Inclusion and beyond

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Assessment, monitoring and development of the work capacity of people with limited work capacity

Gemma M.C. van Ruitenbeek

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CHAPTER 1

General Introduction

Over the years, the attention for inclusion and participation in paid work has grown, driven by its psychological (Jahoda, 1981, 1982; Warr, 1987), social and economic value (Lindsay, 2018; Schuring et al., 2011, 2016). Numerous studies have shown that unemployment can lead to health complaints, particularly mental health complaints (Broom et al., 2006; Goldsmith et al., 1996; Kim & Von dem Knesebeck, 2016; Paul, 2005; Paul et al., 2009; Warr, 1994). Furthermore, it may also affect physical health (McKee-Ryan et al., 2005) and social isolation (World Health Organization, 2011). On the other hand, reintegration in work leads to huge health gains. People who reintegrated in work reported an increase in self-perceived mental health and well-being. While their physical health and healthy behaviour increased, their healthcare consumption and the costs for benefits decreased (Burdorf & Schuring, 2016). Thus, participation in paid work is beneficial for both individuals and society as a whole (Lindsay et al., 2018).

Although the tension in the labour market is intense and growing, fifteen million people in the European Union who are actively seeking for work have difficulties in finding a job (Eurostat, 2022a). People with disabilities and people with a low educational background are most vulnerable in this respect. Despite European and national policies, as well as laws and regulations, people with disabilities or limited work capacity lag far behind the general working population with regard to participation in paid work. This also applies to the United States (Lindsay, 2018). Although in the Netherlands, the participation level of the general population is relatively high (80%) in comparison to other European countries, the participation level of people with disabilities scores below the European average with 43% (Eurostat, 2019a). In addition, the unemployment rate of people with a low educational background is much higher than that of those with a high or medium educational level (Eurostat, 2022b). Education and disability are interrelated, as people with disabilities are more likely to drop out of school than non-disabled, respectively 31.5% and 12.3% (Eurostat, 2019b). In addition, underemployment and underutilization of talents is often the case for people with disabilities (Colella & Bruyère, 2011; Lindsay et al, 2018). This means that people with disabilities and limitations who are actually working work part-time more often, get lower salaries, are less likely to be promoted, and get fewer chances to develop themselves than non-disabled people (OECD, 2019; Versantvoort & Van Echtelt, 2016). This negatively affects people with disabilities or limited work capacity, and it has a negative effect on the economy. First of all, this has a negative effect on these people because the chance that they are able to make a living based on the height of their income is relatively small. Moreover, they do not get the same chances in development as the non-disabled, even though everyone has a natural tendency to develop oneself (Deci & Ryan, 1985). Especially in times of increasing labour market shortages, exclusion and underemployment negatively affect the economy because it leads to stagnation in care, education, production and service.

With my research, I want to contribute to the universal right to participate in work (United Nations, 2006), and the societal mission of integrating everyone who has the capacity and willingness in good and sustainable work as advocated by the OECD (2018) and the Netherlands Council for Government Policy (Dutch: Wetenschappelijke Raad voor het Regeringsbeleid, WRR, 2020). This research focuses on the assessment of capacities, skills and development potential that are required for job matching and development purposes of a large group of people that has been ignored thus far. These are people who are often described as ‘people with disabilities or limitations’ or ‘people with a distance to the labour market’, but limitations arise in relation to their context (WHO, 2001). Due to technological developments, intensification and increased flexibility requirements, the work context has changed and work demands have increased. The consequence is that the competences of a growing group of people do not match with the demands of the labour market. Therefore, ‘the labour market has distanced itself from the people’ (Zijlstra, 2018).

Insight into the work capacities of people with disabilities and limited work capacity is needed in order to help them to find paid work that fits their work capacity and to increase their participation in paid work overall. In addition, as the title of this dissertation indicates, I want to go beyond inclusion: I want to contribute to not only helping people with limited work capacity to find paid work in regular organizations, but also enable them to contribute to society according to their capacity in the long term. Therefore, it is important that they can develop their capacities while working. Yet, scientifically validated measures are lacking for the assessment of work capacities of people with limited work capacity, and measures are lacking that can monitor the development of their work capacities over time. In order to monitor their development, it is important to have adequate measures and instruments that help to assess whether they develop themselves over time. For this specific group, this has been largely neglected. Sustainable inclusion of people with limited work capacity in regular organizations is dependent on an adequate person-job fit (Zijlstra et al., 2017) and adequate vocational guidance during work (Bruyère et al., 2004; SZW, 2018). A person-job fit necessitates insight into a person's capacities in relation to work outcomes. Adequate vocational guidance requires insight into the relation between work resources and work outcomes (e.g., behaviour and task performance), and how this develops during work. As such, the central research question of this dissertation is:

How can the work capacity of people with limited work capacity (LWC) be measured in relation to work outcomes, and how can their development be monitored during work?

In this general introduction, I will describe the background and context of my central research question. First, I will elaborate on the background and features of the target group. Second, I will discuss developments in the labour market, and discuss how these developments affect work requirements that are needed to participate in the current labour market. Third, I will discuss the state of the art of work capacity assessment and the importance of guidance aimed at development during work, which leads to the conclusion of this introduction and the research questions of this dissertation. Finally, this chapter will be concluded with the outline of the dissertation.

Target group

In this dissertation, I focus on a diverse group of people that, due to various reasons, is not able to participate independently in the labour market. It concerns people to whom the Dutch Participation Act of 2015 (Rijksoverheid, 2022) and the 'Banenafspraak' (the Dutch Jobs Agreement is an agreement made between employers' , trade unions and the government, 2013) applies, such as people with disabilities, people on social security benefits, and low-educated people. The act and the agreement aim to stimulate participation in paid work of people that experience barriers when they apply for paid work, such as people with disabilities. The causes for these barriers can be viewed from different perspectives.

From a biomedical and neurotypical perspective, barriers for participation are caused by physical or mental impairments. It concerns linear and one direction cause-effect perspectives, such as the model of International classification of impairments, disabilities, and handicaps (ICIDH-model) (WHO, 1980), which assumes that illness leads to reduced capacity and in turn will lead to impairments. An impairment is regarded as a deviation from 'normality' that hinders people from performing according to a certain functional norm. Moreover, in this view, individuals with deficiencies need to be cured in order to be able to participate in work.

