 100-114 is identified as good fidelity; and the category of high/exemplary fidelity (115-125) is added too.

The value of fidelity to IPS principles has been confirmed as correlating between scoring on IPS fidelity scales and employment outcomes (Bond et al. 2012; Henry et al. 2014; Kim et al. 2015; Lockett et al. 2016). The most recent of these conducted a

meta-analysis, considering if employment outcomes were predicted by IPS fidelity scale score. It concluded that low fidelity scores predict low employment attainment, but fidelity above the 'good' threshold made it possible to attain better outcomes but did not predict good employment obtainment. Therefore, this meta-analysis has applied inclusion criteria, whereby studies must be measured using one of the IPS fidelity scales and consistently measure good or exemplary implementation of IPS.

Trials which have not yet been published, been withdrawn or have been terminated, were excluded. Finally, only studies with a specific focus on research pertaining to severe mental illness were retained. Works that did not compare an IPS cohort to a control cohort were also excluded: including two where the intervention of interest (IPS), was included in both experimental and control interventions (Craig et al. 2014; McGurk et al. 2015; Glynn et al. 2017; Schneider et al. 2016). This process resulted in 12 studies included in a data extraction process. The detailed report on the exclusion of articles is provided in Appendix C.

These 12 studies were cross-referenced with the existing meta-analyses reviewed earlier in the Chapter to identify new studies from which new data could be pooled into a refreshed meta-analysis. This cross-referencing is summarised in Table 3.3. Four meta-analyses had research questions which did not overlap with this systematic review; two focused on moderators on effect (Carmona et al. 2017; Metcalfe et al. 2018); another retrieved samples for pooling where it was possible to identify young people only (Bond et al. 2015). The meta-analysis study which focused on cognitive remediation as an augmentation to IPS (Chan et al. 2015) excluded all studies identified by this systematic search. Four meta-analyses were conducted before publication of many of the 12 studies included in this review (Crowther et al. 2001; Twamley et al. 2003; Campbell et al. 2011; Kinoshita et al. 2013); and two were published at a similar time, so publication time lag (Moher et al. 2009) may explain missing articles. The most recent Cochrane review included all the identified studies but did not isolate them as a group. It instead isolated high fidelity studies, which included one overlapping study (Gold et al. 2006); but did not include the 11 remaining studies which achieved good fidelity. Their criteria for high fidelity studies also included two-arm studies where IPS was involved in both the intervention and control groups (Schonebaum et al. 2006; Tsang et al. 2010; Craig et al. 2014; Lecomte et al.

2014), and work published as a conference paper without data (Nuechterlein et al. 2010).

It has been established that good fidelity to IPS intervention is sufficient to yield good outcomes (Lockett et al. 2016), and that exceeding this standard does not further enhance results. Therefore, a meta-analysis of good fidelity IPS RCTs is of value to the field in providing a combined effect size of what can be achieved through 'good enough' fidelity to IPS principles. For this study, it provides a baseline of expected outcomes for comparison.

Table 3.3 Cross Reference of Existing Meta-Analysis and Identified Good Fidelity IPS RCTs

publication	META 11 (Metcalf e 18)	META 10 (Suijkerbuij k 17)	META 09 (Carmona 16)	META 08 (Lockett 16)	META 07 (Modini 16)	META 06 (Chan 15)	META 05 (Bond 15)	META 04 (Kinoshita 13)	META 03 (Campbell 11)	META 02 (Twamley 03)	META 01 (Crowther 01)
RCT25 (MUESER 04-09)	included but focused on moderators	included, but not grouped as good fidelity for comparison	included but focused on moderators	included	included	MA focused on cognitive remediation so not included	MA focused young population	included	included		
RCT30 (GOLD 02- 06)	included but focused on moderators	included, but not grouped as good fidelity for comparison	included but focused on moderators	included	included	MA focused on cognitive remediation so not included	MA focused young population	included	missing	not yet published	not yet published
RCT31 (LATIMER 06)	included but focused on moderators	included, but not grouped as good fidelity for comparison	included but focused on moderators	included	included	MA focused on cognitive remediation so not included	MA focused young population	included	included	not yet published	not yet published
RCT36 (BOND 07- 09)	included but focused on moderators	included, but not grouped as good fidelity for comparison	included but focused on moderators	Included	included	MA focused on augmentati on so not included	MA focused young population	included	missing	not yet published	not yet published
RCT40 (KILLACKEY 08-14)	included but focused on moderators	included, but not grouped as good fidelity for comparison	missing	Included	included	MA focused on augmentati on so not included	MA focused young population	Included	missing	not yet published	not yet published

publication	META 11 (Metcalf 18)	META 10 (Suijkerbuijk 17)	META 09 (Carmona 16)	META 08 (Lockett 16)	META 07 (Modini 16)	META 06 (Chan 15)	META 05 (Bond 15)	META 04 (Kinoshita 13)	META 03 (Campbell 11)	META 02 (Twamley 03)	META 01 (Crowther 01)
RCT41 (WONG 08)	included but focused on moderators	included, but not grouped as good fidelity for comparison	included but focused on moderators	included	included	MA focused on augmentation so not included	MA focused young population	included	missing	not yet published	not yet published
RCT47 (HOWARD 04-11)	included but focused on moderators	included, but not grouped as good fidelity for comparison	included but focused on moderators	missing	included	MA focused on augmentation so not included	MA focused young population	included RCT48a (HOWARD 10-11)	missing	not yet published	not yet published
RCT52 (HOFFMAN 12-14)	included but focused on moderators	included, but not grouped as good fidelity for comparison	missing	missing	included	MA focused on augmentation so not included	MA focused young population	missing	not yet published	not yet published	not yet published
RCT59 (OSHIMA 14)	included but focused on moderators	included, but not grouped as good fidelity for comparison	missing	included	included	MA focused on augmentation so not included	MA focused young population	not yet published	not yet published	not yet published	not yet published

publicatio n	META 11 (Metcalf e 18)	META 10 (Suijkerbui jk 17)	META 09 (Carmona 16)	META 08 (Lockett 16)	META 07 (Modini 16)	META 06 (Chan 15)	META 05 (Bond 15)	META 04 (Kinoshita 13)	META 03 (Campbell 11)	META 02 (Twamley 03)	META 01 (Crowther 01)
RCT60 (WAGHOR N 14)	included but focused on moderator s	included, but not grouped as good fidelity for compariso n	missing	included	missing	MA focused on augmentat ion so not included	MA focused young population	not yet published	not yet published	not yet published	not yet published
RCT62 (BEJERHOL M 11-15)	included but focused on moderator s	included, but not grouped as good fidelity for compariso n	included	missing	included	MA focused on augmentat ion so not included	MA focused young population	ongoing study	not yet published	not yet published	not yet published
RCT63 (BOND 15)	included but focused on moderator s	included, but not grouped as good fidelity for compariso n	missing	included	missing	MA focused on augmentat ion so not included	MA focused young population	not yet published	not yet published	not yet published	not yet published

3.4 RESULTS SYSTEMATIC REVIEW OF GOOD FIDELITY IPS

3.4.1 Description of Studies

Study details are provided in Table 3.4. and full data extraction tables are included in Appendix D. The majority of the studies were conducted in the US (Mueser et al. 2004; Gold et al. 2006; Bond et al. 2007; Bond et al. 2015), and several in Europe: Sweden (Bejerholm et al. 2015); Switzerland (Hoffmann et al. 2012); and the UK (Heslin et al. 2011). Adoption of the intervention has extended to Canada (Latimer et al. 2006) and Australia (Killackey et al. 2008; Waghorn et al. 2014). Smaller scale studies confirming the validity of the intervention in different cultures are emerging in Asian countries (Wong et al. 2008; Oshima et al. 2014).

The studies range from 2004 (Mueser et al. 2004) to 2015 (Bejerholm et al. 2015). Reflecting the inclusion criteria, all studies focus on a population with severe mental illness; three studies included a mixed mental health population, but the majority experienced SMI (Wong et al. 2008; Hoffmann et al. 2012; Oshima et al. 2014). Two studies included sub-groups of those experiencing severe mental illness: Bond et al. (2015) included those with SMI who also had an offending history and justice department involvement; Killackey et al. (2008) focused on early intervention services for those experiencing a first episode of psychosis.

Mueser et al. (2004) and Gold et al. (2006) conducted 24-month RCTs in the US as two sites of the large multi-site Employment Intervention Demonstration Project (EDIP). EDIP included eight trials (Cook et al. 2005), interventions and sample sizes varied widely across sites; and due to heterogeneity, individual studies were considered for inclusion in this meta-analysis rather than the sizeable combined study.

The Mueser et al. (2004) trial has been published across a series of papers (Mueser, Clark, et al. 2004; Mueser et al. 2009; 2014). It investigated the effectiveness of two experimental interventions, IPS and Psychosocial Rehabilitation (PSR): which while not accredited, resembled the clubhouse model (CH) against treatment as usual (TAU). For the meta-analysis, only two cohorts were included: the IPS intervention

sample and the TAU sample. Gold et al. (2006) compared IPS as one component of assertive outreach treatment to TAU of traditional vocational rehabilitation (TVR).

Bond et al. (2007) reported on a 24-month RCT in Chicago, comparing IPS with TAU of PVT. This study has been published in multiple peer-reviewed publications (Bond et al. 2007; Harding et al. 2008; McGuire et al. 2011; Bond & Kukla 2011; Kukla et al. 2012; Bond et al. 2013; Kukla & Bond 2013). Bond et al. (2015) have also investigated the effectiveness of IPS in the US with a population experiencing complex mental health problems who also have an offending history. The trial compared IPS with TAU: a job club providing support in job searching, application and interview.

Establishing IPS in new geographical locations was the focus of many studies. Latimer et al. (2006) conducted the first IPS RCT outside the USA, comparing IPS with a TAU of sheltered workshops in Canada for a period of one year.

In Europe, studies have been conducted across Sweden, Switzerland and the UK. Bejerholm et al. (2015) oversaw a trial to establish the efficacy of IPS in Sweden. This 18-month RCT has been published across peer-reviewed journals, and a doctoral thesis (Bejerholm et al. 2011; Areberg & Bejerholm 2013; Bejerholm et al. 2015), and compares IPS with a TAU of traditional Prevocational training (PVT).

Hoffman et al. (2012; 2014) conducted an RCT with a long follow-up period of 5 years in Switzerland, published in two peer-reviewed papers. The trial compared IPS with TAU traditional PVT. Local policy resulted in a deviation from IPS principles, whereby people scoring low on a functional assessment were required to be excluded. Heslin et al. (2011) conducted the first IPS RCT in the UK over a 2-year period, which provided a mean follow-up of 703 days (SD95.5) when comparing IPS with TAU of PVT. This study has two associated publications (Howard et al. 2010; Heslin et al. 2011).

Two studies were held in Australia. Waghorn et al. (2014) conducted a 12-month RCT, comparing IPS with TAU employment services. The intended four sites were reduced to three, due to difficulty in recruiting IPS providers. Killackey et al. (2008) conducted a small-scale, short 6-month RCT, with a population experiencing first episode psychosis. The trial compared IPS with TAU.

The intervention has also been trialled in an Asian context. Oshima et al. (2014) conducted a small, short-time scale RCT in Japan of only 6-month duration to

evaluate the applicability of IPS to Japanese culture. The trial compared IPS with TAU of tradition PVT. Cultural requirements caused a deviation from IPS principles: staff were unable to contact employers directly and worked through intermediaries. Wong et al. (2008) conducted an 18-month RCT, which examined the applicability and effectiveness of IPS in Hong Kong. The trial compared IPS with TAU of tradition PVT.

3.4.2 Quality of RCTs and potential bias

It is not possible to blind participants or providers to the nature of the intervention provided. For example, while the provision of a medicine can be provided without knowledge of its active or placebo nature, this is far more challenging in a behavioural intervention (Friedberg et al. 2010). All studies are therefore subject to potential bias. Only one study took precautions to ensure that those carrying out and gathering outcome measures were unaware of whether the intervention provided was IPS or TAU (Bejerholm et al. 2015). High attrition is a factor in many behavioural interventions and has been identified as a potential source of bias in several included studies (Gold et al. 2006; Bond et al. 2007; Bejerholm et al. 2011; Waghorn et al. 2014). Unfortunately, the active involvement of participants over a prolonged length of time often leads to high drop-out rates (Bond et al. 2016); researchers must include this factor in their determination of sample sizes (Bejerholm et al. 2015; Bond et al. 2015). Details on potential bias are included in Table 3.4.

Table 3.4 RCTs and potential bias

Study	Population	Participants	Demographics	Potential Bias
RCT25 (MUESER 04-09)	USA SMI Single site	204 IPS 68 TAU 69 (PSR 67) <i>excluded from this MA</i>	Gender - Male IPS 61.8% TAU 59.7% Age IPS Mean 41.7 (SD 8.8) TAU Mean 40.9 (SD 9.3)	Strengths; computer generated randomisation; reported attrition Weaknesses; lack of blinding (participants; providers and those measuring outcomes) ? Concern regarding publication bias of EDIP
RCT62 (BEJERHOLM 11-15)	Sweden SMI Multi-site	120 IPS 60 TAU 60	Gender - Male IPS 47% TAU 65% Age IPS Mean 38 (SD 8) TAU Mean 38(SD 8)	Strengths; computer generated randomisation and centralised allocation; blinding of those measuring outcomes Weaknesses; lack of blinding (participants and providers); high attrition rate (28%) reported
RCT59 (OSHIMA 14)	Japan Mixed - including SMI Single site	37 IPS 18 TAU 19	Gender - Male IPS 83.3% TAU 68% Age IPS Mean 40.1 (SD 8.5) TAU Mean 41.1 (SD 9.4)	Strengths; no attrition (but challenges recruiting to the study) Unclear; no information about randomisation/allocation Weaknesses; small sample size; fidelity to model not independently appraised; lack of blinding (participants; providers and those measuring outcomes)
RCT63 (BOND 15)	US SMI & Offending History Multi-site	87 IPS 43 TAU 44	Gender - Male IPS 77% TAU 82% Age IPS Mean 42.9 (SD 11.5) TAU Mean 44.6 (SD 11.6)	Strengths; independent randomisation and allocation Weaknesses; lack of blinding (participants; providers and those measuring outcomes)

Study	Population	Participants	Demographics	Potential Bias
RCT41 (WONG 08)	Hong Kong SMI Mixed MI predominantly SMI Single site	92 IPS 46 TAU 46	Gender - Male IPS 54% TAU 65% Age IPS Mean 32.4 (SD 8.9) TAU Mean 34.7 (SD 9.4)	Strengths; computer generated randomisation; low attrition Unclear; allocation process Weaknesses; lack of blinding (participants; providers and those measuring outcomes)
RCT52 (HOFFMAN 12-14)	Switzerland Mixed MI including SMI Single site	100 IPS 46 TAU 54	Gender - Male IPS 65% TAU 65% Age IPS Mean 33.5 (SD 9.8) TAU Mean 34.1 (SD 9.2)	Strengths; computer generated randomisation & allocation Weaknesses; lack of blinding (participants; providers and those measuring outcomes)
RCT60 (WAGHORN 14)	Australia SMI Multi-site	208 IPS 106 TAU 102	Gender - Male IPS 50.7% TAU 49.3% Age IPS Mean 32 (SD 8.9) TAU Mean 32.8 (SD 8.9)	Strengths; computer generated randomisation; Unclear; allocation process Weaknesses; lack of blinding (participants; providers and those measuring outcomes); high attrition; contamination 28 individuals in the control group swapped to the intervention group after 6mths (this was in the trial SOP)
RCT40 (KILLACKEY 08-14)	Australia SMI Single site	41 IPS 20 TAU 21	Gender - Male IPS 20% TAU 19% Age IPS Mean 21.29 (SD 2.39) TAU Mean 21.42 (SD 2.21)	Strengths; computer generated randomisation; independent allocation Weaknesses; lack of blinding (participants; providers and those measuring outcomes)

Study	Population	Participants	Demographics	Potential Bias
RCT31 (LATIMER 06)	Canada SMI Single site	150 75 IPS 75 TAU	Gender - Male IPS 62.7% TAU 60.8% Age IPS Mean 39.9 (SD 9) TAU Mean 40.6 (SD 11)	Strengths; computer generated stratified randomisation; independent allocation Weaknesses; lack of blinding (participants; providers and those measuring outcomes)
RCT30 (GOLD 02-06)	US SMI Single Site	143 IPS 66 TAU 77	Gender - Male IPS 28.8% TAU 45.4% Age ranges reported IPS 18-25yrs 9(13.6%) 26- 45yrs 42(63.6%) >46yrs 15(22.7%). TAU 18-25yrs 9(11.7%) 26- 45yrs 59(76.6%) >46yrs 9(11.7%).	Strengths; computer generated stratified randomisation; independent allocation Weaknesses; lack of blinding (participants; providers and those measuring outcomes); high attrition; deviation from study protocol
RCT36 (BOND 07-09)	US SMI Single site	200 IPS 100 TAU 100	Gender - Male IPS 63% TAU 64.2% Age IPS Mean 39.7(SD 9.4) TAU Mean 38 (SD 9.7)	Strengths; computer generated stratified randomisation; independent allocation Weaknesses; lack of blinding (participants; providers and those measuring outcomes); high attrition
RCT47 (HOWARD 04-11)	UK SMI Multi-Site	219 IPS 109 TAU 110	Gender - Male IPS 69% TAU 66% Age IPS Mean 38.4(SD 9.5) TAU Mean 38.3 (SD 9.3)	Strengths; computer generated stratified randomisation; independent allocation Weaknesses; lack of blinding (participants; providers and those measuring outcomes)

3.4.3 Pooled sample demographics

The pooled sample of the intervention group of studies was 749. This comprised 62% males, but there was considerable variation in gender splits across the studies. Gold included only 29% male participants, while Oshima included 83% males. The pooled sample in control groups comprised 65% males. While these groups are evenly matched, it is essential to consider if IPS RCTs are accurately recruiting samples which reflect the population. It has been suggested that mental health research tends to be over-inclusive of male participants (Longenecker et al. 2010). The representation of males in psychosocial research is a mean percentage of 65%, but this is thought to misrepresent the actual population (Longenecker et al. 2010; Kirkbride et al. 2012).

The mean age of participants of 11 studies included in the meta-analysis ranged from 21.29 years (SD 2.39) to 42.90 (SD11.50). If, as contended by Bond et al. (2015), IPS should be targeting young people experiencing their first episode of psychosis, those studies with a mean age above 35 perhaps need to consider their recruitment strategies, as this represented more than half of the included studies (Mueser et al. 2004; Latimer et al. 2006; Bond et al. 2007; Howard et al. 2010; Oshima et al. 2014; Bejerholm et al. 2015; Bond et al. 2015).

3.4.4 Pooled sample: Education & Employment Experience

Several studies included details on the educational attainment of participants (Mueser, Clark, et al. 2004; Gold et al. 2006; Bond et al. 2007; Wong et al. 2008; Bond et al. 2015). Within the IPS intervention arm of the RCTs, only a very small percentage (9%) did not complete school exams.

Studies relating to employment outcomes frequently cite details of participants' employment history. To allow pooling of sample numbers, variables were transformed and grouped into two categories: Experience of Paid Employment; No Experience of Paid Employment. Six studies were included in this review which could be combined (Mueser et al. 2004; Gold et al. 2006; Latimer et al. 2006; Heslin et al. 2011; Waghorn et al. 2014; Bejerholm et al. 2015). It was not possible to include previous employment data from Oshima et al. (2014), as data on percentages in employment pre- and post-

diagnosis could not be translated to the uniform categories selected for MA. Wong et al. (2008) provided only mean duration of previous employment and were therefore also excluded. Hoffman et al (2014) only detailed work status on commencement of study. Combining samples, just over half (53%) had experience of employment in the last five years.

3.4.5 Pooled sample: Social Support

Analysis relating to support concerns formal or informal support in the home environment; and draws data from two frequently cited variables: living situation, and marital status. Supportive relationships have been found to help a return to work among a population on sick leave (Ekbladh et al. 2010b).

Studies included in this meta-analysis included data relating to marital status (Mueser et al. 2004; Gold et al. 2006; Bond et al. 2007; Killackey et al. 2008; Wong et al. 2008; Waghorn et al. 2014), or living situation (Heslin et al. 2011; Oshima et al. 2014); or both (Bejerholm et al. 2015; Bond et al. 2015). It was not possible to include studies which only detailed if participants were ever married, as current relationship status was not clear (Latimer et al. 2006; Wong et al. 2008; Hoffmann et al. 2014).

Within the IPS intervention arm of the RCTs, 26% of the group were married, but just over half (52%) were living alone. This large proportion varies markedly from the UK population of people with psychotic illnesses, among whom only 0.5% are married (McManus et al. 2009).

3.5 META-ANALYSIS OF GOOD FIDELITY IPS

3.5.1 Outcome One: Job attainment

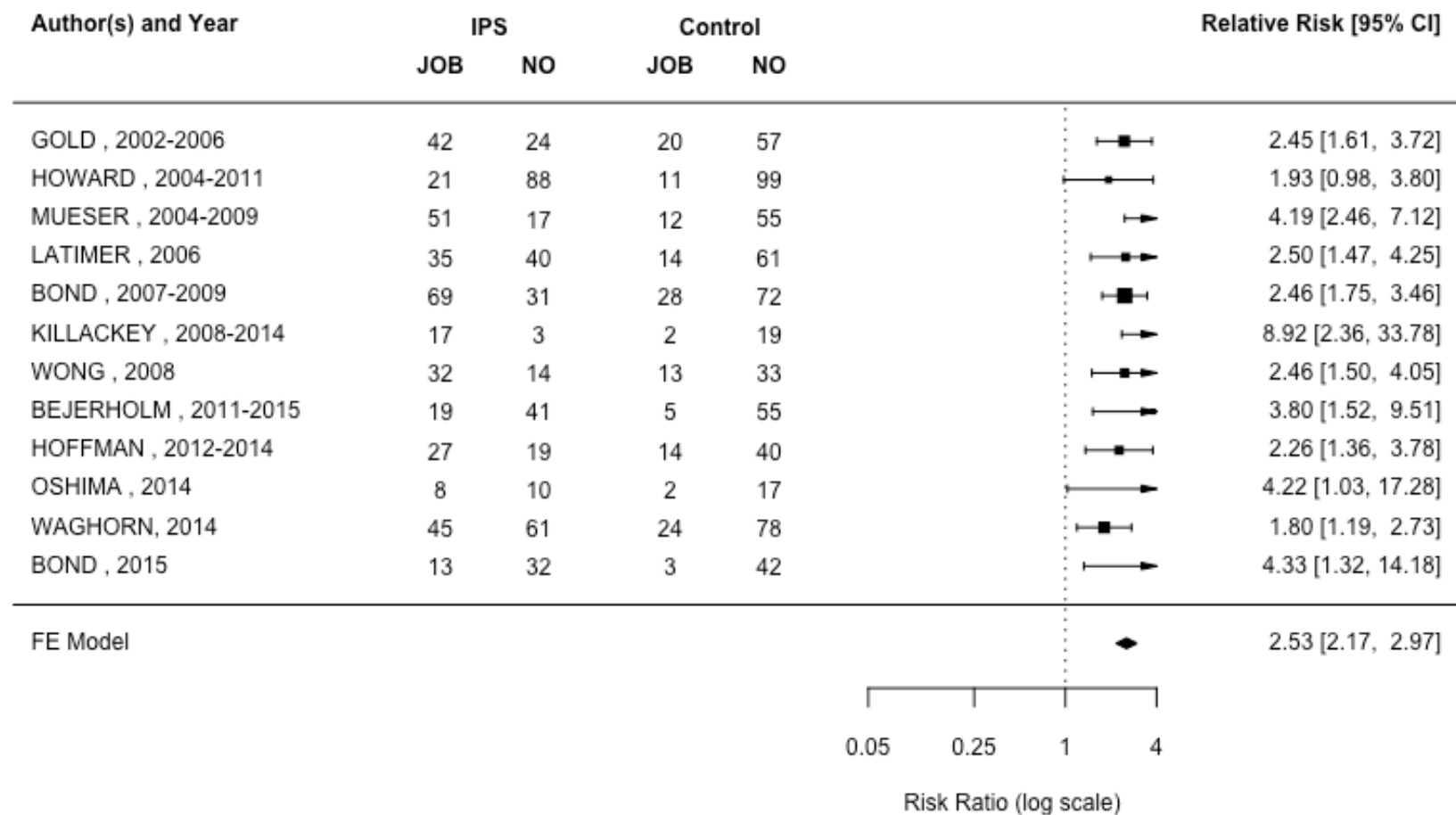
All 12 RCTs reported data on obtainment of competitive employment. However, the criteria applied by studies varied; for some, it simply involved having started in an open employment job. For others, a period in post was required: Bejerholm et al (2015) required one week's work; Hoffman et al (2012) required 5 days; Oshima et al (2014) required a job involving at least 5 hours per week.

Risk ratios (RRs) were calculated for job obtainment in each study; these results were pooled to produce a forest plot of RR and combined results. The analyses were performed with Metafor Package (Viechtbauer 2010) in the statistical software R-Project package (R Core Team 2015)

Heterogeneity was examined using the Q test (Higgins & Thompson 2002); $Q(11)=12.39$ $p>0.05$. The Q test was insignificant and the null hypothesis of homogeneity across studies accepted. As the studies are considered homogeneous, a fixed effect method for pooling RR was appropriate. A fixed effect model assumes that the effect is comparable across studies, as other variables including study design, populations and outcome measures are consistent across trials.

All 12 studies provided data for comparison of job outcomes. Results indicated that participants receiving supported employment-based treatments showed significantly better competitive job placement outcomes than those receiving other vocational treatments: $RR = 2.53$, 95% CI: 2.17– 2.97 (Figure 3.3). Values above one indicate a greater likelihood of attaining a job; in all cases, this was better for the IPS intervention group compared to the control. In only one study (Howard et al. 2010), the lower of the 95% RR confidence intervals crossed 1; while Oshima et al (2014) was at the borderline, with the lower end of the confidence intervals at 1.03. Where confidence intervals cross 1, the null hypothesis that there is no difference between groups cannot be refuted, and some uncertainty is introduced for the individual

Figure 3.3 Forest Plot of Risk Ratio of Obtaining Employment



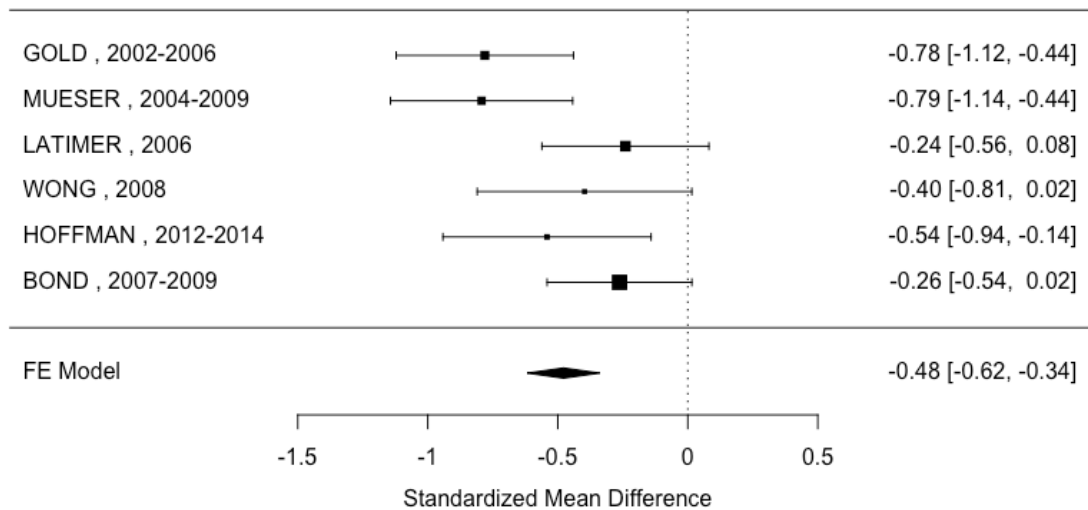
study (Howard et al. 2010). The combined effect of all studies confirms the significant effect.

However, Howard et al. (2010) has been subject to criticism. While the total score of fidelity measure meets the criteria for 'good implementation', the IPS service did not comply with the requirement for integration with mental health services (Campbell 2010; Latimer 2010; Bond et al. 2012)

3.5.2 Outcome One: mean difference days to first post

Six of the 12 studies also provided comparable data on days to first job for the successful participants in the IPS intervention group, with the control group. In all studies, the mean difference favoured the intervention group; although for three studies, the standard deviations of the mean difference crossed the zero line, suggesting some element of chance explained the outcome. However, once the results were pooled across studies, the standardised mean difference = -0.49 (-0.54, -0.29).

Figure 3.4 Forest Plot of Mean Difference Between IPS and Control Group: Days to First Job



3.6 CONCLUSIONS OF SYSTEMATIC REVIEW & META-ANALYSIS

There are currently 11 published meta-analyses of IPS which were reviewed, while a further meta-analysis of good fidelity IPS RCTs was conducted. All meta-analyses have provided evidence that IPS is the most effective intervention in supporting people with complex mental health problems back to work. However, due to the challenges in conducting behavioural RCTs to high methodological rigour, this evidence is not of high quality.

There is some evidence from a small-scale meta-analysis that the intervention is effective when situated within early intervention services. Only political context seems to act as a moderator to effect: low welfare benefits and weak employment rights improve the likelihood of attaining employment. No individual patient characteristics have been identified as a moderator to effect.

There is some evidence that augmentation to IPS may improve outcomes (Chan et al. 2015). Carmona et al (2017) suggested personal characteristics may work in a dynamic fashion on employment outcomes of intervention: by enhancing our understanding of individual characteristics, future augmentations of IPS can be targeted to best effect.

The influence of motivation for a return to work has been highlighted as an issue for investigation in the future (Suijkerbuijk et al. 2017; Carmona et al. 2017). Having a goal of obtaining competitive employment is a criterion of IPS and therefore for participation in clinical trials. However, trials to date have included different inclusion criteria for supported employment programmes; understanding the nature and influence of motivation on goals and outcomes could be a fruitful area for future trials.

Finally, while meta-analyses have provided persuasive evidence, this is limited to employment related outcomes. Future studies should investigate efficacy regarding improvements in health and wellbeing (Kinoshita et al. 2013).

This study offers the opportunity to consider predictors of employment, including a more nuanced understanding of motivation for work (Braveman et al. 2005). In addition, the interlinked factors of roles, habits and the contextual environment, and how these may influence motivation and readiness for work, will be explored.

The previous Chapter suggested an opportunity to investigate a comprehensive set of theoretically derived, well-defined, independent but inter-related psychosocial variables, among a population experiencing complex mental health problems who are seeking employment. This Chapter has confirmed the relevance of this intention to an intervention study of IPS, and the opportunity to contribute new knowledge to an existing, well-researched evidence-based intervention.

An investigation of predictive psychosocial factors may increase knowledge about who may benefit from IPS, as well as understanding about which participants may benefit quickly from a simple IPS intervention and who may have more complex needs and require an augmented intervention. While this study is limited to investigating the working role interview ratings at the commencement of intervention, future investigations could analyse psychosocial rating on completion of an intervention, and thus respond to Kinoshita's recommendation of including health and wellbeing evaluation of IPS.

CHAPTER 4: AN AUGMENTATION OF IPS

4.1 OCCUPATIONAL THERAPY AND VOCATIONAL REHABILITATION

Exclusion from employment is a priority for healthcare providers, governments and society (Bush et al. 2009; Schneider et al. 2009; Kilian et al. 2012). Healthcare professionals have been identified as key personnel to provide such support and lead VRS (Frank and Thurgood, 2006). OTs are considered key providers of VRS due to their unique specialist skills, knowledge and professional values (Kirsh et al. 2005, 2010; Waghorn et al. 2009). This includes knowledge of mental health and its impact on occupational performance, occupational analysis, job evaluation, environmental considerations, and taking a holistic approach to support clients (Kennedy-Jones et al. 2005; Baxter et al. 2012). As such, OTs are deemed 'well placed to play a central role in employment schemes' (Royal College of Psychiatrists 2002, pg8).

Adoption of the evidence-based approach of IPS has been advocated in occupational therapy journals and reported in several OT-led studies (Moll et al. 2003; Cocks & Boaden 2009; Bejerholm et al. 2011; Baxter et al. 2012; Areberg & Bejerholm 2013; Lexén et al. 2013; Nygren et al. 2013; Prior et al. 2013; Waghorn et al. 2014; Bejerholm et al. 2015; Lexén & Bejerholm 2016; Zhang et al. 2017; D'Amico et al. 2018; Noyes et al. 2018; Talbot et al. 2018). VRS has been a core component of occupational therapy since the profession's inception (Braveman et al. 2001). Despite this, the research priority for OTs is to research and articulate their unique contribution to the field (College of Occupational Therapists 2008; Arbesman & Logsdon 2011; D'Amico et al. 2018).

4.1.1 The Model of Human Occupation

The model of human occupation (MOHO) is a well-established, highly researched theoretical model, which has been found to be the most clinically applied model of practice in the profession (Lee et al. 2008, 2009; Maciver et al. 2016; Taylor 2017). MOHO has guided practice in VRS (Mentrup et al. 1999; Lee & Kielhofner 2010; Prior

et al. 2013) through intervention programmes and having well developed assessment tools (Braveman et al. 2005).

4.1.2 The Worker Role Interview

The worker role interview (WRI) (Braveman et al. 2005) is a measurement tool theoretically based on a dynamic systems model: the model of human occupation (MOHO) (Kielhofner 2008). The purpose of the WRI is to understand psychosocial factors which influence the ability to attain employment. In the WRI, the person's motivation for work is conceptualised by three theoretical constructs: personal causation, values, and interests (items 1–7). Two theoretical constructs conceptualise lifestyle with its influence on work: roles and habits (items 8–13). The theoretical construct of the environment (items 14–17) includes the person's perception of the physical and social environment in relation to their work situation. Performance capacities are not identified by the WRI, since these are better assessed by observation (Veloza et al. 1999; Kielhofner et al. 2008). The WRI items and rating criteria are included in Appendix E.

4.1.2.1 Applicability of the WRI

The WRI (Braveman et al. 2005) is a widely used measurement tool in vocational rehabilitation (Coole et al. 2013), highly regarded in terms of clinical utility (Fisher 1999; Yngve & Ekbladh 2015). Application of the WRI has been described in the US (Biernacki 1993; Baron & Littleton 1999; Fisher 1999; Veloza, et al. 1999; Braveman 2001; Kielhofner et al. 2004; Paul-Ward et al. 2005; Forsyth et al. 2006; Paquette 2008; Egan et al. 2015; Julian & Valente 2015a); Sweden (Haglund et al. 1997; Öhman et al. 2001; Kjellberg et al. 2003; Ekbladh et al. 2004, 2010b, 2014; Mettävainio & Ahlgren 2004; Forsyth et al. 2006; Kåhlin & Haglund 2009; Areberg, Björkman & Bejerholm 2013; Argentzell & Eklund 2013; Sturesson et al. 2013; Bejerholm & Areberg 2014; Yngve & Ekbladh 2015; Ekbladh & Sandqvist 2015); Iceland (Ásmundsdóttir 2004; Ingvarsson & Theodórsdóttir 2004; Forsyth et al. 2006; Fenger & Kramer 2007); the UK (Baxter et al. 2012; Lohss et al. 2012; Coole et al.

2013); Ireland (Codd et al. 2010); Canada (Haslam et al. 2010); and Switzerland (Köller et al. 2011).

The assessment's applicability is recognised across diagnostic groups with utility in physical settings (Fisher 1999; Velozo et al. 1999; Kielhofner et al. 1999; Kjellberg et al. 2003; Ekbladh et al. 2004, 2010a; Mettävainio & Ahlgren 2004; Forsyth et al. 2006; Fenger & Kramer 2007; Julian & Valente 2015a;), including musculoskeletal conditions (Biernacki 1993; Baron & Littleton 1999; Jackson et al. 2004; Paquette 2008; Köller et al. 2011; Coole et al. 2013); HIV (Braveman 2001; Kielhofner et al. 2004; Paul-Ward et al. 2005); traumatic brain injury (Moller et al 2017); rheumatoid arthritis (Codd et al. 2010); mental health (Haglund et al. 1997; Kjellberg et al. 2003; Ásmundsdóttir 2004; Ekbladh et al. 2004, 2010b; Mettävainio & Ahlgren 2004; Forsyth et al. 2006; Fenger & Kramer 2007; Haslam et al. 2010; Lloyd et al. 2010; Lohss et al. 2012; Argentzell & Eklund 2013; Ekbladh & Sandqvist 2015; Egan et al. 2015; Julian & Valente 2015a); dementia (Öhman et al. 2001); and intellectual disabilities (Kåhlin & Haglund 2009).

More recently, the assessment has also been found useful when reasons for work exclusion are more related to social than health factors (Soeker et al. 2015; Muñoz et al. 2016). Of particular interest to this study, Baxter et al. (2012), Prior et al. (2013), Areberg, Björkman & Bejerholm (2013) and Bejerholm & Areberg (2014), have applied the WRI in IPS services with people with mental health problems.

4.1.2.2 Psychometric Properties of the WRI

The WRI consists of a semi-structured interview with a therapist-administered four-point rating scale of 16 items. An overview of the assessment and rating criteria is included in Appendix E. The WRI has high test-retest reliability and high total inter-rater reliability (Biernacki 1993; Haglund et al. 1997; Velozo et al. 1999; Forsyth et al. 2006; Fenger & Kramer 2007; Köller et al. 2011; Lohss et al. 2012). Items on the WRI generally coalesce well to form a valid measure of psychosocial factors related to work in item response studies (Haglund et al. 1997; Forsyth et al. 2006; Fenger & Kramer 2007; Köller et al. 2011; Lohss et al. 2012). However, all four environmental items tend to misfit when investigated using Rasch analysis, the exception to this pattern was in the Lohoss et al (2012) study where environment items fitted the one

unidimensional scale. Yet as the environmental context is recognised as clinically significant, items pertaining to the work environment and social support have been retained. The WRI also appears to be sensitive in detecting different levels of psychosocial capacity for work, and can predict a return to work from sickness absence (Ekbladh et al. 2004, 2010b).

Lohss et al. (2012) undertook a Rasch analysis with a comparable population to this study. Their research was in the UK, and their sample population was people with complex mental health problems. The findings confirmed the applicability of the WRI to this population, with all but one item and over 90% of clients fitting the Rasch model. . 'Commitment to Work' was the easiest item; 'perception of co-workers' was the hardest. This finding is similar to the pattern of other Rasch analysis studies; habituation and interest items are more difficult, while enjoyment and commitment are easier (Lohss et al. 2012).

The one item to misfit was 'expectation of success in work'. An explanation for this was provided: suggesting that unrealistic appraisal of abilities, leading to over-confidence which does not align with actual occupational functioning, may be a feature of illness among those with a diagnosis of schizophrenia and personality disorder. The WRI manual suggests that even when confidence in work success is unrealistic, it is an asset in readiness for employment (Braveman et al. 2005). This seems to correspond with the principles and findings of IPS (Bond 2004; Bond & Drake 2008).

4.1.2.3 Predictive ability of the WRI

Several studies have considered the predictive ability of the WRI. These are summarised in Table 4.1. However, the majority have adopted methodologies which used the WRI to discriminate between work status (Kåhlin & Haglund 2009; Haslam et al. 2010; Julian & Valente 2015b); it is impossible to know the causal effect. It is not possible to determine whether higher scores on particular items preceded employment or increased as a result of participating in it. It is flawed to consider these studies as contributing to establishing the predictive ability of the WRI.

Two studies did not find predictive value: in initial studies related to the WRI, Velozo (1999) investigated the relationship between total score of the WRI rather than item

scores; and found no significant predictive ability. Kahlin (2009) was unable to determine differences between the status of those in day centres or sheltered work.

Ekbladh has conducted quantitative (Ekbladh et al. 2004, 2010b) and qualitative (Ekbladh & Sandqvist 2015) studies, and found several predictive items. The quantitative studies are comparable to this research, although have a different population and predicting a different outcome (return to work from sickness absence). These results will be a useful reference point to compare with the findings of this study.

Table 4.1 WRI Research Studies

Study	Population	Research Question and Method	Results
(Veloza, et al. 1999)	US Mixed diagnosis	Multiple logistic regression including WRI total score as one predictor	Global score did not predict return to work
(Ekbladh et al. 2004; Ekbladh, Thorell & Haglund 2010b)	Sweden: In employment on sickness absence	Analysis of WRI rating and return to work, longitudinal study over 2 yr, univariate and multiple logistic regression	<p>Univariate analysis significant items were</p> <ul style="list-style-type: none"> • Adapts routine to minimise difficulties (6,12, 24 mths) • Daily routines (6, 24 mths) • Pursues interests (6, 24mths) • Perception of family and peers (6, 12, 24mths) • Expectation of job success (6,12, 24mths) • Influence of other roles (24 mths) • Takes responsibility (6,12, 24 mths) • Commitment to work (24 mths) <p>Logistic regression most significant model included</p> <ul style="list-style-type: none"> • Expectation of job success (6,12, 24mths) • Daily routines (6, 24 mths)
(Kåhlin & Haglund 2009)	Sweden Learning disabilities	Used WRI interview ratings to profile employment status	No significant differences identified between day centre and sheltered employment attendees
(Haslam et al. 2010)	Canada mental health	Used WRI interview ratings to profile those working and those unemployment	Total scores for global score, personal causation items roles items
(Areberg & Bejerholm 2013; Bejerholm & Areberg 2014)	Sweden IPS mental health	WRI used as an evaluation along with job outcomes in IPS	1. Assumed predictive ability of WRI and measured other initial predictors against work ability measured by WRI.