Over the years, these models, especially the neurotypical perspective, have been criticised for medicalization of (cognitive) functioning that differs from the majority of human beings. Nowadays, more and more people advocate framing neurocognitive diversity as 'normal' and as a healthy representation of biodiversity, rather than as 'abnormal' or impaired functioning (Chapman, 2021). Furthermore, the basic assumption of these models that disability only arises from a defect of a person is also criticised. Therefore, social-relational models came to existence. The shift in perspective from the traditional biomedical model towards bio-psychosocial models is marked by the shift from the ICIDH model (WHO, 1980) to the International Classification of Functioning, Disability and Health (WHO, 2001), ICF-framework in short. This ICF-framework provides a conceptual basis for defining and measuring health and disability, and it differentiates between impairments of body and functional impairments, activity and capacity impairments, and participation impairments. According to this ICF-framework, health problems or illnesses do not cause disability as such, but disability arises only from a poor person-environment fit. Thus, a physical or functional impairment only becomes disabling in the interaction with an environment that requires particular activities or capacities that are not compatible with the reduced or abnormal[1] capabilities of the person. Nowadays, work environments require an increasing degree of flexibility, adaptability and social interaction, and therefore have a high potential for causing disability, particularly for people with developmental disorders (Vornholt, 2018). The increase of claimants of disability insurance of young disabled persons (in Dutch Wajong) that compensates the financial loss of being unemployed, indicates such a trend. Over the past decade, the influx of people with developmental disorders who are dependent on this disability insurance, such as mentally disabled people, people with attention deficit (hyperactivity) disorder (AD(H)D), and people with autism has increased substantially (Vansantvoort & Echtelt, 2016).

This means that the increase in work requirements plays an important role in disabling people to participate in work. Today, even people without a physical or functional impairment face difficulties in finding and keeping work, such as people who lack sufficient education or competencies. Many school dropouts cannot find work (Lavoie et al., 2021). The ICF-framework ignores these kind of disabling factors since the framework views impaired participation only in relation to health-related issues. Moreover, the ICF-framework can be criticized for framing the behaviour and functioning of persons in relation to what is generally accepted and most prevalent in the general population. Instead, every individual should be seen as a unique person with their own capacities and talents that can flourish under the right circumstances. Therefore, I define people with limited work capacity (LWC) as a very diverse group of people with a large variety of skills and competences, who cannot find and keep paid work that fits their capacity without support in the current labour market. Limited work capacity should be considered in relation to the disabling contextual factors, such as work that does not match that person's actual capacities. This implies that limited work capacity is not a feature or characteristic of an individual, but is rather something that emerges from the interaction between the individual and the work context. Disabling factors in the work context will be discussed more in-depth in the next paragraph.

[1]As previous discussed for defining disability and impairments, the ICF-model refers to deviating behaviour or functioning of a person compared to what is most prevalent in the general population.

Developments in the labour market and its consequences

Over the years, technology-driven and economically driven developments changed the scope and nature of work and working conditions. Changes such as automation, flexibility demands and intensification have increased the work requirements. These developments impose higher demands on work quality and quantity for both employees and those who are searching for work (Fouarge, 2017; OECD, 2018a; World Economic Forum, 2020; WRR, 2020; Zijlstra, et al., 2012). Below, I will discuss the consequences of these changes.

Technological developments such as automation, robotization, and digitalization have consequences for the volume and nature of work. While Adam Smith (1776) warned urgently against the use of technology that reduced work to the execution of a few simple, monotonous operations that were physically demanding and made employees "stupid and ignorant" in the beginning of the Industrial Revolution, these practices have affected the quality of work for centuries. Nowadays, new technologies make work less monotonous and less physically demanding, but all the more mentally demanding (WRR, 2020). The change in work demands in the labour market has qualitative consequences as well as quantitative consequences, as employment in high-skilled work is increasing and employment in simple production work is decreasing. In line with this, the importance of higher-level computer skills, problem-solving capacity, and interpersonal skills (e.g., communication and social skills) is growing (Borghans et al., 2014; Green, 2012). In contrast, work that consists of routine manual tasks and work that requires routine cognitive ability, such as the work of cashiers, bank employees and secretarial assistants, is increasingly taken over by machines. Fouarge (2017) found that employment has grown most in high-skilled occupations in which high levels of problem solving ability in combination with high levels of interpersonal skills are required. Corresponding to these findings, Graetz and Michaels (2015) found evidence that due to innovations, worked hours for both low-skill and middle-skill workers were reduced. These findings indicate that technical developments contribute to an increase of work that requires higher-level cognitive and interactive skills, and a relative reduction of work that requires low- and middle-level cognitive and interactive skills. While the 'First Machine Age' following the industrial revolution resulted in so-called 'job polarization', the current 'Second Machine Age' intervenes even further in our working lives. The 'Second Machine Age' concerns a new age in which automation and software-driven machines replace human brainpower. Both physical and intellectual tasks are automated, and machines are programmed to, for example, diagnose diseases or drive cars (Brynjolfsson & McAfee, 2014). Moreover, due to these new technologies, workers are increasingly controlled by applications on portable devices instead of getting orders and instructions from human beings. Examples of such rapidly growing new services are (fast) food delivery services and taxi services. These developments have a huge impact on the nature of work, the demands placed upon workers, and social interactions in work settings (WRR, 2020). They can lead to a new sort of alienation, as workers stay isolated from interpersonal contact while working (Rosa, 2016). On the other hand, new technologies can support people with occupational disabilities to execute their tasks, enabling organizations to become more inclusive (OECD, 2018b).

Thus, technology can affect work in different directions, but more importantly, technology does not develop autonomously. Employers can decide how technology is used and take into account how it will affect humans: complementary or substitutional to human labour, supportive or directive. Although they can use technology in complementary and supportive ways, aimed to increase the quality of work (WRR, 2020), it seems that all too often the opposite happens and the use of technology causes an increased workload and intensification. This also applies when technology is used to work from home or to read emails at any time. Nowadays, it is quite common and expected that employees reply to emails in the evening and during weekends (Zijlstra & Nyssen, 2017).

A second development that affects working conditions is increased flexibility. This refers to two kinds of developments in the labour market. The first is the opportunity to work at any time and any place, as touched upon in the previous paragraph. The other kind of flexibility refers to the rise of flexible contracts and self-employment, and the decline of permanent contracts. In the Netherlands, more than a third of workers do not have a permanent contract. The Netherlands is the leading country in the European Union with regard to temporary contracts. The proportion of self-employed people (in Dutch ZZP'ers) is relatively high in comparison to other European countries (WRR, 2020). Moreover, the proportion of individuals with disabilities with temporary contracts is comparatively high in the Netherlands. A temporary contract is rarely a stepping stone to a permanent contract anymore. The proportion of flexible workers who still have the same job after two years is 10% lower than employees with permanent contracts (WRR, 2020). On top of low income security due to flexible contracts, people with disabilities earn less and have limited opportunities for development (OECD, 2019; Versantvoort & Van Echtelt, 2016). In international research, there is consensus about the relationship between job insecurity and a greater risk of health problems (Gallie, 2013; Kalleberg, 2018). Furthermore, low earnings can lead to poverty, which increases health risks even more (Broeders et al., 2018), with an ongoing effect on their descendants (Raphael, 2011), including delayed cognitive development (Larson, 2007). Finally, people on temporary contracts are deprived from opportunities for learning and development, even though this is crucial for their sustainable employability (Kira et al., 2010; Fleuren et al., 2020; Van der Heijden et al., 2009; Van der Klink et al., 2010).

A third development in work that affects the working conditions and, thus, the requirements for work in the current labour market is intensification. Intensification concerns, among other things, increasing work pressure that stems from the fact that workers need to do more in the same amount of time (or even in less time), and that employees need to work hard and fast to meet deadlines originating from the current high-productivity economy. Many people work overtime or take their work home because they cannot finish it during their official working hours. Moreover, besides time-related intensification, the expanding service economy results in intensification of interpersonal contacts. Currently, the majority of people are employed in the service sector (Ortiz-Ospina & Lippolis, 2017). This implies that the majority of work requires high interpersonal skills in order to be able to deal with clients and customers (Fouarge, 2017; Van den Berg et al, 2018; WRR, 2020; Zijlstra et al., 2012). Communication skills, the ability to manage emotions, the ability to de-escalate, and the ability to cope with stress are getting increasingly important (Van den Groenendaal et al., 2020). Health care and education are known for highly demanding emotional labour, but now emotional labour is seeping into less obvious professions, such as postal and parcel deliverers, cashiers and security guards. These employees are confronted with clients' increased demands and aggressive behaviour (WRR, 2020). A broad spectrum of workers report emotional strain that can lead to stress, emotional exhaustion (Hülsheger & Schewe, 2011), burnout, and absenteeism (Van Echtelt, 2014; WRR, 2020). Research by TNO (2020) showed that more than a quarter of absenteeism is work-related, and the majority of the absentees attribute their problems to psychosocial workload, such as excessive stress or emotional pressure, or problems with managers or customers. Many employers (55%) consider work pressure and work stress as important occupational risk factors. In line with this, 60% of the reported occupational diseases are mental diseases, of which burnout and stress are most commonly reported (Nederlands Centrum voor Beroepsziekten, 2020). However, although work can be pathogenic and push people out of the workforce, there is a scientific tendency to

consider work as medicine (GGZ-standaarden, 2020).

This section shows that due to technological developments, flexibility demands and intensification, work demands in the labour market have increased. Finding and keeping paid work has become problematic for a large group of people. Moreover, the required skills have shifted from physical to psychological skills such as problem-solving, communication and social skills. This means that instruments to assess and monitor work capacity, and developments thereof, need to focus on these 'soft skills'. This will be discussed in the next paragraph.

Work capacity assessment

The changes in work and work demands, and especially the shift from physical to psychological demands, necessitates focusing on psychosocial functioning and psychological resources in work capacity assessment. However, to date, physicians and medical experts play a central role in the work capacity assessment of people with limited work capacity. Physicians and medical experts are specialists in biomedical functioning and treatment in case of biomedical dysfunction, but they are less specialized in psychosocial aspects of functioning. Although it is recognized that there is a need to move beyond physical and functional performance based work capacity assessments and to incorporate environmental and psychosocial factors in work capacity assessment (Cronin et al. 2013), the biomedical model still prevails in work capacity assessment (Sengers et al., 2022). The dominance of the biomedical perspective has led to standardized test batteries for work capacity assessment that correspond to this view. For that reason, occupational health care providers and clinical specialists evaluate work capacity from their own perspective and field of expertise (Cronin et al. 2013; Soer et al., 2008). Each assess to what extent body structures, physical, psychological and functional performance differentiate from what is considered the 'standardized' performance of the general population. Although a shift towards a more holistic view in work capacity assessment has been recognized, medical factors are still largely dominant (Sengers, 2022). This type of work capacity assessment yields insight into the *in*capacity rather than capacity to work. Although work capacity assessment that yields information about *in*capacity is very useful to determine eligibility for benefits in order to compensate people with disabilities financially, this kind of work capacity assessment is not helpful when participation in work is the objective. This refers to an essential shift from compensation to participation in social security systems as proclaimed by the OECD (2003), a shift that many countries have made since the beginning of this century in order to reduce government spending regarding social benefits (WRR, 2020; Mulders et al., 2022). People with limited work capacity not only have a right to participate in work (United Nations, 2006), but also have a duty to work according to their own capacity (e.g., Dutch participation act, Rijksoverheid, 2022). Therefore, adequate instruments are needed to facilitate their participation, which also help and stimulate the development of their work capacity in relation to current work demands.

Before discussing how work capacity can be assessed in relation to work demands, insight into how work capacity can be defined is needed. In the literature, work capacity and work ability are used interchangeably, but the definitions for these two concepts differ slightly (Lederer et al., 2014). In a recently published study by Sengers and colleagues (2022), work capacity is defined as a dynamic multidimensional phenomenon that is based on both individual aspects and effects of the interaction between individual, psychosocial, behavioural and environmental conditions. Work ability, on the other hand, is defined as the degree to which a person is able to cope with the physical, mental, social, contextual and organizational demands at work. Both definitions acknowledge

the multidimensionality of the concept. However, there are several differences between the two definitions. Tuomi and colleagues (1998) emphasize the importance of the individual's ability to adapt to contextual demands, while Sengers and colleagues (2022) acknowledge the role of the environment that determines the outcome in interaction with individual characteristics. This recognition is in line with the approach to work analysis of Roe and Zijlstra (1991), which is based on the action regulation theory. In this view, the interaction between the characteristics of an individual (e.g. capacities) and the individual's work situation (e.g. work requirements) is essential for work outcomes at the individual level (e.g. development) and at the organizational level (e.g. productivity). Work behaviour is considered to be the link between work requirements and work outcomes in this interaction process (Roe & Zijlstra, 1991). Moreover, the definition of Sengers recognizes the dynamics of the concept. This means that work capacity is not seen as a static phenomenon, but as a phenomenon that develops under influence of both the individual and its context. The recognition that development of people is dependent on contextual factors corresponds to self-determination theory (SDT) (Deci & Ryan, 1985). According to this SDT, people have a natural tendency to develop themselves, and therefore seek and engage in challenges in their environment, which provokes learning and development. The dynamic interaction between persons and their environment is also acknowledged in the job demand–control model (JDC) (Karasek, 1979). The JDC-model is most commonly cited in relation to job demands and workers control and its health-related outcomes, such as burnout. However, the learning dimension of the JDC-model, and thus its positive learning outcome, is less recognised (Weststar, 2009). Therefore, the definition of work capacity of Sengers and colleagues (2022) is preferred.