Study	Population	Research Question and Method	Results
		intervention study	2. Totalled scores on volitional items and habituation items increased with employment outcomes in IPS
(Ekbladh & Sandqvist 2015)	Sweden common mental health conditions	Factors which supported RTW – qualitative study framework analysis using WRI	Factors which recently RTW employees found important were Adapts routine to minimise difficulties All environmental items Daily routines Expectation of job success Enjoys work
(Julian & Valente 2015b)	US injured veterans	Used WRI interview ratings to profile those working and those unemployment	Univariate analysis found significant correlation between employment status and Adapts routine to minimise difficulties Daily routine Influence of other roles Takes responsibility Commitment to work

4.1.3 Comparing IPS Career Profile Interview and WRI

A further step to understand the contribution of the WRI to IPS was to compare the WRI questions (Appendix F) with the IPS Career Profile (IPS Employment Center at Rockville Institute 2017) (Appendix G). The career profile is not a standardised assessment tool. It is the interview recommended for initial information gathering for people entering an IPS programme. The career profile therefore offers an operationalisation of variables considered important in IPS for comparison to the WRI. Diagrams were used to compare the WRI questions in either direction; corresponding rating scale items with the career profile interview and vice versa; and the career profile interview with the WRI. Diagrams are included in Appendixes H, which cross matches questions included in both interviews; Appendix I identifies WRI questions missing from the Career Profile interview; Appendix J identifies Career Profile questions missing from the WRI.

4.1.3.1 Rating items included on the WRI but not considered in the IPS Career Profile

MOHO encompasses four elements: volition, habituation, performance capacity, and environment. The WRI has items which assess volition, habituation and the environment.

The IPS career profile has questions which gather information and overlap with:

Volition items

All interest questions are shared, so this concept is well considered by both interviews. However, only around half of WRI personal causation questions (13/24) and values questions (3/8) have comparable questions in the career profile. While much of the same discussion will take place with the two interview schedules, it is likely that the WRI will consider volitional items in greater depth.

Habituation items

Roles and habits are minimally considered by the career profile. Only three of nine WRI 'role' and only two of twelve 'habits' questions are covered by the career profile. It is highly unlikely that an employment specialist using the career profile will gain an insight into how roles and habits may influence readiness for employment.

Environmental items

Similarly, only two of twelve questions relating to the environment in the WRI have comparable questions in the career profile.

4.1.3.2 Rating items included on the IPS Career Profile but not considered in the WRI

The career profile provides structured questions which provides greater details in relation to educational and work experience than is covered in the current WRI interview guide. Greater attention is also paid to potential barriers to employment regarding substance misuse and criminal convictions. The interview also reflects key principles of IPS; rapid job search and benefits advice. Supplementing the WRI with these questions would enhance OTs adherence to principles.

4.2 CONTRIBUTION OF MOHO AND THE WRI TO IPS

Occupational therapists have a significant role to play in VRS; and have theoretical models and assessment tools to draw upon to guide their practice. Occupational therapists have been recognized as having the professional skills to provide IPS, and have added to the evidence base of IPS-leading studies, including RCTs (Wong et al. 2008; Tsang et al. 2010; Waghorn et al. 2014; Bejerholm et al. 2015; Zhang et al. 2017). However, there is still a need to articulate the profession's unique contribution (Noyes et al. 2018; D'Amico et al. 2018). The WRI is a valid, reliable assessment tool, which can discriminate between levels of work status, and has been shown to have predictive ability for return to work among a population on sickness absence.

Occupational Therapists using the WRI to gather initial assessment information at the commencement of an IPS intervention will gain a more thorough insight into volitional items, and a far greater appreciation of habituation and environmental factors which may influence readiness for employment.

There is an opportunity in this study to consider the predictive ability of the WRI in an unemployed population with complex mental health problems receiving IPS intervention. By establishing the value of professional knowledge in an assessment process, a first step is taken to articulate a unique OT contribution.

CHAPTER 5: METHODS

5.1 PURPOSE OF STUDY

The literature review has established that people with complex mental health problems have both the aspiration and the potential to succeed in employment and education. Yet despite this, they are often excluded from the opportunity. This marginalisation has negative impacts on the health and wellbeing of the individual, and economic consequences for society.

An established intervention, IPS, has been demonstrated to have good efficacy in supporting people with mental health problems to achieve their vocational goals in multiple meta-analyses of numerous RCTs. Indeed, a meta-analysis conducted as part of this study combined the findings of RCTs investigating good fidelity IPS: which is comparable with the study's context. The combined risk ratio of attaining employment was 2.53, with 95% confidence intervals at 2.17– 2.97 (Figure 3.3).

Recent investigations into IPS have focused on making the intervention more efficient, time-limited (Burns et al. 2015; Whitworth 2018), and developing augmentations to improve outcomes (Tsang et al. 2010; Boycott et al. 2012; Au et al. 2015; Dewa et al. 2018). To underpin sound clinical decision-making, it is crucial that healthcare professionals can predict who is likely to benefit from a time-limited intervention, and who will require a more complex augmented intervention.

Considerable effort has been exerted in identifying psychosocial factors which may be helpful in predicting obtainment of employment among people with complex mental health problems. However, research has primarily considered individual psychosocial factors in isolation as predictors. This study proposes to adopt a theoretical position (Wewiorski & Fabian 2004) to consider psychosocial factors, and to view these as dynamic and inter-related. This approach has proved rewarding in investigating return to work from sick leave (Ekbladh et al. 2010b). The purpose of this study is to describe the relationship between psychosocial factors (independent variables) on

employment outcomes (dependent variables) in a population of people with complex mental health problems who are unemployed. The research is interested in two relationships.

5.1.1 Research Questions

- Can psychosocial variables predict who will obtain employment or education?
- Can psychosocial variables predict who will obtain employment or education within 9 months, and who will take an extended period of time?

The research assumes that these psychosocial variables and employment outcomes are objectively measurable; therefore, a quantitative approach is the appropriate research paradigm. Psychosocial variables will be measured using the WRI (Braveman et al. 2005). The intention is to deductively test a theory (Allsop, 2007) of how identified psychosocial variables, as measured by the WRI (Braveman et al. 2005), may predict the outcome and timing of attaining vocational goals.

Prior to multiple logistic regression, an initial step of univariate analysis will test the relationship between each psychosocial variable and the outcome of attainment of employment or education opportunity. A null hypothesis will be tested in each instance that the independent variable (psychosocial variable) is unrelated to the dependent variable (employment or education opportunity).

In contrast to correlation analyses (or simple regression), limited to comparing a single predictor with the outcome (Field et al. 2012), multiple regression affords the opportunity to construct models which simultaneously examine the effects of all predictors (Gelman & Hill 2006).

This research offers an opportunity to provide a unique contribution to knowledge about predictors of success in an IPS programme. It will investigate a comprehensive set of theoretically derived, well-defined, independent but inter-related psychosocial variables, with a population experiencing complex mental health problems, who are seeking employment.

5.1.2 Post-positivist position of research

The purpose of this study is to describe the relationship between psychosocial factors (independent variables) on employment outcomes (dependent variables). The epistemological stance of the researcher is that there is value in refining our understanding of objective truth (Robson & McCartan 2016).

The research depends on a measurement tool, the worker role interview (Braveman et al. 2005). This allows us to quantify psychosocial variables and employment outcomes objectively. The study aims to deductively test a theory and offer a unique contribution to knowledge: explaining the relationship between psychosocial variables and employment outcomes.

However, the researcher's ontological position recognises that objective measurement of variables is imperfect and as such the evidence underpinning this new knowledge is fallible (Robson & McCartan 2016) and therefore must be open to further investigation and refinement. This post-positivist positioning of the research recognises the desirability of objective truth; merely an approximation of it is both helpful and realistic in advancing research and practice (Crotty 1998; Robson & McCartan 2016). The psychosocial variables in this context are defined within a specific model of practice of the occupational therapy profession, and evidence generated is influenced by this particular perspective (Robson & McCartan 2016). Improvements in practice can only be guided by the best available evidence at any point in time. The findings will reflect probabilities in the relationships between independent variables and outcomes, these probabilities should be tested in future studies, from differing perspectives, and thereby improved upon.

5.1.2.1 Context of the research

The context of the research is articulated in the introduction. The thesis is one component of an ongoing professionalising action research initiative between the university and the health board (VRS). Due to the nature of this component, a quantitative approach is the appropriate choice. Integrating the views of clinicians into the methods is an important factor in ensuring the findings have both statistical and clinical significance (Sedgwick 2014a), and maintain the integrity of an established scholarship of practice partnership (Forsyth et al. 2005; Taylor 2017c). This

partnership provides a dialogue between empirical knowledge (such as that derived from this quantitative study) and theoretical knowledge (Taylor 2017b).

In this instance, the research question arose in practice, the research methodology was agreed between practitioners and the researcher, data is derived from practice, and practitioners have a role in reviewing and interpreting findings. These findings will then be integrated back into practice, and the ongoing research partnership will continue. The link between theory, research and practice is explicit and guides the question asked, choice of variables and how they are measured (Bonell et al. 2018). This ensures that research in an applied context generates findings which continue to refine and improve theory, and recognises that new knowledge will be subject to further refinement in the future (Robson & McCartan 2016).

5.1.3 An Observational Study - Prospective Cohort Design

A prospective cohort study (de Win et al. 2007; Jager et al. 2007; Siriwardena 2012) was undertaken, which utilised a secondary dataset (Smith et al. 2011). The dataset was provided by the established vocational rehabilitation services (VRS), experienced in providing intervention based on IPS (Bond et al. 2011), with established good fidelity to the model over several years. The model of human occupation also guides the team's interventions: MOHO (Taylor 2017), and the WRI (Braveman et al. 2005) are routinely completed with all patients accessing the service. The study design is prospective: participants are recruited at the commencement of intervention, followed up for a period of up to five years, with the outcome recorded (obtained/did not obtain employment).

The prospective nature is an advantage, as variables are predefined and measured consistently, and the data relating to independent and dependent variables are gathered in temporal sequence (Sedgwick 2013, 2014b). The established VRS provides an assessment and intervention for people with complex mental health problems. A dataset has been routinely collected over several years, and is currently used to evaluate the service. It is intended that this database is used for secondary data analysis.

5.1.4 Fidelity of Intervention

The consistency of intervention is ensured as the service is routinely appraised for fidelity to the IPS principles by trained assessors, using a standardised assessment tool the IPS fidelity scale (Bond et al. 2011b); the team has received ongoing training and regular caseload supervision to integrate evidence-based occupational therapy into practice. The experts appraising the service are independent of both the clinical service and the research. The team has been graded as maintaining good fidelity to IPS principles in the last two appraisals.

5.1.5 Secondary Data Collection

Using secondary data enables researchers to address high impact research questions with significantly less time and resources than would be required in a study involving primary data collection (Doolan & Froelicher 2009; Smith et al. 2011; Cheng & Phillips 2014; Okafor et al. 2016). Secondary data offers access to large sample sizes, relevant measures (in this case, the WRI), and longitudinal data that is readily available, allowing insights into trends within the phenomena of interest (Smith et al. 2011). Moreover, as performing research may expose participants to a degree of risk, e.g. by exploring potentially sensitive areas, using secondary data affords the opportunity to address important research questions without putting subjects at risk of adverse reactions or other harms associated with participation (Doolan & Froelicher 2009). Furthermore, the use of data collected as part of a routine clinical practice provides researchers with real-life data for testing new hypotheses relevant to practice models.

However, several limitations have been identified in the literature and must be acknowledged. The primary challenge is that by using data collected with no research question in mind, methods used and measures which were chosen may differ from those that might have otherwise been selected (Doolan & Froelicher 2009). Thus, it is not uncommon that some critical variables are not available for the analysis (Cheng & Phillips 2014). Similarly, the data may not be collected for all population subgroups or geographical regions of interest. There is a possibility of missing data creating residual confounders, when omitted variables are crucial covariates to control for in the secondary analysis (Cheng & Phillips 2014).

In this circumstance, the WRI (Braveman et al. 2005) was selected as an appropriate initial assessment and outcome measure for service evaluation. Clinicians have routinely used this measurement tool for each person accessing the service. We can therefore be confident that a consistent, standard dataset is available for analysis.

Another major limitation is that the researchers analysing the data are not usually the same individuals as those involved in the data collection process. Consequently, they are likely to be unaware of study-specific nuances or glitches in the data collection process, which may be important to the interpretation of specific variables in the dataset (Cheng & Phillips 2014). It is important that researchers planning to analyse secondary datasets recognise unique issues pertinent to data quality at the beginning, so that the potential for introducing threats to reliability and validity can be addressed and their impact on the results considered (Boo & Froelicher 2013).

In this circumstance, a partnership is in place between the researcher and clinicians in the service, and measurement tools were selected together. Ongoing training has been provided by the researcher to the clinical service to ensure the data quality; and that any nuances and glitches are highlighted and addressed quickly to minimise risk to reliability and validity.

5.1.6 Analysis

The collected data was subject to analysis with the use of multiple logistic regression (Kleinbaum & Klein 1994; Gelman & Hill 2006; Stoltzfus 2011; Hosmer et al. 2013), using R data analysis software (R Core Team 2015). Multiple logistic regression allowed research questions to be addressed by constructing models which examine the effects of psychosocial predictors on the probability of a person with complex mental health problems obtaining (or not obtaining) paid employment (McCullagh & Nelder 1989). Independent variables will be examined using multiple logistic regression to model the likelihood of a person with complex mental health problems obtaining (or not obtaining) paid employment. Thereafter, independent variables will be re-examined to model the likelihood of requiring an intervention of longer than nine months to achieve vocational goals. Possible confounds which may influence outcomes will be controlled for (age, gender, educational achievement, history of employment).

The intention was to deductively test, using logistic regression, a theory of how identified psychosocial variables may predict the outcome of employment goals. In contrast to correlation analyses (or simple regression), limited to comparing a single predictor with the outcome (Field 2012b), multiple regression will afford the opportunity to construct models which simultaneously examine the effects of all predictors (Gelman & Hill 2006). The outcome variables in both research questions are binary; did/did not obtain employment or education; did/did not attain goal within nine months. When the outcome variable is binary, the assumption of linearity between independent and dependent variables is violated: therefore the correct methodology is logistic regression (Field 2012b).

Interpretation of the analysis will be shared and discussed with expert clinicians in their field, to ensure that findings are considered from both a statistical and clinical significance (Sedgwick 2014a).

5.2 STUDY SAMPLE

5.2.1 Target Sample Size

Approximations have been developed which allow informed estimates of the numbers that may be suitable (such as in the algorithms used by the G*Power software package, (Faul et al. 2007)). Unfortunately, while these are helpful in many simple study designs, when designs become more complicated, as they do in multiple regression, they become much less helpful. In these cases, it is necessary to rely on suggestions made by experienced applied statisticians. The most widely-used suggestion for estimating sample size for multiple logistic regression is that of 10 observations per variable for each outcome in the intended model (Harrell 2001). At 10 observations per variable, estimating that the analysis would investigate 10 independent variables with two outcome variables, an initial estimate of 200 observations was considered.

Field (2012) offers guidance more specific to multiple logistic regression, which suggests that a sample size of 119 may be sufficient; while Hsieh et al. (1998); and

Hsieh (1989) acknowledge it is only when analysis begins that necessary sample sizes can be determined. Therefore, the intended sample size at the commencement of data gathering was set at a minimum sample size of 200. Liaison with the VRS provided assurance that this was achievable.

5.2.2 Generalisability of findings

To assist in the generalisability of the study findings, the sample were compared to mental health populations, through national data depositories held by Information Services Division (ISD) and the Health and Social Care Information Survey (HSCIS). ISD provides high-quality health information nationally and for each health board. The HSCIS provides the Adult Psychiatric Morbidity Survey (APMS), conducted every seven years (most recently published in September 2016). The sample population were compared with national norms for age, gender, ethnicity, diagnosis, living situation, marital status and indices of multiple deprivations. To do this, relevant national population datasets were accessed from ISD publications, including the mental health dashboard of the National Benchmarking Project and The Mental Health Inpatient and Day Case dataset (SMR04), which collects episode-level data on patients receiving care at psychiatric hospitals, at the point of both admission and discharge. Further, we will also compare our sample and mental health populations in England by educational attainment, employment status and welfare claimant status. To do this, we will access relevant population data from the Adult Psychiatric Morbidity Survey (2014).

The sample were also compared to the pooled demographic information compiled in the systematic review of good fidelity IPS RCTs. This process allowed comparison of the population accessing this service with previous research. This provided an insight into whether the same population are accessing the local service, and if outcomes can be reliably compared across this cohort study and RCTs.

5.2.3 Inclusion criteria

The register of clients and the dataset at the VRS was reviewed. The register included all clients of the service who met the following inclusion criteria

- Age over 18
- Consented to intervention
- Initial employment goal of securing paid employment
- Maintained engagement with the service until discharge or time of data gathering (not lost to service).

5.3 DATA COLLECTION

The data dictionary used in the analysis is included in Appendix K.

5.3.1 Preparing the data for transfer

To ensure quality of the data and minimise missing data while protecting the identities of service users, the data was managed and transferred by a trained researcher on site at both services. The researcher is employed at Queen Margaret University and holds an honorary contract with the health board. Data was robustly anonymised prior to transfer.

The direct care clinical team reviewed a register of all patients who have completed intervention with the vocational rehabilitation. Only those who provided informed consent for participation in the service and sharing of data were included in the register.

A research ID code was applied to identify data within the dataset uniquely. A cross-reference list matching the research ID code to the actual patient register is maintained by the clinical service and stored separately from clinical files and research data.

All identifiable information was removed by the researcher: who holds an honorary contract with the NHS organisation, permitting access to clinical notes. This process

included transforming postcodes into the quintile range of the Scottish Index of Multiple Deprivation, and date of birth was transformed into age on admission. Date of admission was transformed into a measure of duration of intervention to goal attainment or discharge. During this process, incomplete data was removed from the dataset. This ensured no identifiable personal data was transferred from the secure NHS Network to the secure QMU network, and no incomplete datasets which would not be included in the analysis were transferred.

5.3.2 Secure transfer of data

Data was transferred from the NHS secure network to the secure network at Queen Margaret University using NHSmail, a secure email service approved by the Department of Health.

5.3.3 Data management

Electronic data is stored on a password-protected computer in securely partitioned Queen Margaret University servers. Hard copies of data analysis are stored in secure locked filing cabinets in the secure office area of Queen Margaret University.

Once data was transferred, it was managed and prepared for analysis by the researcher, supported by a trained statistician. A secure office area at Queen Margaret University was used for all data analysis. This analysis was conducted by the investigator, supported by a statistician on a partitioned drive of a secure networked computer. The investigator's supervisory team also had access to the data.

All digital research data is stored securely on the University-networked storage system in both original and processed formats. Non-digital data, such as printed data, is stored securely in appropriate storage facilities. The University provides the infrastructure and expertise for long-term curation, preservation and access to research data. This infrastructure includes mechanisms and secure services for backup, registration, deposit and retention of research data in support of current and future access, during and after completion of research projects. The investigator, statistician and supervisory team will have access to the data. Digital data will be securely deleted from hard drives, and non-digital data will be shredded.

5.4 ETHICAL CONSIDERATIONS

5.4.1 Ethical Approval

The Medical Research Council decision-making tool (Medical Research Council, 2018) was reviewed to establish the necessity for NHS Research Ethics Committee (REC) approval. At the proposal stage, the researcher felt that the study may be classified as exempt from REC review, and only require approval through Queen Margaret University's procedures (Queen Margaret University 2011). The study conformed to the NHS Health Research Authority statement (NHS Health Research Authority 2011), which suggests research involving secondary analysis of non-identifiable information collected in the course of normal care is normally excluded from REC review. However, the intention of the study is to produce generalizable, transferable findings; therefore, the online tool recommended seeking NHS REC approval.

An application was made through the integrated research and application system (IRAS ID 230949). A favourable opinion was provided by the proportionate review sub-committee of the South Central – Berkshire B Research Ethics Committee (Appendix L), and the study was registered with the Research and Development Office at the health board.

5.4.2 Lack of capacity for informed consent

Only patients with capacity to give informed consent are included in the dataset. It includes patients accessing vocational rehabilitation at the research site. The existing dataset is limited to patients who have provided informed consent for the reuse of clinical data for research purposes. All data will be robustly anonymised; transfer of data will comply with Caldicott principles (Department of Health 2013)

5.4.4 Confidentiality of data

Caldicott principles (Department of Health 2013) were adhered to at all times. No person-identifiable information was recorded or transferred for secondary analysis. Data transfer was conducted over a secure network, from NHS Lothian's secure IT network to Queen Margaret University's secure network, using NHSmail.

All procedures complying with information management and confidentiality were approved by the Ethics Committee and Research and Development Generic Review Manager.

The researcher holds an honorary NHS contract to support the service evaluation, and is a Health and Care Professional Council (HCPC) registered occupational therapist, subject to its standards of conduct, performance and ethics.

5.4.5 Risks, burdens and benefits

This study is limited to secondary analysis of an existing dataset; there is no risk, burden or benefit to included patients. It is intended that the research outcomes will benefit the future design of vocational rehabilitation services.

5.5 ANALYSIS PLAN

5.5.1 Anonymising Data

While on the secure network at NHS Lothian, simple calculations were performed on the database to ensure anonymity. Date of birth and admission date were used to calculate age on admission. Postcode was transformed to SIMD Quintile range using the SIMD website (Scottish Government 2016). Date of admission and either date of goal attainment or date of discharge (without goal attainment) was used to calculate duration of intervention.

5.5.2 Recording Data Gathering

Data gathering procedures were recorded at NHS bases: detailing numbers of cases reviewed, included and excluded, together with reasons for exclusion.

Data was collated on all assessing occupational therapists, describing their level of experience and training in both IPS and MOHO. Therapists were grouped as follows:

- ‘Novice therapists’: one year or less employed in VRS
- ‘Experienced therapists’: over one year, less than ten years employed in VRS
- ‘Expert therapists’: over 10 years’ experience.

Further details were gathered regarding training and mentorship:

- Certified training in IPS or only mentorship
- Training and mentorship in MOHO IPS

5.5.3 Data Format and Analysis Software

Data was received at Queen Margaret University as a comma-separated values (CSV) file. This file was read into R version 3.4.3 (R Core Team 2015), an open source software program for statistical analysis. R Studio (R Core Team 2015) was used as an interface. This programme provides easy viewing of R code, and outputs of data tables and graphs at the same time.

5.5.4 Data cleaning and reviewing missing data

All data was reviewed by summarising variables to identify incomplete or incorrect values. Variables missing more than 5% of data were identified. Variables with a higher proportion of missing data were more likely to fail to reach the minimum expected value of five instances in analysis of correlation (Field 2012a), and therefore would be excluded. Where this occurred, options to collapse data into fewer variables was considered (Hosmer et al. 2013).

5.5.5 Summarising Data

In order to understand data, the demographic and psychosocial variable data were summarised.

5.5.5.1 Categorical variables

Demographic variables comprised nominal data variables e.g. gender, ethnicity and ordinal data, with 4 level ratings on the WRI (strongly supports, supports, interferes and strongly interferes). These variables were summarised in frequency tables, which calculated the percentages. All WRI and several demographic variables were collapsed into binary variables for univariate analysis.

Outcome variables were also summarised in frequencies tables with percentages. This included two binary outcomes: 'did obtain' or 'did not obtain' employment or educational opportunity; and obtained employment or education in 'less than nine months' or 'more than nine months'.

Additionally, the outcome variable, 'did obtain' or 'did not obtain' employment or educational outcome, was transformed into likelihood ratio of obtaining employment. The R programme, Metafor (Viechtbauer 2010), was used this calculation. The likelihood ratio of obtaining employment with 95% confidence intervals were compared to those from experimental arms of the studies included in Chapter Three.

5.5.5.2 Continuous variables

Continuous independent variables were limited to age and duration of intervention. Mean and standard deviations, median and IQ range were computed for all continuous variables. Distributions of continuous data were visually summarized using histograms.

The continuous variable of duration of intervention was also used as a dependent outcome variable. The subgroup who obtained employment were partitioned, then classified into a binary outcome variable: obtained employment or education in 'less than nine months' or 'more than nine months'.

5.5.6 Univariate Analysis

Using the approach recommended by Stoltzfus (2011) and Hosmer et al. (2013), an initial step for selecting variables involved univariate analysis of all independent and dependent variables. Appropriate tests of association were conducted, and significance levels set at 0.05 and 95% CI. A null hypothesis tested in each instance was that the independent variable (psychosocial variable) is unrelated to the dependent variable (employment or education opportunity).

5.5.6.1 Categorical variables

To discover if there was a relationship between two categorical variables, independent predictor variables (demographic or psychosocial), and dependent outcome variable (obtained / did not obtain) contingency tables (Field 2012a) were constructed using the R programme, GModels (Warnes et al. 2018): denoting frequencies of identifying with each category. Pearson's chi squared test (Pearson 1900, cited in Field et al. 2012; Fisher 1922), were conducted to compare actual frequencies observed in a sample with those we might expect to observe in those categories by chance.

This calculation calculates

$$\begin{aligned} \text{deviation} &= \sum (\text{observed} - \text{model})^2 \\ \chi^2 &= \frac{\sum (\text{observed}_{ij} - \text{model}_{ij})^2}{\text{Model}_{ij}} \end{aligned}$$

Where i = rows n the contingency table
j = columns n the contingency table

$$\text{Model}_{ij} = E_{ij} = \frac{\text{row total}_{ij} \times \text{column total}_{ij}}{n}$$

Where n = total number of observations

To provide an illustration of this calculation, the demographic variable was gender. The contingency table for gender and outcome is presented below

	Obtained	Did not obtain
GENDER		
male	81	43
female	47	31

$$\text{Model male, obtained} = \frac{128 \times 124}{202} = 78.57$$

$$\text{Model male, did not obtain} = \frac{74 \times 124}{202} = 45.43$$

$$\text{Model female, obtained} = \frac{128 \times 78}{202} = 49.43$$

$$\text{Model female, did not obtain} = \frac{74 \times 78}{202} = 28.57$$

The chi-square can then be calculated

$$\chi^2 = \frac{\sum (\text{observed}_{ij} - \text{model}_{ij})^2}{\text{Model}_{ij}}$$

$$\begin{aligned} \chi^2 &= \frac{(81 - 78.57)^2}{78.57} + \frac{(43 - 45.43)^2}{45.43} + \frac{(47 - 49.43)^2}{49.43} + \frac{(31 - 28.57)^2}{28.57} \\ &= \frac{(2.43)^2}{78.57} + \frac{(-2.43)^2}{45.43} + \frac{(-2.43)^2}{49.43} + \frac{(2.43)^2}{28.57} \\ &= 0.07 + 0.13 + 0.12 + 0.21 \\ &= 0.53 \end{aligned}$$

Pearson's chi squared test results were then checked against contingency tables with reference to degrees of freedom. In most cases, the degrees of freedom (df) were equal to 1. This is calculated as $(r - 1) (c - 1)$, where r = number of rows and c = number of columns in the contingency table. In the gender example $(2-1) (2-1) = 1$.

A potential problem with the chi square test is that the sampling distribution of the test statistic has an approximate chi-square distribution. Larger samples improve the approximation; to confidently use the chi-square test, the expected frequencies must be greater than 5 (Field 2012a). As this study is primarily using 2x2 contingency tables, we must be conscious that Pearson's chi-squared test has a tendency toward Type 1 error or false positive where the null hypothesis is rejected. A Yates continuity correction lowers the chi-squared statistic by subtracting 0.5 from the absolute value of deviation before it is squared (disregarding negative values).

$$\begin{aligned} \chi^2 &= \frac{(81 - 78.57 - 0.5)^2}{78.57} + \frac{(43 - 45.43 - 0.5)^2}{45.43} + \frac{(47 - 49.43 - 0.5)^2}{49.43} + \frac{(31 - 28.57 - 0.5)^2}{28.57} \\ &= \frac{(1.93)^2}{78.57} + \frac{(1.93)^2}{45.43} + \frac{(1.93)^2}{49.43} + \frac{(1.93)^2}{28.57} \\ &= 0.05 + 0.08 + 0.08 + 0.13 \\ &= 0.33 \end{aligned}$$

Fisher's exact test allows computation of the exact probability for the chi squared statistic for use on a 2x2 contingency table (cited in Field et al. 2012). In this case, the probability is 0.56 and the chi-squared is not significant. The null hypothesis is that gender has no effect on employment outcome; this hypothesis cannot be rejected, and no relationship between independent and dependent variable has been identified.

5.5.6.2 Continuous variable

In order to conduct a parametric test, three assumptions were checked: that each data point is independent, that data is normally distributed, and that variance was equivalent across groups. Data summaries were reviewed to ensure that each data point was independent. Normal distribution was checked visually using histograms and qq-plots, and by reviewing measures of centrality. Gplots programme (Warnes et al. 2016) was used in R to plot graphs. Q-Q plot (quantile-quantile plot) draws the

correlation between a given sample and the normal distribution (Field 2012). Normal distribution was also confirmed or refuted using the Shapiro-Wilk Test (1965) of normality. Finally, an F-test of equality of variances was conducted: to confirm the null hypothesis that the two normal populations have the same variance.

An unpaired t-test was used for continuous variables with a normal distribution.

The t-test statistical value is used to test if the means are different; it is calculated as follows:

$$t = \frac{M_1 - M_2}{\sqrt{\frac{SD_1^2}{n_1} + \frac{SD_2^2}{n_2}}}$$

SD² is an estimator of the common variance of the two samples. It can be calculated as follows:

$$SD^2 = \frac{\sum (x - m_A)^2 + \sum (x - m_B)^2}{n_A + n_B - 2}$$

The significance of t-test results was checked again with consideration to degrees of freedom.

Where assumptions were not normally distributed, boxplots were used to visualise distribution of data against outcome variables. Boxplots were plotted using R programme gplots (Warnes et al. 2016).

5.5.7 Odds ratio of binary variables

Results for independent variables are typically reported as odds ratios (OR) with 95% confidence intervals (CI). (Stoltzfus 2011)

Odds Ratios are also calculated, again using the gender variable as an example:

$$\text{Odds} = \frac{\text{Number of men who obtained employment}}{\text{Number of men who didn't obtain employment}}$$

$$\text{Odds of men securing employment} = \frac{81}{43} = 1.88$$

$$\text{Odds of females securing employment} = \frac{47}{31} = 1.52$$

$$\text{Odds ratio} = \frac{\text{odds males obtaining employment}}{\text{odds females obtaining employment}} = \frac{1.88}{1.52} = 1.2$$

5.5.8 Consultation with Clinicians

A consultation workshop was held involving current staff working in the VRS. This included all expert clinicians (>10 years' experience) (n=3), an equal number of experienced clinicians (1<10 years' experience), and 1 novice therapist (<1 year of experience). Additionally, an experienced member of support staff was present.

The consultation involved the researcher presenting univariate analysis and findings of previous research (as included in Chapter 4). A discussion then proceeded of each variable in turn, with clinicians sharing their views about the clinical significance of each variable to their practice, clinical reasoning and intervention planning. Consideration was also given to inter-related demographic variables, and the potential of variables acting as confounding factors. This discussion was transcribed, and themed under the following headings:

- Agreement with significant factors
- Agreement with the insignificance of variables
- A mismatch between statistical significance and clinical significance:
 - Statistically significant but not clinically important
 - Clinically important but not statistically significant.

5.5.9 Multiple Logistic Regression

Multiple logistic regression was also conducted in R data analysis software (R Core Team 2015) utilizing the `mlogit` package (Henningsen: 2011uu). The preceding univariate analysis only provided a comparison of single predictors with the outcome (Field 2012b).

Psychosocial variables exist in a dynamic system (Thelen 2005). Multiple logistic regression is the appropriate statistical approach to improve the univariate analysis and construct models which simultaneously examine the effects of all predictors (Gelman & Hill 2006). Regression techniques measure associations, predict outcomes, and control for confounding variable effects. Logistic regression enables a researcher to analyse the effect of a group of independent variables on a binary outcome, by quantifying each independent variable's unique contribution (Stoltzfus 2011).

5.5.9.1 Preparing the Data

Estimating models will fail if they include variables which contain missing values (Field 2012b). Thus, the dataset was reviewed, and all cases with missing data were deleted for the purposes of MLR.

5.5.9.2 Linear Regression

To understand the process of logistic regression, it is helpful to first review linear regression. This is based on two assumptions: the outcome is a continuous variable; and the relationships between the outcome and predictor variables can be plotted on a straight line (Stoltzfus 2011; Field 2012c). By calculating the effect of the variable on the outcome, linear models serve to predict outcomes.

5.5.9.3 Logistic regression

In logistic regression, the outcome variable is categorical; in this study, both outcomes are binary. So both assumptions of linear regression are violated. It is not possible to predict an absolute outcome (Stoltzfus 2011); instead, the probability of belonging to a specific outcome is predicted. A logit scale is used to transform linear regression to generate a logit of the odds of being in one outcome category or the other.

Key assumptions of logistic regression are: independence of variables, linearity of relationship between continuous predictor variables and log-transformed outcome, absence of collinearity between predictor variables. Models must also be checked for adequate fit, and that there are no outlying, significantly influencing coefficients (Stoltzfus 2011; Field 2011, 2012b, 2012c).

5.5.9.4 Backward Stepwise Approach to Model Building

There are three approaches to model building (Field 2012c):

- Hierarchical: based on past work, the researcher decides which order to enter predictors into the model.
- Forced entry: where all predictors are simultaneously entered
- Stepwise approaches (backwards and forwards): based on mathematical criteria.

Stepwise approaches risk exclusion of variables - which while not significant when considered in a univariate analysis, may be important when included in the context of other variables (Field 2012c). Stoltzfus (2011) reasons that it is not the method itself which is flawed, but researchers considering only mathematical criteria and thoughtlessly including and excluding variables. This can result in clinically important, but marginally significant variables being excluded; or statistically significant variables, with no clinically plausible relationship to the outcome, being included. In this study, a backward stepwise approach was adopted. Considerable effort was applied to integrating theory and clinical reasoning to the selection of variables in combination with the mathematical criteria.

5.5.9.5 Selecting variables for inclusion

It is important to select the best variable to include in models to predict outcomes. Stoltzfus (2011) advocates using well-established theory, past research, clinical observations, preliminary statistical analysis, or some sensible combination of these different options. In this study, a well-established theory, MOHO (Taylor, 2017) was originally used to select the variables gathered. Past research on psychosocial variables, defined by the model and assessed through the WRI (Braveman et al. 2005) were reviewed. Clinical observations were appraised through clinical consultation; particular attention was paid to identifying potential confounding factors.

Univariate analysis of each variable was conducted. All factors were considered in the choice of initial variables to include in the models. Hosmer (2013) suggests that successful modelling is part statistical methods, part experience, part common sense.

The rationale for minimising the number of variables in the model is that the resultant model is more likely to be numerically stable and is more easily adopted for use (Hosmer et al. 2013).

The more variables included in a model, the greater the estimated standard errors become, and the more dependent the model becomes on the observed data (Hosmer et al. 2013).

5.5.9.6 Number of Variables included in Initial Models

Consideration of the number of variables to include is important. Too many variables can result in overfit to the sample under investigation, and a model which cannot be generalised to the population (Stoltzfus 2011). Having an insufficient number of observed outcomes for the number of variables included may result in an over-estimated coefficient value with large standard errors. Therefore, we rely on the previously stated rule of a minimum of 10 outcomes per variable included.

The model to predict obtained/did not obtain employment was limited by the smaller of the two outcome groups (with complete data), did not obtain employment or educational opportunity (n=71). A maximum of seven variables was the limit. The number of variables included in the second model was smaller - yet as only those who obtained employment and had complete data were included, those who took longer than nine months amounted to 60 participants. A maximum of six variables was considered.

As recommended by Hosmer (2013) and Stoltzfus (2011), a p-value of 0.25 on significance of univariate analysis was set for inclusion. This assists in guarding against exclusion of potentially important variables.

5.5.9.7 Assessment of Model Fit and Effect Size

Each model summarised the deviance using the chi-squared goodness of fit test, reported with degrees of freedom and probability values. Pseudo R^2 were calculated for each model, and as recommended by Field (2012), three versions are reported: the Hosmer and Lemshow R^2 , based on the chi-square score; Cox and Snells' R^2 ,

based on the deviance of the model: this statistic never reaches a theoretical maximum of 1; therefore, Nagelkerke's R^2 provides a correction. All these statistics provide an indication of the significance of the model.

To assist in the interpretation of the model, Odds Ratio are calculated to understand the odds of an outcome occurring related to each variable. The value of the odds interpreted as greater than one suggests that the outcome is more likely to occur; less than one, that the outcome is less likely to occur. Values where the confidence intervals cross one must be treated with caution, as the outcome may be due to chance.

5.5.9.8 Testing Assumptions

Linearity of Continuous Variables

No continuous variables were included in final models for either research question, so linearity is not reported. However, if necessary, a log transformation of the continuous variable would have been calculated and the model run again with the log-transformed data, to identify any significant relationship. If a p value of the z score was identified, this would indicate that the assumption of linearity had been violated.

Assumption of Independence and no Multicollinearity

Predictor variables should be independent of each other. While previous research using Rasch Analysis and presented in Chapter Four has confirmed the independence of WRI items, each model was checked for independence and multicollinearity. The Durban Watson test was used to identify correlations in errors, applying Field (2012)'s recommendation that results of less than 1 or greater than 3 are problematic; and that to confirm independence, results should be non-significant.

Items which are not independent overlap, and therefore redundant variables, may be included in the model (Stoltzfus 2011). As recommended by Field (2012c), the variance inflation factor (VIF) was calculated. The VIF is presented for each variable in the model; if the largest VIF is greater than 10, there is a cause for concern; if the average variance inflation differential is substantially greater than 1, the regression may be biased; a VIF tolerance below 0.1 indicates a serious problem, and below 0.2 a potential problem, according to Bowerman and O'Connell (1990), Myers (1990) and Menard (1995; all cited by Field et al. 2012).

Outliers and Influential cases

Odds ratios were calculated for each variable; outliers falling outside of the 95% confidence intervals were identified. These residuals related to the outliers were then reviewed for exclusion using the following criteria (Field 2012):

- Any variable with a standard error of greater than 3 is unlikely to occur by chance and should be excluded
- More than 1% of observations with a standard error of greater than 2.58 is unacceptable
- More than 5% of observations with a standard error of greater than 1.96 is evidence of poor representation

Where outliers were detected, their influence on the model were considered and a decision taken to exclude where appropriate (Stoltzfus 2011).

5.5.9.9 Comparing Models

Models were compared by finding the difference in deviance statistics. An anova function would determine the difference in deviances between each model; but does not give an indication of significance. Thus, this was done manually in R: computing the difference in deviance, degrees of freedom and significance of the difference. In general, models with fewer variables are simpler; and without evidence of a significant difference, the simpler model is preferred (Stoltzfus 2011; Hosmer et al. 2013).

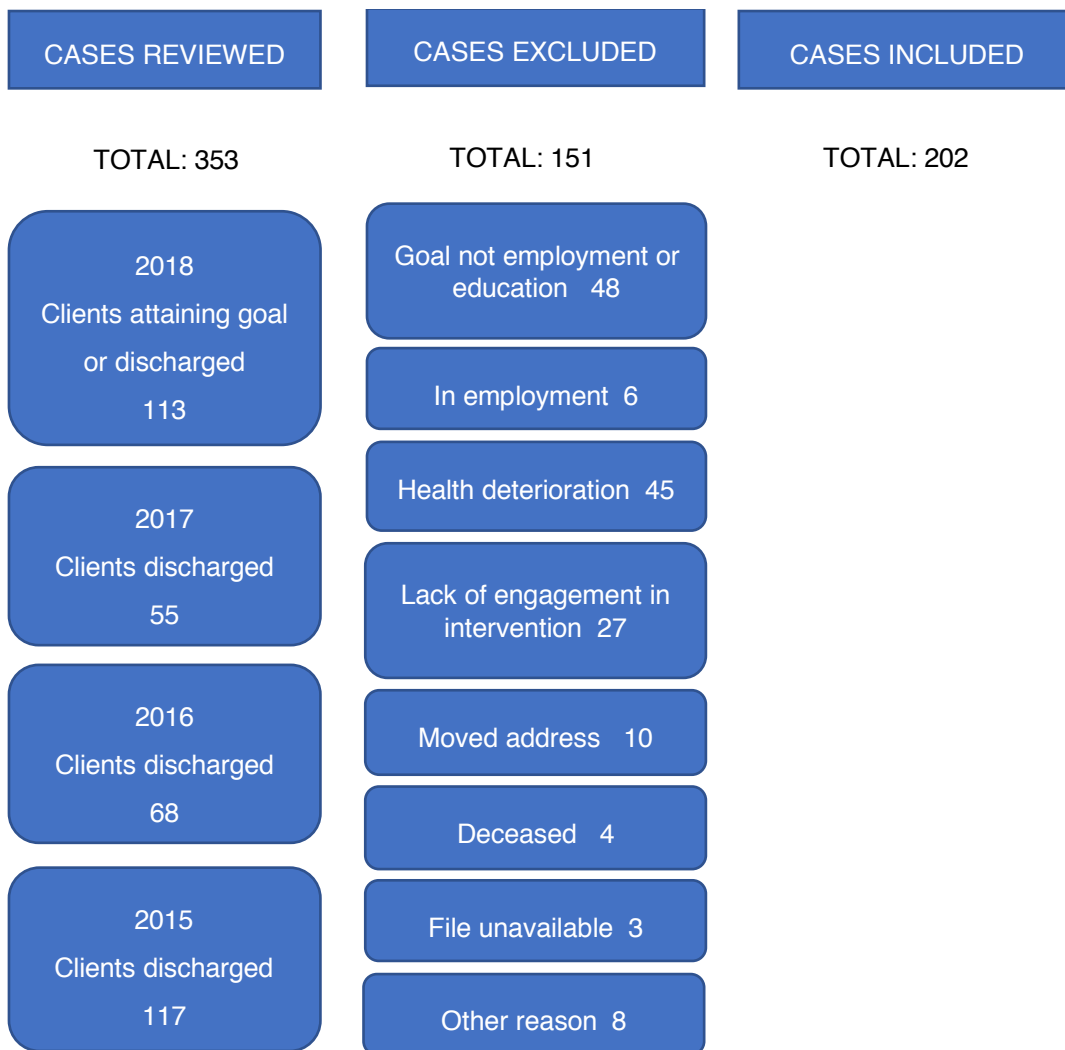
CHAPTER 6: RESULTS

6.1 INCLUSION IN THE STUDY SAMPLE

The VRS included in this study has been in operation since 2011. The intended sample size for this study was 200. The existing database of clients registered with the service was reviewed. Clients who had successfully obtained their first paid employment position or educational enrolment and those who had been discharged from the service were included. Working backwards in time, data associated with clients registered with the VRS between 2018 and 2015 were reviewed for inclusion in the study.