Considering the importance of work capacity assessment for adequate and sustainable inclusion of people with LWC, it is important to explore how work capacity of our target group can be measured. Since we need to focus on work capacity instead of incapacity, we need measures that relate peoples' work *resources* to contextual and organizational demands. In addition, we also need to include people's own view in work capacity assessment. As discussed in the previous section, work capacity and work ability are used interchangeably in the literature. The definition of work ability accompanies the work ability index (WAI) (Tuomi et al., 1998) that was developed to assess the potential of prolonged work participation of older workers. It concerns a measure for workers' own appraisal of one's (current, recent past and forthcoming) physical, mental, and social resources in relation to contextual and organizational demands at work to predict workers' work ability (Ilmarinen, 2006; Tuomi et al., 1998). The WAI possesses positive features, as it relates a person's resources to contextual and organizational demands, and it is based on one's own appraisal of resources instead of that of a medical specialist who evaluates functional performance by assessing to what extent one's performance deviates from 'standardized' performance. However, the problem of the WAI is that it does not define psychosocial resources and contextual demands. The outcome of the WAI is dependent on people's own experience and interpretation of broad concepts such as psychological resources and work demands. For example, people need to evaluate their mental ability in one question: *'How do you rate your current work ability with respect to the mental demands of your work?'* People with LWC cannot build on extensive work experience, and therefore lack a frame of reference for assessing (mental) work demands. For that reason, the WAI is unsuitable for self-report of the work capacity of people with LWC.

The section about developments in the labour market demonstrates that psychological resources have become increasingly important in the current labour market, while physical resources have become less crucial. In the discipline of work and organizational psychology, there is a strong tradition in self-report instruments aiming to get insight into psychological resources in

relation to work demands or work outcomes for job matching purposes of the general population (Barrick et al., 2001; Bono & Judge, 2003; Gottfredson, 1997; Salgado et al., 2002; Schmidt & Hunter, 1998, 2004; Stajkovic & Luthans, 1998). This means that there are many reliable and valid self-report instruments available for the general population in the literature, such as intelligence or "IQ" tests (Byington & Felps, 2010) or personality tests (Bono & Judge, 2003; Goldberg, 1992; Stajkovic & Luthans, 1998). However, research regarding the validity of these measures for work capacity assessment of people with LWC is lacking. As argued above, the target group is a very diverse group of people with a diversity of skills and competencies who cannot participate in paid work without support. Their participation restrictions vary from an interrelational misfit between health related issues, neurodiversity (such as dyslexia, autism or attention deficit hyperactivity disorders), or a lack of sufficient education (Rijksoverheid, 2020). People from the target group may for instance deal with low literacy or may have difficulty understanding metaphorical language (e.g., individuals with autism) (Happé, 1995) that is often used in these instruments. For that reason, they may interpret existing standardized instruments differently from the general population. Nevertheless, for job matching and development purposes, it is crucial to incorporate the view of people with LWC in the assessment of psychological resources in relation to work outcomes.

Guidance and development during work

As discussed in the previous section, work capacity assessment is essential for job matching in order to find work that fit one's capacities. Once one has found work, keeping the job is a major concern for people with LWC (Berendsen et al., 2020; ILO, 2020; UWV, 2017). Poor guidance during work is seen as an important cause for failure to keep the job (Bruyère et al., 2004; SZW, 2018). Successful inclusion of people with LWC depends on adequate information about their job requirements and role, the expectations with respect to interpersonal and group relationships, and the nature of the organization as a whole (Medina & Gamero, 2017). There are several approaches for guidance of, e.g., people with severe mental illness at work, such as supported employment (Bond et al., 2001) and individual placement and support (IPS) (Becker et al., 2007; Van Weeghel & Michon, 2018). These approaches address, among other things, support aiming for successful inclusion in an organization, and focus on teaching the necessary skills after placement. However, a methodical approach to monitor and guide the process of developing skills and behaviours aimed at improving work performance and professional development of people with LWC at work is missing. Meeting the performance standards is an important requirement for extending the contract. In order to fulfil the performance standards, people with LWC are dependent on adequate vocational support (Bruyère et al., 2004; SZW, 2018), both in the short term and in the long term. According to the self-determination theory (SDT), human beings are growth-oriented and try to actualise their potentials and capacities (Deci & Ryan, 1985). Unfortunately, there is hardly any literature in the work and organizational psychology on the developmental process of people with LWC in regular work settings. Learning and development during work can be facilitated by giving formative, accurate, concrete, specific, frequent, and task- and/or goal-oriented feedback. Moreover, that for effective learning, receivers need to have the opportunity to respond to feedback and to be involved in a dialogue with provider (Thurlings et al., 2013). An instrument that provides an adequate structure to monitor and guide a learning and developmental process that meets these standards is lacking up till now.

Conclusion

It is generally recognized that participation in paid work has psychological (Jahoda, 1981, 1982; Warr, 1987), social and economic value (Lindsay, 2018; Schuring et al., 2011, 2016). Sustainable inclusion in paid work of people with LWC requires insight into their work capacities in relation to work outcomes. In addition, adequate vocational guidance requires an instrument that provides a structure to monitor and guide their developmental process during work. Many people assume that people in this particular group have very little or no capacity to learn and to develop themselves. Therefore, adequate instruments to assess the work capacity of people with LWC that help to demonstrate that they can learn and develop themselves while at work are needed. Moreover, insight is needed into which factors influence their learning process. This is a prerequisite for sustainable inclusion of this group of people in paid work. Instruments and measures that are needed to achieve this aim are lacking thus far. This dissertation aims to fill this gap so that professionals in the field of occupational rehabilitation can use a methodical approach in guiding people with Limited Work Capacity. This conclusion leads to our following research questions:

1. What are the most relevant measures for psychological resources in relation to work outcomes, and what is needed to make these measures accessible and reliable for people with LWC?
2. What are the most relevant work outcomes of people with LWC, and how can the relation between the psychological resources and these work outcomes be explored in order to test the predictive validity, and thus validate the measures?
3. How can the development in work capacity of people with LWC be measured during work, and to what extent is their development influenced by contextual factors?

We will answer these research questions subsequently in this dissertation.

Outline of the dissertation

Chapter 2 Instrument development

Chapter 2 addresses the first research question: What are the most relevant measures for psychological resources in relation to work outcomes, and what is needed to make these measures accessible and reliable for people with LWC? In doing so, theory-based measures that predict work outcomes, specifically mental ability, conscientiousness, self-efficacy, and coping, are adapted to people of our target group. People in this group often deal with low literacy or face difficulties in understanding metaphorical language, such as people with autism. Observer measures are developed in order to address the concerns of professionals in the field of vocational rehabilitation (such as job coaches and vocational experts) about the ability of people with LWC to reflect critically on themselves and to provide accurate answers on self-report questionnaires. Therefore, the observer report serves as a reference to the self-report. Furthermore, this chapter explores the comprehensibility, relevance and suitability of the scales for people with LWC. Finally, multi-source and longitudinal data serve to test the reliability and dimensionality of the self- and observer report measures.