A total of 353 cases of data were screened, of whom 202 were eligible. Figure 6.1 summarises the process up to the inclusion of 202 cases in this study. A cumulative total of 151 people were removed from the sample on the application of inclusion-exclusion criteria. Exclusions were made where clients expressed no goal for paid employment or education (48) or were already in employment at commencement (6); the service initially accepted referrals for people whose goals were volunteering or sheltered work placement, or who required job retainment support. These clients did not fulfil the inclusion criteria for this study. Further reasons for exclusion were due to clients choosing to or having to withdraw or terminate intervention; deterioration in physical or mental health (45); determining to disengage with the VRS (27); moving to another area (10); and a small number died (4). Files being unavailable or not appropriate for review explain the final 11 exclusions.

Figure 6.1 Summary of Inclusion Process



6.2 THERAPISTS GATHERING DATA

The 21 occupational therapists who conducted initial assessments and therefore gathered data for the study are described in Table 6.1 below, with details provided of the number of evaluations submitted by therapists of varying experience. The staff team includes permanent and rotating staff. Rotating staff will spend at most a year within the service and have been classified as novices in the field of VRS. Permanent staff have been categorised into those with more than one year but less than 10 years' experience. Therapists working in VRS for over 10 years have been classified as

experts. All therapists were coached and mentored in the application of both IPS and MOHO. Induction processes ensured all staff were trained and competent in conducting and rating worker role interviews. All experienced and expert team members have participated in at least one certified IPS training course, A small proportion of the novice group did not complete certificated IPS training during their time with the service, but mentorship and supervision ensured an evidence-based approach was maintained.

Assessing occupational therapists often did not provide intervention over time. Thus, no further analysis was conducted, as no relationship between outcome, and initial assessing therapist could be expected. Therapists were split evenly between novices (48%) and experienced or expert therapists (52%). Almost half (48%) of the data was provided by therapists experienced in VRS; and a further 35% by expert practitioners. Novice therapists contributed only 17% of the data.

Table 6.1 Therapists' Experience and Contribution of Data

	LEVEL OF EXPERIENCE (ALL COMPETENT IN MOHO AND IPS)		NUMBER OF ASSESSMENTS INCLUDED IN DATASET	
		%	n	%
NOVICE (NO IPS CERTIFICATE)	4	19	11	5%
NOVICE	6	29	25	12%
EXPERIENCED	8	38	96	48%
EXPERT	3	14	70	35%

6.3 CHARACTERISTICS OF THE SAMPLE GROUP

6.3.1 Demographic characteristics

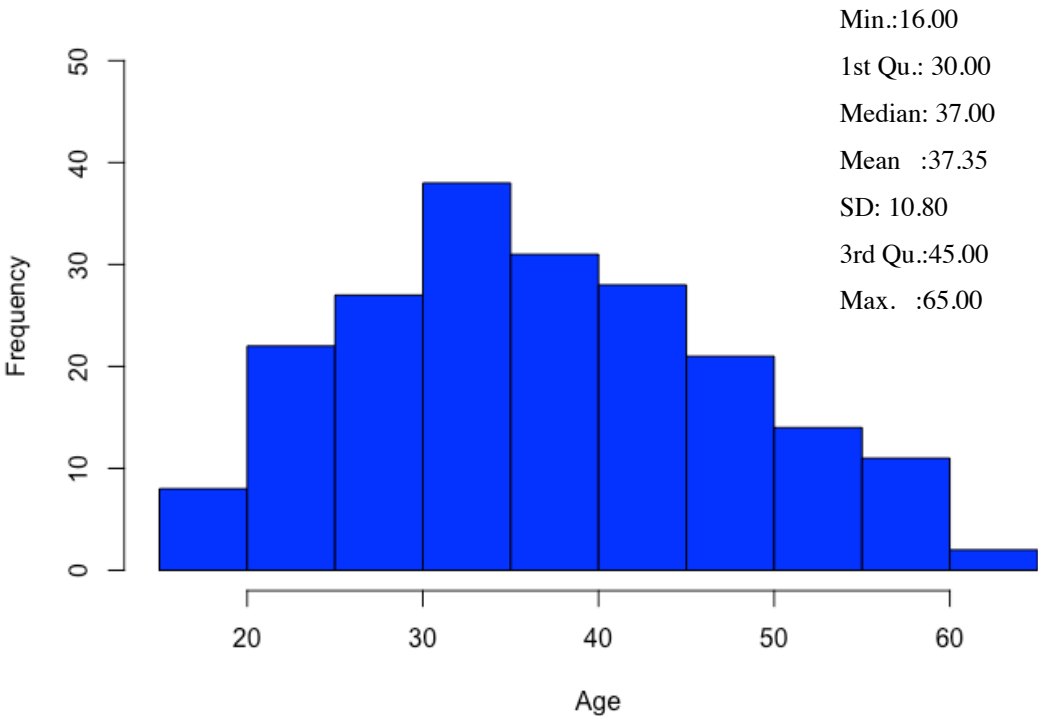
The demographic characteristics, diagnosis, social situation, educational and work history are summarised in Table 6.2. The sample was predominately male (61%) and middle-aged (mean age 37.4 years (SD10.80)). The distribution of ages is provided in Figure 6.2: the median age of the sample was 37, and the interquartile range, 30 to 45.

There was very little ethnic diversity in the sample group, with 92% included in the Information Services Division data dictionary: Group A: White (Information Services Scotland 2018). Group A includes people who are Scottish, Other British, Irish, Gypsy/ Traveller, Polish and other white ethnic groups. There was some diversity in the group, but numbers were so few as to risk anonymity by identifying them within the sample. Therefore, the groups were collapsed. Similarly, ISD grouping B to H were collapsed into one group of 17 people.

Table 6.2 All Demographic Data

CHARACTERISTIC		missing data			
		<i>Mean</i>	<i>SD</i>	0	0%
AGE		37.4	10.8		
		n	%	n	%
GENDER				0	0%
	male	124	61.4%		
	female	78	38.6%		
ETHNICITY				0	0%
	other ethnic group	17	8.4%		
	White	185	91.6%		
DIAGNOSIS				0	0%
	ICD10 F2 Schizophrenia...	105	52.0%		
	ISD10 F3 Mood	67	33.2%		
	ICD10 other diagnosis	30	14.9%		
SIMD				0	0%
	most deprived quintile 1	38	18.8%		
	quintile 2	35	17.3%		
	quintile 3	33	16.3%		
	quintile 4	32	15.8%		
	least deprived quintile 5	64	31.7%		
MARITAL STATUS				6	3.0%
	Married / de facto	33	16.8%		
	Single	163	83.2%		
LIVING SITUATION				4	2.0%
	With others	97	49.0%		
	Alone	101	51.0%		
QUALIFICATION ATTAINMENT				2	1.0%
	Did Not Attain School Quals	18	9.0%		
	Exams from School	61	30.5%		
	Further Education	121	60.5%		
PREVIOUS EMPLOYMENT				0	0.0%
	Previous employment	182	90.1%		
	No previous experience	20	9.9%		

Figure 6.2 Distribution of Age



6.3.2 Mental Health Conditions

The purpose of the service is to provide vocational rehabilitation to people with complex mental health problems. Just over half of the sample (52%) fall within the diagnostic category group of ICD10 F20-29 schizophrenia, schizotypal and delusional disorders (World Health Organization 2016). A third meet the diagnostic criteria for ICD10 F30-39 Mood (affective) disorders (World Health Organization 2016): primarily bipolar affective disorder. Other diagnostic classifications represented include anxiety, behavioural syndromes, psychological development and personality disorders. However, again, small numbers required collapsing categories into a larger group of ‘other diagnoses’.

6.3.3 Social Situation of the Sample Group

The majority, almost one third (32%) of the sample live within the least deprived of the city catchment area. Almost one fifth (19%) live in the least deprived areas, with

others spread evenly across the second to fourth quintiles, as measured by the Scottish Index of Multiple Deprivation 2016 (Scottish Government 2016). Most of the sample are single (83%); just over half are living alone (51%).

6.3.4 Education and Employment History

The group is predominately well educated, with 60% having pursued education beyond school level. A small proportion (9%) did not attain any school-level qualifications. The vast majority (90%) have had some experience of paid employment; the database did not gather how significant or how long ago this employment had been.

6.3.4.1 Missing data

Complete data was collected for all demographic characteristics, diagnosis and level of deprivation and previous employment. Missing data occurred for minimal numbers of cases concerning marital status (6 cases), living situation (4 cases) and educational attainment (2 cases).

6.3.5 Comparing Sample to Population

The sample population was compared with published statistics on norms for age, gender, ethnicity, diagnosis, living situation, marital status and indices of multiple deprivations.

Only 30 (15%) of cases in this sample were aged 25 years or younger. Clinical epidemiology studies suggest 75% of mental disorders will have emerged for the first time by age 25 (McGorry 2015), suggesting that VRS service is not targeted early in health intervention. It is known that younger people are less likely to access services

The sample population is predominantly male. This is at odds with meta-analysis of incidence, which suggests that while incidence of psychosis is higher among males in the age group of 45 and under. Proportions are more evenly split once those aged over 45 are integrated (HR: 0.98; 95% CI: 0.70, 1.36) (Kirkbride et al. 2012). The sample reflected only minimal ethnic diversity regarding ethnicity: 92% are white, compared to a 96% white population recorded in Scotland in the 2011 census.

Concerning marital status and living situation, this study varies from findings from mental health population surveys in England (McManus et al. 2009). In this study, 16.8% were married, or in a cohabiting relationship. McManus et al. (2009) found only 0.5% of those with psychotic illness were in a similar relationship. In this study, 51% were living alone, compared with a national average of 35% (Scottish Household Survey Project Team 2017). Almost one-third of this sample lived in postcode areas in the least deprived quintile. People with mental health problems are more likely to live in a more deprived area (Corbett et al. 2009), so again our population differs from the general mental health population.

To consider the reach of the VRS to provide a service to people with a complex mental health problem in the local area, incidence of psychotic illness was reviewed. In the UK, an incidence of 0.7% of the population had a psychotic illness (Kirkbride et al 2012) while a recent international meta-analysis pooled median global prevalence of psychotic disorders was 0.46% (Moreno-Küstner et al. 2018). The local population served by the VRS numbers 513, 210. The more conservative meta-analysis prevalence rates would suggest around 2,360 of the population served by the VRS have a psychotic illness. If, as indicated by previous research, approximately 50% of this group would like to obtain open employment or education (Secker et al. 2001; Perkins & Farmer 2009; Rinaldi & Hill 2013), it can be recognised that the service is only reaching a small proportion of the population which it could be supporting.

6.3.6 Comparing sample to other IPS research

The sample was also compared to research on good fidelity IPS interventions. The studies included in the meta-analysis (Chapter 3) were reviewed. The gender split of this study was 61%: comparable to the pooled sample of the intervention group of studies included in the meta-analysis (62%). The randomised controlled studies ranged from only 29% male (Gold et al. 2006) to 83% male (Oshima et al. 2014). The mean age of participants of eleven studies included in the meta-analysis ranged from 21.29yrs (SD 2.39) to 42.90 (SD11.50). The mean age in this study was 37.40 (SD10.80), so tends towards the higher age range.

The majority of studies have been conducted in the US and in London (Howard et al. 2010), and reflect more ethnic diversity. Only studies relating to a complex mental

health population were included in the meta-analysis; therefore, diagnostic representations are similar. This study sample had a higher proportion (21%) of people who are married/cohabiting than can be seen in a wider population of people with complex mental health problems. Within the IPS RCTs, 26% of participants across eight studies were married or cohabiting, an even greater difference to the norm. The proportion of people living alone (51%) in this study sample was equivalent to the two reporting IPS RCT sample groups (52%). Only a small proportion of this study had not obtained school exams (9%): compared to pooled samples in the meta-analysis, where the figure was 35% of the combined samples across six studies that reported comparable data.

This study only gathered data pertaining to having ever worked before: a majority of people (91%) had some paid work experience. In the studies included in the meta-analysis, eight studies reported proportions who had worked in the last five years, with the pooled data totalling 55% with work experience in this time period. The differing time criteria make it impossible to compare this study with others.

6.4 PSYCHOSOCIAL VARIABLES FROM THE WRI

Item ratings of all sixteen Worker Role Interview (Braveman et al. 2005) items are presented in Table 6.3 across the four-point rating scale: strongly supports; supports; interferes; strongly interferes.

6.4.1 Volition: Personal Causation Items

All data is available for analysis in two of the three personal causation items ('expectation of success' and 'takes responsibility'). 'Assesses ability and limitations' has not been rated for one case. Very few instances (5 or less) of 'strongly interferes' occurred in two items - 'Assesses ability and limitations', and 'expectation of success' – thus analysis of these variables is vulnerable to error (Field et al. 2012).

6.4.2 Volition: Value Items

All data is available for analysis in only one value item ('commitment'), while 'work goals' has not been rated for one case. 'Work goals' ratings have spread across all four levels, but the 'strongly interferes' rating has not been selected at all in 'commitment'.

6.4.3 Volition: Interest Items

Neither item in this section has all data available for analysis. 'Enjoys work' has been unrated five times; 'pursues interests' is unrated on two occasions. In addition to five cases of missing data, the variable 'strongly supports' has only been applied on five occasions in 'enjoys work'.

6.4.4 Habituation: Roles

'Appraises work expectations' has not been rated in four cases but has an adequate spread of ratings across all levels. 'Influence of other roles' has been fully rated across all cases, but the level 'strongly interferes' has only been applied in two cases.

6.4.5 Habituation: Habits

'Work habits' has not been rated in five cases; but has an adequate spread of ratings across all levels. Both 'work routines' and 'adapts routines to minimise difficulties' are missing ratings in one case - but do also have adequate spread across all rating levels.

Table 6.3 All Worker Role Interview Data

WORKER ROLE INTERVIEW ITEM	missing data			
	n	%	n	%
ASSESSES ABILITIES AND LIMITATIONS			1	0.5%
Strongly Supports	35	17.4%		
Supports	102	50.7%		
Interferes	59	29.4%		
Strongly Interferes	5	2.5%		
EXPECTATION OF SUCCESS IN WORK			0	0.0%
Strongly Supports	17	8.4%		
Supports	92	45.5%		
Interferes	88	43.6%		
Strongly Interferes	5	2.5%		
TAKES RESPONSIBILITY			0	0.0%
Strongly Supports	30	14.9%		
Supports	81	40.1%		
Interferes	82	40.6%		
Strongly Interferes	9	4.5%		
COMMITMENT TO WORK			0	0.0%
Strongly Supports	69	34.2%		
Supports	106	52.5%		
Interferes	27	13.4%		
Strongly Interferes	0	0.0%		
WORK RELATED GOALS			1	0.5%
Strongly Supports	29	14.4%		
Supports	89	44.3%		
Interferes	74	36.8%		
Strongly Interferes	9	4.5%		
ENJOYS WORK			5	2.5%
Strongly Supports	36	18.3%		
Supports	114	57.9%		
Interferes	42	21.3%		
Strongly Interferes	5	2.5%		
PURSUES INTERESTS			2	1.0%
Strongly Supports	32	16.0%		
Supports	77	38.5%		
Interferes	81	40.5%		
Strongly Interferes	10	5.0%		

WORKER ROLE INTERVIEW ITEM	missing data			
	n	%	n	%
APPRAISES WORK EXPECTATIONS			4	2.0%
Strongly Supports	50	25.3%		
Supports	108	54.5%		
Interferes	34	17.2%		
Strongly Interferes	6	3.0%		
INFLUENCE OF OTHER ROLES			0	0.0%
Strongly Supports	50	24.8%		
Supports	96	47.5%		
Interferes	54	26.7%		
Strongly Interferes	2	1.0%		
WORK HABITS			5	2.5%
Strongly Supports	33	16.8%		
Supports	96	48.7%		
Interferes	52	26.4%		
Strongly Interferes	16	8.1%		
DAILY ROUTINES			1	0.5%
Strongly Supports	13	6.5%		
Supports	62	30.8%		
Interferes	106	52.7%		
Strongly Interferes	20	10.0%		
ADAPTS ROUTINES TO MINIMIZE DIFFICULTIES			1	0.5%
Strongly Supports	13	6.5%		
Supports	87	43.3%		
Interferes	85	42.3%		
Strongly Interferes	16	8.0%		
PERCEPTION OF PHYSICAL WORK SETTING			20	9.9%
Strongly Supports	27	14.8%		
Supports	107	58.8%		
Interferes	46	25.3%		
Strongly Interferes	2	1.1%		
PERCEPTION OF FAMILY AND PEERS			16	7.9%
Strongly Supports	50	26.9%		
Supports	92	49.5%		
Interferes	33	17.7%		
Strongly Interferes	11	5.9%		

WORKER ROLE INTERVIEW ITEM	missing data			
	n	%	n	%
PERCEPTION OF BOSS AND/OR COMPANY			58	28.7%
Strongly Supports	26	18.1%		
Supports	52	36.1%		
Interferes	57	39.6%		
Strongly Interferes	9	6.3%		
PERCEPTION OF COWORKERS			65	32.2%
Strongly Supports	26	19.0%		
Supports	63	46.0%		
Interferes	40	29.2%		
Strongly Interferes	8	5.8%		

6.4.6 Environment

Considerably more missing data has occurred across all items in this section. 'Perception of Physical Work Setting' is unrated in 20 cases; 'Perception of Family and Peers' is unrated in 16 cases. 'Perception of Boss and/or Company' is unrated in 58 cases; 'Perception of Coworkers' is unrated in 65 cases (almost a third of the sample). Compounding the challenge of including any environmental items in the analysis is the low use (2 cases) of 'strongly interferes' in rating 'perception of the physical work setting'.

6.4.7 Missing data and low occurrence of ratings

In summary, seven items have missing data to a lesser extent (4 or 5 cases): enjoys work, appraises work expectations and work habits, or to a greater degree (16 (10% of the sample) to 65 (32% of the sample)), all environmental items. 'Strongly interferes' was rarely utilised as a rating across six items: appraises work expectations; assesses abilities and limitations, expectation of success, enjoys work, influence of other roles, perception of physical environment; and was unused in one item, commitment.

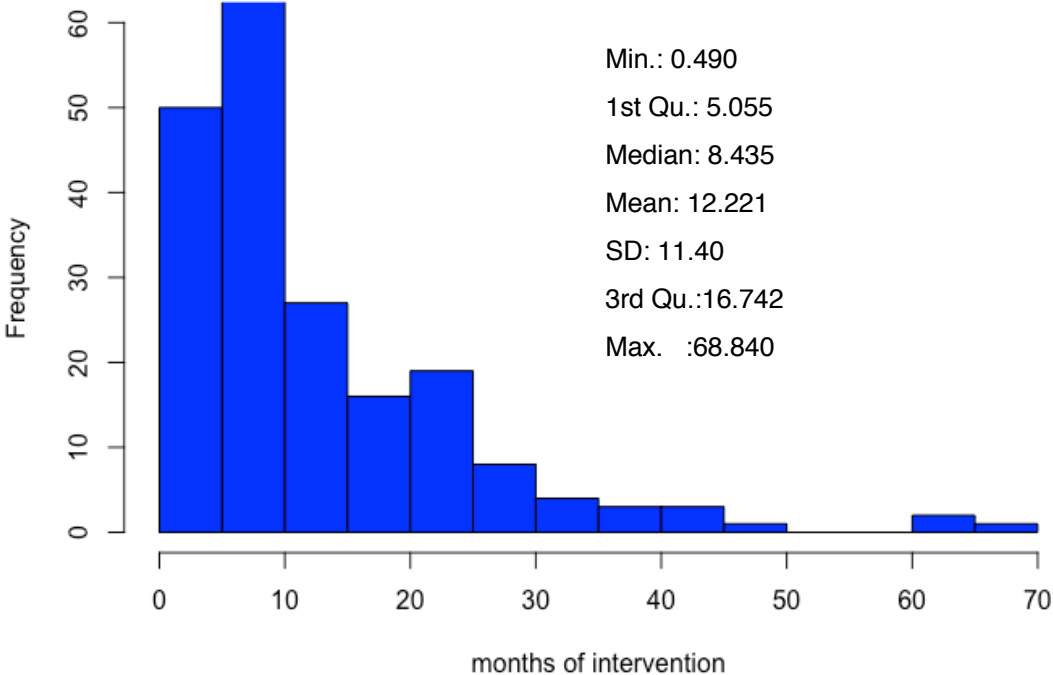
Overall, this culminates in 11 of the 16 worker role interview items being vulnerable within the analysis plan for multiple logistic regression, which requires data to be as complete as possible and to have higher than five responses to each independent variable (Field et al. 2012). Therefore a decision was taken to collapse the four-point

rating scale into a binary option variable: supports and interferes (Hosmer et al. 2013). 'Strongly supports' and 'supports' ratings were combined into one variable, 'supports'; and 'strongly interferes' and 'interferes' ratings were collapsed into 'interferes'. This approach has been used in other research (Kielhofner et al. 2004) pertaining to the worker role interview (Braveman et al. 2005).

6.5 DURATION OF INTERVENTION

Duration of intervention data reflects either months until the obtainment of the first job or educational opportunity, or months to discharge without successful vocational goal attainment. The mean duration of intervention was just over a year: 12.22 months (SD11.40). The distribution of duration of intervention is plotted in Figure 6.3 and is right-skewed with a long tail. Duration of intervention is not normally distributed. It is, therefore, helpful to report the median (8.44), and IQ range (5.05-16.74) to understand the pattern of duration of the intervention.

Figure 6.3 Distribution of duration of intervention to discharge or goal attainment



This can be further broken down to review those who do obtain employment/education (n=128) (Figure 6.4) and those who do not (n=74) (Figure 6.5). Different patterns of distribution emerge dependent on outcome. There is a significant right skew to the distribution of when people obtain employment or education, the majority within the first year. A long tail continues to around three and half years, with outliers beyond 5 years of intervention. For those who are discharged without attaining their vocational goal, most leave within eight months, with a second peak at around two years. Again, there are a small number of people who maintain engagement with services for four years plus without attaining their goal. Good fidelity IPS RCT studies have a range of mean time to first job of 2.2 months (SD2.53) (Wong et al. 2008), to 6.6 months (SD6.21) (Gold et al. 2006). The mean of this study was 11.96 (SD 12.18), a considerably longer timeframe.

Figure 6.4 Distribution of duration of intervention to goal attainment

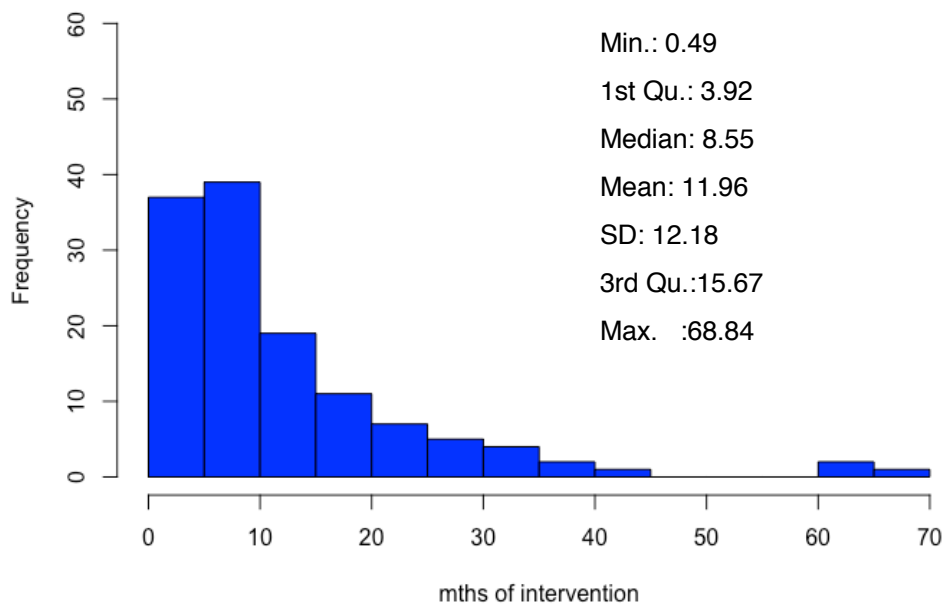
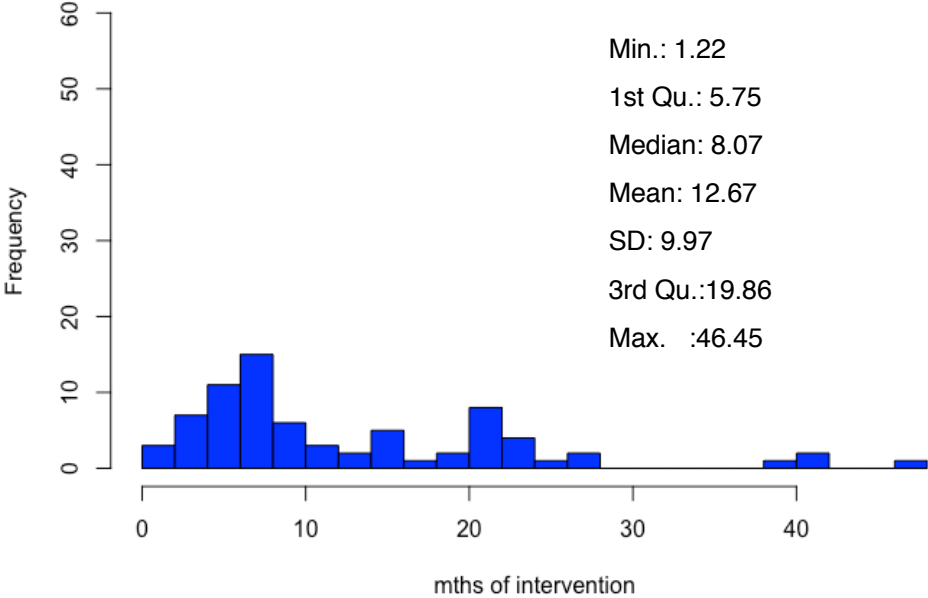


Figure 6.5 Distribution of duration of intervention to discharge, no goal attainment



6.6 OUTCOME OF INTERVENTION

Of the sample of 202, 128 (63%) were successful in their employment or education goal, and 74 (37%) were unsuccessful, and discharged without achieving their primary goal of open employment or educational opportunity. Figure 6.6 is a forest plot demonstrating the pooled odds ratio of the intervention arm of RCTs included in the meta-analysis. Figure 6.7 is the same forest plot with this study integrated. While it is interesting to recognise that the odds ratio of this study is better than seven of the 12 studies looked at in Chapter 3, caution in interpretation is wise, as this was an observational cohort study with an extended follow-up period.

Figure 6.6 Forest Plot: Likelihood Ratio of Obtaining Employment in Good Fidelity IPS RCTs

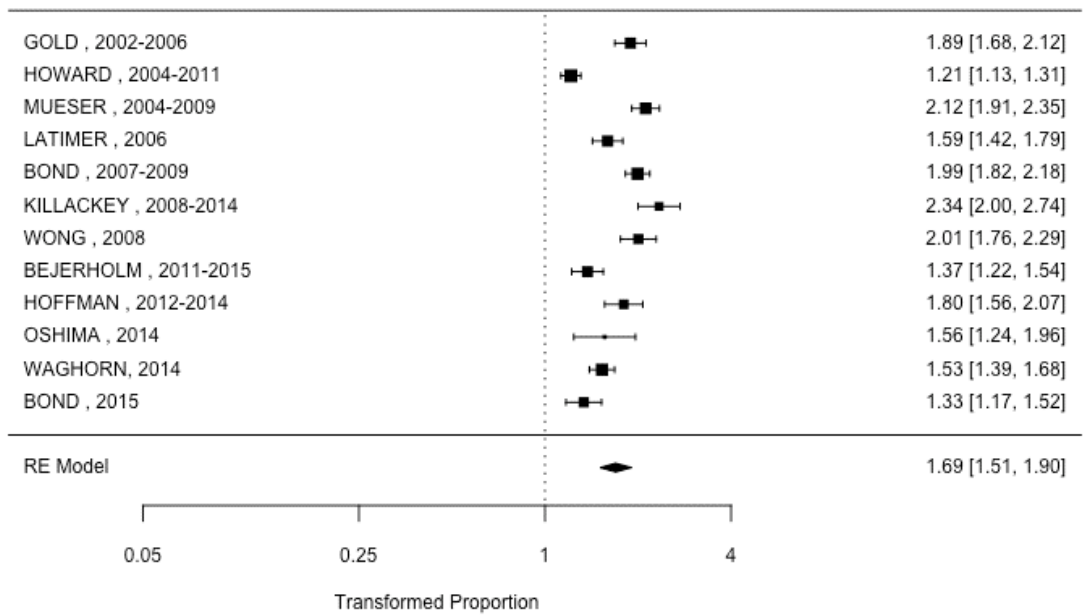
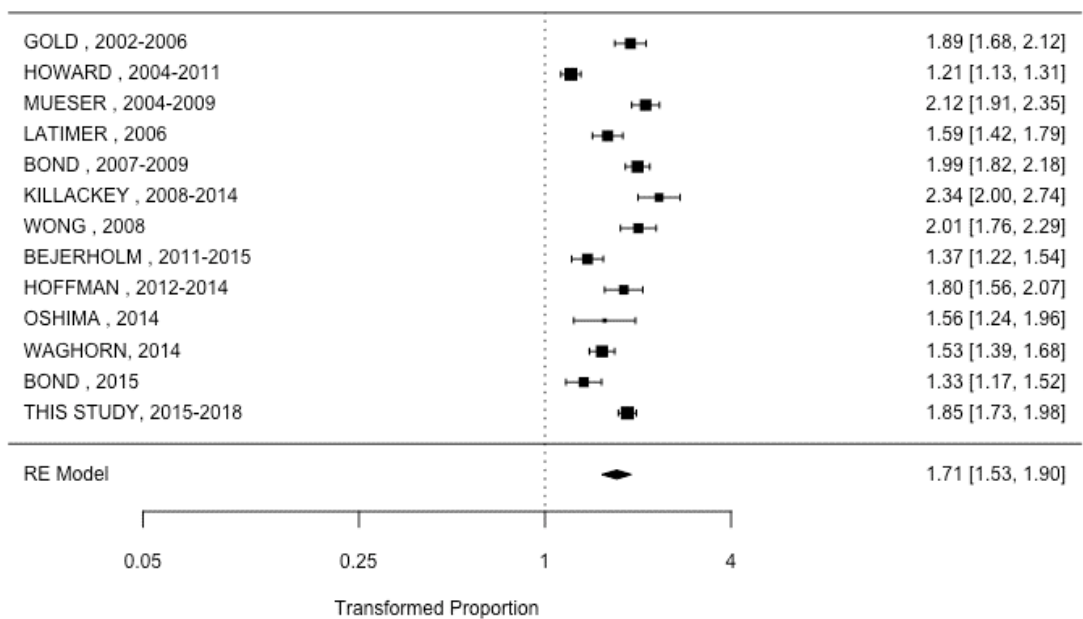


Figure 6.7 Forest Plot: Likelihood Ratio of Obtaining Employment in Good Fidelity IPS RCTs, integrating this study's Odds Ratio



6.7 RELATIONSHIPS; INDEPENDENT & DEPENDENT VARIABLES

The dataset was categorised into two groups by outcome variable, identifying those who 'did attain' (n=128) and 'did not attain' (n=74) their vocational goal of employment or education programme. Univariate analysis was conducted on each variable, identifying associations between independent variables (demographic and psychosocial variables) and the dependent outcome. The analysis included building contingency tables, conducting Pearson's chi-square on categorical variables, and two sample t-test on continuous data. Finally, odds ratios were calculated for binary variables. Significant relationships are highlighted in bold, and these variables were taken forward for multiple logistic regression. Demographic variables are presented in Table 6.4. Psychosocial variables are presented in Table 6.5. Odds ratios were calculated for independent variables, identifying the likelihood of employment and unemployment. These are shown in Tables 6.5 and 6.6.

To exclude a variable from the multiple logistic regression, the process applied to the dismissed variable included:

- Confirming all expected frequencies were greater than in contingency tables (greater than 5)
- This allowed Pearson's Chi Square to be calculated. The resultant Chi Square (with Yates correction) for gender was $\chi^2(1) = 0.53$, $p = 0.47$.
- This non-significant result meant the null hypothesis that gender does not influence employment outcome could not be rejected.
- The odds ratio confirmed this result; the odds of a person securing employment if they were male rather than female is 1.24 (0.66, 2.32). The confidence intervals at 95% cross the value 1, implying any difference may be through chance.

Conversely, to include a variable from multiple logistic regression, the following decision tree was followed for the included item, 'educational attainment':

- Confirming all expected frequencies were greater than in contingency tables (greater than 5)
- This allowed Pearson's Chi Square to be calculated. The resultant Chi Square (with Yates correction) for 'did not obtain', compared to 'obtained school qualification' was $\chi^2(1) = 3.86$, $p = 0.05$.

- This significant result meant the null hypothesis that obtainment of school exams does not influence employment outcome can be rejected.
- The odds ratio confirmed this result; the odds of a person securing employment if they have obtained school exams compared to not having done so is 2.95 (0.99, 9.45). The 95% confidence intervals just cross value 1: meaning this may be due to chance alone, and this variable should be treated with caution.

Table 6.4 All demographic data: Contingency tables and tests of association

Characteristic	attained employment/education		did not attain employment/education		Two Sample t-test			
	n	%	n	%	<i>t</i>	<i>df</i>	<i>p</i>	
AGE CONTINUOUS VARIABLE					-2.45	200	0.02	
					Pearson's Chi-square test. (*with Yates Corection)			
					χ^2	<i>df</i>	<i>p</i>	
GENDER		n	%	n	%			
	male	81	40.1%	43	21.3%	0.33*	1	0.56
	female	47	23.3%	31	15.4%			
EHNICITY								
	Other ethnic group	12	5.9%	5	2.5%	0.15*	1	0.70
	White	116	57.4%	69	34.2%			
SIMD								
	most deprived quintile 1	20	9.9%	18	8.9%	8.93	4	0.06
	quintile 2	21	10.4%	14	6.9%			
	quintile 3	17	84.2%	16	7.9%			
	quintile 4	21	10.4%	11	5.5%			
	least deprived quintile 5	49	24.3%	15	7.4%			
SMID (BINARY 1)								
	Less deprived quintiles 2-5	108	53.5%	56	27.7%	1.79*	1	0.18
	Most deprived quintile 1	20	9.9%	18	8.9%			
SMID (BINARY 2)								
	Least deprived quintile 5	49	24.3%	15	7.4%	6.22*	1	0.01
	More deprived quintiles 1-4	79	39.1%	59	29.2%			

Characteristic	attained employment/education		did not attain employment/education		Pearson's Chi-square test. Corection)		(*with Yates
	n	%	n	%	χ^2	df	p
DIAGNOSIS							
ICD10 F2 Schizophrenia...	62	30.7%	43	21.3%	2.97	2	0.23
ISD10 F3 Mood	48	23.8%	19	9.4%			
ICD10 other diagnosis	18	8.9%	12	5.9%			
MARITAL STATUS							
Married / defacto	24	12.2%	9	4.6%	0.95*	1	0.33
Single	101	51.5%	62	31.6%			
LIVING SITUATION							
With others	64	32.3%	33	16.7%	0.27*	1	0.60
Alone	62	31.3%	39	19.7%			
EDUCATIONAL ATTAINMENT							
Did Not Attain School Quals	7	3.5%	11	5.5%	5.06	2	0.08
Exams from School	41	20.5%	20	10.0%			
Further Education	78	39.0%	43	21.5%			
EDUCATIONAL ATTAINMENT (BINARY)							
School & Further Education Quals	119	59.5%	63	31.5%	3.86*	1	0.05
Did Not Attain School Quals	7	3.5%	11	5.5%			
PREVIOUS EMPLOYMENT							
Previous employment	117	57.9%	65	32.2%	0.33*	1	0.57
No previous experience	11	5.5%	9	4.5%			

6.7.1 Continuous Variables

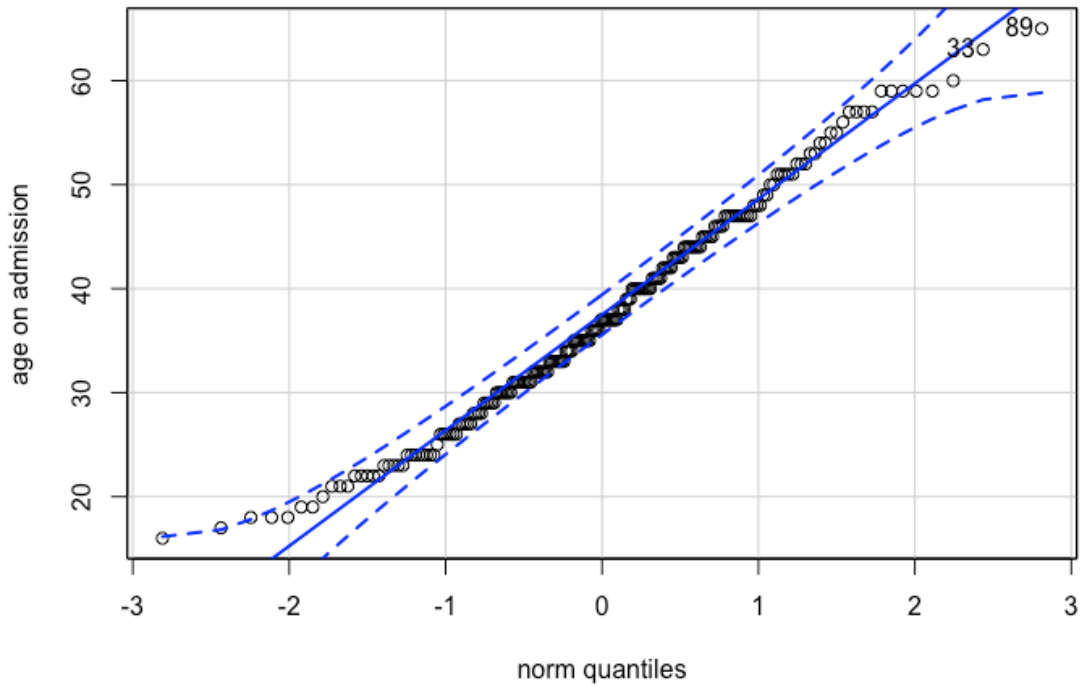
In order to conduct t-tests, three assumptions were checked: that each data point is independent, that data is normally distributed, and that variance was equivalent across groups.

6.7.1.1 Age

Each of the 202 cases has an independent coding of age. The histogram of age distribution suggests normally distributed data in the whole sample. Strong evidence of normal distribution is provided visually by the quantile-quantile (q-q) plot (Figure 6.8). The normal distribution of age in the two outcome subgroups, 'goal attained' and 'goal not attained', was indicated by Shapiro-Wilk normality test. In the 'did attain' group, $W = 0.98$, $p < 0.1$. In the 'did not attain' group, $W = 0.98$, $p > 0.2$. The non-significance p-values in both subgroups confirm the null hypothesis that age is distributed normally.

Finally, homogeneity of variance was excluded: $F(127, 73) = 0.83$, $p = 0.1$. As the p-value is greater than the significance level $\alpha = 0.05$, there is no significant difference between the variances of the two sets of data. As all assumptions are met, it was possible to perform a two-sample t-test $t = -2.45$ (df 200) $p < 0.02$. These findings establish a significant relationship between age and outcome.

Figure 6.8 Normal distribution of age



6.7.1.2 Duration of Intervention

Each of the 202 cases has an independent coding of education of independence, but the histogram of distribution demonstrates that data is right-skewed with a long tail, reflecting that a majority of cases have a shorter duration of intervention, while fewer have an extended period. The Q-Q plot in Figure 6.9 confirms the data is not normally distributed. Therefore, it is not possible to conduct a t-test. Instead, data is categorised into two subgroups for later analysis, 'less than or equal to 9 mths', reflecting an intervention that could be described as IPS-lite; and those who continue beyond the maximum time for IPS Lite ('over 9 mths'). Duration of intervention was excluded from univariate analysis in preparation for multiple logistic regression. Summaries of median and IQ range are included with the box plot (Figure 6.10). The mean duration of intervention before attaining employment or education goal was 11.96 months (SD 12.18); and the mean duration of intervention to discharge without attaining the goal was 12.68 (9.97).