Chapter 3 Testing criterion validity

Chapter 3 addresses the second research question: What are the most relevant work outcomes of people with LWC, and how can the relation between the psychological resources and these work outcomes be explored in order to test the predictive validity and thus validate the measures? Sustainable inclusion of the target group is dependent on a person-job fit and adequate vocational support aimed at displaying required work behaviour and meeting performance standards. These aspects are important to achieve long-term employment in regular organizations. Therefore, theory-based outcome measures, such as work behaviour and task performance, serve as criterions to test the predictive validity of measures for psychological resources, to be specific mental ability, conscientiousness, self-efficacy, and measures of coping. People from the target group and their 'significant other' (the individual's relative or personal coach) serve as sources of information for the psychological resources by completing a questionnaire when the individual with LWC started working (T1). Their workplace mentor and supervisor serve as sources of information for work outcomes, and completed questionnaires after 4 weeks of work (T2). This chapter gives insight into the criterion-related validity of independent variables of self- and other-report, and gives insight into the partition variance of various predictor variables.

Chapter 4 Monitoring the development of people with LWC

Chapter 4 addresses the third and last research question: How can the development in work capacity of people with LWC be measured during work, and to what extent is their development influenced by contextual factors? In doing so, this chapter explores the development in cognitive functioning and work behaviour of people with LWC during work. In addition, it investigates the extent to which their development in these aspects is influenced by workplace acceptance and workplace mentors' support. In the literature, 'acceptance' and 'support' are considered as preconditions for development. Therefore, they are expected to influence the development of people with LWC. In this chapter, people with LWC and their workplace mentor provide data on dimensions of cognitive functioning and work behaviour at three time points over a four-month period. Furthermore, people with LWC provide data on the level of workplace acceptance and support they experience at work. Finally, this chapter gives insight into the development over time with the help of growth curve modelling.

Chapter 5 General discussion

Finally, Chapter 5 gives an overview of the main findings and discusses the theoretical and practical implications, and the relevance of this study for policy, as well as the added value of this research for the target group, practitioners, and science. Subsequently, the strengths, limitations and directions for future research are discussed. Finally, the general discussion ends with the main conclusion of this thesis

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CHAPTER 2

The Development of an Instrument to Measure the Work Capability of People with Limited Work Capacity (LWC)

This chapter is based on: Van Ruitenbeek, G. M. C., Zijlstra, F. R. H., & Hülsheger, U. R. (2019). The Development of an Instrument to Measure the Work Capability of People with Limited Work Capacity (LWC). *Journal of Occupational Rehabilitation, 29*(1), 163–174.

Abstract

Purpose Participation in regular paid jobs positively affects mental and physical health of all people, including people with limited work capacities (LWC), people that are limited in their work capacity as a consequence of their disability, such as chronic mental illness, psychological or developmental disorder. For successful participation, a good fit between on one hand persons' capacities and on the other hand well-suited individual support and a suitable work environment is necessary in order to meet the demands of work. However, to date there is a striking paucity of validated measures that indicate the capability to work of people with LWC and that outline directions for support that facilitate the fit. Goal of the present study was therefore to develop such an instrument. Specifically, we adjusted measures of mental ability, conscientiousness, self-efficacy, and coping by simplifying the language level of these measures to make the scales accessible for people with low literacy. In order to validate these adjusted self-report and observer measures we conducted two studies, using multi-source, longitudinal data.

Method Study 1 was a longitudinal multi-source study in which the newly developed instrument was administered twice to people with LWC and their significant other. We statistically tested the psychometric properties with respect to dimensionality and reliability. In Study 2, we collected new multi-source data and conducted a confirmatory factor analysis (CFA).

Results Studies yielded a congruous factor structure in both samples, internally consistent measures with adequate content validity of scales and subscales, and high test–retest reliability. The CFA confirmed the factorial validity of the scales.

Conclusion The adjusted self-report and the observer scales of mental ability, conscientiousness, self-efficacy, and coping are reliable measures that are well-suited to assess the work capability of people with LWC. Further research is needed to examine criterion-related validity with respect to the work demands such as work-behaviour and task performance.

Introduction

In Europe, there is growing understanding of the economic and psychological importance of labour participation of people with limited work capacity (LWC). People with LWC concern a very wide and diverse group of people that has, similar to the general population, the right to labour participation stated by the International Covenant on Civil and Political Rights (1966). Unfortunately, fundamental disabilities and restrictions overshadow the talent and work capacity of people with LWC. Their limitations vary from developmental disorders (67%), mental illnesses (19%) and somatic disability (14%), and half of this group deals with a combination of disorders (UWV, 2015). Although the nature and severity of the limitations differ from person to person, the majority of people with LWC experience difficulties with important cognitive skills that affect the capability to work, such as concentration, memory recall, setting priorities, and problem solving (Fadyl et al., 2010). Furthermore, they often have difficulties with understanding and remembering job related procedures or instructions, interactions with co-workers, lack persistence in order to complete the work, and adapt and act independently (MacDonald-Wilson et al., 2003). Nevertheless, they are entitled to get the support they need in order to participate in work (Nelissen et al., 2017). Several scholars have highlighted the economic and psychological values of participation in work (Jahoda, 1981; Paul & Batinic, 2010; Vornholt et al., 2013; Zijlstra et al., 2012). In addition, more recently research of Schuring et al. (2016) showed that people from the target group with a paid job evaluated their mental health, happiness, self-worth and mastery significantly higher than people who stayed unemployed. Moreover, their level of independency increased, while the use of care decreased as a result of labour participation.

Notwithstanding their limitations, the majority of people with LWC are capable to provide a productive contribution dependent on adequate support (Villotti et al., 2018) and a suitable job (Van Ruitenbeek et al., 2013). We argue that self-report instruments can enable people with LWC to identify their respective strengths and weaknesses and that such an instrument is indispensable for their successful integration into the labour market. However, up to date tailored self-report instruments for selection and support practices of people with LWC are lacking in human resource practices. The existing instruments that have been developed for the general population are not always suitable for people with LWC, since they often deal with low literacy or lack in mental ability to understand the language that is used in most questionnaires. For instance, people with autistic symptoms face problems with metaphorical language. Moreover, people with mental disorders such as attention deficit hyperactivity disorder (ADHD) often face difficulties in concentrating over longer periods of time, which makes it difficult for them to complete extensive instruments. For these reasons, we adapted existing instruments in order to develop an instrument that assesses the mental work capability of people with LWC, and that can help to identify their respective strengths and weaknesses. First, such an instrument can inform selection and placement decisions. Second, it sheds light on areas in which people with LWC require training or need specific support on the work floor. Third, it can help people with LWC to reflect on their strengths and weaknesses, which will promote their professional and personal development. As described above, it is crucial that people with LWC are enabled to reflect on their strengths and weaknesses in order to develop a certain level of self-understanding. Timmer et al. (2003) claim that self-reflection enables people with LWC to take on more responsibility and initiative, and increases their autonomy. Goal of the present study is therefore to present the development and initial validation of an instrument to assess the mental work capability of people with LWC.