Figure 6.9 Establishing distribution of duration of intervention

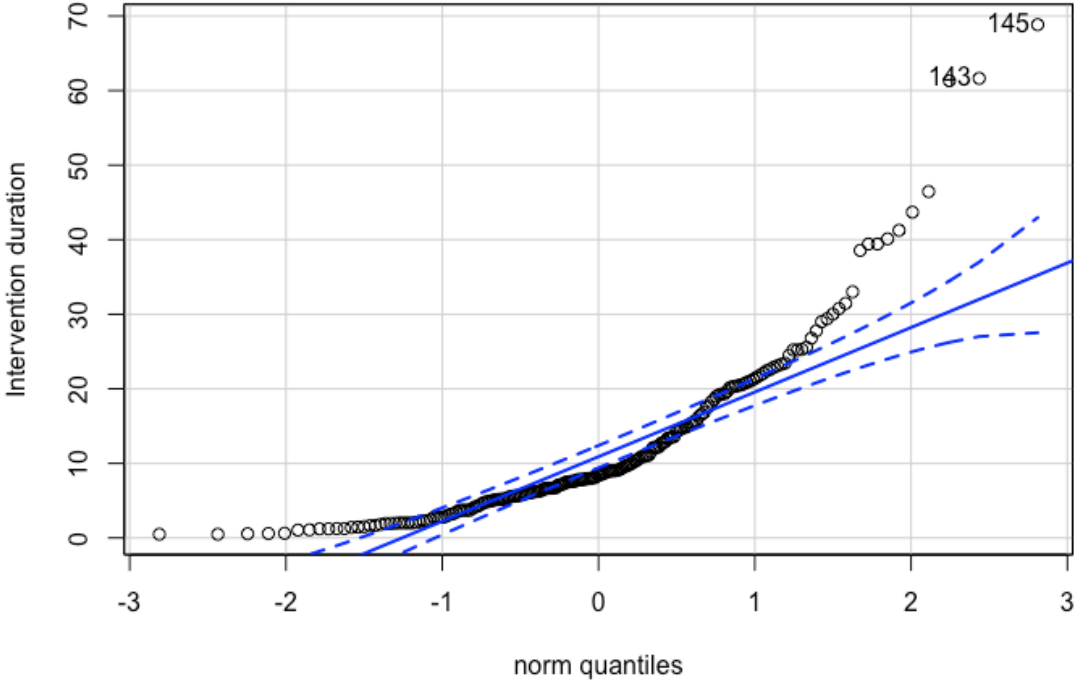
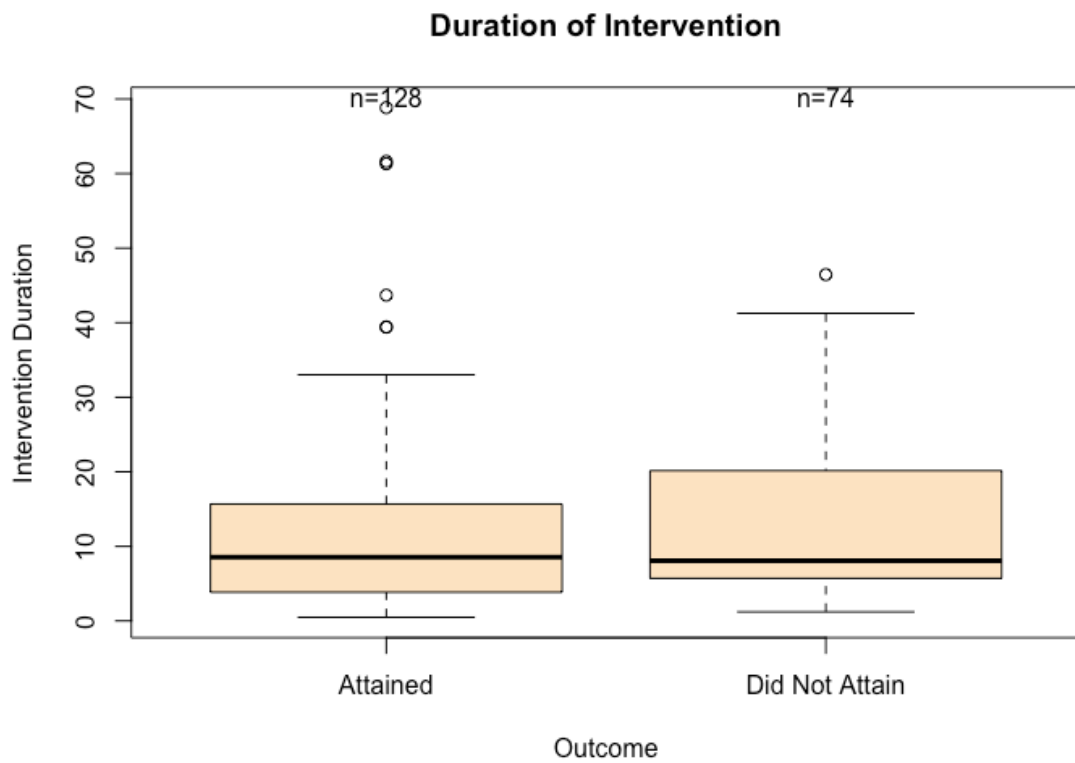


Figure 6.10 Boxplot of duration of intervention by outcome



Summary Statistics Attained

Min.: 0.49
 1st Qu. 3.92
 Median 8.55
 Mean 11.96
 SD: 12.18
 3rd Qu. 15.67
 Max. 68.84

Summary Statistics Did Not Attain

Min.: 1.22
 1st Qu. 5.75
 Median 8.07
 Mean 12.68
 SD: 9.97
 3rd Qu. 19.86
 Max. 46.45

6.7.2 Categorical Variables

6.7.2.1 Demographic variables

Analysis of the majority of categorical demographic variables (Table 6.4) did not reach a level of significance to prove a relationship to outcome. Gender, ethnicity, diagnosis, marital situation, living situation and previous employment all had $p > 0.1$. Two multi-factor categorical variables had significance $p < 0.1$ and were explored further. SIMD data was gathered by quintile and therefore had five factors. Those living in the most and least deprived areas were compared to the rest of the sample. There was no significant relationship between most deprived addresses and outcome. A significant association was found between least deprived areas and outcome: $p = 0.01$.

Educational attainment was initially analysed with three levels, then collapsed to a dichotomous variable, 'did not attain school qualifications' and 'attained school exams and/further qualifications'. This analysis yielded a borderline significance result: $p = 0.05$.

6.7.2.2 Psychosocial categorical variables

Several WRI items (Table 6.5) were found to be significant in univariate analysis: responsibility, work goals, appraises expectations, work habits, work routines, adapts ($p < 0.01$). Two further items, commitment and work goals were significant at $p < 0.05$. Assesses abilities and limitations almost reached significance with a p value of 0.06; and was also considered for multiple logistic regression models. Hosmer argues that not limiting inclusion of variable traditional levels (such as 0.05) may exclude variables which are important.

Table 6.5 All WRI collapsed into binary variable: Contingency tables and tests of association

Characteristic	attained employment/education		did not attain employment/education		Pearson's Chi-square test. (*with Yates Correction)		<i>p</i>
	<i>n</i>	%	<i>n</i>	%	χ^2	<i>df</i>	
ASSESSES ABILITIES AND LIMITATIONS							
Supports	93	46.3%	44	21.9%	3.47*	1	0.06
Interferes	34	16.9%	30	14.9%			
EXPECTATION OF SUCCESS IN WORK							
Supports	73	36.1%	36	17.8%	1.01*	1	0.31
Interferes	55	27.2%	38	18.81%			
TAKES RESPONSIBILITY							
Supports	80	39.6%	31	15.4%	7.23*	1	0.01
Interferes	48	23.8%	43	21.3%			
COMMITMENT TO WORK							
Supports	117	57.9%	58	28.7%	5.79*	1	0.02
Interferes	11	5.5%	16	7.9%			
WORK RELATED GOALS							
Supports	86	42.8%	32	15.7%	10.56*	1	0.001
Interferes	41	20.4%	42	20.9%			
ENJOYS WORK							
Supports	94	47.7%	56	28.4%	0.00*	1	1.00
Interferes	30	15.2%	17	8.6%			
PURSUES INTERESTS							
Supports	71	35.5%	38	19.0%	0.29*	1	0.59
Interferes	55	27.5%	36	18.0%			
APPRAISES WORK EXPECTATIONS							
Supports	107	54.0%	51	25.8%	6.14*	1	0.01
Interferes	18	9.1%	22	11.1%			

Characteristic	attained employment/education		did not attain employment/education		Pearson's Chi-square test. (*with Yates Correction)		
	n	%	n	%	χ^2	df	p
INFLUENCE OF OTHER ROLES							
Supports	97	48.0%	49	24.3%	1.69*	1	0.19
Interferes	31	15.4%	25	12.4%			
WORK HABITS							
Supports	92	46.7%	37	18.8%	7.88*	1	0.01
Interferes	34	17.3%	34	17.3%			
DAILY ROUTINES							
Supports	57	28.4%	18	9.0%	7.02*	1	0.01
Interferes	71	35.3%	55	27.4%			
ADAPTS ROUTINES TO MINIMIZE DIFFICULTIES							
Supports	78	38.8%	22	11.0%	16.43*	1	0.0001
Interferes	50	24.9%	51	25.4%			
PERCEPTION OF PHYSICAL WORK SETTING							
Supports	87	47.8%	47	25.8%	0.00*	1	0.97
Interferes	32	17.6%	16	8.8%			
PERCEPTION OF FAMILY AND PEERS							
Supports	98	52.7%	44	23.7%	1.72*	1	0.19
Interferes	25	13.4%	19	10.2%			
PERCEPTION OF BOSS AND/OR COMPANY							
Supports	49	34.0%	29	20.1%	0.01*	1	0.91
Interferes	43	29.9%	23	16.0%			
PERCEPTION OF CO-WORKERS							
Supports	59	43.1%	30	21.9%	0.00*	1	1.00
Interferes	32	23.4%	16	11.7%			

6.7.2.3 Odds ratios of independent binary variables

As a further step (Hosmer et al. 2013), odds ratios with 95% confidence intervals were calculated for all variables. Variables with multiple factors and continuous variables were collapsed into binary variables for this purpose:

- Age was categorised into those 25 or under, compared to those older than 25.
- Diagnosis was collapsed into F20 diagnosis compared to all others; and F30 diagnosis compared to all others
- SMID most deprived quintile compared to less deprived areas
- SMID least deprived quintile compared to more deprived areas
- Those who did not obtain school qualifications compared to others

Odds ratios were conducted to appraise the likelihood of obtaining employment or educational opportunity (Table 6.6), and the likelihood of not attaining vocational goals (Table 6.7). Those items in bold had confidence intervals which did not cross 1 and are therefore considered significant.

Table 6.6 All demographics and WRI collapsed into binary variable: Odds ratios of obtaining employment/education

<i>likelihood of attaining employment if...</i>	<i>Odds Ratio</i>	<i>95% Confidence Intervals</i>	
male rather than female	1.24	0.66	2.32
25 or under compared to older	2.60	0.97	8.20
other ethnic group compared to white	1.43	0.44	5.39
most deprived compared to less deprived living situation	1.73	0.79	3.76
least deprived living situation compared to more deprived	2.43	1.20	5.13
ICD all other diagnosis compared to diagnosis of F2 schizophrenia....	1.47	0.80	2.75
ICD diagnosis of F3 mood.... compared to all other diagnosis	1.73	0.89	3.47
married/de facto compared to single	1.63	0.68	4.26
living with others compared to living alone	1.22	0.66	2.27
any school or further education qualification compared to no school qualification	2.95	0.99	9.45
no previous employment compared to those with previous employment history	1.47	0.51	4.13
ASSESSES ABILITIES AND LIMITATIONS Supports v's interferes	1.86	0.97	3.58
RESPONSIBILITY Supports v's interferes	2.30	1.24	4.33
COMMITMENT Supports v's interferes	2.92	1.18	7.44
WORK GOALS Supports v's interferes	2.74	1.46	5.19
ENJOYS WORK Supports v's interferes	0.95	0.45	1.97
PURSUES Supports v's interferes	1.22	0.66	2.26
APPRAISES WORK EXPECTATIONS Supports v's interferes	2.55	1.19	5.54
INFLUENCE OF OTHER ROLES Supports v's interferes	1.59	0.81	3.13
WORK HABITS Supports v's interferes	2.47	1.29	4.78
WORK ROUTINES Supports v's interferes	2.44	1.25	4.93
ADAPTS Supports v's interferes	3.59	1.88	7.03
PHYSICAL ENVIRONMENT Supports v's interferes	0.93	0.43	1.95
FAMILY AND PEERS Supports v's interferes	1.69	0.79	3.57
BOSS Supports v's interferes	0.90	0.43	1.89
CO-WORKERS Supports v's interferes	0.98	0.43	2.19

6.8 CONSULTATION WITH CLINICIANS

At this point, a consultation took place with clinicians working in the VRS. This consultation group included each of the three expert therapists, three of the experienced therapists, and one novice.

6.8.1 Agreement with significant factors

6.8.1.1 Age

The group recognised that only small numbers of young people accessed the VRS and felt this was a problem to be addressed. Younger people tended not to have been jaded by bad experiences in the workplace and had not yet had the time to become hopeless; whereas losing hope was a factor for older people. In addition, the clinicians highlighted that younger people could benefit from government structures for those Not in Employment or Education (NEETS) (Scottish Government 2014).

6.8.1.2 Least deprived areas

The group noted that those living in the least deprived areas were more likely to have access to technology to support accessing employment and education: such as smartphones, internet access and computers. Also, support networks in the local community may present more job opportunities.

6.8.1.3 Did not attain school qualifications

This factor generated discussion: the timeframe of educational attainment was considered vital. If it was recent, it might enable someone to feel hopeful; but if more historical, hope may be lost. Therapists also shared that clients may perceive that previous success could be replicated by improving self-efficacy.

6.8.1.4 Takes responsibility

Therapists considered this an important item in clinical assessment. Perceiving others to be responsible for lack of productive life roles is very difficult to challenge. Those who see themselves as accountable for change are easier to partner within therapy. A relationship was also recognised between those who take responsibility and are able to structure their habits and routines towards vocational pursuits.

6.8.1.5 Appraises work expectations

The ability to understand the basics of working life was considered an important item at clinical assessment.

6.8.1.6 Daily routines

Therapists agreed that the statistical significance was clinically significant.

6.8.1.7 Adapts routines to minimize difficulties

Again, therapists considered this to be a clinically relevant item, and were unsurprised it was statistically significant.

6.8.1.8 Commitment to work

This item was felt to be a prerequisite for engaging in VRS. Those who are given a rating of 'interferes' tend to be externally motivated by others who think the individual client should have a vocational role, while the individual themselves feel ambivalent. Therapists recognised that people rated as 'interferes' on this item might get work but not sustain employment for long.

6.8.1.9 Work-related goals

While in agreement with inclusion, therapists did not consider this to be such an important item: particularly among clients who had never worked, or for whom this was long in the past. Therapists shared that clients often seemed to struggle with the concept of goalsetting initially; perhaps this is a skill built in employment or during VRS intervention.

6.8.2 Agreement with the insignificance of variables

6.8.2.1 Enjoys work

This item was felt to be a prerequisite for clients to engage with VRS.

6.8.2.2 Expectation of Success

Higher ratings in this item was felt to be clinically helpful in keeping clients motivated and engaged, even when attaining goals is challenging and prolonged - but would not necessarily predict success.

6.8.2.3 Perceptions of the physical environment, co-workers and boss

These items were perceived to lack relevance to those who had been unemployed for a prolonged period: the majority of people accessing the VRS.

6.8.2.4 Pursue interests

This item was seen as challenging to rate, and not considered clinically important for this population.

6.8.3 Mismatching significance; not clinically important

6.8.3.1 Assesses abilities and limitations

The group were split in their views on this item. Some felt that clients tended to underestimate their abilities, and expressions of confidence were often mere bravado; while others felt clients could tend towards unrealistic overestimation of abilities. The group agreed this was a challenging item to rate, and for clients to appraise when they had been unemployed for a prolonged period.

This item was included in the early model but disregarded in subsequent iterations.

6.8.3.2 Work habits

The therapists all regularly found this item a challenge to rate in a population who tended to have been out of employment for a prolonged period, and did not find this clinically important.

This item was included in the early model but disregarded in subsequent iterations.

6.8.4 Mismatching significance: clinically important.

6.8.4.1 Family and peers

This was felt to be a clinically significant item; support networks can be highly motivating, championing and encouraging an unconfident person. They may also help in securing opportunities. However, occasionally supporters may be overly involved, and this can be problematic. The group were interested to find if this item was important, as sharing findings with family members and professionals may enlist greater appropriate support.

This item was reviewed but the levels of missing data required its exclusion from models. A larger sample size in future research would allow for investigation of this item.

6.8.4.2 Influence of other roles

For a few therapists, this item was thought to be important; other roles may take up considerable time and be a barrier to achieving vocational goals. The group also considered that this might be a barrier to accessing VRS services for some individuals.

As suggested by the clinicians, this item may be relevant for a small proportion of people. A larger sample size in future research would allow investigation.

6.9 UNIVARIATE ANALYSIS SIGNIFICANT FINDINGS

The following items were all found to be significant in univariate analysis and therefore considered for model building in multiple logistic regression.

- Continuous variable
 - Age (Figure 6.11 – has binary variable ≤ 25 yrs vs older)
- Binary categorical variables
 - Least deprived quintile compared to other addresses (Figure 6.12)
 - Did not obtain school qualifications compared to others (Figure 6.13)
 - Takes responsibility (Figure 6.14)
 - Appraises work expectations (Figure 6.15)
 - Daily routines (Figure 6.16)
 - Adapts routines to minimize difficulties (Figure 6.17)
 - Commitment to work (Figure 6.18)
 - Work-related goals (Figure 6.19)

Mosaic plots were generated for each of these variables to understand the influence on outcome (Figures 6.11-6.19). Mosaic plots are a graphical method of showing the values (cell frequencies) in a contingency table, cross-classified by one or more 'factors' (Friendly & Meyer 2015) in this case outcome. In Figure 6.11, the widths of the rectangles represent the proportion of people aged 25 and under, and those who are older. The height of the rectangles represents the proportion of people within each outcome group. The area of each rectangle is proportional to the frequency of each combined age and outcome group. Each of the areas of the four rectangles represents the numbers in the body of the contingency Tables 6.4 and 6.5.

Figure 6.11 Mosaic plot of frequencies outcome by age

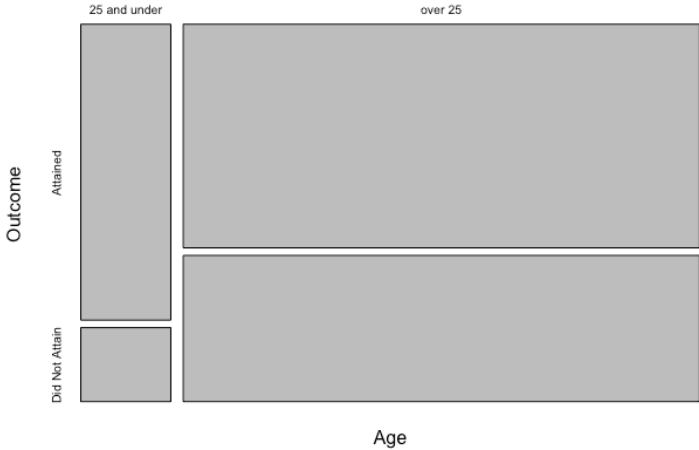


Figure 6.12 Mosaic plot of frequencies outcome by deprivation

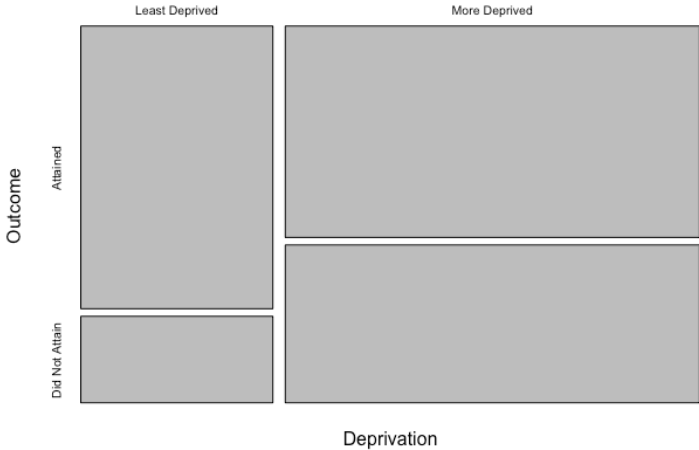


Figure 6.13 Mosaic plot of frequencies outcome by education

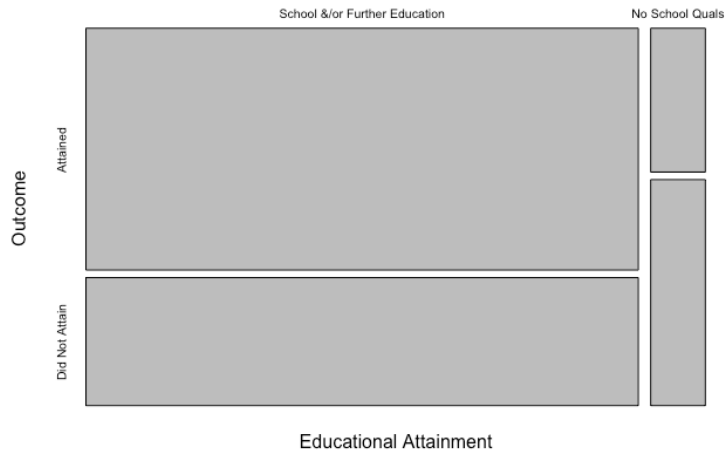


Figure 6.14 Mosaic plot of frequencies outcome by responsibility

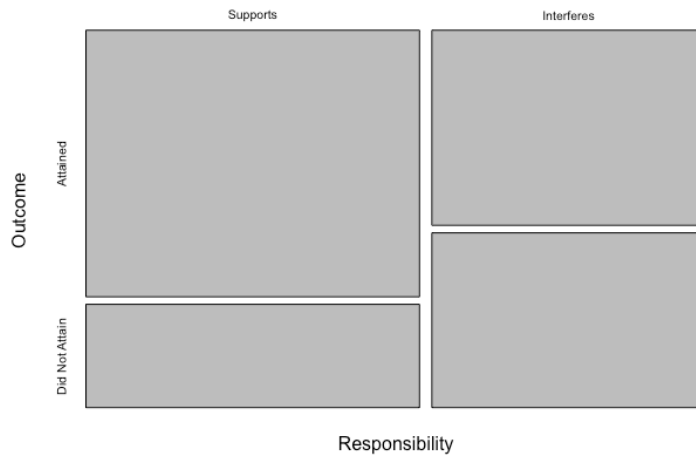


Figure 6.15 Mosaic plot of frequencies outcome by appraises

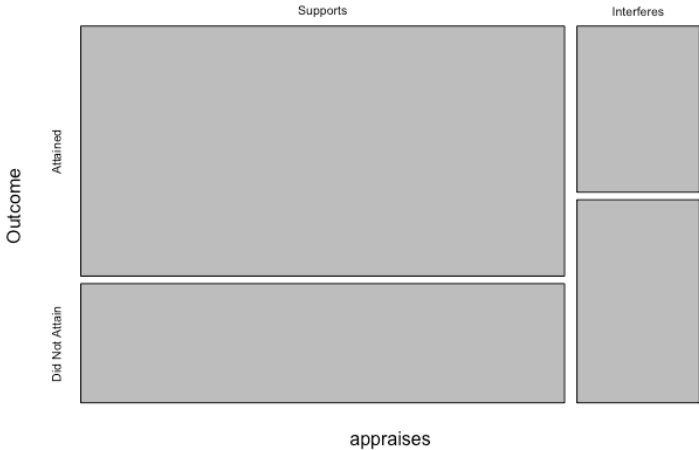


Figure 6.16 Mosaic plot of frequencies outcome by routines

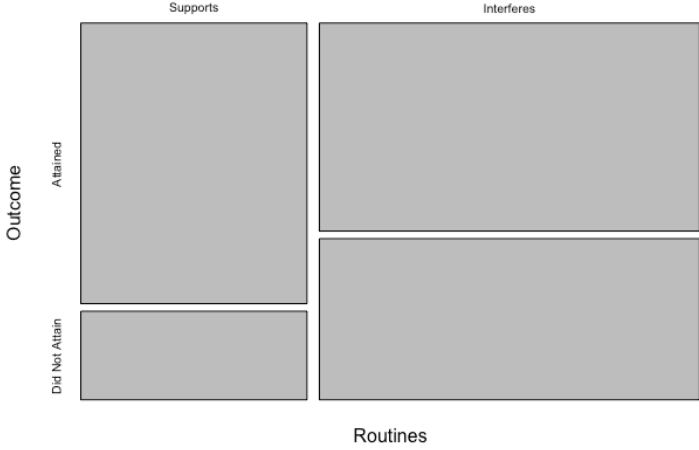


Figure 6.17 Mosaic plot of frequencies outcome by adapts

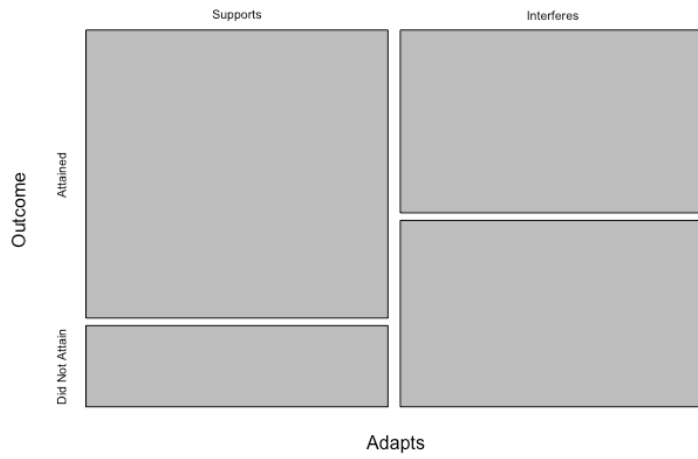


Figure 6.18 Mosaic plot of frequencies outcome by commitment

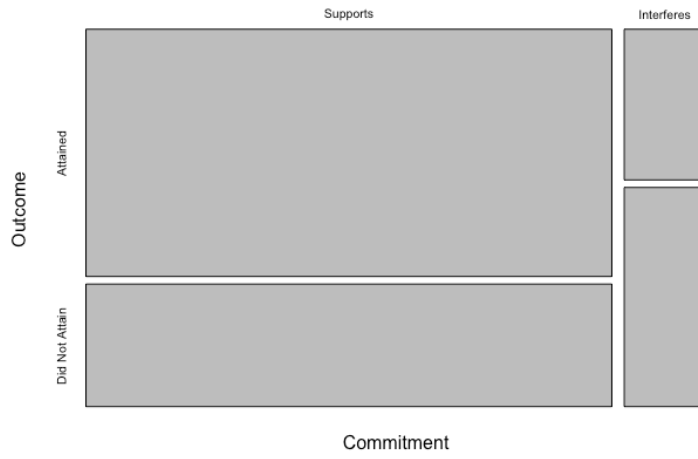
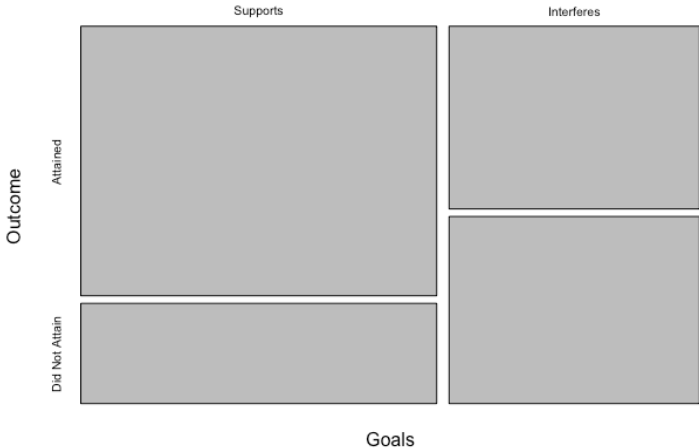


Figure 6.19 Mosaic plot of frequencies outcome by goals



6.10 MLR – ATTAINING PAID EMPLOYMENT OR EDUCATIONAL OPPORTUNITY

An appraisal was conducted of the dataset categories grouped by outcome variable ‘did attain’ (n=128) and ‘did not attain’ (n=74). The inclusion of missing data will cause models to fail in multiple logistic regression (Field et al. 2012). Therefore, any case with missing data across any of the variables, identified for inclusion through the univariate analysis, were excluded from this stage of the investigation. Exclusions resulted in:

- The outcome group for obtained employment or education reduced to 119
- The outcome group for did not attain vocational goal reduced to 71

6.10.1 Model 1

It must be acknowledged that the multiple logistic regression modelling is limited by the small numbers retained in the ‘did not attain’ the outcome group. If the lenient guideline of 10 cases per variable is observed, a maximum of 7 predictor variables can be entered: reflecting the small sample of only 71 in the ‘did not attain’ outcome group. This guideline was applied to test a first model (Table 6.7); seven variables

identified as most significant in univariate analysis and clinical consultation were included.

Table 6.7 Obtaining or not obtaining employment/education Model 1

	<i>b (SE)</i>	<i>z</i>	<i>95% CI for Odds Ratio</i>		
			<i>Lower</i>	<i>Odds Ratio</i>	<i>Upper</i>
Constant	-0.27 (0.71)		0.18	0.76	3.08
Adapts Routines to Minimize Difficulties	-1.37 (0.39)	***	0.12	0.25	0.54
Work-Related Goals	-0.91 (0.37)	*	0.19	0.40	0.83
Takes Responsibility	-0.19 (0.39)		0.39	0.82	1.79
Daily Routine	-0.03 (0.42)		0.43	0.97	2.22
Living in Least Deprived Area	0.74 (0.29)	**	1.22	2.10	3.76
Appraises Work Expectations	-0.37 (0.44)		0.29	0.69	1.64
Age (Continuous Variable)	0.03 (0.02)	.	0.99	1.03	1.06

$R^2 = 0.18$ (Hosmer-Lemeshow), 0.20 (Cox-Snell), 0.28 (Nagelkerke)

Model $\chi^2(7) = 44.25$ $p < .001$

. $p < 0.1$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Variables in Model 1 were tested for independence using the Durbin-Watson Test (DWT). Statistic= 1.78 $p > 0.05$, suggesting variables are independent. The average VIF=1.19 with a range from 1.02-1.33; therefore, we can assume multicollinearity was not present. Three cases (1.5%) were identified as outliers, but errors were less than 2.5 in all cases and therefore do not reach criteria for inadequate representation. A Cook's influence level of only 0.03 in all instances demonstrate cases have little influence over the model; leverage in each case is less than the mean. All cases also fall within the acceptable range of co-variance. This model was able to predict with 30% accuracy on this sample (Table 6.8). It was not possible to test accuracy of the model on a different sample due to limitation of the sample size, so this may not represent true accuracy of the model. So many variables make a model less clinically useful, so a second iteration was constructed.

Table 6.8 Model 1: Accuracy of predictions on this sample

	FALSE	TRUE	Percentage accurately predicted
Attained	101	18	15%
Did Not Attain	34	37	52%
TOTAL ACCURATE %			29%

6.10.2 Model 2

Insignificant variables in model 1 were removed, leaving just three variables: 'Adapts Routines to Minimize Difficulties', 'Work-Related Goals', and 'Living in the Least Deprived Area'. Results of model 2 are set out in Table 6.9.

Table 6.9 Obtaining or not obtaining employment/education Model 2

		<i>b (SE)</i>	<i>95% CI for Odds Ratio</i>		
			<i>Lower</i>	<i>Odds Ratio</i>	<i>Upper</i>
Constant		0.49 (0.28)	. 0.94	1.64	2.88
Adapts Routines to Minimize Difficulties		-1.49 (0.35) ***	0.11	0.22	0.43
Work-Related Goals		-1.03 (0.35) **	0.17	0.36	0.69
Living in Least Deprived Area		0.86 (0.28) **	1.40	2.37	4.19

$R^2 = 0.16$ (Hosmer-Lemeshow), 0.19(Cox-Snell), 0.26 (Nagelkerke)

Model $\chi^2(3) = 39.69$ $p < .001$

. $p < 0.1$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Fewer variables may be more helpful in making a model clinically relevant (Stoltzfus 2011). However, pseudo r^2 is less in model 2. Variables in model 2 were again tested for independence: DWT statistic= 1.76 $p > 0.05$, suggesting variables are independent. The average VIF=1.05 with a narrow range from 1.03-1.08; therefore, we can assume multicollinearity was not present. Three cases (1%) were identified as outliers to model 2. Errors for all 3 cases were identical (2.34); and at less than 2.5, did not reach the criteria for poor representation. A Cook's influence level of only 0.05 in all cases

demonstrated they have little influence over the model. However, leverage was identified at 0.13, just over twice the mean of 0.06. Additionally, cases fell just outside (0.93) the acceptable range of covariance (0.94-1.06).

This model was able to predict with 33% accuracy on this sample (Table 6.10). It was not possible to test accuracy of the model on a different sample due to limitation of the sample size. Outliers were identified and inspected; one case had never experienced any employment, and another scored very low ('strongly interferes') on habits. Both these features may explain the outlying. Outliers were removed, and the model re-examined.

Table 6.10 Model 2: Accuracy of predictions on this sample

	FALSE	TRUE	Percentage accurately predicted
Attained	95	24	20%
Did Not Attain	32	39	55%
TOTAL ACCURATE %			33%

6.10.3 Model 2a

Results of model 2a are included in Table 6.11. As would be expected, pseudo r2 improved in model 2a; all tests performed confirmed independence of variables, absence of multicollinearity and no outlying cases. Removal of cases increased the percentage accuracy of the model (Table 6.12), with the limitations previously stated.

Table 6.11 Obtaining or not obtaining employment/education Model 2a (excluding misfit cases 75, 11, 139).

	<i>b (SE)</i>		<i>95% CI for Odds Ratio</i>		
			<i>Lower</i>	<i>Odds Ratio</i>	<i>Upper</i>
Constant	0.55 (0.30)	.	0.98	1.74	3.16
Adapts Routines to Minimize Difficulties	-1.79 (0.37)	***	0.08	0.16	0.34
Work-Related Goals	-1.29 (0.37)	***	0.13	0.27	0.56
Living in Least Deprived Area	1.20 (0.31)	***	1.85	3.30	6.27

$R^2 = 0.21$ (Hosmer-Lemeshow), 0.23(Cox-Snell), 0.33 (Nagelkerke)

Model $\chi^2(3) = 51.89 p < .001$

. $p < 0.1$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 6.12 Model 2a: Accuracy of predictions on this sample

	FALSE	TRUE	Percentage accurately predicted
Attained	95	24	20%
Did Not Attain	29	39	57%
TOTAL ACCURATE %			34%

6.10.4 Comparing Models attaining employment or education

In Model 1, which included all univariate analysis, significant variables were applied to the data with excluded cases, then compared to Model 2a: which excluded outliers and only included variables with significance for Model 1 of $p < 0.05$. The models were compared calculating the difference in deviance. A chi-square distribution found $\chi^2(7) = 3.60 p = 0.46$. There is no evidence to reject the null hypothesis that the nested model is as good as the full model; therefore, the simpler model is preferred.

6.10.5 Interpretation of Model attaining employment or education

The effect of each predictor variable ('adapts routines to minimize difficulties'; 'work related goals'; 'living in area of least deprivation') is significant on the outcome variable. The direction of their influence varies. A rating of 'interferes' in either of the WRI items will decrease the odds of obtaining employment or educational opportunity, while living in a less deprived area improves the odds of attaining vocational goals.

An 'interfere' rating in 'adapts routines' reduces the likelihood of goal attainment by 84%, when accompanied by a poor rating 'in work related goals' and living in a more affluent area.

An 'interferes' score on 'work related goals' reduces the likelihood of goal attainment by 73%, when in the context of residing in an affluent area and an accompanying poor rating in 'adapts routines'.

The effect of living in an area defined as in the least deprived quintile increases odds of obtaining employment or education by 230%, despite low scores in both 'adapts routines' and 'work related goals'.

6.11 WHO ACHIEVES GOAL WITHIN NINE MONTHS AND WHO TAKES LONGER

The next stage of analysis focused on those who did obtain employment or an educational opportunity (n=128). This group was divided by a new dependent variable: those who obtained employment within nine months (less than 9 mths) (n=68); and those who took a more extended period (more than 9 mths) (n=60).

6.11.1 Demographic Variables

The reduced sample size limited the number of variables available for analysis, maintaining a minimum number of five expected occurrences in each contingency table cell (Field et al. 2012). Remaining demographic variables available for analysis are reported in Table 6.13. The univariate analysis protocol was followed again. Chi-square tests and odds ratios are reported for each variable. Neither level of

deprivation or age reached the alpha level of significance ($p < 0.05$). Within this analysis, a different variable related to social situation transpired as significant: living with others $\chi^2 (1) = 8.10$, $p < 0.05$.

6.11.2 Psychosocial categorical variables

The four environmental variables were excluded from further analysis due to high rates of missing data. Analysis of all other WRI variables is reported in Table 6.14. Only two items, 'adapts routines to minimise difficulties', and 'influence of other roles' were significant in the univariate analysis.

6.11.3 Odds Ratios

Odds ratios with 95% confidence intervals are reported in Table 6.15. Three variables previously identified as significant – 'living with others rather than alone'; 'adapts routines to minimise difficulties'; and 'influence of other roles' - all demonstrated influence on the outcome, which is unlikely to be due to chance.

Table 6.13 Comparing those obtaining employment/education in less or more than 9 months: Demographic data: Contingency tables and tests of association

Characteristic	less than 9mths		more than 9mths		Pearson's Chi-square test. (*with Yates Correction)		
	n	%	n	%	χ^2	df	p
GENDER							
male	39	30.5%	42	32.8%	1.68	1	0.19
female	29	22.7%	18	14.1%			
AGE CONTINUOUS VARIABLE							
					Two Sample t-test		
					<i>t</i>	<i>df</i>	<i>p</i>
					-1.41	126	0.16
SMID (BINARY 2)							
Least deprived quintile 5	27	21.1%	22	17.2%	0.03	1	0.86
More deprived quintiles 1-4	41	32.0%	38	29.7%			
LIVING SITUATION							
With others	42	33.3%	22	17.5%	8.10	1	0.004
Alone	24	19.1%	38	30.2%			

Table 6.14 Comparing those obtaining employment in less or more than 9 months: WRI binary variables data: Contingency tables and tests of association

Characteristic	less than 9mths		more than 9mths		Pearson's Chi-square test. (*with Yates Correction)		
	n	%	n	%	χ^2	df	p
ASSESSES ABILITIES AND LIMITATIONS							
Supports	49	38.6%	44	34.7%	0.00	1	1.00
Interferes	18	14.2%	16	12.6%			
EXPECTATION OF SUCCESS IN WORK							
Supports	38	29.7%	35	27.3%	0.01	1	0.92
Interferes	30	23.4%	25	19.5%			
TAKES RESPONSIBILITY							
Supports	41	32.0%	39	30.5%	0.13	1	0.71
Interferes	27	21.1%	21	16.4%			
COMMITMENT TO WORK							
Supports	62	48.4%	55	43.0%	0.00	1	1.00
Interferes	6	4.7%	5	3.9%			
WORK RELATED GOALS							
Supports	49	38.6%	37	29.1%	1.42	1	0.23
Interferes	18	14.2%	23	18.1%			
ENJOYS WORK							
Supports	49	39.5%	45	36.3%	0.05	1	0.82
Interferes	17	13.7%	13	10.5%			
PURSUES INTERESTS							
Supports	34	27.0%	37	29.4%	0.94	1	0.33
Interferes	32	25.4%	23	18.3%			

Characteristic	less than 9mths		more than 9mths		Pearson's Chi-square test. (*with Yates Correction)		
	n	%	n	%	χ^2	df	p
APPRAISES WORK EXPECTATIONS							
Supports	57	45.6%	50	40.0%	0.13	1	0.72
Interferes	11	8.8%	7	5.6%			
INFLUENCE OF OTHER ROLES							
Supports	57	44.5%	40	31.3%	4.22	1	0.04
Interferes	11	8.6%	20	15.6%			
WORK HABITS							
Supports	50	39.7%	42	33.3%	0	1	1.00
Interferes	18	14.3%	16	12.7%			
WORK ROUTINES							
Supports	27	21.1%	30	23.4%	0.98	1	0.32
Interferes	41	32.0%	30	23.4%			
ADAPTS ROUTINES TO MINIMIZE DIFFICULTIES							
Supports	35	27.3%	43	33.6%	4.65	1	0.03
Interferes	33	25.8%	17	13.3%			

Table 6.15 Those obtaining employment/education: Demographic/WRI collapsed into binary variable: Odds ratios of obtaining employment/education within 9 months or longer

<i>likelihood of attaining employment in less than 9mths compared to longer</i>	<i>Odds Ratio</i>	<i>95% Confidence Intervals</i>	
male rather than female	0.58	0.26	1.27
least deprived living situation compared to more deprived	1.14	0.52	2.48
living with others compared to living alone	2.99	1.38	6.67
ASSESSES ABILITIES AND LIMITATIONS Supports v's interferes	0.99	0.42	2.34
RESPONSIBILITY Supports v's interferes	0.82	0.37	1.78
COMMITMENT Supports v's interferes	0.94	0.21	3.93
WORK GOALS Supports v's interferes	1.69	0.75	3.85
ENJOYS WORK Supports v's interferes	0.83	0.33	2.06
PURSUES Supports v's interferes	0.66	0.31	1.42
APPRAISES WORK EXPECTATIONS Supports v's interferes	0.73	0.22	2.24
INFLUENCE OF OTHER ROLES Supports v's interferes	2.57	1.04	6.65
WORK HABITS Supports v's interferes	1.06	0.44	2.50
WORK ROUTINES Supports v's interferes	0.66	0.31	1.41
ADAPTS Supports v's interferes	0.42	0.19	0.93

6.12 MLR – TIME TO ATTAIN EMPLOYMENT / EDUCATION

An appraisal was conducted of the dataset categories grouped by outcome variable 'less than 9 mths' (n=68) and 'more than 9 mths' (n=60). The inclusion of missing data will cause models to fail in multiple logistic regression (Field et al. 2012): therefore, any case with missing data across any of the variables, identified for inclusion through the univariate analysis, were excluded from this stage of the investigation. Exclusions resulted in:

- The outcome group, 'less than 9 mths' reduced to 66
- The outcome group, 'more than 9 mths' reduced to 60

6.12.1 Model 3

Multiple logistic regression modelling is limited by the small numbers retained in the 'more than 9 mths' outcome group. If the lenient guideline of 10 cases per variable is observed, a maximum of 6 predictor variables can be entered to predict the outcome. This guideline was applied to test a first model (Table 6.16); only five variables identified as most significant in univariate analysis were included. Two variables, age and gender, which did not reach traditionally accepted levels of significance, but for which univariate analysis yields a p-value <0.2 were included (Hosmer et al. 2013). These variables, while not significant alone, may be a confounding factor in multiple logistic regression. No other variable reached this level of minimal significance.