Typically, measures used in Human Resources Management for selection and developmental purposes are self-report measures. Naturally, the validity and usefulness of such measures

is dependent on the extent to which individuals are willing and able to reflect on themselves, their feelings, experiences, behaviour, and respond to the respective items. Yet, professionals in the field of integration of people with LWC in the regular labour market, such as job coaches and vocational experts, regularly express concerns that due to their limitations, people with LWC may not be able to critically reflect on themselves and to provide accurate answers in self-report questionnaires. However, we believe that people with LWC will be able to reflect on themselves with the help of tailored measures. For this reason, it is all the more important to tailor the measures to this specific target group and adapt the language. Moreover, to address concerns of professionals in the field, we argue that it is important to use other sources of information in combination with information provided by the target person (the person with LWC). A unique feature of the instrument we developed in the present endeavour is therefore that it consists of a self-report (of the target person) and an observer version that is to be completed by one or more significant others. These are individuals who know the target person well, such as relatives or people who work or have worked with the target person. In sum, this project aims to develop a customized instrument that measures the mental work capability of people with LWC, in order to enhance the individual support that is given by co-workers or supervisors in the daily work practice on the work floor. As such, the present instrument extends and supplements existing tools with more therapeutic foci (e.g. the Occupational Therapy Practice Framework or Model of Human Occupation). For example, the present instrument can be used as a tool that can facilitate the transition process from clinical support to support in daily practice. In this study, we combine knowledge from the disciplines of work and organizational psychology and occupational rehabilitation. In doing so, we not only build upon this knowledge but also make important contributions to them. The work and organizational psychology literature has built up a solid knowledge base on how personal characteristics (personality traits, mental abilities) relate to work performance (Barrick et al., 2001; Bono & Judge, 2003; Gottfredson, 1997; Salgado et al., 2002; Schmidt & Hunter, 1998, 2004; Stajkovic & Luthans, 1998). However, this line of research has only considered the general population, while ignoring the specifics of individuals with LWC. In the occupational rehabilitation literature, the specifics of individuals with LWC are well understood, but the role of personal characteristics like personality traits and mental capabilities in relation with employment outcomes has received far less attention (Holwerda et al., 2013; Lagerveld et al., 2010). Recently also in this discipline occupational rehabilitation, studies have been conducted on the relation between personality traits and work productivity of people with mental disorders. Nevertheless, we argue that both disciplines can benefit from tailored and validated measures to study more accurately relationships between personality traits and work performance in this specific population.

Method

Based on the work and organizational psychology literature we first selected specific scales which we expected to be predictive of future work behaviour in our target group. We adapted existing measures of mental ability, conscientiousness, self-efficacy and coping to people with LWC. In the interest of this particular target group, of which the majority deals with fundamental disabilities and restrictions, we chose not only to select predictors from the personality literature (i.e., mental ability, conscientiousness, and self-efficacy), but also a coping measure. Since the nature and severity of the disability can differ from person to person, we deem their coping-style of greater predictive importance than the nature or severity of their disability.

In order to assess the psychometric properties of these customized self-report and observer scales, we follow Hinkin's (1998) steps for scale development. Specifically, we conducted two studies: the first study consisted of two phases. First, we developed the instrument and assessed the comprehensibility of scales for people with LWC. Second, we assessed the psychometric properties such as dimensionality and reliability. In the second study the factorial validity was investigated.

Study 1: Instrument Development, Dimensionality and Reliability

Measures

In this section we describe the theoretical basis for the selection of various scales. The concepts of mental ability, conscientiousness, self-efficacy and coping will be discussed. Furthermore, we will elaborate on the process of assessing the face validity and evaluating the clarity of the language used in the scales for people with a low literacy level.

General mental ability (GMA) (Schmidt & Hunter, 2004) or general cognitive ability (Schmidt & Hunter, 1998) refers to individuals' capability for logical reasoning, solving problems, making decisions, abstract thinking, and the ability to learn (Gottfredson, 1997). GMA or IQ (Byington & Felps, 2010) is generally considered as the most valid predictor of job performance (Gottfredson, 1997; Schmidt & Hunter, 1998, 2004). However, the nature of work and its context determine how important mental ability is. For complex tasks, mental ability is often more relevant than for simple tasks. Simple or routinized tasks rely less on problem solving behaviour, and require less abstract thinking and decision-making. As a consequence, mental ability has less predictive power for low-complexity than for high-complexity jobs. It goes without saying that all tasks require some level of mental ability, but the required level of mental ability depends on the level of job complexity (Gottfredson, 1997). An important question in this respect is which cognitive skills predict work performance of people with limited work capacity? Fadyl et al. (2010) argue that cognitive skills that clearly affect the work ability of workers who experience impairment(s) are attention, concentration, memory, planning and organizing, problem solving, initiation, communication and adapting. The Vocational Cognitive Ratings Scale (VCRS) (Greig, 2004) includes these elements. The VCRS is designed for people with chronic mental illness in order to assess their cognitive strengths and weaknesses in actual work settings, and by that, suggest areas for improvement. We therefore argue that the VCRS can be helpful in our line of research and expect that mental ability measured with an adapted version of the VCRS can be an important predictor of work performance of people with LWC.

Conscientiousness is considered as the second most powerful predictor with respect to work performance in various levels of professions and jobs after mental ability (Barrick et al., 2001; Salgado et al., 2002; Schmidt & Hunter, 2004). Barrick and Mount (1991) stated that conscientiousness reflects all traits that are important to fulfil all kinds of task in all kinds of professions. People with high levels of conscientiousness are seen as trustworthy, careful and cautious, have high orientation to accomplish tasks (Wanberg et al., 2002), are reliable and goal-oriented (Barrick et al., 2001), responsible, and hardworking (Barrick & Mount, 1991). Since we seek to identify powerful predictors of success at work in various low level work settings and jobs, conscientiousness seems to be precisely that personal characteristic that is essential for the success in work of people with LWC. In this study the Dutch HEXACO personality inventory (De Vries et al., 2008) was tailored to people with LWC.