Table 6.16 Attaining employment in more than 9 months: Model 3

	<i>b (SE)</i>	<i>95% CI for Odds Ratio</i>		
		<i>Lower</i>	<i>Odds Ratio</i>	<i>Upper</i>
Constant	0.21 (0.92)	0.20	1.24	1.79
Adapts Routines to Minimize Difficulties	1.25 (0.44) **	1.51	3.48	8.57
Influence of other roles	-1.21 (0.53) *	0.10	0.29	0.80
Living alone	-0.86 (0.43)	0.18	0.42	0.97
Age (Continuous Variable)	0.01 (0.02)	0.97	1.01	1.05
Gender	-0.45 (0.41)	0.28	0.64	1.42

$R^2 = 0.14$ (Hosmer-Lemeshow), 0.12 (Cox-Snell), 0.19 (Nagelkerke)

Model $\chi^2(5) = 23.55$ $p < .001$

. $p < 0.1$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Variables in Model 3 were tested for independence using the Durbin-Watson Test (DWT). Statistic= 1.92 $p > 0.05$, suggesting variables are independent. The average VIF=1.12 with a range from 0.84-1.19; therefore, we can assume multicollinearity was not present. Two cases (1.5%) were identified as outliers, but the error was less than 2.5 and did not reach criteria for inadequate representation. A Cook's influence level of only 0.04 and 0.07 demonstrates the case has little influence over the model, and leverage is around the mean. The cases also fell within the acceptable range of covariance. This model was able to predict with 40% accuracy on this sample (Table 6.17), but the interpretation of this should be cautious in the absence of an independent sample.

Table 6.17 Model 3: Accuracy of predictions on this sample

	FALSE	TRUE	Percentage accurately predicted
Less than 9mths	49	17	26%
More than 9mths	26	34	57%
TOTAL ACCURATE			40%

6.12.2 Model 2

Insignificant variables in Model 3 were removed, leaving just two variables: 'Adapts Routines to Minimize Difficulties', and Influence of Other Roles'. Results of Model 4 are included in Table 6.18. The fewer variable may be more helpful in making the model clinically relevant (Stoltzfus 2011). The pseudo r2 is equivalent in both Models 3 and 4.

Table 6.18 Obtaining employment in more than 9 months: Model 2

	<i>b (SE)</i>		<i>95% CI for Odds Ratio</i>		
			<i>Lower</i>	<i>Odds Ratio</i>	<i>Upper</i>
Constant	0.32 (0.43)		0.59	1.39	3.40
Adapts Routines to Minimize Difficulties	1.21 (0.42)	**	1.50	3.35	7.98
Influence of Other Roles	-1.51 (0.50)	**	0.08	0.22	0.56

$R^2 = 0.09$ (Hosmer-Lemeshow), 0.08 (Cox-Snell), 0.13 (Nagelkerke)

Model $\chi^2(2) = 15.92$ $p < .001$

. $p < 0.1$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Variables in Model 2 were again tested for independence. DWT statistic= 1.97 $p > 0.05$, suggesting variables are independent. The VIF for both items was 1.13; therefore, we can assume multicollinearity was not present. No cases were identified as outliers. This model was able to predict with 74% accuracy on this sample (Table 6.19). It was not possible to test accuracy of the model on a different sample, due to limitation of the sample size.

Table 6.19 Model 2: Accuracy of predictions on this sample

	FALSE	TRUE	Percentage accurately predicted
Attained	25	41	62%
Did Not Attain	8	52	86%
TOTAL ACCURATE			74%

6.12.3 Comparing models time to attain employment/education

Model 3 and Model 4 were compared using a likelihood ration test following a chi-square distribution $\chi^2(3) = 7.62$ $p < 0.05$. There is no evidence to reject the null hypothesis that the nested model is as good as the full model. Therefore, the simpler model is preferred.

6.12.4 Interpretation of model time to attain employment/education

The effect of both predictor variables ('adapts routines to minimize difficulties', and 'the influence of other roles') is significant on the outcome variable. The direction of their influence is opposing. This varying influence is illustrated in the mosaic plots (Figures 6.20 and 6.21). Those who are rated 'supports' in 'adapts routines' are more likely to take longer to obtain employment or education opportunity: 235% more likely to take more than nine months. However, being rated as 'supports' in 'influence of other roles' makes it more likely an individual will obtain employment quicker; and individuals are 78% less likely to be in the group taking nine months or longer. This phenomenon will be considered in the discussion.

Figure 6.20 Mosaic plot of frequencies: Time to goal attainment by adapts

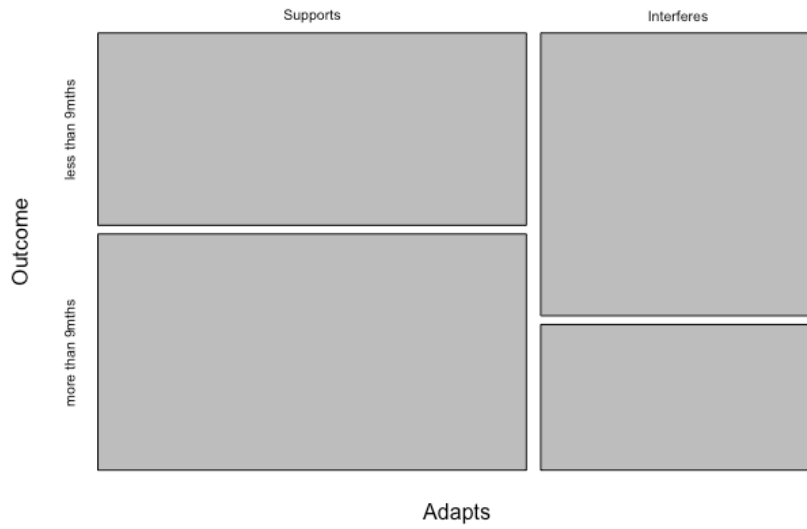
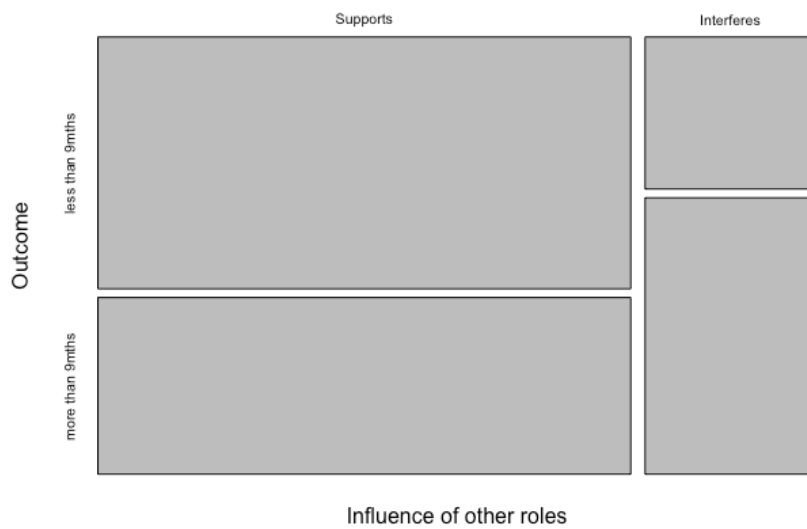


Figure 6.21 Mosaic plot of frequencies: Time to goal attainment by influence of other roles



CHAPTER 7: DISCUSSION AND CONCLUSIONS

7.1 EFFICIENT USE OF EFFICACIOUS INTERVENTIONS

Although all people have a fundamental human right to work and fair pay (United Nations 1948), employment and education opportunities are often limited for people with CMHP (Marwaha et al. 2007; Salkever et al. 2007; Waghorn et al. 2009; Perkins & Farmer 2009). This study has conducted a critical systematic review of the literature, including a meta-analysis. The study has established the efficacy of IPS with good fidelity to principles (Bond et al. 2011) to support people with CMHP in obtaining employment or education.

Contemporary research is looking at both delivering IPS in an efficient time limited manner 'IPS Lite' , while retaining outcomes (Burns et al. 2015; Whitworth 2018); and how to augment the intervention to meet the more complex needs of those whose vocational aspirations are not currently supported by IPS (Dewa et al 2018; Metcalfe et al 2018). Both these streams of research in the future would allow stratifying of individuals into a simple efficient IPS programme and a more complex augmented programme of IPS. This study has provided new knowledge to support stratification (Moons et al 2012) of interventions by increasing knowledge about who is likely to benefit from each approach.

7.2 PSYCHOSOCIAL PREDICTORS

This study initially reviewed the abundance of literature investigating predictors of employment outcomes, identifying that although psychosocial variables are recognised as important factors in supporting attainment of vocational goals, further research is required.

In previous research, psychosocial factors have been poorly defined and investigated as individual constructs in an non-theoretical manner (Wewiorski & Fabian 2004). Research on return to work from sick leave has considered psychosocial variables, defined by the MOHO (Taylor 2017) and WRI (Braveman et al. 2005) as inter-related

constructs. This has proved fruitful in understanding predictive properties of the WRI with a different population (Ekbladh et al. 2010b).

The relevance of occupational therapy theory and practice as a potential augmentation to IPS - in particular, MOHO and the WRI - as adopted in the study context has been established within the literature review. This study intended to describe the relationship between psychosocial factors on employment outcomes in a population of people with complex mental health problems who are unemployed. The research adopted a quantitative approach to understanding two relationships. Can psychosocial variables predict who will obtain employment or education? Can psychosocial variables predict who will obtain employment or education within 9 months, and who will take an extended period of time?

This chapter will now consider the findings, focusing on this study's unique contribution to knowledge - which concerns the predictors of success in an IPS programme for people experiencing complex mental health problems who are seeking employment.

7.3 PREDICTIVE ABILITIES OF PSYCHOSOCIAL VARIABLES

The first research question explored if psychosocial variables predicted obtainment of employment or education. Three demographic or social factors were identified in univariate analysis as correlated to outcomes: age; living in a less deprived area; educational attainment. Several WRI items were also associated with outcomes: volitional items; taking responsibility; commitment to work; work-related goals. Habituation items were: appraises work expectations; work habits; daily routines; adapts routines to minimise difficulties. No environmental items were identified, but this may have been due to high levels of missing data. In general, the clinicians who were consulted agreed that the statistical significance was clinically important.

Assesses abilities and limitations almost reached levels of statistical significance, but consultation with the clinicians generated opposing views. Some therapists had experience of clients over-estimating their abilities. Similarly, in Lohoss et al. (2012), unrealistic appraisal of abilities, associated with diminished insight among people with complex mental health problems, was offered as an explanation for assessing abilities and limitations being the only misfit item on the otherwise unidimensional scale of the

WRI. This explanation is worthy of consideration, as the item has not misfitted on any of the other five Rasch analysis studies, conducted with other populations.

Lohoss et al. (2012) was the only study limited to a population experiencing complex mental health problems. In converse to the Lohoss et al (2012) explanation, clinicians in this study noted that many clients under-estimated their abilities due to poor self-efficacy. Clinicians also felt that prolonged absence of a productive life role made it very difficult for clients to appraise their own skills, with a lack of realistic experiences to reflect upon. This explanation corresponds to research into predictors of successful outcomes in IPS: which has found recency of employment experience (Burke-Miller et al. 2006; Corbière et al. 2011) improves likelihood of employment.

Work habits was another item considered challenging to rate. Based on the verbal reports of clients who had been out of employment for a significant time or had no work experience, this item was left unrated and was, therefore, missing data for analysis. Assessed abilities and limitation and work habits were included in the early model for logistic regression, but excluded at the first iteration of backward stepwise regression.

7.3.1 Logistic Regression Models and their interpretation

Iterations of multiple logistic regression modelling resulted in a final model which included: 'Adapts routines to minimise difficulties'; 'work-related goals'; and 'living in an area of lesser deprivation'. Nagelkerke pseudo R² (0.33) suggests around a third of variance in outcome may be explained by this model. Odds ratio and significant statistics of each of these items demonstrate their important influence on the outcome when considered together. Individuals who were rated 'supports' or 'strongly supports' in both 'adapts routines to minimise difficulties' and 'work goals' were more likely to obtain employment. These ratings, combined with living in an area with low deprivation, increased chances of success in the IPS programme.

'Adapts routines to minimise difficulties' has consistently been one of the hardest items when the WRI has been investigated through Rasch analysis (Haglund et al. 1997; Velozo et al. 1999; Forsyth et al. 2006; Fenger & Kramer 2007; Köller et al. 2011; Lohss et al. 2012). 'Work Goals' is consistently one of the middle items on a scale from easy to hard items in the same Rasch analysis-based studies. The Lohoss

et al. (2012) study, with the most comparable population, found 'work goals' to be the fifth hardest item.

Living in an area of least deprivation had the most significant effect on the outcome. This is interesting and is a new finding, perhaps related to previous research on economic and political moderators of IPS outcomes (Catty et al. 2008; Metcalfe et al. 2018). Previous studies have found that contexts on national scale influence outcomes, through factors such as local employment rates, access to welfare benefits and employment rights. No research has considered such local factors as deprivation in the local postcode area. Clinicians considered that low levels of deprivation may be linked to factors which make it easier to find employment opportunities. Living within areas of low deprivation may be correlated with having established social networks which foster job opportunities with friends or family connections and having access to facilities and technologies which facilitate job searching.

It is worth noting that the city which is the context of the study is recognised as having relatively low deprivation: containing only one of the top ten areas of deprivation in the country, compared to five of ten regions of least deprivation (Scottish Government 2016).

7.3.2 Different predictive models for different outcomes

It is useful to compare the predictive model which emerged from this study with that established by Ekbladh et al (2010b) study on return to work from sick leave. Only 'adapts routines to minimise difficulties' was significant in Ekbladh's study on return to work, at all three timeframes (six, 12 and 24 months), but only in univariate analysis. It was not significant in the multiple logistic regression. Work-related goals were not significant at any level of analysis.

Items which were predictive in return to work from sick leave were 'expectation of success' and 'daily routines'. Expectation of success was not significant at any stage of analysis in this study, although clinicians considered it an essential factor in helping to maintain motivation and hope. Daily routines were significant at a univariate level; but were excluded from an early iteration of the regression model.

The complete separation of models predicting a return to work from sick leave and obtaining employment or education from a long-term absence of productive life role

is indicative of the very different circumstances and requirements of vocational rehabilitation programmes. This difference in important WRI items in return to work versus obtaining employment for the first time (in a long time or ever) perhaps reflects how psychosocial variables vary in terms of having an employment experience to reflect upon and return to as an outcome of the intervention. Those returning to work from sickness absence have a relatively recent experience of being in employment, before their absence. While for many people accessing IPS employment experience may be a significant time in the past, perhaps prior to onset of illness, or as in this study a small proportion may never have worked.

7.3.3 Difference between predicting attainment and profiling status

The univariate analysis in this study converges to some degree with studies that profile the working status of participants. 'Adapts routines to minimise difficulties' is identified as an essential factor in both qualitative (Ekbladh & Sandqvist 2015) and quantitative studies (Julian & Valente 2015a). Considering other important habituation items, only one, 'daily routines', is significant in all studies. Influence of other roles was significant in profiling injured veterans' work status (Julian & Valente 2015b). In this study, clinicians recognised influence of other roles as a clinically significant item, but it did not reach a level of significance in regression modelling for this research question, it was however significant in the second question investigating time taken to attain goal.

No volitional items were consistently significant across all studies. 'Taking responsibility' and 'commitment to work' were significant across this study and the veteran study (Julian & Valente 2015b). Appraising work expectations was significantly associated with the outcome at a univariate level in this study - but was not considered in either study profiling work status. This difference can perhaps be explained in the timing of assessment: in this study, the item was assessed before employment. For some, imagining expectations of a future job might be difficult and result in therapists giving a rating of 'interferes'. However, when we look at studies profiling whether a person is employed or not, those in employment all have the advantage of a job to reflect upon. So, a rating of 'supports' may be an outcome of being in work rather than a pre-requisite ability.

Similarly, work-related goals are predictive of outcomes at the univariate level and within logistic regression. It is, however, not helpful in profiling employment status. Having goals seems to be crucial in making a change towards being employed or in education; but is not explanatory of status.

Environmental items were all considered important in a qualitative investigation of factors supporting a return to work; but to date, their significance has not been established in any study. Clinicians in this study believe that a supportive network of friends or peers can be instrumental in assisting attaining vocational goals; however, this analysis was limited by the considerable amount of missing data across all environmental items.

7.4 PSYCHOSOCIAL VARIABLE PREDICTING TIME TO GOAL ATTAINMENT

The second research question explored if psychosocial variables were able to predict the timescale of obtaining employment or education. Previously significant items in Question 1 were not important in Question 2: neither age or level of deprivation was significant in predicting how long it might take to achieve a vocational goal. A different item, living with others, did transpire as important. Clinicians had considered having a supportive network as helpful in obtaining employment. While the WRI item, perception of family and peers, was not significant at any stage, the clinical importance of social support might in some way be reflected in the importance of this demographic variable in predicting the time taken to achieve the goal. It was not possible to include environmental WRI items in analysis relating to the second research question due to reduced sample size and the amount of missing data.

Two WRI items were significantly associated with the time taken to obtain employment or education. Adapts routines to minimise difficulties was again significant, along with the influence of other roles.

7.4.1 Logistic Regression Models and their interpretation

Fewer variables were included in the regression modelling to understand whether psychosocial items can predict time to outcome. While not reaching traditional levels

of significance, age did reach the minimal level of significance suggested by Hosmer (2012) of $p < 0.2$, so was included in an initial model containing two demographic variables: age and living with others; and two WRI items: adapts routines to minimise difficulties; and influence of other roles.

Results of the first model led to the exclusion of both demographic variables. The final model included: 'Adapts routines to minimise difficulties' and 'influence of other roles'. Nagelkerke pseudo R² (0.13) suggests around 13% of the variance in outcomes may be explained by this model. Odds ratio and significant statistics of each of these items demonstrate their important influence on the outcome when considered together.

In the first research question, both WRI items acted in the same direction on the outcome of attaining employment. In this model, explaining the time taken to goal attainment, the two WRI items operate in opposite directions.

7.4.2 Direction of the influence of WRI variables on time to outcome

Individuals rated as 'supports' or 'strongly supports' in 'the influence of other roles' are more likely to obtain employment quicker. Clinicians identified this as an important item and were surprised it was not significant in explaining whether a person achieved employment. However, it appears that the significance they identified was not in whether goals were attained, but in explaining the potential complexity of the interventional programme required and the time taken to reach a successful outcome. Those individuals with established life roles in other areas formed in routines take a more extended period to change their life circumstances and successfully obtain employment. It is acknowledged in behavioural change programmes (Thelen 2005; French et al. 2012) that changing habits and routines are challenging and can take prolonged time.

Adapting routines to minimise difficulties is significant in models explaining whether a person obtains employment and how long it will take them to achieve goals. Appearing in both models indicates the importance of the item to this population when pursuing vocational goals; and suggests a group of individuals with complex needs who need a complex intervention which will not be delivered in a time-limited IPS programme like IPS-lite (Burns et al. 2015).

7.5 OCCUPATIONAL ADAPTION: A COMPLEX PROCESS

The successful outcome of a vocational rehabilitation programme, obtaining employment requires an individual to reconstruct their occupational identity. This reconstruction of occupational identity is termed occupational adaptation in occupational therapy theory and occupational science (Kielhofner et al. 2009; Walder & Molineux 2017)).

Occupational adaption is a lifelong process experienced by everyone throughout life as we interact with our environments. Occupational adaptation is an ongoing process of change (O'Brien and Kielhofner 2017) to achieve desired occupational goals, requiring traits of resilience. Resilience allows necessary adjustments to engage and adjust in new roles until a new sense of identity is formed (Greene 2014). The drive for change may vary over time, dependent on internal and external factors (O'Brien and Kielhofner 2017). Sustaining the drive for change requires us to repeat new ways of being over time. Through repetition, a newly organised identity is formed (O'Brien and Kielhofner 2017). A sense of occupational competence in this new identity is gradually formed (deLasHeras et al. 2017). In the absence of a productive life role, practice and reparation of a working role is not possible - so sustaining a drive for change to achieve occupational adaption is challenging.

In the absence of successful goal attainment, hopelessness and negative feelings may impact on motivation for change (Walder & Molineux 2017), and a willingness to determine current circumstances as acceptable may emerge. Maintaining current identity may provide a sense of security and familiarity (Walder & Molineux 2017).

7.5.1 Predictive WRI items; time to goal attainment

Individuals rated as 'supports' on 'adapts routines to minimize difficulties' take longer to obtain employment. The definition of 'adapts routines to minimize difficulties' is: 'How the person has managed use of time, routine, and habits since the injury or since being out of work'. Criteria used to positively rate this item are 'successfully (or some success) adapts to changing circumstances, adapts routine well, actively seeks to overcome difficulties since being ill/or out of work' (Braveman et al. 2005).

Individuals rated as 'interferes' on 'influence of other roles' take longer to obtain employment. The definition of 'influence of other roles' is: 'How much other roles in the client's life influence his/her return to work'. The criteria used to negatively rate this item is 'other roles (significantly) interfere with return to/ finding, keeping work, and seriously conflict with work role' (Braveman et al. 2005).

In the context of having been out of work for a prolonged length of time, adapting routines to minimise difficulties may be accomplished by establishing a range of life roles unrelated to employment or education. This could be recognised as successful occupational adaptation: forming an occupational identity which is somewhat satisfying. Maintaining motivation to move beyond the safety and security offered by established identity may be more challenging for individuals who have achieved this level of occupational adaptation, compared to those with an absence of alternative life roles, for whom difficulties in managing time, routines and habits persist.

7.5.2 Occupational Adaptation an Ongoing Process

Occupational therapists working with clients need to maintain their awareness that occupational adaptation is a lifelong dynamic process (Taylor 2017). Reappraisal can be supported by a process of developing competence, identity and supporting motivation for change (Walder & Molineux 2017). In VRS with people with complex mental health problems, opposing factors to maintaining motivation for change have been identified. Fear of failure and frustrations at the time involved job-searching, particularly when this is unsuccessful (Kinn et al. 2014). This is compounded when time spent in unsuccessful job hunting is interfering with life roles perceived as more successful (Kinn et al. 2014). It is understandable therefore how these factors may diminish motivation. Prolonged unemployment, even when motivation is high, can result in lowered self-efficacy and doubts about capacity for employment (Mettävainio & Ahlgren 2004).

A qualitative meta-synthesis (Kinn et al. 2014) identified how challenging the phase of seeking work may be. Using the analogy of ice-skating and hence, fear of falling, getting off the bench onto the ice to seek work requires confidence that may vary over time. They recommend that therapists must have insight into these challenges, offer empathy, and remain focused on the individual's original motivations for change (Kinn

et al. 2014). Corbiere et al (2011) suggest practical support in job searching and preparatory behaviours may help maintain motivation.

Some researchers recommend that this is where providing sheltered workshops or day centres may have some value, allowing the establishment of work-focused routines (Argentzell & Eklund 2013). However, there are inherent risks in getting stuck in simulated worker roles. Previous studies have found simulated activities lacked challenge; they may lead to boredom, and the unintended consequence of diminishing confidence to seek out greater challenges (Prior et al. 2013). These segregated environments also limit regular social contact to others in the same situation, who do not act as role models in open employment or education (Argentzell & Eklund 2013; Prior et al. 2013; Kirsh 2016).

7.5.3 Personal recovery

There are similarities between the concept of occupational adaptation in occupational therapy literature and the concept of personal recovery:

‘A deeply personal, unique process of changing one’s attitudes, values, feelings, goals, skills and/or roles ... to live a satisfying, hopeful and contributing life even with the limitations caused by illness’ (Anthony 1993).

Employment is recognised by many as central to the concept of personal recovery (Markowitz 2001; Boardman et al. 2003; Morrow et al. 2009), and is frequently a recovery goal for individuals with CMHPs (Noyes et al. 2018).

Gammelgaard et al. (2017) investigated how IPS and employment may influence recovery. They characterised successful attainment of employment as achieving five elements of personal recovery: Connectedness, Hope, Identity, Meaning and Purpose in Life, and Empowerment (CHIME) (Leamy et al. 2011). Employment provided connectedness with society and professionals in the VRS. Hopes included aspirations in employment, which offers opportunities beyond work in social life and leisure pursuits. They found that identities changed before employment and identity as a job seeker and valued individual. Meaning and purpose were extended by participating in job seeking and imagined in a new identity. And personal responsibility for job seeking promoted feelings for empowerment (Gammelgaard et al. 2017).

Mechanisms for maintaining this sense of connectedness, hope, identity, meaning and empowerment over a prolonged length of time in an IPS programme warrant further research.

7.5.4 Occupational Adaptation and aspirations for recovery

Findings of this study has recognised the challenge of maintaining drive for change in the dynamic process of occupational adaption. Goals to attain employment take longer when individuals have established satisfying roles and routines in other aspects of life. It is feasible that the large population of people with CMHP who have considered vocational goals and therefore have not engaged with IPS have simply not been supported to reappraise their identities and may hold beliefs that they are not capable of being successful in employment or education. Self-stigmatisation as a barrier to achieving vocational goals is well established (Provencher et al 2002; Hielscher et al 2017) Occupational therapist work across mental health services and have the opportunity to intervene early, promoting employment or education as a realistic goal (Noyes et al. 2018; Read et al 2018) ; instilling hope and extending aspirations in personal recovery journeys. OTs delivering IPS services should recognise the fluctuating nature of occupational adaptation and work to sustain beliefs that successful attainment of vocational goals is realistic. Recent studies have investigated the role of internships in open employment with some success (Sveinsdottir et al. 2014; Sveinsdottir & Bond 2017; Carmona et al. 2018). In contrast to segregated environments, internships provide real experience, the chance to practice new routines and form a new identity. The open employment environment also offers opportunities for developing new social networks with role models in employment, instilling hope and connectedness.

7.6 SUSTAINING IMPLEMENTATION OF EVIDENCE-BASED PRACTICES

This cohort study was implemented as one component of an ongoing scholarship of practice partnership. Randomised controlled trials and subsequent meta-analysis are responsible for generating much of the evidence of efficacy of IPS. RCTs and meta-analyses are recognised as the highest level of evidence for intervention (Howick 2011). Prognostic research, such as this study, where the aim is to predict outcome high-quality prospective cohort studies with adequate power, offers the best evidence (Hemingway et al. 2013; Riley et al. 2013; Steyerberg et al. 2013; Hingorani et al. 2013).

There are inherent problems in RCTs; these challenges have been recognised in IPS research. The efficacy of interventions established in clinical trials may not be sustained in implementation in clinical services without the monitoring involved in managing RCTs (Bergmark et al. 2018). RCT often result in small-scale implementation across several remote sites (Talbot et al. 2018). Funded research enlists the support of funders, external champions and decision-makers in addition to the finance to support implementation: this may not be sustained when the RCT concludes that growth and maintenance of services are challenging in the context of cost pressures on the NHS (Hutchinson et al. 2018). The enthusiasm and support around trial implementation can wane when the research is completed (Hegelstad et al. 2018). Put simply, the efficacy established in RCTs may not be translated into effectiveness in real world day-to-day practice (Westfall et al. 2007)

This phenomenon has also been recognised by Noel et al. (2017), who recommend the value of a continuing learning community to sustain and generalize implementation (Latimer 2017). Local scholarship of practice offers a potential forum for this ongoing learning.

The OECD (2015b) suggest that secondary analysis of data gathered for clinical purposes offers opportunities to improve the implementation of new initiatives and ongoing evaluation. To achieve this aim, the NHS must establish mechanisms to support the secondary use of health data to increase impact (Singh & Sittig 2016). Such mechanisms create opportunities for researchers to answer clinical questions in real clinical situations (Okun et al. 2013).

This study was one example of a priority of the NHS: making use of clinical data to improve quality and deliver good value care. (NHS England 2018). To make the most of this potential growing field of secondary data analysis, research must ensure the reliability and validity of data (Raghupathi & Raghupathi 2014; Scott et al. 2017).

7.6.1 Comparing samples of RCTs and secondary data analysis

The gender split of this study (61% male) was almost identical to the pooled sample from good fidelity RCTs (62% male). However, concern has been raised by Kirkbride et al. (2012), who recognise that psychosocial intervention studies for people with CMHP tend to be around 64% male, while the actual population is more evenly split.

This study also shared a disproportionate number of married people when compared to a population with CMHP. Around 17% of participants were married; whereas in the pooled sample of IPS studies, 26% were married. Yet national surveys suggest only around 0.5% of people with complex mental health problems are married.

It may be that more males have the motivation to work on vocational goals, and that people who are in significant relationships enlist the support of their partner to support their aspirations. Regardless, good quality VRS services should be available to all people with CMHP. Therefore, VRS should make an effort to increase recruitment of female clients: those without naturally occurring social support networks.

Of greatest concern, however, is the low numbers of young people accessing VRS. This is not a problem unique to this study. Only 30 (15%) of cases in this sample were aged 25 or younger; the mean age was 37.40 (SD10.80). The mean age of participants of the eleven studies included in the meta-analysis ranged from 21.29 (SD 2.39) (Killackey et al. 2014) to 42.90 (SD11.50) (Bond et al 2015). The study with the youngest age range was focused on early intervention; and the next lowest mean age was 32 (SD8.9) (Waghorn 2014). Therefore, it appears that VRS are not reaching young people.

The Schizophrenia Commission has acknowledged the value of early intervention service in delivering IPS to support young people in obtaining educational opportunities: citing that for every person who does not gain a university degree, there is a lost net benefit of £197,000 to society; and completing a college qualification is

likely to result in a 12% wage gain (Schizophrenia Commission 2012). The integration of IPS into early intervention services for people with psychosis is also highly recommended by the Work Foundation (Bajorek et al. 2016). If educational and employment goals are not addressed early, it risks individuals becoming stuck in mental health services (Ásmundsdóttir 2004).

Despite the small numbers of young people, age was established as a significant univariate predictor. This confirms the work of Burke-Miller et al. (2006; 2012); Salkever et al. (2007); and Tsang et al. (2010). Early exclusion from education and employment risks long-term detrimental effects on health and wellbeing, and establishes an economic burden on society (Sveinsdottir et al. 2018). IPS research to date, despite recognising the value of education, is often measured only on employment outcomes.

Killackey et al. (2018) highlight the value of assisting young people to complete education, as this improves an individual's future career potential. This is supported by the significant negative relationship between not completing school exams and outcomes in both this study and Hegelstad et al. (2018). Killackey et al. (2018) recommend that a more targeted approach to educational outcomes may be required: the IPS fidelity scale should include references to educational outcomes, and recent studies have suggested the employment of an IPS worker with expertise in working in the education sector (Killackey et al. 2018).

7.6.2 Effectiveness of IPS cohort study compared to IPS RCTs

It is also important to compare the outcomes of this study to those of good fidelity IPS RCTs. The likelihood ratio of obtaining employment in this study was similar or better to many IPS RCTs. Good fidelity IPS RCT studies have a range of mean time to first job of 2.2 months (SD2.53) (Wong et al. 2008) to 6.6 months (SD6.21) (Gold et al. 2006). The mean of this study was 11.96 (SD 12.18), a considerably longer timeframe. This extended time probably owes to realistic IPS intervention in practice, as opposed to artificial time constraints of RCTs (Mueser et al. 2016).

7.7 THE ADDED VALUE OF MOHO AND THE WRI TO IPS

As established in the meta-analyses, IPS is the most effective form of VRS, and leads to successful outcomes for around 60% of individuals. However, for a proportion of successful people, sustaining employment is challenging and requires ongoing support (McGurk & Mueser 2006; Suijkerbuijk et al. 2017). It is therefore essential to investigate augmentations to IPS (Dewa et al. 2018). Chapter Four articulates the rationale for augmenting IPS with theory-based occupational therapy; and provides a justification for the measurement of psychosocial variables of interest.

To date, research has investigated cognitive rehabilitation, social and workplace skills training, targeting improvements in work capacity (Dewa et al. 2018). Tentative findings are positive, but further investigation is required. Dewa et al. (2018) have recognised the need to identify particular populations for whom these augmentations are most effective, to allow screening for more complex interventions (Noyes et al. 2018)

Metcalfe et al. (2018) have also recognised that predictors of success warrant further investigation: including client characteristics, motivations, resilience and skills, which have not been measured in RCTs. The WRI offers a valid, reliable measure; and as has been demonstrated, adds to knowledge about the predictors of success and requirement for augmented services. This study has therefore begun to respond to Metcalfe et al. (2018)'s recommendation that future research should investigate client-specific characteristics by measuring client and environmental factors.

7.7.1 Relevance of Items to Population of Interest

Some caution must be noted regarding the relevance of some of the psychosocial items as defined in the WRI to clients of IPS who experience complex mental health problems and who have never been in employment or have a prolonged history of unemployment.

In this study, therapists described difficulty rating seven WRI items due to the absence of recent employment experience to reflect upon resulting in missing data. This was particularly evident in all four environmental items where between 10% and 32% of the sample had missing data. The four environmental items are; 'Perception of

Physical Work Setting'; 'Perception of Family and Peers'; 'Perception of Boss and/or Company'; and 'Perception of Co-workers'. Therapists identified other items; 'Enjoys Work'; 'Appraises Work Expectations' and 'Work Habits', as challenging to rate. However, these items were missing data to a lesser extent (only 4 or 5 cases). Similar challenges were acknowledged in the study by Lohss et al. (2012).

The relevance of these WRI items to this population is a matter of concern for both practitioners and researchers. Therapists involved in this study concurred with Argentzell & Eklund (2013), Prior et al. (2013), and Kirsh (2016) that the environmental factors are clinically very important. Therefore practitioners should considering interventions which allow clients to have a real work experience prior to rating the WRI. Facilitating internships in real work placements is one potential intervention, recommended by Sveinsdottir and colleagues (2014 and 2017) and highlighted by Carmona et al. (2018) in their meta-analysis. Researchers should consider the definitions and rating criteria for each of four environmental items in future revisions of the assessment tool to ensure its applicability in this field of practice. Therapists have also highlighted challenges rating 'Enjoys Work'; 'Appraises Work Expectations' and 'Work Habits' it may therefore be helpful for researchers to review definitions and criteria for these items in future versions of the WRI.

7.7.2 Significance of Items

The WRI has been established to be a valid measure of psychosocial factors related to work in item response studies (Haglund et al. 1997; Forsyth et al. 2006; Fenger & Kramer 2007; Köller et al. 2011; Lohss et al. 2012). Studies have also confirmed the applicability of the WRI to a mental health population (Haglund et al. 1997; Kjellberg et al. 2003; Ásmundsdóttir 2004; Ekbladh et al. 2004, 2010b; Mettävainio & Ahlgren 2004; Forsyth et al. 2006; Fenger & Kramer 2007; Haslam et al. 2010; Lloyd et al. 2010; Lohss et al. 2012; Argentzell & Eklund 2013; Ekbladh & Sandqvist 2015; Egan et al. 2015; Julian & Valente 2015a). The Lohss et al. (2012) study had a comparable complex mental health population in the UK.

This study has added to the body of evidence supporting the WRI. Six items demonstrated highly significant ($p > 0.01$) correlations with outcome variables when considered in univariate analysis; 'Takes Responsibility', 'Work-related Goals',

'Appraises Work Expectations', 'Work Habits', 'Daily Routines', 'Adapts Routines to Minimize Difficulties'. Two further items, 'Commitment to Work' and 'Work-related Goals' were significant ($p < 0.05$).

Nine WRI items in this study demonstrated no significant correlation when tested in univariate analysis with the outcome variable related to question one (attained employment or educational outcome). These were; 'Assesses Abilities and Limitations', 'Expectation of Success in Work', 'Enjoys Work', 'Pursues Interests', 'Influence of Other Roles', 'Perception of Physical Work Setting', 'Perception of Family and Peers', 'Perception of Boss and/or Company', 'Perception of Co-workers'. It is interesting however that the item 'Influence of Other Roles' was significant in predicting time to positive outcome, the focus of the second research question.

The insignificance of five of these items (all four environmental items and the item 'Enjoys Work') may be related to the previously acknowledged missing data. Therapists also suggested that the item 'Enjoys Work' may be a pre-requisite for clients to self refer and engage with VRS and so may have been rated similarly for the entire sample. While not statistically significant in this study, clinicians confirmed the clinical significance of environmental items. A further item, 'Expectation of Success in Work', was considered important in clinical practice where a clients confidence that a successful outcome is possible is a vital component of maintaining clinical engagement.

The item 'Assesses Abilities and Limitations' generated opposing discussion amongst clinicians. Some clinicians recognised clients may tend to underestimate their abilities while others felt over-estimation was a challenge. This suggests closer investigation of the definition of this item may be warranted for this population. Similarly, the item 'Pursues Interests' is also recommended for further investigation with this population, as it was considered a challenging item to rate and an item which was not considered clinically useful to therapists in this study.

7.7.3 Predictive models

The evidence of correlations in univariate analysis summarised above is helpful in establishing the relevance of the WRI in this population. This study also offers initial evidence of the predictive validity in this population using multiple logistic regression. MLR is used to construct models which simultaneously examine the effects of several predictors (Gelman & Hill 2006) and quantify each independent variable's unique contribution (Stoltzfus 2011).

Models were constructed to investigate the likelihood of attainment of paid employment or educational opportunity. The final iteration of these models included two WRI items; 'Adapts Routines to Minimise Difficulties'; and 'Work-related Goals'; in association with 'living in an area of lesser deprivation'. Results suggest this final model explained around a third of the variance between attaining and not attaining employment or educational opportunity. To address research question two further models were constructed to predict who may take longer to achieve a positive outcome. The final iteration of these models comprised two items, both from the WRI; 'Adapts Routines to Minimise Difficulties' and 'Influence of Other Roles'. Results suggest this model may explain around 13% of the variance in outcomes. These initial findings are helpful in providing models for testing in future studies, both of these models require validation on a different population (Altman and Royston, 2000; Moons et al., 2009).

7.8 LIMITATIONS OF STUDY

7.8.1 Systematic Review

It must be acknowledged that the systematic review and meta-analysis conducted in the initial literature review of this study relied only on published data, some multi-site studies such as the Equolise trial (Burns 2007) had a mixture of fidelity adherence, with some site achieving good fidelity. It was not feasible within the limitations of this study to make a direct approach to lead researcher in historical trial to retrieve subsets of data to include in the analysis, a step which was taken by Lockett et al. (2016).

7.8.2 Sample

7.8.2.1 Sample Size

While the sample size identified in the research proposal was reached in the actual study, the proportion of people who did not attain employment limited the number of variables available for investigation in MLR. Future studies should include a larger sample size to allow a greater number of variables to be involved in model building (Field 2012b).

7.8.2.2 Homogenic participants

In addition to the sample size, a number of the demographic variables were not available for analysis due to limited variability within the sample group. There was minimal variability in four demographic variables; ethnicity, marital status, living situation and diagnosis. This raised two issues in the research. Very small numbers risked the anonymity of participants who may be identifiable within the study by being identified within very small groupings of particular characteristics. Frequencies of less than five in contingency tables result in a vulnerability in using chi-square test (Field 2012a). Both these issues required variables to be collapsed into fewer factors.

7.8.2.3 Recruitment of clients to VRS

Very few younger clients are accessing IPS support in the study context, this limited the analysis that could be conducted on the predictive nature of younger age on outcome. Despite the limited numbers under the age of 25yrs (only 15% of the sample) younger age was found to be significant in univariate analysis. It was also included in initial models in multiple logistic regression, although was ultimately excluded. Lack of inclusion of younger people is a problem in the reach of the service who should prioritise widening access to include younger participants. It is important to acknowledge that this is not just a problem for this study. McGorry (2015) noted that younger clients often fail to access psychosocial support. Indeed most IPS RCTs fail to reach this priority group, the systematic review conducted within this study found only one study out of twelve RCTs had a mean age of participants below 30rs (Killackey et al. 2014).

This study also reflects the participants of RCTs regarding gender and marital status. It is important to acknowledge that it appears participants accessing IPS services do not adequately reflect the general population of people experiencing complex mental health problems. Slightly more men engage with IPS services than would be expected from the population, there is a considerably greater skew towards married people in VRS compared to the general population. Only around 0.5% of people with complex mental health problems are married, the pooled sample of IPS studies in the systematic review included 26% were married, the distortion is less in this study but is still considerable at 17% of participants..

7.8.3 Variables

7.8.3.1 Independent Variables - Missing Data

Several psychosocial variables were missing data. Missing data occurred to a lesser extent (4 or 5 cases) in three items 'enjoys work', 'appraises work expectations' and 'work habits'. Of greater concern significant proportions of cases were missing data for all the environmental items; between 10% and 32% of the sample. In the consultation, clinicians reported all these items were challenging to explore in interviews with clients who had either been out of work for a prolonged period or had

never worked. Participants had no reference point of paid employment to reflect upon in discussion, this made rating items impossible. The difficulty in assessing certain items in a long-term unemployed client group is perhaps an issue to consider in the future development of the WRI as previously identified by Lohoss et al. (2012). Clinicians consulted in this study agreed with previous studies (Haglund et al. 1997; Velozo et al. 1999; Forsyth et al. 2006; Fenger & Kramer 2007; Lohss et al. 2012) that environmental factors, particularly support networks and role models (Argentzell & Eklund 2013; Prior et al. 2013; Kirsh 2016) are important considerations in supporting success in IPS programmes, maintaining focus on the environment is therefore vital in assessments.

Compounding the challenge of missing data was the limited variability in scorings applied by therapists; 'Strongly interferes' was rarely utilised as a rating across six items: appraises work expectations; assesses abilities and limitations, expectation of success, enjoys work, influence of other roles, perception of physical environment; and was unused in one item, commitment. Therefore, ratings were collapsed into binary options rather than 4point ordinal scale in this study. To fully explore the four-point scale, the sample size would have to increase four-fold. Pragmatically this would be challenging in a single site study and would require larger scale multi-site study.

7.8.3.2 Independent Variables - Refinement

The scholarship of practice partnership allowed early agreement of variable of interest for investigation. On reflection in analysing data and reviewing previous data, it became clear that one variable was not clearly defined. This study only gathered binary data regarding previous employment; the individual has or has not worked previously. It is clear that more detailed information on recency of the employment experience and how this impact on psychosocial variables would be of interest, this should be explored in future research.

7.8.3.3 Dependent Variable - Outcome of Interest

This study was limited to only examining the simple outcome of did an individual attain employment, and how long a period of intervention did this take. This study adopted the definition of attained employment or education used in many RCTs having started a job or educational course (Mueser et al. 2004; Gold et al. 2006; Latimer et al. 2006;

Bond et al. 2007; Killackey et al. 2008; Wong et al. 2008; Heslin et al. 2011; Waghorn et al. 2014; Bond et al. 2015). Other studies have required greater engagement with employment or education; at least one week (Hoffman et al. 2012; Bejerholm et al. 2015) or minimum hours per week (Oshima et al. 2014).

Assuming a new identity as a worker or student requires an extended engagement in a productive life role. It would be valuable to conduct a prospective cohort study investigating whether psychosocial variables can predict employment or education tenure. Such an investigation would require extended contact with participants to maintain data regarding ongoing work status. Such a study could not be conducted in secondary data analysis as clinical services would not routinely collect this information.

7.8.4 Testing the Validity of the Model

The final models presented provide an answer to both research questions; which psychosocial variables predict outcome; and which psychosocial variable predict time taken to goal attainment. It has not been within the scope of this study to test the model on a different population. It is therefore recommended that models should be validated on a different cohort (Altman and Royston, 2000; Moons et al., 2009).

It is possible to perform validation on the original data set, splitting the sample into two sets; one for model development the other for validation. However, due to the size of the sample in this study, it was not possible to further reduce the statistical power to perform “split sample” validation (Altman and Royston, 2000).

7.8.5 Summary

The generalisability of this study is influenced by several factors identified above; some variables lacked frequency of occurrence or did not adequately reflect a population of people experiencing complex mental health problems; gender, marital status, ethnicity, living situation and diagnosis. Larger sample sizes from more multiple sites may improve this in future studies, however diversity of recruitment does not appear to be an issue unique to this study context and seems to be a matter of concern to all VRS services. A larger sample size would, however, allow inclusion of more variables in the regression model. This study provides a starting point for investigation, the models developed in the study provide a basis for regression models in future studies.

7.9 IMPLICATIONS FOR POLICY

7.9.1 Measuring Equality

The Scottish Government recognises in their mental health strategy (Scottish Government 2017, pg.8) that employment is ‘the single biggest inequality that people with mental health problems face’, and intend to measure employment rates as a quality indicator of mental health service outcomes. Accurate figures on local rates of employment among people with complex mental health problems are not currently available, development of a routine measure would enhance recognition of employment as a valid outcome measure of health and wellbeing.

7.9.2 Integration of IPS and Health Services

The current national mental health policy (Scottish Government 2017) proposes to work in collaboration across government departments to explore innovative ways of connecting mental health, disability and employment support. An outcome of the previous mental health strategy (Scottish Government 2012) was to continue to advance IPS programmes across Scotland. (Scottish Government 2015). The Scottish Government should consider the importance of evidence-based interventions to deliver services which promote recovery, especially in the intended propagation of best practice in first episode psychosis services. Both recovery and early intervention are tenets of the current mental health strategy. To achieve evidence-based practice, mental health services must be integrated with IPS services. Studies which are not integrated into health services (Heslin 2010) deliver suboptimal outcomes (Campbell 2010; Latimer 2010).

7.9.3 Demonstrating Effective Implementation in Scotland by OTs

This study has demonstrated that health services in Scotland can deliver an effective IPS service with outcomes comparable to those in international RCTs. Occupational therapists have the skills to provide IPS with good fidelity. Recognising that IPS is the most efficacious VRS for a population with complex mental health problems, the

Scottish Government should endorse the deployment of occupational therapists to deliver IPS integrated within existing mental health service.

This study has also provided evidence that occupational therapists have unique knowledge helpful in understanding the complexity of needs. Occupational therapists also have the skills to tailor intervention programmes to identified individualised needs and are therefore equipped with the ability to deliver both simple IPS interventions and augmentations to enhance IPS. The effectiveness of an IPS augmented with Occupational Therapists theory and practice requires investigation. Endorsement by the Scottish Government of the deployment of occupational therapist delivering IPS would provide the context to enable future multi-site research across Scotland. The Scottish mental health service could contribute to international efforts to extend the evidence-base and better meet the employment and educational needs of this socially excluded population.

7.9.4 Early Intervention a Priority

This study, in common with the majority of IPS research sites, has not reached a young population. The Scottish Government are wise in their intention to focus efforts on establishing evidence-based interventions in early psychosis services. Supporting individuals to complete school and further education programmes must be established as routine outcomes of early psychosis services. Participation in open education and employment will prevent individuals from becoming stuck in a cycle of disability and playing a patient's role (Ásmundsdóttir 2004; Bond et al. 2016).

The Scottish Government has recognised the need for fair and equal access to education for disadvantaged groups, and schools and universities are challenged to widen access (Commission of Widening Access, 2016). To date, the educational outcomes of IPS programmes have been disappointing in comparison to employment outcomes (Killackey et al. 2018). Occupational therapists have demonstrated effectiveness within learning support services to help establish individuals in the learning environment participate fully in learning and achieving outcomes (Lahav et al. 2016). Integrating VRS with MH services is critical in delivering employment outcomes, the integration with educational services to achieve educational aims may be a fundamental ingredient missing in achieving educational goals in IPS

programmes. Schools, colleges and universities should consider the enhancement of in-house services to support students with complex needs to thrive.

7.10 IMPLICATIONS FOR PRACTICE

7.10.1 The value of Appropriate Assessment in IPS

Developers of IPS recommend that vocational evaluations are not required in IPS programmes, although do encourage information gathering through the career profile interview. Reservations regarding assessments seem to be primarily founded on the perception that vocational evaluation is limited to performance capacity measurement, and will lead to the screening out of individuals with limitations (Swanson and Becker 2011). This study has provided evidence of the value of one vocational evaluation the WRI in predicting who may benefit from simple time-limited IPS and who may require an extended more complex intervention. The WRI purpose is to identify psychosocial strengths which may be built upon, and highlight potential areas of difficulty in order to intervene most effectively. This information at the beginning of an intervention would allow appropriate targeting of augmented interventions, thus improving efficiencies (Dewa et al. 2018; Metcalfe et al. 2018).

7.10.1.1 Stratification of services and individualised intervention plans

Adopting an assessment which can identify those who will benefit from simple IPS and those who will require a more complex intervention will allow services to make the most efficient use of resources available by stratifying individuals into the most appropriate stream of intervention as early as possible (Moons et al. 2009). This study has established that the WRI offers useful insights into the complexity of need. Early identification of those who have complex needs will support the formulation of individually tailored intervention plans, supporting individuals attain their vocational goals.

7.10.2 Installation of hope

7.10.2.1 During IPS

OTs are developing intervention plans with individuals who exhibit factors identified in the models as requiring more complex interventions to sustain motivation for employment should consider opportunities to provide positive experiences of

engaging in productive life roles in real situations. Internships provide potential avenue worthy of exploration. However, therapists should attend to the note of caution offered by Reme et al. (2018) that internships are an intervention and must not be regarded as an outcome.

7.10.2.2 Setting employment goals

All professionals including OTs working within mental health services should continually encourage individuals to consider employment and education as one aspect of their personal recovery journey. This expectation should be established in early intervention services to prevent individuals from becoming stuck in mental health services (Ásmundsdóttir 2004; Bond et al. 2016). Without an active and encouraging support network to raise aspirations individuals may never engage with VRS.

7.10.2.3 Getting the right people to IPS

This study in common with other IPS research studies has been unsuccessful in reaching a younger population, in the early stages of mental health intervention. The study has also had a greater number of participants who are married and have naturally occurring support that would be expected in the population. This disproportionate representation of mental health population gives an indication of the limited reach of IPS services into the general population of those with CMHP.

7.10.3 Recommendations for Practice

Three practice recommendations have emerged from this study

7.10.3.1 Practice Recommendation One

Occupational therapists use the WRI to stratify individuals into appropriate IPS interventions and formulate complex intervention programmes building on psychosocial strengths and responding to or attenuating for, areas of limitation. In instances where rating the WRI is challenging due to limited employment experience, OTs should explore the value of internships to enhance the assessment process.

7.10.3.2 Practice Recommendation Two

IPS service must pay attention to sub-groups of the population who are not currently accessing support; mechanisms must be put in place to extend the reach of IPS services to meet the needs of those in early intervention services and those living alone who do not benefit from naturally occurring support networks.

7.10.3.3 Practice Recommendation Three

Occupational therapists should work with health and educational institutions to consider service structures to deliver both simple IPS and an augmented version of IPS in adult, early intervention mental health services and within educational establishments. The scholarship of practice partnerships could offer support in the training and mentoring of local adult and early intervention services in the establishment both simple IPS and an augmented version of IPS.

7.11 IMPLICATIONS FOR RESEARCH

7.11.1 Advancing the Evidence-Base of IPS

As original model developers have generated a substantial amount of the evidence-base in IPS, potential bias in their findings has been identified in meta-analyses (Suijkerbuijk et al. 2017) and therefore a new generation of researchers are invited to conduct RCTs to reduce the potential bias effect (Campbell 2010; Latimer 2010; Bond 2012).

7.11.1.1 The value of secondary data analysis

This study has demonstrated the potential to extend the evidence base through secondary data analysis. Researchers are partnering with clinicians in practice address high impact research questions with significantly less time and resources than would be required in a study involving primary data collection (Doolan & Froelicher 2009; Smith et al. 2011; Cheng & Phillips 2014; Okafor et al. 2016). Secondary data offers access to large sample sizes, the sample included in this study was more substantial than all but two of the RCTs reviewed in the systematic review (Heslin et al. 2010; Waghorn et al. 2014). Secondary data analysis also affords the opportunity to address research questions while limiting the impact on participants, therefore not putting subjects at risk of adverse reactions or other harms associated with participation (Doolan & Froelicher 2009).

Furthermore, the use of data collected as part of a routine clinical practice provides researchers with real-life data for testing new hypotheses relevant to practice models. In this study, the real-life situation has allowed identification of problems concerning participants accessing the service; findings will support recruitment strategies to address the limited numbers of younger people accessing support and those with less naturally occurring social supports.

7.11.1.2 Sustainability of Services

The challenge of sustainability is a factor to consider in RCT research, where well funded and managed trials are successful for the duration of implementation but are

not integrated into mainstream services (Markström et al. 2017; Noel et al. 2017; Bergmark et al. 2018). Embedding services within core services, collaboration and ongoing learning and development, monitoring and evaluation are recognised as a component for successful sustainability (Markström et al. 2017; Noel et al. 2017; Bergmark et al. 2018). Scholarship of practice (Forsyth et al. 2005; Taylor 2017c) initiatives, such as the one typified by this study, offer great potential for clinical practice to benefit from sustainability and researchers to benefit from ongoing access to real-life data.

Due to the rapidly increasing numbers of research studies focused on IPS, it is essential that future meta-analytical studies continue to respond to questions arising from practice. In addition to updating combined effect sizes, attention should be paid to augmentations and adaptations.

7.11.2 Determining the importance of principles

In order to understand the fundamental intervention of IPS, it is crucial to consider the current principles underpinning the model. The successful outcomes of the trial conducted by Burns et al. (2015) would suggest that some investigation of the principles would be helpful in determining the importance of each principle and how adherence is measured. The Burns et al. trial (2015) dropped the principle of time unlimited support and still demonstrated impressive outcomes, suggesting this principle may be less critical than others. In contrast, the trial conducted by Howard et al. (2010) has been criticised in the literature for not adhering to the principle of integration of IPS and mental health treatment (Latimer 2010; Campbell 2010; Bond 2012). The study context achieved ratings of the fidelity scale suggesting good adherence to principles, but their outcomes are seen as outliers (Bond 2012), with fewer employment outcomes which also took longer to achieve. Integration between VRS and MH services would seem to be a highly important principle which does impact on outcomes. This variance in effect of principles on results (time unlimited support, less important; integration of IPS and MH, highly important) suggests that the fidelity scale itself should be investigated. Its current standardisation has relied upon classical test theory to examine reliability and validity. Numeric scores are applied to measure variables. A problem is introduced by assuming these numeric scores are ordinal and can generate a meaningful total score. The study by Heslin et al. (2010) demonstrates the flaw in this approach, a significant principle, given equal

weighting to others, can be withdrawn and the service maintains a good fidelity score. Investigation of the weighting of individual principles adopting an item response approach would allow the importance of principles to the outcome to be determined (McAllister 2008; Bond and Fox 2015).

7.11.2.1 Investigating augmentations evidence-based OT

This study has established psychosocial variables which predict successful outcome in an IPS programme, and also predict who will require complex augmented interventions to achieve their vocational goals. OTs have evidence-based interventions to address the complex needs identified by the WRI. Future research should evaluate the effectiveness of IPS augmented with evidence-based occupational therapy compared to simple IPS. There are several IPS services worldwide led by research-active OTs; such a research study would benefit from international collaborations.

7.11.3 Predicting Outcomes of IPS

7.11.3.1 Job tenure

This study has been limited in focus considering only employment or educational attainment. It is vital that future research considers job tenure as an outcome. Brief episodes of working in unsatisfying roles are unlikely to establish a new and rewarding identity. It may be that differing psychosocial variables may predict success in IPS or augmented IPS if the dependent outcome variable is job tenure.

7.11.3.2 Outcomes of being in employment

Including occupational therapists in future RCTs of IPS would allow the measurement of psychosocial variables of health and wellbeing as recommended by Suijkerbuijk et al. (2017) in the most recent Cochrane review of IPS. Responding to this recommendation would extend knowledge about the positive outcome of IPS beyond employment outcomes.

7.11.4 Recommendations for Research

Three research recommendations have emerged from this study

7.11.4.1 Research Recommendation One

Investigation of IPS principles and fidelity measure adopting an item response approach would quantify the impact of principles on outcomes and improve the fidelity measure scale. This, in turn, would assist in the identification of critical components of simple IPS, and ensure fundamental aspects are integrated into augmented models currently being developed.

7.11.4.2 Research Recommendation Two

An international collaboration of occupational therapy researcher should combine efforts to conduct a multi-site study of IPS augmented with evidence-based occupational therapy compared to simple IPS intervention. This study should utilise secondary data to extend the evidence base of IPS while sustaining and enhancing service provision, benefiting both agendas.

7.11.4.3 Research Recommendation Three

Researchers should work with clinicians using the findings of this study to update the current worker role interview. A revised version should improve the WRI utility with a population of people with complex mental health problems and those who have never been employed, or have been unemployed for a significant period of time.

7.12 DISSEMINATION PLAN

An outcome of professional doctorate education is the ability to develop and disseminate an original argument which contributes to professional knowledge. The vital nature of dissemination of research findings has been acknowledged in the review conducted by Lord Stern (Department for Business, Energy and Industrial Strategy, DBEIS, 2017).

The early stages of the scholarship of practice partnership have previously been shared in peer-reviewed publications (Baxter et al. 2012; Prior et al. 2013; Maciver et al. 2013) and progression of the research has been shared at international conferences (Prior et al. 2012, Prior et al. 2013; Prior et al 2014a, b) and contribution to a chapter current edition of MOHO theory textbook (Melton et al. 2017). Impact of the research has also been cited as an example of good practice in government policy documents (Scottish Government 2012; National Allied Health Professional Mental Health Clinical Leads Group 2012).

Priority will now be given to the dissemination of this element of the study through publication in targeted, open access, peer-reviewed, high impact journals. This priority is informed by the requirements of the research excellence framework (DBEIS 2017) Target journals will have an audience of multi-professional groups. Some of the practice implications and recommendations are focused on the occupational therapy profession. The scholarship of practice partnership is committed to sharing findings through professional journals, and this researcher will support clinical colleagues in this endeavour. Additionally, conferences and events will be targeted for sharing findings and establish networks with researchers with similar research interests. Established networks with OT researchers in Norway, Sweden, Canada and South Africa will be used to share finding and explore opportunities to engage in future international research initiative to take forward the research recommendations.

7.13 CONCLUSIONS

This study has produced a thesis which represents new knowledge added to complementary fields of research and practice; occupational therapy and individual placement and support. The literature review underpinning the research has provided a reference point conducting a critical appraisal of good fidelity IPS and presents a new systematic review and meta-analysis providing a combined risk ratio of attaining employment and estimated time to employment. New evidence is continually emerging and this meta-analysis of good fidelity IPS has not previously been published.

Significant psychosocial predictors of attaining employment or education in an IPS programme have been identified in the univariate analysis. Multiple logistic regression allowed construction of a model comprising 'adapts routines to minimize difficulties'; 'work-related goals' and 'living in an area of least deprivation' which together go some way to predicting the probability of success in IPS.

Significant psychosocial predictors of who will require a longer more complex intervention in IPS programme have been identified in the univariate analysis. Again multiple logistic regression allowed construction of a model comprising 'adapts routines to minimize difficulties'; 'influence of other roles' which together go some way to predicting who is unlikely to benefit from IPS lite interventions but are still likely to succeed given appropriate time and support to address more complex needs.

This study has advanced understanding of the importance of psychosocial factors in IPS and provides evidence to support the unique contribution occupational therapy theory and practice offers to IPS. The research has also identified differences in two vocational rehabilitation interventions; supporting people to return to work from sickness absence and supporting people who are unemployed attain employment or education. Predictors of success differed depending on the employment status of the population and indicated that intervention strategies should vary. Recommendations for how to take forward these findings in practice policy and research have been shared.

Work is one of the most valued roles in society, offering the opportunity to create self-identity and improve financial and social status. However, people with complex mental health problems (CMHP) continue to be excluded from this human right. Occupational therapists have unique knowledge and skills to contribute to tackling this equality issue

and must take the opportunity to work with multi-professional colleagues to improve the lives of those excluded from the right to actively contribute and participate in society.

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APPENDICES

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Appendix A. Meta-Analyses included in Systematic Review

META 01 (Crowther 01)	Crowther, R, Marshall, M, Bond, G, & Huxley, P 2001, 'Vocational rehabilitation for people with severe mental illness', Cochrane Database Of Systematic Reviews, p. N.PAG, CINAHL Plus with Full Text, EBSCOhost, viewed 27 February 2018.
META 02 (Twamley 03)	Twamley, E.W., Jeste, D.V. & Lehman, A.F., 2003. Vocational Rehabilitation in Schizophrenia and Other Psychotic Disorders: A Literature Review and Meta-Analysis of Randomized Controlled Trials. <i>Journal of Nervous & Mental Disease</i> , 191(8), pp.515–523.
META 03 (Campbell 11)	Campbell, K., Bond, G.R. & Drake, R.E., M.D., Ph.D, 2011. Who Benefits From Supported Employment: A Meta-analytic Study. <i>Schizophrenia bulletin</i> , 37(2), pp.370–380.
META 04 (Kinoshita 13)	Kinoshita, Y. et al., 2013. Supported employment for adults with severe mental illness. <i>Cochrane Database of Systematic Reviews</i> , 13(9).
META 05 (Bond 15)	Bond, G.R., Drake, R.E., M.D., Ph.D & Luciano, A., 2015. Employment and educational outcomes in early intervention programmes for early psychosis: A systematic review. <i>Epidemiology and Psychiatric Sciences</i> , 24(5), pp.446–457.
META 06 (Chan 15)	Chan, J.Y.C., Hirai, H.W. & Tsoi, K.K.F., 2015. Can computer-assisted cognitive remediation improve employment and productivity outcomes of patients with severe mental illness? A meta-analysis of prospective controlled trials. <i>Journal of psychiatric research</i> , 68, pp.293–300.
META 07 (Modini 16)	Modini, M. et al., 2016. Supported employment for people with severe mental illness: systematic review and meta-analysis of the international evidence. <i>British Journal of Psychiatry</i> , 209(1), pp.bjp.bp.115.165092–22.
META 08 (Lockett 16)	Lockett, H, Waghorn, G, Kydd, R, & Chant, D 2016, 'Predictive validity of evidence-based practices in supported employment: A systematic review and meta-analysis', <i>Mental Health Review Journal</i> , 21, 4, pp. 261-281, PsycINFO, EBSCOhost, viewed 27 February 2018.
META 09 (Carmona 16)	Carmona, V.R., journal, J.G.-B.I.2017, Employment outcomes for people with schizophrenia spectrum disorder: A meta-analysis of randomized controlled trials. search.proquest.com
META 10 (Suijkerbuijk 17)	Suijkerbuijk, Y.B. et al., 2017. Interventions for obtaining and maintaining employment in adults with severe mental illness, a network meta-analysis <i>Cochrane Work Group</i> , ed., John Wiley & Sons, Ltd.
META 11 (Metcalf 18)	Metcalf, J.D., Drake, R.E., M.D., Ph.D & Bond, G.R., 2018. Economic, Labor, and Regulatory Moderators of the Effect of Individual Placement and Support Among People With Severe Mental Illness: A Systematic Review and Meta-analysis. <i>Schizophrenia bulletin</i> , 44(1), pp.22–31.

Appendix B. Meta-Analyses excluded from Systematic Review

Excluded Studies - Not in English

Title Abstract Screen

Multidisciplinary interventions: review of studies of return to work after rehabilitation for low back pain' 2009, Journal Of Rehabilitation Medicine (Stiftelsen Rehabiliteringsinformation), 41, 3, pp. 115-121, CINAHL Plus with Full Text, EBSCOhost, viewed 27 February 2018.

Bethge, M 2017, '[Work-Related Medical Rehabilitation]', Die Rehabilitation, 56, 1, pp. 14-21, MEDLINE, EBSCOhost, viewed 27 February 2018.

Bjarnason-Wehrens, B, Held, K, & Karoff, M 2006, '[Heart groups in Germany-current situation and prospects]', Herz, 31, 6, pp. 559-565, MEDLINE, EBSCOhost, viewed 27 February 2018.

Streibelt, M, & Egner, U 2012, '[A meta-analysis of the impact of sample, kind of outcome measurement and time of follow up on occupational re-integration after vocational retraining]', Die Rehabilitation, 51, 6, pp. 398-404, MEDLINE, EBSCOhost, viewed 27 February 2018.

Excluded Studies - Not focused on complex mental health population

Title Abstract Screen

Cochrane, A, Higgins, N, FitzGerald, O, Gallagher, P, Ashton, J, Corcoran, O, & Desmond, D 2017, 'Early interventions to promote work participation in people with regional musculoskeletal pain: A systematic review and meta-analysis', Clinical Rehabilitation, 31, 11, pp. 1466-1481, PsycINFO, EBSCOhost, viewed 27 February 2018.

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Kent, M, & Dorstyn, D 2014, 'Psychological variables associated with employment following spinal cord injury: a meta-analysis', Spinal Cord, 52, 10, pp. 722-728, CINAHL Plus with Full Text, EBSCOhost, viewed 27 February 2018.

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Park, E, Kim, J, & Kim, S 2016, 'Meta-analysis of the effect of job-related social skill training for secondary students with disabilities', *Journal Of Vocational Rehabilitation*, 44, 1, pp. 123-133, PsycINFO, EBSCOhost, viewed 27 February 2018.

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Sweetland, J, Howse, E, & Playford, E 2012, 'A systematic review of research undertaken in vocational rehabilitation for people with multiple sclerosis', *Disability & Rehabilitation*, 34, 24, pp. 2031-2038, CINAHL Plus with Full Text, EBSCOhost, viewed 27 February 2018.

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Riipinen, M, Hurri, H, & Alaranta, H 1994, 'Evaluating the outcome of vocational rehabilitation', *Scandinavian Journal Of Rehabilitation Medicine*, 26, 2, pp. 103-112, CINAHL Plus with Full Text, EBSCOhost, viewed 27 February 2018. (PAIN)

Excluded Studies - Study reported in more than one publication – primary study retained

Title Abstract Screen

Crowther, R, Marshall, M, Bond, G, & Huxley, P 2001, 'Helping people with severe mental illness to obtain work: systematic review', *BMJ: British Medical Journal (International Edition)*, 322, 7280, pp. 204-208, CINAHL Plus with Full Text, EBSCOhost, viewed 27 February 2018.

Excluded Studies - Not focused on IPS intervention and outcomes of intervention

Title Abstract Screen

Lewin, A, & Mitchell, M 1999, 'Using group mean centering for computing adjusted means by site in a randomized experimental design. The case of California's Work Pays Demonstration Project', *Evaluation Review*, 23, 2, pp. 146-161, MEDLINE, EBSCOhost, viewed 27 February 2018.

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Dilk, M, & Bond, G 1996, 'Meta-analytic evaluation of skills training research for individuals with severe mental illness', *Journal Of Consulting And Clinical Psychology*, 64, 6, pp. 1337-1346, MEDLINE, EBSCOhost, viewed 27 February 2018.

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Full text screen

Wewiorski, N, & Fabian, E 2004, 'Association between demographic and diagnostic factors and employment outcomes for people with psychiatric disabilities: A synthesis of recent research', *Mental Health Services Research*, 6, 1, pp. 9-21, PsycINFO, EBSCOhost, viewed 27 February 2018.

Tsang, H, Leung, A, Chung, R, Bell, M, & Cheung, W 2010, 'Review on vocational predictors: a systematic review of predictors of vocational outcomes among individuals with schizophrenia: an update since 1998', *Australian & New Zealand Journal Of Psychiatry*, 44, 6, pp. 495-504, CINAHL Plus with Full Text, EBSCOhost, viewed 27 February 2018.

Excluded Studies - Not a meta-analysis of separate studies

Title Abstract Screen

Taylor, T, Killaspy, H, Wright, C, Turton, P, White, S, Kallert, T, Schuster, M, Cervilla, J, Brangier, P, Raboch, J, Kalisová, L, Onchev, G, Dimitrov, H, Mezzina, R, Wolf, K, Wiersma, D, Visser, E, Kiejna, A, Piotrowski, P, Ploumpidis, D, Gonidakis, F, Caldas-de-Almeida, J, Cardoso, G, & King, M 2009, 'A systematic review of the international published literature relating to quality of institutional care for people with longer term mental health problems', *BMC Psychiatry*, 9, p. 55, MEDLINE, EBSCOhost, viewed 27 February 2018.

Full text screen

Barton, R 1999, 'Psychosocial rehabilitation services in community support systems: a review of outcomes and policy recommendations', *Psychiatric Services (Washington, D.C.)*, 50, 4, pp. 525-534, MEDLINE, EBSCOhost, viewed 27 February 2018.

Latimer, E 2008, 'Individual placement and support programme increases rates of obtaining employment in people with severe mental illness', *Evidence Based Mental Health*, 11, 2, p. 52, CINAHL Plus with Full Text, EBSCOhost, viewed 27 February 2018. (multi-site international RCT, meta-analysis of sites within study)

Leff, H, Cook, J, Gold, P, Toprac, M, Blyler, C, Goldberg, R, McFarlane, W, Shafer, M, Allen, I, Camacho-Gonsalves, T, & Raab, B 2005, 'Effects of job development and job support on competitive employment of persons with severe mental illness', *Psychiatric Services (Washington, D.C.)*, 56, 10, pp. 1237-1244, MEDLINE, EBSCOhost, viewed 27 February 2018. (multi-site study meta analysis of sites within study)

Excluded Studies - Articles referring to not reporting MA

Title Abstract Screen

Bond, G, Campbell, K, & Drake, R 2012, 'Standardizing measures in four domains of employment outcomes for individual placement and support', *Psychiatric Services*, 63, 8, pp. 751-757, PsycINFO, EBSCOhost, viewed 27 February 2018.

Furukawa, TA 2001, 'Psychosocial treatment for schizophrenia', *The American Journal Of Psychiatry*, 158, 12, pp. 2092-2093, PsycINFO, EBSCOhost, viewed 27 February 2018.

Fitzgerald, S, & Rumrill, P 2005, 'Quantitative alternatives to narrative reviews for understanding existing research literature', *Work: Journal Of Prevention, Assessment & Rehabilitation*, 24, 3, pp. 317-323, PsycINFO, EBSCOhost, viewed 27 February 2018.

Shergill, SS 2008, 'Highlights of this issue', *The British Journal Of Psychiatry*, 192, 3, p. A10, PsycINFO, EBSCOhost, viewed 27 February 2018.

Gueron, J 2007, 'Building evidence: what it takes and what it yields', *Research On Social Work Practice*, 17, 1, pp. 134-142, CINAHL Plus with Full Text, EBSCOhost, viewed 27 February 2018.

Yaeda, J, Iwanaga, K, Fujikawa, M, Chan, F, & Bezyak, J 2015, 'The use of evidence-based practice among Japanese vocational rehabilitation professionals', *Rehabilitation Counseling Bulletin*, 58, 2, pp. 70-79, PsycINFO, EBSCOhost, viewed 27 February 2018.

Appendix C. Coding System – combining RCT articles into Single Studies and summarising inclusion / exclusion

Included Studies

REFERENCE	trial no.	Publications
RCT25 (MUESER 04-09)	edip ips arm	Mueser, K.T. et al., 2004. The Hartford Study of Supported Employment for Persons With Severe Mental Illness. <i>Journal of consulting and clinical psychology</i> , 72(3), pp.479–490. Mueser, K.T. et al., 2004. Posttraumatic Stress Disorder, Supported Employment, and Outcomes in People with Severe Mental Illness. <i>CNS Spectrums: The International Journal of Neuropsychiatric Medicine</i> , 9(12), pp.913–925. Mueser, K.T., Becker, D., M.Ed. & Wolfe, R., 2009. Supported employment, job preferences, job tenure and satisfaction. <i>Journal of Mental Health</i> , 10(4), pp.411–417. MUESER, K.T., BOND, G.R., ESSOCK, S.M., CLARK, R.E., CARPENTER-SONG, E., DRAKE, R.E. and WOLFE, R., 2014. The effects of supported employment in Latino consumers with severe mental illness. <i>Psychiatric Rehabilitation Journal</i> . 06, vol. 37, no. 2, pp. 113-122.
RCT30 (GOLD 06)	edip ips	Gold, P.B. et al., 2006. Randomized Trial of Supported Employment Integrated With Assertive Community Treatment for Rural Adults With Severe Mental Illness. <i>Schizophrenia bulletin</i> , 32(2), pp.378–395.
RCT31 (LATIMER 06)		Latimer, E.A. et al., 2006. Generalisability of the individual placement and support model of supported employment: results of a Canadian randomised controlled trial. <i>British Journal of Psychiatry</i> , 189(1), pp.65–73.
RCT36 (BOND 07-13)		Bond, G.R. et al., 2007. A randomized controlled trial comparing two vocational models for persons with severe mental illness. <i>Journal of consulting and clinical psychology</i> , 75(6), pp.968–982. Fraser, V.V. et al., 2008. VR closure rates for two vocational models. <i>Psychiatric rehabilitation journal</i> , 31(4), pp.332–339. Harding, B. et al., 2008. Factors associated with early attrition from psychosocial rehabilitation programs. <i>Community Mental Health Journal</i> , 44(4), pp.283–288. Kukla, M. & Bond, G.R., 2009. The working alliance and employment outcomes for people with severe mental illness enrolled in vocational programs. <i>Rehabilitation Psychology</i> , 54(2), pp.157–163. Kukla ME. The relationship between employment status and non-vocational outcomes for persons with severe mental illness enrolled in vocational programs: a longitudinal study [dissertation]. BOND, G.R., CAMPBELL, K. and BECKER, D.R., 2013. A test of the occupational matching hypothesis for rehabilitation clients with severe mental illness. <i>Journal of Occupational Rehabilitation</i> . 06, vol. 23, no. 2, pp. 261-269. KUKLA, M. and BOND, G.R., 2013. A randomized controlled trial of evidence-based supported employment: Non-vocational outcomes. <i>Journal of Vocational Rehabilitation</i> . 04, vol. 38, no. 2, pp. 91-98. KUKLA, M., BOND, G.R. and XIE, H., 2012. A prospective investigation of work and non-vocational outcomes in adults with severe mental illness. <i>The Journal of Nervous and Mental Disease</i> . 03, vol. 200, no. 3, pp. 214-222. MCGUIRE, A.B., BOND, G.R., CLENDENNING, D.R. and KUKLA, M., 2011. Service Intensity as a Predictor of Competitive Employment in an Individual Placement and Support Model. <i>Psychiatric Services</i> , 62(9), pp. 1066-72.

RCT40 (KILLACKEY 08-14)	<p>Killackey, E., Jackson, H.J. & McGorry, P.D., 2008. Vocational intervention in first-episode psychosis: individual placement and support v. treatment as usual. <i>British Journal of Psychiatry</i>, 193(2), pp.114–120.</p> <p>Killackey E, Allot KA, Cotton SM, Chinnery GL, Sun P, Collins Z, et al. Recovery in first-episode psychosis: first results from a large randomized controlled trial of IPS. <i>Early Intervention in Psychiatry</i>. 2012; Vol. 6, issue Suppl. 1:13.</p> <p>Allott KA, Cotton SM, Chinnery GL, Baksheev GN, Massey J, Sun P, et al. The relative contribution of neurocognition and social cognition to 6-month vocational outcomes following individual placement and support in first-episode psychosis. <i>Schizophrenia Research</i> 2013;150(1): 136–43.</p> <p>Killackey E, Allot K, Cotton SM, Jackson H, Scutella R, Tseng YP, et al. A randomized controlled trial of vocational intervention for young people with first-episode psychosis: method. <i>Early Intervention in Psychiatry</i> 2013;7:329–37.*</p> <p>Killackey E, Allott KA, Cotton S, Chinnery GL, Jackson H. Baseline to 18 months: main results from a randomized controlled trial of individual placement and support for young people with first-episode psychosis. <i>Early Intervention in Psychiatry</i>. 2014; Vol. 8, issue Suppl. 1: 152.</p> <p>BAKSHEEV, G.N., ALLOTT, K., JACKSON, H.J., MCGORRY, P.D. and KILLACKEY, E., 2012. Predictors of vocational recovery among young people with first-episode psychosis: findings from a randomized controlled trial. <i>Psychiatric Rehabilitation Journal</i>. 12, vol. 35, no. 6, pp. 421-427.</p> <p>KARAMBELAS, G.J., COTTON, S.M., FARHALL, J., KILLACKEY, E. and ALLOTT, K.A., 2017. Contribution of neurocognition to 18-month employment outcomes in first-episode psychosis. <i>Early Intervention in Psychiatry</i>. 10/27,.</p> <p>LAUBER, C., 2009. Individual placement and support improves employment of young people with first episode psychosis. <i>Evidence Based Mental Health</i>. 05, vol. 12, no. 2, pp. 53-53.</p>
RCT41 (WONG 08)	<p>Wong, K.K. et al., 2008. A Randomized Controlled Trial of a Supported Employment Program for Persons With Long-Term Mental Illness in Hong Kong. <i>Psychiatric Services</i>, 59(1), pp.84–90.</p>
RCT47 (HOWARD 04- 11)	<p>Howard, L.M. et al., 2010. Supported employment: randomised controlled trial. <i>British Journal of Psychiatry</i>, 196(5), pp.404–411.</p> <p>HESLIN, M. et al., 2011. Randomized controlled trial of supported employment in England: 2 year follow-up of the Supported Work and Needs (SWAN) study. <i>World Psychiatry</i>, 10(2), pp.132–137. FOLLOW UP STUDY TO HOWARD</p> <p>Thornicroft G. Employment programme for patients with severe mental illness operated by status employment. <i>National Research Register</i> 2004; Vol. 4.</p>
RCT52 (HOFFMAN 12-14)	<p>ISRCTN 260990 32</p> <p>Hoffmann, H. et al., 2012. A randomised controlled trial of the efficacy of supported employment. <i>Acta Psychiatrica Scandinavica</i>, 125(2), pp.157–167. Available at: http://search.ebscohost.com/login.aspx?direct=true&db=psych&AN=2012-00643-007&site=ehost-live.</p> <p>Hoffmann, H. et al., 2014. Long-Term Effectiveness of Supported Employment: 5-Year Follow-Up of a Randomized Controlled Trial. <i>American Journal of Psychiatry</i>, 171(11), pp.1183–1190. FOLLOW UP STUDY TO HOFFMAN 2012</p> <p>JÄCKEL, D., KUPPER, Z., GLAUSER, S., MUESER, K.T. and HOFFMANN, H., 2017. Effects of Sustained Competitive Employment on Psychiatric Hospitalizations and Quality of Life. <i>Psychiatric Services (Washington, D.C.)</i>. 06/01, vol. 68, no. 6, pp. 603-609.</p>

RCT59 (OSHIMA 14)		Oshima, I. et al., 2014. A randomized controlled trial of individual placement and support in Japan. <i>Psychiatric rehabilitation journal</i> , 37(2), pp.137–143.
RCT60 (WAGHORN 14)		Waghorn, G.R. et al., 2014. A multi-site randomised controlled trial of evidence-based supported employment for adults with severe and persistent mental illness. <i>Australian Occupational Therapy Journal</i> , 61(6), pp.424–436. Available at: http://search.ebscohost.com/login.aspx?direct=true&db=rzh&AN=103924895&site=ehost-live . WAGHORN, G., DIAS, S., GLADMAN, B. and HARRIS, M., 2015. Measuring what matters: Effectiveness of implementing evidence-based supported employment for adults with severe mental illness. <i>International Journal of Therapy & Rehabilitation</i> . 09, vol. 22, no. 9, pp. 411-420.
RCT62 (BEJERHOLM 11-15)	NCT009 60024	Bejerholm, U. et al., 2015. Individual placement and support in Sweden - a randomized controlled trial. <i>Nordic journal of psychiatry</i> , 69(1), pp.57–66. Available at: http://www.tandfonline.com/doi/full/10.3109/08039488.2014.929739 . Areberg, C, & Bejerholm, U 2013, 'The effect of IPS on participants' engagement, quality of life, empowerment, and motivation: a randomized controlled trial', <i>Scandinavian Journal Of Occupational Therapy</i> , 20, 6, pp. 420-428, CINAHL Plus with Full Text, EBSCOhost, viewed 4 April 2018. Bejerholm, U, Larsson, L, & Hofgren, C 2011, 'Individual placement and support illustrated in the Swedish welfare system: A case study', <i>Journal Of Vocational Rehabilitation</i> , 35, 1, pp. 59-72, CINAHL Plus with Full Text, EBSCOhost, viewed 4 April 2018. Hasson H. Systematic evaluation of implementation fidelity of complex interventions in health and social care. <i>Implement Sci</i> . 2010 Sep 3;5:67. doi: 10.1186/1748-5908-5-67.
RCT63 (BOND 15)		Bond, G.R. et al., 2015. A Controlled Trial of Supported Employment for People With Severe Mental Illness and Justice Involvement. <i>Psychiatric Services</i> , 66(10), pp.1027–1034. SVEINSDOTTIR, V. and BOND, G.R., 2017. Barriers to employment for people with severe mental illness and criminal justice involvement. <i>Journal of Mental Health (Abingdon, England)</i> . 12/21, pp. 1-9.

Excluded not SMI

REFERENCES	trial no.	Publications
RCT29 (DREBING 05)		Drebing CE, Van Ormer EA, Krebs C, Rosenheck R, Rounsaville B, Herz L, et al. The impact of enhanced incentives on vocational rehabilitation outcomes for dually diagnosed veterans. <i>Journal of Applied Behavioral Analysis</i> 2005;38(3):359–72. KASHNER, T.M., ROSENHECK, R., CAMPINELL, A.B., SURÃS, A., CRANDALL, R., GARFIELD, N.J., LAPUC, P., PYRCZ, K., SOYKA, T. and WICKER, A., 2002. Impact of work therapy on health status among homeless, substance-dependent veterans: A randomized controlled trial. <i>Archives of General Psychiatry</i> . 10, vol. 59, no. 10, pp. 938-945.

RCT46 (PENK 10)		Penk W, Drebing CE, Rosenheck RA, Krebs C, Van Ormer A, Mueller L. Veterans Health Administration transitional work experience vs. job placement in veterans with co- morbid substance use and non-psychotic psychiatric disorders. <i>Psychiatric Rehabilitation Journal</i> 2010;33(4): 297–307.
RCT51 (DAVIS 12)	NCT00333801	Davis, L.L. et al., 2012. A Randomized Controlled Trial of Supported Employment Among Veterans With Posttraumatic Stress Disorder. <i>Psychiatric Services</i> , 63(5), pp.464–470. DAVIS, L.L., PILKINTON, P., PODDAR, S., BLANSETT, C., TOSCANO, R. and PARKER, P.E., 2014. Impact of social challenges on gaining employment for veterans with posttraumatic stress disorder: An exploratory moderator analysis. <i>Psychiatric Rehabilitation Journal</i> . 06, vol. 37, no. 2, pp. 107-109. funder report here http://www.dtic.mil/dtic/tr/fulltext/u2/a609603.pdf
RCT54 (DRAKE 13)		Drake, R.E., M.D., Ph.D et al., 2013. Assisting Social Security Disability Insurance Beneficiaries With Schizophrenia, Bipolar Disorder, or Major Depression in Returning to Work. <i>American Journal of Psychiatry</i> , 170(12), pp.1433–1441. FREY, W.D., AZRIN, S.T., GOLDMAN, H.H., KALASUNAS, S., SALKEVER, D.S., MILLER, A.L., BOND, G.R. and DRAKE, R.E., 2008. The mental health treatment study. <i>Psychiatric Rehabilitation Journal</i> . 08, vol. 31, no. 4, pp. 306-312.
RCT68 (BEJERHOLM 17)	NCT00960024	Bejerholm, U. et al., 2015. Individual placement and support in Sweden - a randomized controlled trial. <i>Nordic journal of psychiatry</i> , 69(1), pp.57–66. SAHA, S., BEJERHOLM, U., GERDTHAM, U. and JARL, J., 2018. Cost-effectiveness of supported employment adapted for people with affective disorders. <i>Nordic Journal of Psychiatry</i> . 04, vol. 72, no. 3, pp. 236-239.
RCT84 (POREMSKI 17-XX)		POREMSKI, D., RABOUIN, D. and LATIMER, E., 2017. A Randomised Controlled Trial of Evidence Based Supported Employment for People Who have Recently been Homeless and have a Mental Illness. <i>Administration and Policy in Mental Health</i> . 03, vol. 44, no. 2, pp. 217-224. POREMSKI, D., WHITLEY, R. and LATIMER, E., 2016. Building trust with people receiving supported employment and housing first services. <i>Psychiatric Rehabilitation Journal</i> . 03, vol. 39, no. 1, pp. 20-26.
RCT90 (DAVIS 18a)		Davis, L.L., Kyriakides, T.C., Suris, A.M., Ottomanelli, L.A., Mueller, L., Parker, P.E., Resnick, S.G., Toscano, R., Scrymgeour, A.A. and Drake, R.E., 2018. Effect of Evidence-Based Supported Employment vs Transitional Work on Achieving Steady Work Among Veterans With Posttraumatic Stress Disorder: A Randomized Clinical Trial. <i>JAMA psychiatry</i> , 75(4), pp.316-324.