Various researchers have indicated that self-efficacy is an important predictor of work behaviour and other important work related outcomes, such as job performance (Bono & Judge, 2003; Stajkovic & Luthans, 1998). However, this has only been studied in the general population. Self-efficacy reflects an individuals' tendency to rely on one's ability to meet job demands in different work contexts (Bosscher & Smit, 1998; Chen et al., 2004; Stajkovic & Luthans, 1998). Self-efficacy can be seen as trust in one's effectiveness. The self-efficacy theory of Bandura (Bandura, 1977) assumes that efficacy determines the type of action people take, the level of effort they put in and their persistency (Bosscher & Smit, 1998). We think that in particular the level of effort that people are willing to invest and their persistency are important predictors of work success of people with LWC. In this study we adapted the GSES-12 scale of Bosscher & Smit (1998) to people with LWC.

Coping refers to the cognitive and behavioural effort that people display in order to control, bear or reduce the effects of internal or external stressors (Folkman & Lazarus, 1980; Schreurs et al., 1984). It is an action that is triggered as a result of the (re)appraisal of stressors (Folkman & Lazarus, 1980). Coping can be seen as a dynamic and continuous process of self-regulation. It encompasses actions that are undertaken on a daily basis to master or reduce the impact of any kind of threat (i.e. disease, disorder or limitation) (Calsbeek et al., 2006). Finding and in particular keeping a job are to a considerable extent dependent on the effectiveness of the self-regulation or coping strategies of people with serious mental illness (Alverson et al., 1995; Cunningham et al., 2000; Michon et al., 2011). Other authors have also indicated how important self-regulation or self-management are as predictors of the development in job-performance (Frayne & Geringer, 2000). Although these studies have been conducted in the general population we think that coping is an even more important predictor of success for people with LWC, since many of them are dealing with serious restrictions and disabilities they have to overcome. For that reason, the shortened coping inventory for stressful situations (CISS-21) (Calsbeek et al., 2003) was adjusted for the use with people with LWC.

After the selection of the concepts described above, we took into account the general guidelines for item development (Hinkin, 1998). Statements were formulated as simple and as short as possible, and were translated to a language level that is intelligible for people with LWC. Since a large part of people with LWC struggles with low-literacy and/or lacks the mental ability to understand complex language that contains figurative language or double negatives. The existing rating scales for mental ability (Greig et al., 2004), conscientiousness (de Vries et al., 2008), self-efficacy (Bosscher & Smit, 1998), and coping (Calsbeek et al., 2003) were adjusted to meet a low-literacy level. Items were formulated at language level B1 (simple Dutch), figurative and non-literal language was avoided and items address only one single issue to assure appropriate interpretation of items by the respondents.

A pre-test was conducted to assess the adequacy of the scales and to test whether people from the target group were able to read and interpret the items correctly. First, the relevance for practice and the suitability of the language level of the questionnaire for the target group was discussed in two focus groups consisting of professionals in the field, such as job coaches and vocational experts. Second, 16 people from the target group completed the questionnaire individually under supervision of the first author. In order to check their ability to read the items, we asked them to read questions aloud. To test the correct interpretation, we asked them to explain the meaning of randomly chosen questions. Moreover, people from the target group were also asked how they experienced the completion of the questionnaire, and what their opinion was about the readability and appropriateness of the questionnaire. Feedback from these processes has been incorporated in the questionnaires. Examples of changes made based on the feedback from professionals in the field concerned; explication of what is meant by "organizing work efficiently". We split this item up into several items referring to concrete actions, such as: "I prepare things, before I start my work", "I complete tasks in a logical order.", "I check whether I have done my work correctly.", and "I correct my mistakes."

Minor changes have been made in the language of the questionnaire. For example: "I'd rather do something *spontaneously*, instead of working according to a set plan." has been changed in: "I'd rather do something *as it comes to my mind*, instead of working according to a set plan." All original scales discriminate five score options and the majority used five-point Likert-scales. Since a Likert-type scale is most used in behavioural research (Hinkin, 1998), we chose this type of scaling for all scales. Furthermore, in order to keep answering a questionnaire as easy as possible, all scales were designed in a 5-point Likert scale (1 = never, 2 = sometimes, 3 = regularly, 4 = almost always, 5 = always).

Participants and Procedure

We administered our survey twice on several schools for youngsters of our target group. Such as schools for special education (*N* at T1 was 35 and *N* at T2 was 31 students), schools for practical education and a remedial educational centre (*N* at T1 was 75 and *N* at T2 was 68 students), and a school for vocational training for low-complexity jobs (*N* at T1 was 68 and *N* on T2 was 46 students). In total 178 (56.2% male) students participated at T1 and 145 (56.6% male) students at T2.

Participants had a mean age of 17.5 (*SD* = 1.6) at T1 and 17.4 (*SD* = 1.5) at T2. In total 172 'significant others' participated at T1, and 136 at T2. The significant others who participated varied from parent (*N* at T1 was 16, *N* at T2 was 15), supervisor (*N* at T1 was 11, *N* at T2 was 9), mentor (*N* at T1 was 127, *N* at T2 was 95), to teacher (*N* at T1 was 18, *N* at T2 was 17). Participants were informed about the procedure and their rights with respect to the research. If students were above 18 years old and fully accountable, they signed an informed consent themselves. Otherwise, their guardian signed the informed consent. After oral information on the study was given and questions were answered, students completed the questionnaire in a classroom under supervision of the first author. The study was approved by the faculty's standing ethical committee for psychology of Maastricht University (reference ECP-133- 08_10_2013).

Analytic Strategy

In order to statistically test the psychometric properties of the self-report and observer scale, and avoiding memory effects, we administered the same questionnaire twice with an interval of 3 months to a group of people with LWC and to a 'significant other' of the respondent (such as a parent or mentor). Subsequently, we subjected the data to exploratory factor analysis (EFA) to explore the dimensionality of scales, and we calculated internal consistency of scales and subscales. Furthermore, we determined the test–retest reliability, and we computed the correlation between the scores of the respondent and the significant other. To examine the appropriateness of the adapted scales for people with low mental capacity and low literacy, we did both an exploratory factor analysis (EFA) and assessed the test–retest reliability. We applied EFA to assess whether underlying dimensions of the new scales were consistent with the dimensions in the original scales, and to see whether the dimensionality in both samples corresponded. Moreover, EFA was used to reduce