Excluded not high/good fidelity IPS

REFERENCES	trial no.	Publications
RCT01	(BEARD 63-78)	Beard JH, Pitt MA, Fisher SH, Goertzel V. Evaluating the effectiveness of a psychiatric rehabilitation program. <i>American Journal of Orthopsychiatry</i> 1963;33:701–12. Beard JH, Malamud TJ, Rossman E. Psychiatric rehabilitation and long-term rehospitalisation rates: the findings of two research studies. <i>Schizophrenia Bulletin</i> 1978;4:622–35.
RCT02	(BECK67)	Becker RE. An evaluation of a rehab program for chronically hospitalised psych patients. <i>Social Psychiatry</i> . 1967; 2:32–8.
RCT03	(WALKER 69)	Walker R, Winick W, Frost ES, Lieberman JM. Social restoration of hospitalised psychiatric patients through a program of special employment in industry. <i>Rehabilitation Literature</i> . 1969; 30:297–303. [PubMed: 5345174]
RCT04	(WOLKON 71)	Wolkon GH, Karmen M, Tanaka HT. (1971) Evaluation of a social rehabilitation program for recently released psychiatric patients. <i>Community Mental Health Journal</i> . 1971; 7:312–22. [PubMed: 5163677]
RCT05	(GRIF 74)	Griffiths RD. Rehabilitation of chronic psychotic patients. <i>Psychological Medicine</i> . 1974; 4:316–25. [PubMed: 4427978]
RCT06	(KULDAU 77)	Kuldau JM, Dirks SJ. Controlled evaluation of a hospital originated community transitional system. <i>Archives of General Psychiatry</i> . 1977; 34:1331–40. [PubMed: 122450]
RCT07	(KLINE 81)	Kline MN, Hoisington V. Placing the psychiatrically disabled: a look at work values. <i>Rehabilitation Counseling Bulletin</i> . 1981:366–9.
RCT08	(DINCIN 82-84)	Dincin J, Witheridge TF. Psychiatric rehabilitation as a deterrent to recidivism. <i>Hospital and Community Psychiatry</i> . 1982; 33:645–50. [PubMed: 7118100] Bond GR. An economic analysis of psychosocial rehabilitation. <i>Hospital and Community Psychiatry</i> . 1984; 35:356–62. [PubMed: 6425193]
RCT10	(BOND 86)	Bond GR, Dincin J. Accelerating entry into transitional employment in a psychosocial rehabilitation agency. <i>Rehabilitation Psychology</i> . 1986; 31:143– 55.
RCT11	(GERVEY 94)	Gervey, R.; Bedell, JR. Psychological assesment and treatment of persons with severe mental disorders. In: Bedell, JR., editor. <i>Supported employment in vocational rehabilitation</i> . Taylor & Francis; Washington DC: 1994. p. 170-5.
RCT12	(BOND 95)	Bond GR, Dietzen LL, Vogler K, Katuin CH, McGrew JH, Miller D. Toward a framework for evaluating cost and benefits of psychiatric rehabilitation: three case examples. <i>Journal of Vocational Rehabilitation</i> . 1995; 5:75–88. Bond GR, Dietzen LL, McGrew JH, Miller LD. Accelerating entry into supported employment for persons with severe psychiatric disabilities. <i>Rehabilitation Psychiatry</i> . 1995; 40:75–94

RCT13 (BELL 93-96)		<p>Bell MD, Milstein RM, Lysaker PH. Pay as an incentive in work participation by patients with severe mental illness. <i>Hospital and Community Psychiatry</i>. 1993; 44:684–6. [PubMed: 8354510]</p> <p>Bell MD, Milstein RM, Lysaker PH. Pay and participation in work activity: clinical benefits for clients with schizophrenia. <i>Psychosocial Rehabilitation Journal</i>. 1993; 17:173–6.</p> <p>Bell MD, Lysaker PH, Milstein RM. Clinical benefits of paid work activity in schizophrenia. <i>Schizophrenia Bulletin</i>. 1996; 22:51–67. [PubMed: 8685664]</p>
RCT14 (MCFARLANE 95-2000)	edip FACT not IPS	<p>McFarlane, WR.; Stastny, P.; Deakins, S.; Dushay, R. Employment outcomes in family-aided assertive community treatment (FACT). Presented at the Institute on Psychiatric Services; Boston. 1995.</p> <p>McFarlane WR, Dushay RA, Deakins SM, Stasny P, Lukens EP, Toran J, Link B. Employment outcomes in family-aided assertive community treatment. <i>Journal of Orthopsychiatry</i>. 2000; 70(2):203–14.</p>
RCT15 (BLANKERTZ 96)	edip not ips	<p>Blankertz L, Robinson S. Adding a vocational focus to mental health rehabilitation. <i>Psychiatric Services</i>. 1996; 47:1216–22. [PubMed: 8916239]</p>
RCT16 (DRAKE 96-2000)		<p>Drake, R.E., M.D., Ph.D et al., 1996. The New Hampshire study of supported employment for people with severe mental illness. <i>Journal of consulting and clinical psychology</i>, 64(2), pp.391–399.</p> <p>Mueser, K.T. et al., 1997. Work and Nonvocational Domains of Functioning in Persons with Severe Mental Illness: A Longitudinal Analysis. <i>The Journal of Nervous & Mental Disease</i>, 185(7), pp.419–426.</p> <p>Clark, R.E., 1998. Supported employment and managed care: Can they coexist? <i>Psychiatric rehabilitation journal</i>, 22(1), pp.62–68.</p> <p>Clark, R.E. et al., 1998. Benefits and costs of supported employment from three perspectives. <i>The Journal of Behavioral Health Services & Research</i>, 25(1), pp.22–34.</p> <p>Becker, D., M.Ed. et al., 1998. Job Terminations Among Persons with Severe Mental Illness Participating in Supported Employment. <i>Community Mental Health Journal</i>, 34(1), pp.71–82.</p> <p>TORREY, W.C. et al., 2000. Self-esteem as an outcome measure in studies of vocational rehabilitation for adults with severe mental illness. <i>Psychiatric Services</i>, 51(2), pp.229–233</p>
RCT17 (CHANDLER 96-97)		<p>Chandler D, Meisel J, McGowen M, Mintz J, Madison K. Client outcomes in two model capitated integrated service agencies. <i>Psychiatric Services</i>. 1996; 47:175–80. [PubMed: 8825255]</p> <p>Chandler D, Meisel J, Hu T, McGowen M, Madison K. Client outcomes in a three-year controlled study of an integrated service agency model. <i>Psychiatric Services</i>. 1996; 47:1337–43. [PubMed: 9117472]</p> <p>Chandler D, Meisel J, Hu T, McGowen M, Madison K. A capitated model for a cross section of severely mentally ill clients: employment outcomes. <i>Community Mental Health Journal</i>. 1997; 33:501–16. [PubMed: 9435997]</p> <p>Chandler-LongBeach {published data only}. Chandler D, Hu T, Meisel J, McGowen M, Madison K. Mental health costs, other public costs, and family burden among mental health clients in capitated integrated service agencies. <i>Journal of Mental Health Administration</i>. 1997; 24:178–88. [PubMed: 9110521]</p>

RCT18 (OKPAKU 97)		Okpaku SO, Anderson KH, Sibulkin AE, Butler JS, Bickman L. The effectiveness of a multidisciplinary case management intervention on the employment of SSDI applicants and beneficiaries. <i>Psychiatric Rehabilitation Journal</i> . 1997; 20:34–41.
RCT19 (DRAKE 99-02)		Drake, R.E., M.D., Ph.D et al., 1999. A randomized clinical trial of supported employment for inner-city patients with severe mental disorders. <i>Archives of General Psychiatry</i> , 56(7), pp.627–633. Dixon, L. et al., 2002. Cost-effectiveness of two vocational rehabilitation programs for persons with severe mental illness. <i>Psychiatric Services</i> , 53(9), pp.1118–1124
RCT21 (LEHMAN 02)	edip ips arm	Lehman, A.F. et al., 2002. Improving Employment Outcomes for Persons With Severe Mental Illnesses. <i>Archives of General Psychiatry</i> , 59(2), pp.165–172.
RCT22 (BRYSON 02)		Bryson G, Lysaker P, Bell M. Quality of life benefits of paid work activity in schizophrenia. <i>Schizophr Bull</i> . 2002;28(2):249–57, https://doi.org/10.1093/oxfordjournals.schbul.a006935 .
RCT23 (BELL 03)		Bell MD, Lysaker PH, Bryson G. A behavioral intervention to improve work performance in schizophrenia: Work behavior inventory feedback. <i>J Vocat Rehabil</i> . 2003;18(1):43–50.
RCT24 (OBRIEN 03)		O'Brien A, Price C, Burns T, Perkins C. Improving the vocational status of patients with long-term mental illness: a randomised controlled trial of staff training. <i>Community Mental Health Journal</i> 2003;39(4):333–47.
RCT32 (SCHONEBAUM 06-16)	edip not ips	Macias C, DeCarlo LT, Wang Q, Frey J, Barreira P. Work interest as a predictor of competitive employment: policy implications for psychiatric rehabilitation. <i>Administration and Policy in Mental Health</i> 2001;28(4):279–97. Schonebaum AD, Boyd JK, Dudek KJ. A comparison of competitive employment outcomes for the Clubhouse and PACT models. <i>Psychiatric Services</i> 2006;57(10):1416–20. Macias C, Rodican CF, Hargreaves WA, Jones DR, Barreira PJ, Wang Q. Supported employment outcomes of a randomized controlled trial of ACT and Clubhouse models. <i>Psychiatric Services</i> 2006;57(10):1406–15. Schonebaum AD, Boyd JK. Work-ordered day as a catalyst of competitive employment success. <i>Psychiatric Rehabilitation Journal</i> 2012;35(5):391 Schonebaum, A.D., Boyd, J.K. & Dudek, K.J., 2006. A comparison of competitive employment outcomes for the clubhouse and PACT models. <i>Psychiatric Services</i> , 57(10), pp.1416–1420. Gold PB, Macias C, Rodican CF. Does competitive work improve quality of life for adults with severe mental illness? Evidence from a randomized trial of supported employment. <i>The Journal of Behavioral Health Services & Research</i> 2016; 43(2):155–71. MACIAS, C., JONES, D.R., HARGREAVES, W.A., WANG, Q., RODICAN, C.F., BARREIRA, P.J. and GOLD, P.B., 2008. When programs benefit some people more than others: tests of differential service effectiveness. <i>Administration and Policy in Mental Health</i> . 07, vol. 35, no. 4, pp. 283-294.
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RCT83 (Khalifa 16-XX)	NCT02442193	KHALIFA, N., TALBOT, E., SCHNEIDER, J., WALKER, D.M., BATES, P., BIRD, Y., DAVIES, D., BROOKES, C., HALL, J. and VÖLLM, B., 2016. Individual placement and support (IPS) for patients with offending histories: the IPSOH feasibility cluster randomised trial protocol. <i>BMJ Open</i> , 6(7),.
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RCT89 (DAVIS 19)	NCT02400736	Supported Employment in OIF/OEF PACT - NO PUBLICATIONS

RCT91 (DAVIS 18b)	NCT01817712	Davis, L.L., Kyriakides, T.C., Suris, A., Ottomanelli, L., Drake, R.E., Parker, P.E., Mueller, L., Resnick, S.G., Toscano, R., Blansett, C.M. and McCall, K.P., 2018. Veterans individual placement and support towards advancing recovery: Methods and baseline clinical characteristics of a multisite study. <i>Psychiatric rehabilitation journal</i> , 41(1), p.55.
RCT92 (Silverman 18)	NCT02487745	The Long-Term Treatment of Drug Addiction and Unemployment - NO PUBLICATIONS
RCT93 (GLYNN 15)	NCT00261716	https://clinicaltrials.gov/ct2/show/results/NCT00261716
RCT94 (Ferguson-Colvin 18)	NCT03118388	https://clinicaltrials.gov/ct2/show/NCT03118388
RCT95 (Erickson 18)	NCT03317132	https://clinicaltrials.gov/ct2/show/study/NCT03317132
RCT96 (Nuechterlein 16)	NCT02823041	https://clinicaltrials.gov/ct2/show/NCT02823041
RCT97 (Nuechterlein 05)	NCT00203788	https://clinicaltrials.gov/ct2/show/NCT00203788?term=NCT00203788&rank=1 Nuechterlein KH, Subotnik KL, Ventura J, Gitlin MF, Green MF, Wallace CJ, Becker DR, Liberman RP, Drake RE, Mintz J. Advances in improving and predicting work outcome in recent-onset schizophrenia. <i>Schizophrenia Bulletin</i> 31(2): 530, 2005.
RCT99 (SMITH 18)	NCT03049813	https://www.clinicaltrials.gov/ct2/show/NCT03049813?term=VIRTUAL+REALITY+JOB+INTERVIEW&recrs=ab&rank=1
RCT100 (Erickson 18)	NCT03483701	https://www.clinicaltrials.gov/ct2/show/NCT03483701?term=NCT03483701&rank=1
RCT101 (Vinogradov 13-16)	NCT01988714	https://clinicaltrials.gov/ct2/show/NCT01988714 Biagianni B, Fisher M, Neilands TB, Loewy R, Vinogradov S. Engagement with the auditory processing system during targeted auditory cognitive training mediates changes in cognitive outcomes in individuals with schizophrenia. <i>Neuropsychology</i> . 2016 Nov;30(8):998-1008. Epub 2016 Sep 12.
RCT102 (Tenhula13-16)	NCT00272168	https://www.clinicaltrials.gov/ct2/show/results/NCT00272168?term=the+use+of+skills+training+to+augment&rank=1&sect=Xa7016#outcome4

Appendix D. Meta-Analysis of Good Fidelity IPS data extraction tables

PUBLICA TION	RESEARCH QUESTION / AIM	GEOGRA PHY	STUDY POPULATION	EXPERIM ENTAL GROUP	GRADE OF IPS FIDELITY	CONTROL GROUP(1)	CONTROL GROUP(2)	COMMENT
RCT25 (MUESER 04-09)	Compare IPS vs PSR vs TAU. Evaluating effects on employment outcomes and social outcomes. One site of EDIP	USA Connecti cut.	SMI; 53%schizophrenia, 21%schizoffective, 5%bipolar, 17%maj depression, 1%PD, 2%other. 46%African American, 30%Latino	SE/IPS	3 GOOD FIDELITY	PSR	TAU	IPS vs PSR vs TAU mean IPS fidelity 70
RCT30 (GOLD 02-06)	Compare ACT & IPS with TAU SE. Original intent was 3 arm ACT vs IPS vs TAU but problems with recruitment. One site of EDIP	USA rural South Carolina	SMI INT. 41 (62.1%) schizophrenia spectrum 25(37.9%) mood spectrum CON. 57 (74%) schizophrenia spectrum 20(26%) mood spectrum	SE/IPS	3 GOOD FIDELITY	SE/IPS		ACT & IPS vs TAU SE. IPS fidelity scores 64, 69, 72, 72. Concern raised about recruitment of participant who did not express goal for employment.
RCT31 (LATIME R 06)	Testing efficacy of IPS in Canada. Hypothesis: (1) IPS more effective than standard VR in employment outcomes. (2) employment improves symptoms, QoL, self- esteem, social support, client functioning, and substance misuse outcomes.	Montreal Canada	SMI INT schizoffective INT 20% CONT 13.5% Other schizophrenia spectrum INT 64% CONT 54.1% Bipolar INT 13.3% CONT 27% other INT 2.7% CONT 5.4%	SE/IPS	3 GOOD FIDELITY	SHELTERED WORK		SE vs TAU sheltered /creative workshops; IPS fidelity score 72, 70.5
RCT36 (BOND 07-09)	Compare IPS and train then place. Hypothesis (1) obtain comp emp faster; (2) longer tenure (3) more job satisfaction	USA Chicago	SMI 37.6% schizophrenia 16.5% schizoffective 23.2% bipolar	SE/IPS	3 GOOD FIDELITY	TRAIN THEN PLACE		IPS vs stepwise work readiness (strong control). Fidelity improved over the study (NORTH Feb/Aug00 not IPS; Dec 00 good. SOUTH Feb00 - not IPS Aug 00 good.
RCT40 (KILLAC KEY 08- 14)	To examine IPS efficacy in first-episode psychosis.	Melbourn e Australia	EPICC service clients Age 15-25yrs all schizophrenia- spectrum disorders.	SE/IPS	3 GOOD FIDELITY	TAU		limited IPS to 6mths vs tau IPS fidelity 68

PUBLICA TION	RESEARCH QUESTION / AIM	GEOGRA PHY	STUDY POPULATION	EXPERIM ENTAL GROUP	GRADE OF IPS FIDELITY	CONTROL GROUP(1)	CONTROL GROUP(2)	COMMENT
RCT41 (WONG 08)	Testing efficacy of IPS in China. Hypothesis: (1) clients receiving IPS better outcomes than conventional VR	Hong Kong, China	long-term mental illness; 70% schizophrenia spectrum, 18% Affective; 12%other	SE/IPS	3 GOOD FIDELITY	TAU		IPS vs tau VR fidelity score 69/75
RCT47 (HOWARD 04-11)	investigate the effectiveness and cost-effectiveness of IPS in England	London UK	SMI - 72.5%Psychotic disorder; 27.5%mood disorder	SE/IPS	3 GOOD FIDELITY	TAU		IPS vs TAU. Fidelity scores BoroughA 67 BoroughB 69 (low scoring criteria integration (A&B) and rapid job search (A))
RCT52 (HOFFMAN 12-14)	Testing efficacy of SE in Switzerland, highly developed social security & welfare systems, rehab programmes and high thresholds to the open labour market.	Bern, Switzerland	SMI who had received the authorisation for vocational rehabilitation from the Swiss Invalidity Insurance. 38%schizophrenia spectrum, 41%affective disorder, 21%other	SE/IPS	3 GOOD FIDELITY	TRADITIONAL VR (USA)		IPS vs traditional VR IPS fidelity (97) scored 66-68 (low scoring criteria zero-exclusion due to cultural context)
RCT59 (OSHIMA 14)	Testing efficacy of IPS in Japan. Hypothesis: (1) clients receiving IPS better outcomes than conventional VR	Asia Japan	Mental health high use of services (includes schizophrenia, neurotic disorder; excludes LD dementia, substance misuse, personality disorder))	SE/IPS	3 GOOD FIDELITY	TRAIN THEN PLACE		ips vs conventional VR. Fidelity score 68/75. (Fidelity assessment by author, not independent)
RCT60 (WAGHORN 14)	Testing efficacy of IPS in Australia - adult population	Brisbane, Townsville and Cairns, Australia	SMI 84.8%psychotic disorder 8.6%bipolar 6.6%major depression/anxiety	SE/IPS	3 GOOD FIDELITY	DISABILITY EMPLOYMENT ADVISOR		IPS vs disability employment services fidelity score not given but report good fidelity,

PUBLICA TION	RESEARCH QUESTION / AIM	GEOGRA PHY	STUDY POPULATION	EXPERIM ENTAL GROUP	GRADE OF IPS FIDELITY	CONTROL GROUP(1)	CONTROL GROUP(2)	COMMENT
RCT62 (BEJERH OLM 11- 15)	Testing efficacy of IPS in Sweden Hypothesis: (1) IPS participant would reach competitive employment at a higher rate; (2) more hrs worked; (3) increased income; (4) longer job tenure (5) reach a job sooner (6) improved community integration	Europe Sweden	six mh teams in southern Swedish city specialised in severe mental illness (psychosis or psychiatric disabilities sig impact on everyday life on a long term basis (>2yrs) Schizophrenia or other psychosis INT 39 (66%) CONT 38 (63%) Bipolar INT 4(7%) CONT 5(8%) other diagnosis INT 16 (27%) CONT 17 (28%)	SE/IPS	1 EXEMPLAR FIDELITY	TRAIN THEN PLACE		IPS vs traditional VR FIDELITY At 6 mths good fidelity (110) at 12mths exemplar (115) at 18mths (117)
RCT63 (BOND 15)	testing efficacy IPS for people with SMI who have a history of arrest or incarceration	Chicago USA	SMI and self-disclosed criminal justice history. 52.9%schizophrenia 18.4%depressive 25.3%bipolar 3.4%other	SE/IPS	3 GOOD FIDELITY	TRADITIONA L VR (USA)		IPS vs job club - popl MI and offending history

PUBLICATI ON	TOTAL SAMPLE	FINAL SAMPLE	IPS SAMPLE START	CONTR L SAMPLE START	IPS SAMPLE END	CONTR L SAMPLE END	IPS MALE	IPS FEMALE	CONTR L MALE	CONTR L FEMALE	IPS MEAN AGE	IPS AGE SD	CONTR L MEAN AGE	CONTR L AGE SD
RCT25 (MUESER 04-09)	137	137	68	69	68	69	42	26	44	25	41.7	8.8	40.9	9.3
RCT30 (GOLD 02- 06)	143	143	66	77	66	77	19	47	35	42	na	na	na	na
RCT31 (LATIMER 06)	150	125	75	74	59	66	47	28	45	29	39.9	9	40.6	11
RCT36 (BOND 07- 09)	187	190	92	92	95	95	58	34	61	31	39.7	9.4	38	9.7
RCT40 (KILLACKE Y 08-14)	41	41	20	21	20	21	16	4	17	4	21.29	2.39	21.42	2.21
RCT41 (WONG 08)	92	92	46	46	46	46	25	21	30	16	32.4	8.9	34.7	9.4
RCT47 (HOWARD 04-11)	219	188	109	110	93	95	72	37	76	34	38.4	9.5	38.3	9.3
RCT52 (HOFFMA N 12-14)	100	93	46	54	42	51	30	16	35	19	33.5	9.8	34.1	9.2
RCT59 (OSHIMA 14)	37	37	18	19	18	19	15	3	13	5	40.1	8.5	41.1	9.4
RCT60 (WAGHOR N 14)	208	116	106	102	67	49	73	33	71	31	32	8.9	32.8	8.9

PUBLICATI ON	TOTAL SAMPLE	FINAL SAMPLE	IPS SAMPLE START	CONTRO L SAMPLE START	IPS SAMPLE END	CONTRO L SAMPLE END	IPS MALE	IPS FEMALE	CONTRO L MALE	CONTRO L FEMALE	IPS MEAN AGE	IPS AGE SD	CONTRO L MEAN AGE	CONTRO L AGE SD
RCT62 (BEJERHO LM 11-15)	120	87	60	60	41	46	28	32	39	21	38	8	38	8
RCT63 (BOND 15)	87	85	43	44	42	43	33	10	36	8	42.9	11.5	44.6	11.6

PUBLICATI ON	IPS NO EXAM S	IPS EXAM S	CONT ROL NO EXAM S	CONT ROL EXAM S	IPS ALON E	IPS WITH OTHE R	CONT ROL ALON E	CONT ROL WITH OTHE RS	IPS SINGL E	IPS DEFA CTO	CONT ROL SINGL E	CONT ROL DEFA CTO	IPS PREV EMP	IPS NO EMP	CONT ROL PREVI OUS EMP	CONT ROL NO EMP
RCT25 (MUESER 04-09)	34	34	34	35	-	-	-	-	3	65	66	3	29	39	28	41
RCT30 (GOLD 02- 06)	31	35	38	39	-	-	-	-	55	11	63	14	62	4	75	2
RCT31 (LATIMER 06)	29	46	35	39	-	-	-	-	60	15	58	16	21	54	25	49
RCT36 (BOND 07- 09)	16	76	17	75	-	-	-	-	71	21	68	24	-	-	-	-
RCT40 (KILLACKE Y 08-14)	-	-	-	-	-	-	-	-	19	1	10	7	-	-	-	-
RCT41 (WONG 08)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RCT47 (HOWARD 04-11)	-	-	-	-	60	49	58	52	-	-	-	-	56	53	61	49
RCT52 (HOFFMAN 12-14)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RCT59 (OSHIMA 14)	-	-	-	-	5	12	4	13	-	-	-	-	14	4	12	7

PUBLICATI ON	IPS NO EXAM S	IPS EXAM S	CONT ROL NO EXAM S	CONT ROL EXAM S	IPS ALON E	IPS WITH OTHE R	CONT ROL ALON E	CONT ROL WITH OTHE RS	IPS SINGL E	IPS DEFA CTO	CONT ROL SINGL E	CONT ROL DEFA CTO	IPS PREV EMP	IPS NO EMP	CONT ROL PREVI OUS EMP	CONT ROL NO EMP
RCT60 (WAGHOR N 14)	36	69	25	72	-	-	-	-	95	10	89	7	39	28	28	39
RCT62 (BEJERHO LM 11-15)	-	-	-	-	-	-	-	-	48	12	50	10	26	20	26	34
RCT63 (BOND 15)	13	30	22	22	-	-	-	-	36	3	40	1	22	21	21	23

PUBLICATI ON	IPS JOB OUTCOME	IPS NO JOB OUTCOME	CONTROL JOB OUTCOME	CONTROL NO JOB OUTCOME
RCT25 (MUESER 04-09)	51	17	19	50
RCT30 (GOLD 02- 06)	42	24	20	57
RCT31 (LATIMER 06)	51	24	39	35
RCT36 (BOND 07- 09)	69	23	32	63
RCT40 (KILLACKE Y 08-14)	17	3	6	15
RCT41 (WONG 08)	32	14	13	33
RCT47 (HOWARD 04-11)	21	72	11	84
RCT52 (HOFFMA N 12-14)	27	19	14	40
RCT59 (OSHIMA 14)	8	10	2	17
RCT60 (WAGHOR N 14)	45	61	24	78

PUBLICATI ON	IPS JOB OUTCOME	IPS NO JOB OUTCOME	CONTROL JOB OUTCOME	CONTROL NO JOB OUTCOME
RCT62 (BEJERHO LM 11-15)	19	22	5	41
RCT63 (BOND 15)	13	29	3	40

PUBLICA TION	IPS TIME TO FIRST POST DAYS (MEAN)	IPS TIME TO FIRST POST DAYS (SD)	IPS TIME TO FIRST POST DAYS 95% CI LOW	IPS TIME TO FIRST POST DAYS 95% CI HIGH	IPS TIME TO FIRST POST DAYS RANGE LOW	IPS TIME TO FIRST POST DAYS RANGE HIGH	CONTRO L TIME TO FIRST POST DAYS (MEAN)	CONTRO L TIME TO FIRST POST DAYS (SD)	CONTRO L TIME TO FIRST POST DAYS 95% CI LOW	CONTRO L TIME TO FIRST POST DAYS 95% CI HIGH	CONTRO L TIME TO FIRST POST DAYS RANGE LOW	CONTRO L TIME TO FIRST POST DAYS RANGE HIGH
RCT25 (MUESER 04-09)	196.63	188.55	-	-	-	-	218.84	137.6	-	-	-	-
RCT30 (GOLD 02-06)	133	-	-	-	49	259	322	-	-	-	217	490
RCT31 (LATIMER 06)	89.4	116.1	-	-	-	-	84.1	103.6	-	-	-	-
RCT36 (BOND 07-09)	156.41	122.26	-	-	-	-	193.44	156.5	-	-	-	-
RCT40 (KILLACK EY 08-14)	-	-	-	-	-	-	-	-	-	-	-	-
RCT41 (WONG 08)	72	77	-	-	-	-	118	143	-	-	-	-
RCT47 (HOWAR D 04-11)	-	-	-	-	72	197	-	-	-	-	118	293
RCT52 (HOFFMA N 12-14)	116.7	155.5	-	-	-	-	214.3	196.5	-	-	-	-
RCT59 (OSHIMA 14)	-	-	-	-	-	-	-	-	-	-	-	-

PUBLICA TION	IPS TIME TO FIRST POST DAYS (MEAN)	IPS TIME TO FIRST POST DAYS (SD)	IPS TIME TO FIRST POST DAYS 95% CI LOW	IPS TIME TO FIRST POST DAYS 95% CI HIGH	IPS TIME TO FIRST POST DAYS RANGE LOW	IPS TIME TO FIRST POST DAYS RANGE HIGH	CONTRO L TIME TO FIRST POST DAYS (MEAN)	CONTRO L TIME TO FIRST POST DAYS (SD)	CONTRO L TIME TO FIRST POST DAYS 95% CI LOW	CONTRO L TIME TO FIRST POST DAYS 95% CI HIGH	CONTRO L TIME TO FIRST POST DAYS RANGE LOW	CONTRO L TIME TO FIRST POST DAYS RANGE HIGH
RCT60 (WAGHO RN 14)	-	-	-	-	-	-	-	-	-	-	-	-
RCT62 (BEJERH OLM 11- 15)	462.5	-	406.3	518.78	-	-	541.2	-	515.57	566.83	-	-
RCT63 (BOND 15)	-	-	-	-	-	-	-	-	-	-	-	-

PUBLICATION	SELECTION BIAS (RANDOM SEQUENCE GENERATION)	SELECTION BIAS (ALLOCATION CONCEALMENT)	PERFORMANCE BIAS (BLINDING OF PARTICIPANTS AND PERSONNEL)	DETECTION BIAS (BLINDING OF OUTCOME ASSESSMENT)	ATTRITION BIAS (INCOMPLETE OUTCOME DATA)	REPORTING BIAS (SELECTIVE REPORTING)	OTHER BIAS
RCT25 (MUESE R 04-09)	low risk	unclear	high risk	high risk	low risk	low risk	unclear
RCT30 (GOLD 02-06)	low risk	low risk	high risk	low risk	high risk number lost was reported	low risk	
RCT31 (LATIME R 06)	low risk	low risk	high risk	high risk	low risk	low risk	unclear
RCT36 (BOND 07-09)	low risk computerised randomisation	low risk independent programme director	high risk no blinding	high risk assessors not blinded	high risk number lost was reported	low risk all reported	unclear grant funded, participants paid for interviews
RCT40 (KILLAC KEY 08-14)	low risk	low risk	high risk	high risk	low risk	low risk	unclear
RCT41 (WONG 08)	low risk	unclear	high risk	high risk	low risk	low risk	unclear
RCT47 (HOWARD 04-11)	low risk	low risk	high risk	high risk	high risk	low risk	low risk
RCT52 (HOFFMAN 12-14)	low risk computerised randomisation	low risk central allocation	high risk	high risk assessors not blinded	low risk	low risk	unclear

PUBLICATION	SELECTION BIAS (RANDOM SEQUENCE GENERATION)	SELECTION BIAS (ALLOCATION CONCEALMENT)	PERFORMANCE BIAS (BLINDING OF PARTICIPANTS AND PERSONNEL)	DETECTION BIAS (BLINDING OF OUTCOME ASSESSMENT)	ATTRITION BIAS (INCOMPLETE OUTCOME DATA)	REPORTING BIAS (SELECTIVE REPORTING)	OTHER BIAS
RCT59 (OSHIMA 14)	unclear - method of randomisation not reported	unclear method not reported	high risk	high risk	low risk	low risk	low risk
RCT60 (WAGHORN 14)	low risk	low risk	high risk	unclear - not reported	high risk	low risk	high - funding based on outcomes; participants able to object if randomised to control group
RCT62 (BEJERHOLM 11-15)	low risk randomisation by independent body and using software	low risk central allocation	high risk - not possible to mask participants or professionals	low risk - assessors blinded	high risk 73% follow up	low risk all reported	low risk grant funded
RCT63 (BOND 15)	low risk	low risk	high risk	high risk	low risk	low risk	low risk

Appendix E. Worker Role Interview items and rating criteria

Explanation of Layout of Appendix

Subsection of Worker Role Interview

Definition:of subsection

1. Item Title: definition of item		
Supports (dichotomous variable used in this research)	SS	Worker role interview rating criteria for strongly supports –collapsed into Supports variable in this research
	S	Worker role interview rating criteria for supports - collapsed into Supports variable in this research
Interferes (dichotomous variable used in this research)	I	Worker role interview rating criteria for interferes –collapsed into Interferes variable in this research
	SI	Worker role interview rating criteria for strongly interferes –collapsed into Interferes variable in this research

Any scoring notes

VOLITION: Personal Causation

Definition: A collection of beliefs and expectations that a person holds about his/her effectiveness in the work environment.

1. Assesses Abilities and Limitations: Individual’s capacity to accurately assess his/her abilities and what they mean for work performance		
Supports	SS	Accurately recognizes, accepts limitations, emphasizes assets, acknowledges how to compensate for limitations, assess impact on possible work activity.
	S	Recognizes some limitations and abilities, reasonably over/underestimates abilities, adequate knowledge of impact on possible work activity.
Interferes	I	Difficulty recognizing/compensating for limitations, over/underestimates abilities, poor work choices.
	SI	Failure to recognize/compensate for limitations, unrealistic estimation of abilities and work choices.

1. Assesses Abilities and Limitations: Individual’s capacity to accurately assess his/her abilities and what they mean for work performance

**Two problems that may emerge in assessing “personal causation” are denial and symptom magnification. In the case of denia, the client denies limitations imposed by injury or condition and may, therefore, “overdo” and fail to follow proper precautions or use proper body mechanics. In the case of symptom magnification, the client magnifies his/her symptoms and, therefore, overestimates the limits imposed by the injury or condition.*

2. Expectation of success in work: A client's belief that he/she will be able to work. Overall, consider the general degree of optimism the person has about working. A client's expectation for being able to work is an asset in and of itself, even if it reflects an unrealistic self-appraisal. (The ability to accurately assess potential to work is rated in the previous item.)

Supports	SS	Optimistic strong belief in effectiveness, confident about overcoming limitations/obstacles/ problems, looks forward to challenges, accepts circumstances beyond control without giving up.
	S	Some optimism, adequate belief in effectiveness, some confidence about overcoming limitations/ obstacles/problems, faces challenges with hope for success.
Interferes	I	Some pessimism, uncertain about success, doubts ability to overcome limitations/obstacles/ problems, discouraged by challenges.
	SI	Pessimistic about working, feels helpless to overcome limitations/obstacles/problems, giving up when challenged.

3. Takes Responsibility: How much responsibility a client takes for his/her work actions and their consequences. A client who initiates action and positively responds to obstacles and challenges by taking action, exerts control over his/her own work situation. This has been described as internal control as opposed to external control, the case of a client allowing the course of his/her work to be determined by outside agents (i.e., other people or events).

Supports	SS	Takes reasonable responsibility, understands aspects of work beyond control, actively seeking to return to/find work.
	S	Takes some responsibility, has some understanding of aspects work beyond control, somewhat active in seeking to return to/find work.
Interferes	I	Avoids responsibility in work/life situation, tends to blame others/circumstances for failures, overly self-critical regarding aspects of work beyond their control, somewhat passive, little initiative for returning to/finding work.
	SI	Avoids responsibility, blames others/personal circumstances for personal failures. Completely passive, no initiative in seeking to return to/find work.

It should be noted that a client could assume too much responsibility for circumstances (i.e. for things that are actually out of his/her control). This would be demonstrated by being compulsive and controlling; having a difficult time accepting that some things are outside of his/her own control. For example, the overly responsible client would not be open to advice, believing that he/she “knows what to do to return to work.” While a high level of responsibility could support return to the job, “over-responsibility” could potentially be a deterrent for return to work. When this is the case, consider whether this results in an advantage (rating of S), an interference (rating of I), or a serious negative impact on return to previous work (rating of SI)

VOLITION: Values

Definition: Client has images of what is good, right, and/or important in his/her job and about being a worker.

4. Commitment to Work The client's commitment to work and importance placed on work.		
Supports	SS	Strong, clear personal standards, values and importance in relation to work, commitment to work strongly outweighs any negative consequences of working.
	S	Adequate sense of values and importance and some personal standards in relation to work, commitment to work somewhat outweighs any negative consequences of working.
Interferes	I	Weak sense of values and importance, and little sense of personal standards in relation to work, commitment to work is outweighed somewhat by negative consequences of working.
	SI	No sense of values, importance, personal standards in relation to working, commitment to work is strongly outweighed by negative consequences of working.

5. Work-Related Goals: Ability to set and attain goals at his/her work setting. Evidence of setting and attaining goals can be found in a history of setting and meeting productivity goals (e.g., amount of piecework completed, level of sales) and in efforts to get training, promotion, putting in time for seniority, taking additional exams, or training to advance to another level of competency.

Supports	SS	Strong history and/or present strength in setting realistic goals, clear planning for, finding, keeping, and for accomplishment /advancement at work, desire to extend/challenge self at work.
	S	Some history and/or present strength of setting realistic goals, some clear planning for finding and keeping work, and for accomplishment/ advancement at work, some motivation to extend/ challenge self at work.
Interferes	I	Little history and/or present strength in setting realistic goals, limited planning for finding and keeping work, unrealistic work goals, limited desire to extend/challenge self at work.
	SI	No history/recollection and/or present strength in setting goals and no clear planning for finding/ keeping work, unrealistic goal setting in relation to strengths/limitations, no goal setting at work due to no previous work history, no desire to challenge/ extend self at work.

VOLITION: Interests

Definition: The pleasure or enjoyment the client finds within and outside of work.

<p>6. Enjoys Work: Pleasure or enjoyment client finds within work. Client may describe liking work in a variety of ways: opportunity to use skills, challenges, interactions with coworkers, etc.</p>		
Supports	SS	High level of enjoyment at work, in a variety of ways, high level of interest in work that corresponds well with abilities/opportunities.
	S	Moderate level of enjoyment, identifies a few ways to enjoy work, work interest somewhat corresponds with abilities/opportunities.
Interferes	I	Little enjoyment, struggles to find an enjoyable aspect of work, work interest does not correspond well with abilities/opportunities.
	SI	No experience enjoying work, interest in work has no relationship to abilities/opportunities, little/no work experience and can't identify work-related interests.

<p>7. Pursues Interests: The ability of an individual to assess his/her own interests and find ways to use these skills in and/or outside of the work situation. The willingness of the individual to explore opportunities to make work and leisure interesting.</p>		
Supports	SS	Actively seeks ways to pursue a range of different interests, gains satisfaction, frequently uses skills to make work /other activities interesting.
	S	Sometimes seeks ways to pursue different interests, gains some satisfaction, sometimes uses skills to make work/other activities interesting.
Interferes	I	Struggles to identify many interests, difficulty gaining satisfaction, rarely uses skills to make work/other activities interesting or take initiative to pursue interests.
	SI	Identifies no interests, no initiative to pursue interests, little/no satisfaction from engaging in interests, never uses skills to make work/other activities interesting.

HABITUATION: Roles

Definition: This process is one of internalizing roles; it involves coming to see one’s self as a worker, parent, student, etc. Internalized roles are images that persons hold of themselves as occupying certain statuses or positions in social groups and of obligations or expectations that accompany being in these roles.

8. Appraises Work Expectations: Client’s ability to internalize both general and specific expectations of work. General expectations for work have to do with basic responsibilities like being on time, calling in when sick, getting along with others, and so on. Specific expectations may have to do with actual work performance such as the kind of tasks to perform or with issues such as safety or courtesy to customers.		
Supports	SS	Clear, realistic understanding of general responsibilities, describes accurately and in detail specific responsibilities of a particular job.
	S	Some generally realistic understanding of general responsibilities; describes general responsibilities of a particular job.
Interferes	I	Poor understanding of general responsibilities, struggles to describe/inaccurately describes specific responsibilities of a particular job.
	SI	No obvious understanding/unable to describe or has inaccurate description of general and specific responsibilities of a particular job.

9. Influence of Other Roles:		
How much other roles in the client’s life influence his/her return to work.		
Supports	SS	Other roles strongly support return to/finding, keeping work, and do not conflict with work role.
	S	Other roles support return to/finding, keeping work, and may conflict somewhat with work role.
Interferes	I	Other roles interfere with return to/finding, keeping work, and will conflict with work role.
	SI	Other roles significantly interfere with return to/ finding, keeping work, and seriously conflict with work role.

HABITUATION: Habits

Definition: Habits are images guiding the routine or typical ways in which a person performs various activities. Habits refer both to the organization of behavior over time and to the style or manner of performance. The degree of organization in work habits and habits outside of work is the degree to which one has a typical use of time that supports competent performance in a variety of roles the client may have.

10. Work Habits: Degree of organization and routine in work.		
Supports	SS	Highly organized work or home routine, highly satisfactory/productive work habits.
	S	Generally organized work or home routine, generally satisfactory/productive work habits, some unsatisfactory work habits.
Interferes	I	Generally disorganized work or home routine, generally unsatisfactory/unproductive work habits.
	SI	Highly disorganized work or home routine, no previous work history/unable to describe working routines.

11. Daily Routine: Degree of organization and routine outside of work.		
Supports	SS	Highly organized daily routine, highly satisfactory/productive habits outside work.
	S	Generally organized routine, generally satisfactory/productive habits outside work.
Interferes	I	Somewhat chaotic daily schedule; insufficiently organized, general lack of activity in daily routine.
	SI	Unable to maintain routine outside work, chaotic life pattern, inactive routine.

12. Adapts Routines to Minimize Difficulties:

How the person has managed use of time, routine, and habits since the injury or since being out of work.

Supports	SS	Successfully adapts to changing circumstances, adapts routine well, actively seeks to overcome difficulties where realistic since being ill/or out of work.
	S	Some success in adapting to changing circumstances by adapting routines, sometimes seeks to overcome difficulties where realistic since being ill/out of work.
Interferes	I	Struggles to adapt to changing circumstances by adapting routines, little effort to overcome difficulties/unrealistic in attempts.
	SI	Not adapted routine, no/completely unrealistic efforts to overcome difficulties since being ill/out of work.

ENVIRONMENT

Definition: The objects, persons, and events with which a person interacts in normal everyday routines.

13. Perception of Physical Work Setting: The physical environment in which the client works, or hopes to work in. The client's impression of how a work environment may support or hinder his/ her return to work or finding and keeping work.		
Supports	SS	Clear understanding of physical work environment and how it will support work performance, anticipates no difficulties and/or has clear ideas how to overcome them.
	S	Some understanding of how physical work environment can support work performance; anticipates some difficulties and/or unsure how to overcome them.
Interferes	I	Poor understanding/concern about how physical work environment might affect work performance; anticipates significant difficulties and/or has little idea how to overcome them.
	SI	No understanding of physical work environment or perceives negatively impact on work performance; unrealistic views of anticipated difficulties and/or no idea how to overcome difficulties.

14. Perception of Family and Peers:

Family's and peers' influence on the client's ability to return to previous work.

Supports	SS	Family/peers are strongly encouraging, supportive, have expectations, positive attitude, willing to help client succeed at work.
	S	Family/peers generally encouraging, supportive, some reservations/ambivalence about client working, somewhat willing to help client succeed at work.
Interferes	I	Family/peers generally discouraging, unsupportive, strong reservations/ambivalence about client working, indifferent to client success at work.
	SI	Family/peers strongly discouraging, unsupportive, no expectations, negative attitude, unwillingness to help client succeed at work, no family/peers identified.

15. Perception of Boss and/or Company: Influence of boss and/or company on the ability of client to return to previous work or find and keep work.

Supports	SS	Feels boss/company attitude is strongly encouraging, supportive, willing to accommodate changes to work schedule and/or work organization. Or, client has no work but has realistic expectations regarding likelihood of support.
	S	Feels boss/company attitude is somewhat encouraging, supportive, willing to accommodate changes to work schedule and/or work organization. Client has no recent work, somewhat under/over estimates support.
Interferes	I	Feels boss/company attitude is generally discouraging, unsupportive, unwilling to accommodate changes to work schedule and/or work organization. Client has no recent work, generally unrealistic regarding expectation of support, history of conflict with previous bosses/ employers.
	SI	Feels boss /company attitude is strongly discouraging, unsupportive, and opposed to accommodation to changes to work schedule and/ or work organization; grossly over/underestimates support, history of serious conflict with bosses/ employers

16. Perception of Coworkers:

Coworkers' influence on client's ability to return to previous work and find and keep work.

Supports	SS	Expects co-workers to be mostly supportive, willing to help; history of successful peer negotiation; good understanding of coworkers' impact on return to/finding/keeping job.
	S	Expects some co-worker support, willingness to help; some history of successful peer negotiation; some understanding of co-workers impact on return to/finding/keeping job.
Interferes	I	Feels co-workers will give limited support and have little willingness to help; limited recent work history; limited awareness of co-workers impact on return to/finding/keeping job.
	SI	Expects unsupportive co-workers and unwillingness to help; Unrealistic ideas coworkers impact on return to/finding/keeping job; no recent work history.

Appendix F. WRI Recommended Questions for this study population

<p>LABEL APPLIED FOR CROSS-REF DIAGRAMS</p>	<p>WRI GUIDELINE QUESTION MENTAL HEALTH</p>
WRI Q R&R1	Describe a typical day now. Describe a typical week. For example, are you working, attending any type of job training or therapy? (H)
WRI Q R&R2	What responsibilities have you got at the moment? (R)
WRI Q R&R3	Are you able to structure your days to meet your current responsibilities? (H)
WRI Q R&R4	How did your routine change when you got sick? (H)
WRI Q R&R5	Were you able to make adjustments in your routines or in your responsibilities (or things you needed to do) while you have been sick? (H/R)
WRI Q R&R6	What aspects of your routine have you been successful in changing? (H)
WRI Q R&R7	Do you miss working? (V)
WRI Q R&R8	Is work an important role for you at the moment? In the future? (or) Can you describe the importance of returning to work?(V)
WRI Q R&R9	Do you feel that your current routine would support returning to work? (H)
WRI Q INT1	What of your current responsibilities do you enjoy? What about them do you enjoy doing? (I/R)
WRI Q INT2	Do you have any other interests or hobbies that you do? (I) With whom? (E)
WRI Q INT3	What do you do in your free time? (I) With whom? (E)
WRI Q INT4	What do you do to have fun? (I)
WRI Q INT5	(For interests mentioned) How often do you _____? Are you satisfied with the amount of time you are able to spend_____? (I)
WRI Q S&A1	Are you able to do the things you need to do? (If no) What limits your ability to do them? (PC)

WRI Q S&A2	Do you have the physical ability to accomplish the things you need or want to do? (PC)
WRI Q S&A3	Are you able to concentrate, problem-solve, and make decisions for the things that you need or want to do? (PC)
WRI Q S&A4	Do you have any mental health problems (e.g., hallucinations, hearing voices, paranoid ideas, confusion, anxiety) that affect your ability to do what you want or need to do? (PerfCap) How do these affect your ability to complete your responsibilities? (PC)
WRI Q S&A5	Are there any other things that affect your ability to do the things you want or need to do? (E.g. drug/alcohol use, criminal history, communicating with others) (PC)
WRI Q ENV1	Are there any physical barriers at work or at home that prevent you from working? (E)
WRI Q ENV2	Are you able to overcome these limitations and barriers? (PC)
WRI Q ENV3	How do your family/friends feel about you being out of work? (E)
WRI Q ENV4	What kind of support does your family and peers give you to find a job? (E)
WRI Q ENV5	In previous jobs, how has your boss supported you working and keeping the job? (E)
WRI Q ENV6	Do you prefer to work alone or with others? How well do you work with others? (E)
WRI Q EXP1	Have you worked in the past? Tell me about the job(s) you did in the past. (R)
WRI Q EXP2	What were your responsibilities within each job? (R)
WRI Q EXP3	What other responsibilities have you had in the past? (R)
WRI Q EXP4	How did you choose the job(s) you did in the past? (V)
WRI Q EXP5	What was the most enjoyable and /or satisfying work that you have had? What made it enjoyable or satisfying? (I)
WRI Q EXP6	What was the least enjoyable and/or satisfying work you have had? What made it such an unsatisfying job? (I)
WRI Q EXP7	What work responsibilities in your life do you feel you do or have done well, or are proud of? (PC)

WRI Q EXP8	What are some things that you have been unsuccessful at doing within a work situation? (PC)
WRI Q EXP9	Have you ever had to deal with a problem or challenge either in work or elsewhere? If so, how did you deal with it? (PC)
WRI Q EXP10	When you worked in the past, did you set goals for yourself? (i.e. promotions, productivity, things to achieve) (V)
WRI Q PREWR1	Describe a typical day when you were last working. (H)
WRI Q PREWR2	What work habits do you have that supported getting your work done in the past? (H)
WRI Q PREWR3	Have you previously had a work routine? Were you able to easily sustain the work routine? (H)
WRI Q PREWR4	What were work habits that you would have liked to change? (H)
WRI Q PREST1	What studies have you done in the past? What qualifications or degrees did you get? (R)
WRI Q VFUT1	Is finding and keeping work important to you? (V) Are you interested in finding a job? (PC)
WRI Q VFUT2	Are you currently looking for work? What are you doing to prepare for returning to work? (PC)
WRI Q VFUT3	Is seeking a job/keeping a job or working an important role for you at the moment? In the future? (V)
WRI Q VFUT4	What would be important about having a job? What would be less important about having a job? (V)
WRI Q VFUT5	What makes it hard for you to find and keep a job? What would need to change for you to be able to start working? (PC)
WRI Q VFUT6	What would stop you from being able to work? (PC)
WRI Q VFUT7	Are you able to do the things you need to do to find and keep a job? (If no) What limits your ability to find work? (PC)

WRI Q VFUT8	Do you have the physical ability to accomplish what you need to do in a job? (PC)
WRI Q VFUT9	Are you able to concentrate, problem-solve, and make decisions to do a job? (PC)
WRI Q VFUT10	Do you have any mental health problems (e.g., hallucinations, hearing voices, paranoid ideas, confusion, anxiety) that affect your ability to work? (PerfCap)
WRI Q VFUT11	How do these affect your ability to complete your work responsibilities? (PC)
WRI Q VFUT12	Are there any other things that affect your ability to work? (E.g. drug/alcohol use, criminal history, communicating with others) (PC)
WRI Q VFUT13	What help or support would you need to help you find and keep a job? (PC)
WRI Q VFUT14	What kind of work do you feel capable of doing? (PC)
WRI Q VFUT15	What skills do you already have which would help you to find and keep a job? (PC)
WRI Q VFUT16	What other experience do you have that might help you to find work? (PC)
WRI Q VFUT17	What do you think is the likelihood of finding and keeping a job at the moment? In the next 6 months and in the future? (PC)
WRI Q VFUT18	If you were looking for work, what kind of work would you find more enjoyable and/ or satisfying? (I)
WRI Q VFUT19	Do you have goals to work towards finding and keeping work? (V)
WRI Q FUTRR1	What kind of expectations would there be on you if you were to start working again? (Specific or general) (e.g., working hours, contract of employment, job description, specific duties of the kind of work they are interested in.) (R)
WRI Q FUTRR2	If you were to start working again, how would you manage all the other things you are currently doing? (R)
WRI Q FUTRR3	How would working again affect your routines? How would you make adjustments? (H)
WRI Q FUTRR4	Thinking to the future, do you think you will be able to alter your routine to accommodate taking on a job? (H)
WRI Q FUTENV1	If you were in work, what kind of physical environment would suit you? What about the physical environment would make work more difficult for you? (E)

WRI Q
FUTENV2

If you were in work, what support would you expect to get from your family/friends?
(E)

WRI Q
FUTENV3

If you were in work, what support would you expect or need to get from your boss?
Colleagues? (E)

Appendix G. Career Profile – Initial Interview format recommended in IPS

published and revised by Original Authors of IPS and used by established IPS services involved in many IPS studies – operationalisation of IPS

*Label applied for IPS Career Profile Question
cross-referencing
diagrams*

<i>WORK GOAL 1a</i>	What is your dream job?
<i>WORK GOAL 1b</i>	What kind of work have you always wanted to do?
<i>WORK GOAL 2</i>	What are your long-term career goals?
<i>WORK GOAL 3</i>	What type of job do you think you would like to have now?
<i>WORK GOAL 4</i>	What is it that appeals to you about that type of work?
<i>WORK GOAL 5</i>	What type of job(s) do you know that you would <u>not</u> want?
<i>WORK GOAL 6a</i>	Do you know people who are working?
<i>WORK GOAL 6b</i>	What types of jobs?
<i>WORK GOAL 6c</i>	What do you think about those jobs?
<i>WORK GOAL 7a</i>	Is there anything that worries you about going to work?
<i>WORK GOAL 7b</i>	Why do you want to work?
<i>EDUCATION 1</i>	Are you interested in going to school or attending vocational training now to advance your work career?
<i>EDUCATION 2a</i>	Education/learning history Did you complete high school?
<i>EDUCATION 2b</i>	Education/learning history If no, would you be interested in earning your GED/high school equivalency diploma?
<i>EDUCATION 3</i>	Did you participate in vocational training classes in high school?
<i>EDUCATION 4a</i>	Have you ever completed an apprenticeship (i.e., plumbing, welding, electrician, etc.)?
<i>EDUCATION 4b</i>	If so, what year?

<i>EDUCATION 5</i>	Did you complete any job related job-related training in the military?
<i>EDUCATION 6</i>	Please describe the training, including years and any certificates earned.
<i>EDUCATION 7</i>	Other education or training programs (name, location, yrs attended, qualification, completed or not, liked/disliked, financial aid)
<i>EDUCATION 8</i>	Do you have copies of the degrees, licenses, certificates that you have earned?
<i>EDUCATION 9</i>	Are you interested in earning a specific certificate, license, or degree for work?
<i>EDUCATION 10</i>	What type of job are you interested in obtaining?
<i>EDUCATION 11</i>	Do you know of a specific training/education program you would like to pursue?
<i>EDUCATION 12</i>	What is it about that field that interests you?
<i>EDUCATION 13</i>	Do you know about the availability of those jobs in this area? What is the occupational outlook for those jobs?
<i>EDUCATION 14</i>	When would you like to start an educational or training program?
<i>EDUCATION 15</i>	How long do you want to go to a school or training program? What is your timeframe for completing education or training?
<i>EDUCATION 16</i>	Would you be interested in visiting some local programs (community college, four-year college, adult vocational training) to learn about different options for degrees and certificates?
<i>EDUCATION 17</i>	Are you interested in joining a trade union (e.g., baker's, maintenance)? Do you know the requirements for joining? Would you like to visit the union office to learn more?
<i>EDUCATION 18</i>	Are there any other job training or educational opportunities that you would like to learn more about?
<i>SCHOOL 1a</i>	Let's talk about some of your school experiences and how they were for you.
<i>SCHOOL 1b</i>	Being called on in class
<i>SCHOOL 1c</i>	Social situations
<i>SCHOOL 1d</i>	Taking tests
<i>SCHOOL 1e</i>	Learning from lecture

<i>SCHOOL 1f</i>	Learning by reading
<i>SCHOOL 1g</i>	Learning hands on
<i>SCHOOL 1h</i>	Concentration
<i>SCHOOL 1i</i>	Memory
<i>SCHOOL 1j</i>	Using computers
<i>SCHOOL 2</i>	Did you have an IEP (individual education plan) while you were in school? Did that include different strategies to help you learn? What were those?
<i>SCHOOL 3</i>	Were you in any advanced classes? Which ones?
<i>SCHOOL 4a</i>	Has anyone ever told you that you had a learning disability?
<i>SCHOOL 4b</i>	What do you know about that?
<i>SCHOOL 4c</i>	What accommodations have helped you in the past?
<i>SCHOOL 5</i>	What are your strengths related to being a student?
<i>SCHOOL 6</i>	What languages do you know?
<i>SCHOOL 7a</i>	What do you need in order to start school? Access to a computer
<i>SCHOOL 7b</i>	What do you need in order to start school? Financial aid
<i>SCHOOL 7c</i>	What do you need in order to start school? Help with transit route
<i>SCHOOL 7d</i>	What do you need in order to start school? Help navigating campus
<i>SCHOOL 7e</i>	What do you need in order to start school? Help talking to teachers/instructors
<i>SCHOOL 7f</i>	What do you need in order to start school? Computer literacy
<i>SCHOOL 7g</i>	What do you need in order to start school? Books/ supplies
<i>SCHOOL 7h</i>	What do you need in order to start school? Help studying
<i>SCHOOL 7i</i>	What do you need in order to start school? More support from family/friends
<i>SCHOOL 7j</i>	What do you need in order to start school? Quiet place to study
<i>SCHOOL 7k</i>	What do you need in order to start school? Mental health support

<i>SCHOOL 7l</i>	What do you need in order to start school? Help with a study calendar
<i>SCHOOL 7m</i>	What do you need in order to start school? Transit card
<i>SCHOOL 7n</i>	What do you need in order to start school? Eldercare
<i>SCHOOL 7o</i>	What do you need in order to start school? Childcare
<i>SCHOOL 7p</i>	What do you need in order to start school? Other
<i>SCHOOL 8</i>	What are your resources for paying for school tuition? For books? For other school costs?
<i>SCHOOL 9</i>	Have you ever received financial aid for school? Have you ever had a grant? What type? Have you ever defaulted on a grant or student loan?
<i>SCHOOL 10</i>	Do you need any type of classroom accommodations?
<i>SCHOOL 11</i>	What other types of supports may help you succeed in school or training?
<i>WORK EXP 1</i>	Most recent job (title employer duties dates, hours,
<i>WORK EXP 2</i>	How did you find this job?
<i>WORK EXP 3</i>	What did you like about job?
<i>WORK EXP 4</i>	What did you dislike?
<i>WORK EXP 5</i>	What was your supervisor like? Your co-workers?
<i>WORK EXP 6</i>	Reason for leaving job?
<i>WORK EXP 7</i>	Other info about job:
<i>WORK EXP 1-7repeat</i>	Next most recent job
<i>MILITARY EXP 1</i>	Branch:
<i>MILITARY EXP 2</i>	Dates:
<i>MILITARY EXP 3</i>	Training or work experience:
<i>MILITARY EXP 4</i>	Certificate or license:

<i>CULTURAL BACKGROUND 1</i>	What is important to you in terms of your background and culture? (i.e., race, ethnicity, color, gender, economic status, etc.)
<i>CULTURAL BACKGROUND 2</i>	Which different languages do you speak? Which language do you prefer?
<i>CULTURAL BACKGROUND 3</i>	What special events or holidays do you celebrate? Are there family traditions that you still practice? How would you like your family involved as we move forward in the process of getting and keeping a job?
<i>CULTURAL BACKGROUND 4</i>	Is it important to you whether your work supervisor is male or female?
<i>CULTURAL BACKGROUND 5</i>	Have you ever felt discriminated against or treated unfairly when you were looking for work or on the job? Could you tell me about that?
<i>MH 1</i>	Has anyone ever told you that you have a mental illness? If so, what did they say?
<i>MH 2</i>	How does your mental illness affect you?
<i>MH 3</i>	What are the first signs that you may be experiencing a symptom flare-up?
<i>MH 4</i>	How do you cope with your symptoms?
<i>MH 5</i>	What medicines do you take and when do you take them?
<i>MH 6</i>	How do the medicines work for you?
<i>PHY H 1</i>	How is your physical health? Do you have any health problems?
<i>PHY H 2a</i>	Do you have any problems with the following: Standing for long periods; Can you stand for more than an hour?
<i>PHY H 2b</i>	Sitting; How long can you sit?
<i>PHY H 2c</i>	Climbing stairs? How many flights? How often?
<i>PHY H 2d</i>	Lifting; How much can you lift?
<i>PHY H 2e</i>	Endurance; How many hours could you work each day? Each week?
<i>PHY H 2f</i>	What is the best time of day for you?
<i>COG H1</i>	Do you have problems with memory?

<i>COG H2</i>	Do you have problems with Concentrating?
<i>COG H3</i>	Doing things fast (psychomotor speed)?
<i>COG H4</i>	If so, what things have helped with these issues in the past?
<i>JOB PREP 1</i>	Do you have the clothes you will need for a job? For interviews?
<i>jOB PREP 2</i>	Do you have an alarm clock or way to wake up for work?
<i>jOB PREP 3</i>	Do you have two forms of identification? Picture ID, social security card...?
<i>jOB PREP 4</i>	How will you get to work?
<i>INTERPER 1</i>	Would you like a job that involved working with the public?
<i>iINTERPER 2</i>	Where do you live and with whom do you live?
<i>INTERPER 3</i>	Who do you spend time with? How often do you see or talk to them?
<i>INTERPER 4</i>	Who can help us think about jobs you would enjoy?
<i>INTERPER 5</i>	Appointment made with this person to discuss jobs. If not, why?
<i>INTERPER 6</i>	Once you are employed, who would be a good person to support you?
<i>INTERPER 7</i>	Anyone else?
<i>FINANCE 1</i>	Do you receive any of the following benefits? (SPECIFIC TO LOCALITY)
<i>fINANCE 2</i>	Do you manage your own money?
<i>FINANCE action</i>	Referral made to benefits planner. If no referral, why not:
<i>DISCLOSURE 1</i>	What could be some of the advantages of having an employment specialist contact employers on your behalf?
<i>DISCLOSURE 2</i>	What could be some of the disadvantages?
<i>DISCLOSURE 3</i>	Are there any things that you would not want your employment specialist to share with an employer?
<i>DISCLOSURE 4</i>	Do you know whether or not you would like your specialist to go ahead and contact employers on your behalf? (It is okay to change your mind at any time):

<i>DISCLOSURE 5a</i>	If you decided that the specialist should not contact employers, what things would you like him or her to do in order to help you find a job? Help with job leads
<i>DISCLOSURE 5b</i>	Rides to job interviews
<i>DISCLOSURE 5c</i>	Help following up on applications
<i>DISCLOSURE 5d</i>	Help filling out applications
<i>DISCLOSURE 5e</i>	Practicing job interview questions and answers
<i>DISCLOSURE 5f</i>	Help writing a resume
<i>DISCLOSURE 5g</i>	other
<i>SUB USE 1</i>	How much alcohol do you drink?
<i>SUB USE 2</i>	How often?
<i>SUB USE 3</i>	Is there a particular time of day?
<i>SUB USE 4</i>	What drugs do you, or have you, used?
<i>SUB USE 5</i>	How often?
<i>LEGAL 1</i>	Have you ever been arrested?
<i>LEGAL 2</i>	Have you ever been convicted of a crime?
<i>LEGAL 3</i>	Conviction 1: yr sentence and repeat
<i>LEGAL 4</i>	What problems, if any, were you having in your life at the time of the offenses?
<i>LEGAL 5</i>	Do you have any pending legal charges? If so, what charge?
<i>LEGAL 6</i>	Parole Officer name: number
<i>LEGAL 7</i>	Do you have a copy of your rap sheet?
<i>LEGAL 8</i>	Do you want to get a copy of it?
<i>DAILY ACT 1</i>	What is a typical day like for you from the time you get up until you go to bed?
<i>DAILY ACT 2</i>	Are there places in your neighborhood that you like to go to?
<i>DAILY ACT 3</i>	Do you belong to clubs, groups, a church, etc.?

DAILY ACT 4

What hobbies or interests do you have?

DAILY ACT 5

What are your typical sleep hours?

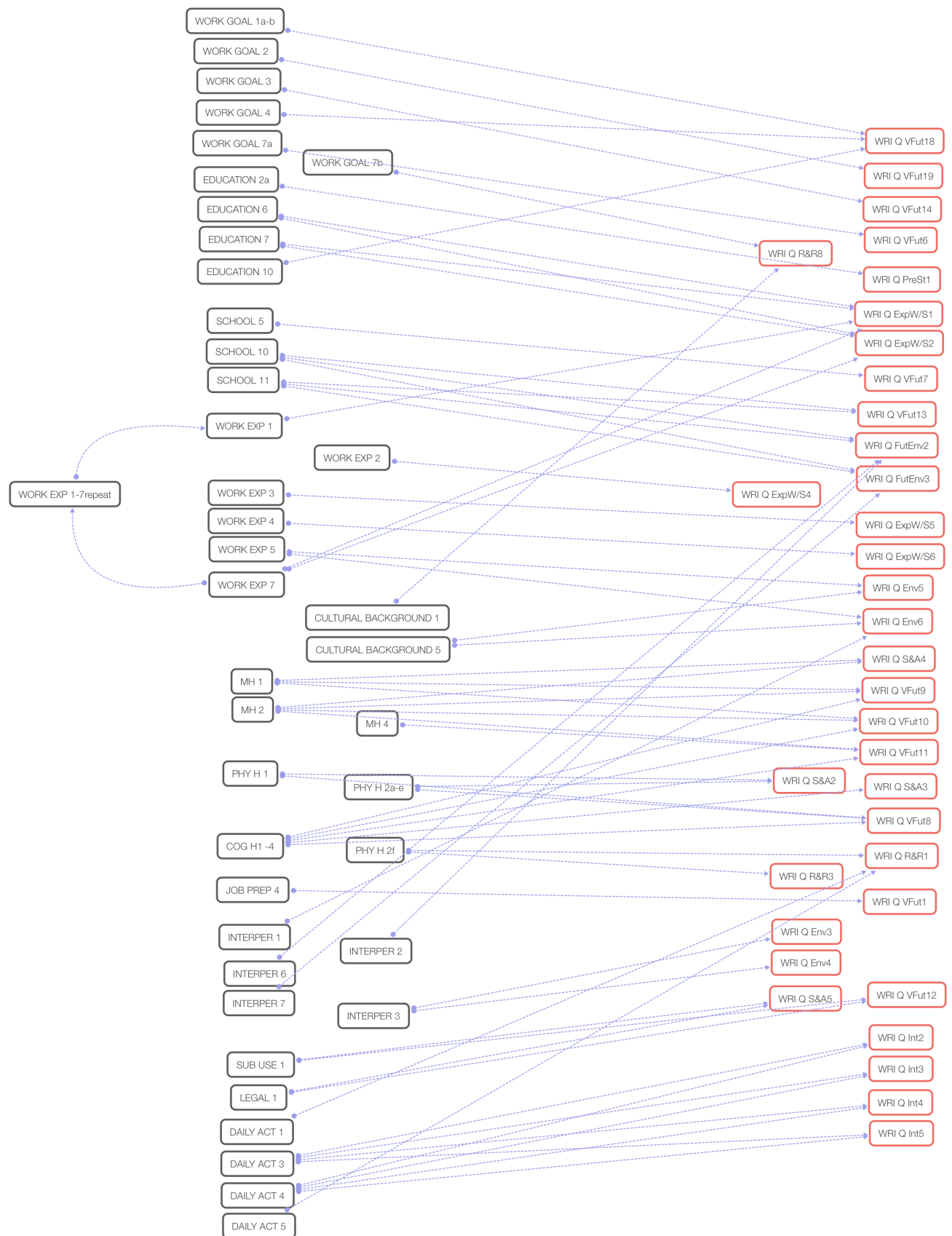
CONTACTS 1

Networking Contacts (Family, friends, previous employers, other)

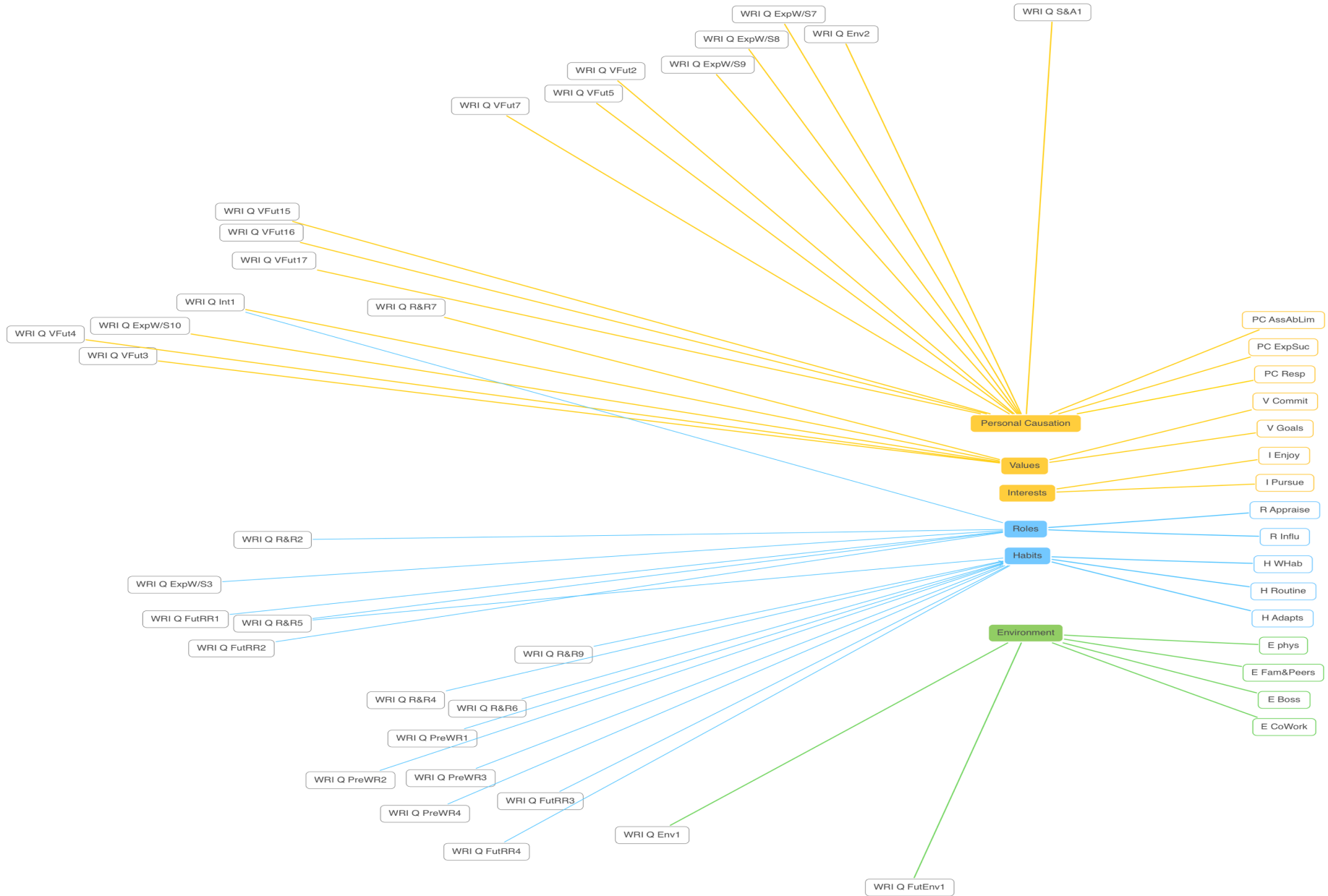
CONTACTS 2

Information from Family, Previous Employers or Others

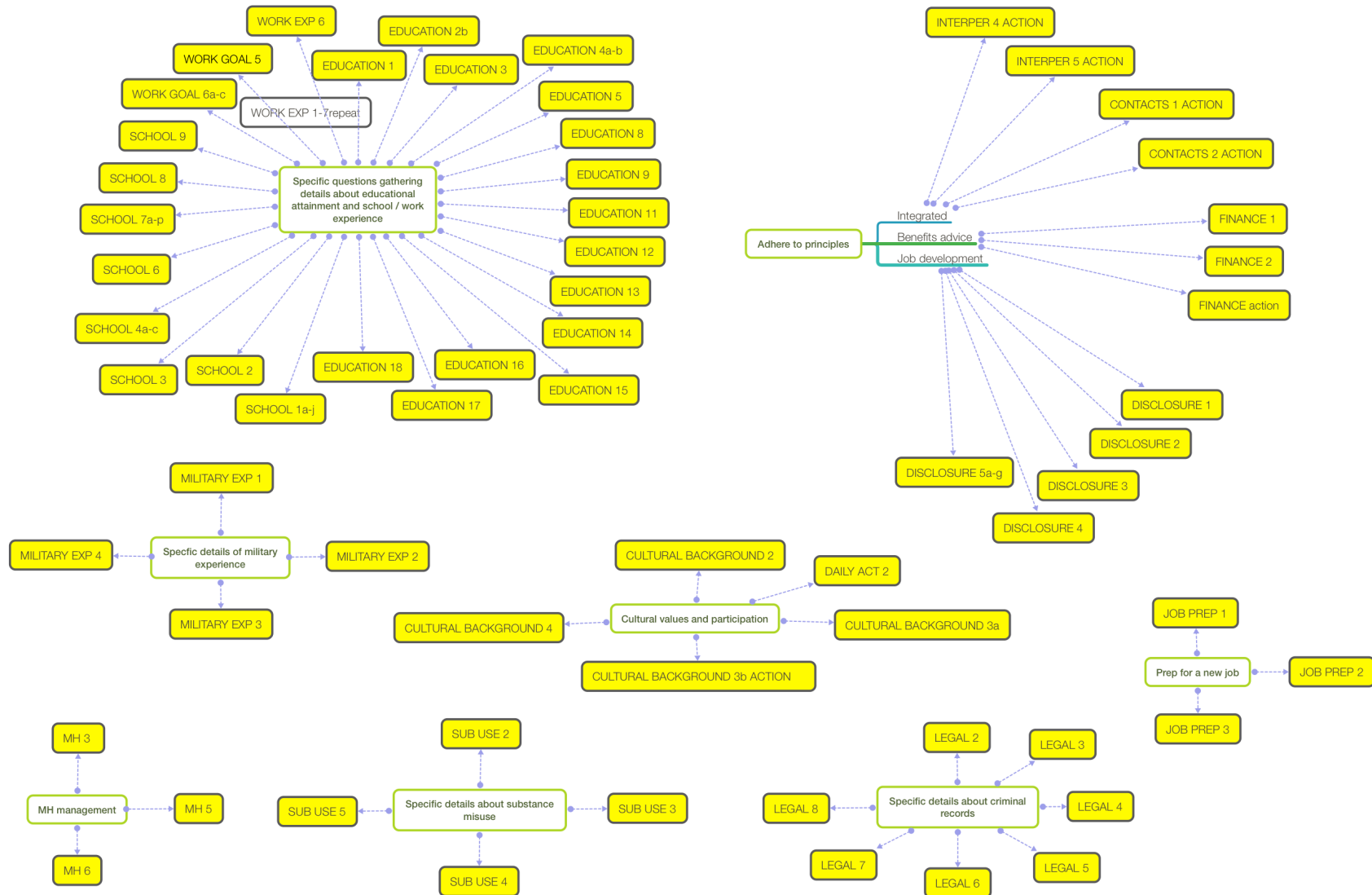
Appendix H Cross match of Career Profile questions to WRI guideline questions



Appendix I. WRI guideline questions which are not included in career profile questions



Appendix J. Career profile questions which are not included in WRI guideline questions



ActiVate Collaboration

Vocational Rehabilitation Evaluation

Data Dictionary

VARIABLE NAME	Variable label	Data type	Measure level	Response codes	Recoding in R
OT	OT	Numerical	factor	0=■ 1=■ 2=■ 3=■ 4=■ 5=■ 6=■ 7=■ 8=■ 9=■ 10=■ 11=■ 12=■ 13=■ 14=■ 15=■ 16=■ 17=■ 18=■ 19=■ 20=■ 21=■	Expert OT trained in IPS and MOHO Experienced OT trained in IPS and MOHO Novice OT trained in IPS and MOHO Novice OT trained in MOHO
GENDER	Gender	Numerical	factor	1= M 2= F 3= Other 0= Unknown	1= Male 2= Female. Only codes used
ETHNICITY (ISD SCOTLAND)	Patient's ethnicity	Numeric	factor	1 - White includes (Scottish; Other British; Irish; Gypsy/ Traveller; Polish; Other white ethnic group) 2 - Mixed or multiple ethnic groups 3 - Asian, Asian Scottish or Asian British includes (Pakistani, Pakistani Scottish or Pakistani British; Indian, Indian Scottish or Indian British; Bangladeshi, Bangladeshi Scottish or Bangladeshi British; Chinese, Chinese Scottish or Chinese British; Other Asian, Asian Scottish or Asian British) 4 - African	1 = White 2;3;4;5;6;7 = other ethnic group Minimal diversity resulted in small proportions in all codes other than white, this risked anonymity so combined into "other ethnic group"

				<p>includes (African, African Scottish or African British; Other African)</p> <p>5 - Caribbean or Black</p> <p>includes (Caribbean, Caribbean Scottish or Caribbean British; Black, Black Scottish or Black British; Other Caribbean or Black)</p> <p>6 - Other ethnic group</p> <p>includes (Arab, Arab Scottish or Arab British; Other ethnic group)</p> <p>7 - Refused/Not provided by patient</p>	
MaritalStat	Marital Status	Numeric	factor	<p>0 - single</p> <p>1 - married / in civil partnership / defacto</p> <p>2 - widowed</p> <p>3 – divorced/ separated</p>	<p>0 - single</p> <p>1 - married / in civil partnership / defacto</p> <p>2 – widowed/divorced/ separated</p> <p>Minimal use of codes 2&3 risked anonymity so combined</p>
LivingSit	Living Situation	Numerical	factor	<p>0=Alone</p> <p>1=With family / partner</p> <p>2=In shared accommodation (not family)</p> <p>3=In supported accommodation</p> <p>4=In hospital</p>	<p>0=Living Alone</p> <p>1=Living With family / partner</p> <p>2-4= Living With Others</p> <p>Minimal use of codes 2,3 &4 risked anonymity so combined</p>

SIMD	Quintile range of Scottish Index of Multiple Deprivation	Numerical	factor	1= first quintile 2=second quintile 3= third quintile 4=fourth quintile 5=fifth quintile http://simd.scot/2016/#/simd2016/BTTTFTT/9/-4.0000/55.9000/	
EduAttain	Educational Attainment	Numerical	factor	0=did not complete school 1= completed school no exams attainment 2= finished school with standard/advanced exam passes 3= dropped out of uni 4= further training (non degree) NHC HND Diploma 5= completed degree level or above	
PrevEmp	Previous employment	Numerical	factor	0 = no paid employment 1 = paid employment	
ICD10_COD E	Primary diagnosis	Numerical	factor	1 = Organic, including symptomatic, mental disorders 2 = Mental and behavioural disorders due to psychoactive substance use 3 = Schizophrenia, schizotypal and delusional disorders 4 = Mood [affective] disorders (inc depression and bi-polar) 5 = Neurotic, stress-related and somatoform disorders 6 = Behavioural syndromes associated with physiological disturbances and physical factors (inc anorexia OCD) 7 = Disorders of adult personality and behaviour	1, 2, 5-11 = other diagnosis 2 = other diagnosis 3 = Schizophrenia, schizotypal and delusional disorders 4 = Mood [affective] disorders (inc depression and bi-polar) Low instance of all codes other than 3 & 4 resulted in small proportions risking anonymity so combined into "other diagnosis"

				8 = Mental retardation 9 = Disorders of psychological development 10 = Behavioural and emotional disorders with onset usually occurring in childhood and adolescence 11 = Unspecified mental disorder	
DoAss	date	Numerical	scale	Date	NOT TRANSFERED
DoOut/Dis	date	Numerical	Scale	Date attained employment or education Or Date of discharge without attaining employment or education	NOT TRANSFERED
Dur_Ass_Out	days	Numerical	Scale	Time from 1stWRI to achieving paid employment /education <i>OR</i> to discharge – no outcome paid employment/education	
ALL WRI ITEMS	WRI ITEMS 1-16	Numerical	Factor Ordinal	1 = Strongly Supports (SS); 2 = Supports (S); 3 = Interferes (I); 4 = Strongly Interferes (SI);	TRANSFORMED INTO 1&2 = SUPPORTS 3&4 = INTERFERES

				5 = N/A	
EmpGoal	Original goal paid employment / education	Numerical	Factor Ordinal	0=no 1=yes paid emp 2 = yes eduction	0 = excluded from research 1&2 combined to employment/education
OutcomeGoal	Achieved paid employment/ education goal	Numerical	Factor	0=no 1=yes paid emp 2 = yes education	0 = Did Not Attain 1 & 2 combined to Attained



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EH21 6UU

Dear Ms Prior

Study title: **An investigation into the relationship between psychosocial factors and employment outcomes in a population of people with complex mental health problems receiving evidence-based supported employment**

REC reference: **18/SC/0352**

Protocol number: **N/A**

IRAS project ID: **230949**

The Proportionate Review Sub-committee of the South Central - Berkshire B Research Ethics Committee reviewed the above application on 26 June 2018.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details. Publication will be no earlier than three months from the date of this favourable opinion letter. The expectation is that this information will be published for all studies that receive an ethical opinion but should you wish to provide a substitute contact point, wish to make a request to defer, or require further information, please contact hra.studyregistration@nhs.net outlining the reasons for your request. Under very limited circumstances (e.g. for student research which has received an unfavourable opinion), it may be possible to grant an exemption to the publication of the study.

Ethical opinion: Favourable Opinion

On behalf of the Committee, the sub-committee gave a favourable ethical opinion of the above research on the basis described in the application form, protocol and supporting documentation, subject to the conditions specified below.

Conditions of the favourable opinion

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

Management permission must be obtained from each host organisation prior to the start of the study at the site concerned.

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

Guidance on applying for HRA and HCRW Approval (England and Wales)/ NHS permission for research is available in the Integrated Research Application System, www.hra.nhs.uk or at <http://www.rdforum.nhs.uk>.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

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

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

Registration of Clinical Trials

All clinical trials (defined as the first four categories on the IRAS filter page) must be registered on a publically accessible database. This should be before the first participant is recruited but no later than 6 weeks after recruitment of the first participant.

There is no requirement to separately notify the REC but you should do so at the earliest opportunity e.g. when submitting an amendment. We will audit the registration details as part of the annual progress reporting process.

To ensure transparency in research, we strongly recommend that all research is registered but for non-clinical trials this is not currently mandatory.

If a sponsor wishes to request a deferral for study registration within the required timeframe, they should contact hra.studyregistration@nhs.net. The expectation is that all clinical trials will be registered, however, in exceptional circumstances non registration may be permissible with prior agreement from the HRA. Guidance on where to register is provided on the HRA website.

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

Ethical review of research sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion").

Approved documents

The documents reviewed and approved were:

Document	Version	Date
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [certificate]		01 August 2017
IRAS Application Form [IRAS_Form_07062018]		07 June 2018
IRAS Checklist XML [Checklist_07062018]		07 June 2018
Letter from funder [funding letter]		31 May 2018
Other [assess 1]	1	25 April 2017
Other [assess 2]	1	08 August 2017
Research protocol or project proposal [protocol]	1	02 May 2018
Summary CV for Chief Investigator (CI) [CI CV]		31 May 2018
Summary CV for student [student CV]		31 May 2018
Summary CV for supervisor (student research) [Forsyth cv]		30 May 2018
Summary CV for supervisor (student research) [Maciver cv]		24 May 2018
Summary of any applicable exclusions to sponsor insurance (non-NHS sponsors only) [certificate]	1	15 July 2017
Summary of any applicable exclusions to sponsor insurance (non-NHS sponsors only) [certificate]	1	15 July 2017
Summary of any applicable exclusions to sponsor insurance (non-NHS sponsors only) [certificate]	1	15 July 2017
Validated questionnaire [worker role interview]		

Membership of the Proportionate Review Sub-Committee

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

There were no declarations of interest made.

Statement of compliance

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

After ethical review

Reporting requirements

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

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

The HRA website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

User Feedback

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

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

HRA Training

We are pleased to welcome researchers and R&D staff at our training days – see details at <http://www.hra.nhs.uk/hra-training/>

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

18/SC/0352 **Please quote this number on all correspondence**

Yours sincerely



PP
Dr John Sheridan
Chair

Email: nrescommittee.southcentral-berkshireb@nhs.net

Enclosures: *List of names and professions of members who took part in the review*

Copy to: *Ms Kim Stuart
Mr Kenny Scott, NRS Generic Review Manager, ACCORD, NHS Lothian*

South Central - Berkshire B Research Ethics Committee

Attendance at PRS Sub-Committee of the REC meeting on 26 June 2018

Committee Members:

Name	Profession	Present	Notes
Dr John Sheridan (Chair)	Consultant Toxicologist and Chemist	Yes	
Mrs Mary Sneade	Clinical Trial manager	Yes	
Miss Elena Villarreal (Vice Chair)	Clinical Trial Manager	Yes	

Also in attendance:

Name	Position (or reason for attending)
Miss Charlotte Ferris	REC Manager