the number of items in order to create a parsimonious set of variables (Hinkin, 1998). We separately subjected the items of the different measures (mental ability, conscientiousness, self-efficacy and coping) of the target group and the group of significant others sample to principal components analysis (PCA) a technique for EFA. After inspection of the correlation matrix that demonstrated that components were related, we subjected the conscientiousness and self-efficacy scale to initial PCA with oblique rotation. The mental ability scale and the coping scale were subjected to initial PCA with orthogonal rotation because the component correlation matrix showed that components of both scales were not related. Primarily extraction was based on the factor structure of the original scale, and since the original mental ability scale lacks a clear factor structure, the extraction was based on Eigenvalues exceeding Kaiser's criterion of 1. First, we examined if the Kaiser–Meyer–Olin (KMO) criterion exceeded the acceptable limit of .5 (Field, 2009) and checked whether the Barletts' Test of Sphericity reached statistical significance on the different scales in both samples. Subsequently, we examined the correlation matrix on inter-item correlations of variables. A lack of correlation between a variable and other variables justifies deletion of that item (Pallant, 2013). Based on this absence of inter-item correlation we deleted one item from the mental ability scale and one from the conscientiousness scale. After deletion of these items, we repeated the PCA procedure. Subsequently, we explored the congruity between the loadings of items on components of the original scales and loadings of items on components of the newly developed scales. When congruity with the original scales was lacking we based the evaluation process about the retention of the number of components on inspection of the scree plots graphs. Additionally, when scree plots showed unclear dimensionality we ran a Monte Carlo Parallel PCA parallel analysis (Watkins, 2000 as cited in Pallant, 2013). Next, we assessed the test–retest reliability by exploring the relationship between two sets of scores on the scales that were administered twice to the same people at T1 and 3 month later (T2). We performed preliminary analysis to determine the assumption of normality, linearity and homoscedasticity (Pallant, 2013). We calculated the relationship between the measurements with the Pearsons product-moment correlation coefficient and for the non-parametric correlations Spearman's rho. We indicated the reliability or the accuracy of scales with Cronbach's alpha coefficient. Finally, we calculated the self-other correlation in order to explore the accuracy of the observer ratings. Moreover, we explored the self-intimate relationship (e.g. parents, partner, family or friends) correlation, and the self-work-related relationship (e.g. job supervisor, supervisor, personal coach or colleague) correlation. As previous research has revealed differences in the accuracy of observer ratings of personality dependent on the frequency of interacting with targets (Connelly & Ones, 2010), we explored the self-intimate relationship correlation and the self-work-related relationship correlation. In order to calculate these correlations, we created dummy variables for intimate relationship and for work-related relationship. SPSS version 24 was used for all these calculations.

Results

Since the original VCRS scale (Greig et al., 2004) lacks factor structural information we ran an initial PCA on a 23-item scale in which the extraction was based on Eigenvalues exceeding Kaiser's criterion of 1. Examination of the correlation matrix on inter-item correlations of variables showed no correlation between one item and all other variables in the student sample that justified deletion of this item from the analysis. After deletion of this item and repetition of the procedure, PCA resulted in a five-factor model for the mental ability scale in both samples (i.e. self-report and observer report). These five factors refer to five of the eight cognitive skills that Fadyl et al. (2010) recognised as important cognitive skills that can interfere with work functioning such as concentration, memory, planning and organizing, problem solving, and adapting. Moreover, based on congruity between the loadings of items on components in the target group sample and loadings of items on component in the significant other sample, we retained all five components. After inspection of the rotated component matrix, we rejected five items, because they had no or relatively low loading on the factor they belong to in terms of content or did not load on a congruent component in both samples. After rejection of those items and repetition of the procedure, the five-factor model with 17 items explained in total 65.35% of the variance in the target group sample, with planning & organization, learning & memory, adaptability, concentration, and problem solving, contributing ranging from 33.16 to 5.78%. In the significant other sample, the model explained in total 72.21%, with variances ranging from 39.67 to 6.16% for the subscales. A more detailed overview of factor loadings is given in Table 1, and a detailed overview of item loadings on components can be obtained from the authors.

The internal consistency reliability of the mental ability scale (17 items) was .88 with alphas for the five subscales ranging from .72 to .84 in the self-report scale, and respectively .91 ranging from .74 to .90 in the observer scale.

The test–retest reliability of the complete mental ability scale (17 items) was r = .76, with correlation coefficients for the five subscales ranging from .47 to .69 for the self-report scale and respectively r = .62 and ranging from .29 to .63 for the observer scale.

The self-other correlation for the mental ability scale was .43, .53 for the intimate relationship and .43 for the work-related relationship, and for the subscales varying from .20 to .39 the self-other correlation, varying from .42 to .62 for the intimate relationship, and varying from .16 to .38 for the work-related relationship.

We executed initial PCA of the conscientiousness scale in which extraction was forced to four components in correspondence with the original scale. Congruity between the loadings of items on components of the original scale and loadings of items on components of the newly developed scale was lacking in both samples. The scree plot showed a clear large drop between the first eigenvalue and the second, followed by a tailing off in both samples, which led to the conclusion that the self-report scales and the observer scale for conscientiousness are unidimensional (Furr, 2011). A one-factor solution for the conscientiousness scale with 8 items explained in total 37.37% of the variance in the target group sample and respectively 56.55% in the significant other sample.

The internal consistency of the complete conscientiousness scale was α = .80 for the self-report scale and α = .90 for the observer scale. The correlation coefficient of the conscientiousness scale was r = .72 for the self-report scale and r = .78 observer scale. The self-other correlation for the conscientiousness scale was .35 varying from .46 for the intimate relationship to .34 for the work-related relationship.

We carried out an initial PCA of the self-efficacy scale in which extraction was forced to three components in correspondence with the original scale. Congruity between the loadings of items on components of the original scale and loadings of items on components of the self-efficacy scale was lacking in both samples. The scree plot graphs were unclear, and thus we doubted the dimensionality of the scale. Therefore, we ran additional a Monte Carlo Parallel PCA parallel analysis (Watkins, 2000 as cited in Pallant, 2013), that led us to the conclusion of a two-dimensional model of the self-efficacy scale in both samples. We repeated the PCA procedure in which extraction of two components was forced. Two items did not load on a congruent component in a two factor

Table 1 *Results of principal component analysis, internal consistency, test-retest reliability and self-other correlation*

Scale and subscales	Number of items original scale	Remaining items	Number of components of new scales	Target group sample (*N* = 178)					Significant other sample (*N* = 172)					Test-retest Reliability	Self-other correlation
				Eigen values	% of variance	Cumm. % of variance	*α*	Test-retest Reliability	Eigen values	% of variance	Cumm. % of variance	*α*			
Mental Ability	23	17	5			65.36					72.21	.90		.62**	.43**
Planning & Organization	-	7		5.637	33.16		.87	.76**	6.743	39.67		.88	.60**	.60**	.39**
Learning & memory	-	4		1.898	11.16		.74	.47**	1.725	10.15		.82	.56**	.56**	.25**
Adaptability	-	2		1.372	8.07		.76	.53**	1.233	7.25		.74	.50**	.50**	.21**
Concentration	-	2		1.222	7.19		.75	.69**	1.528	8.99		.90	.63**	.63**	.28**
Problem solving	-	2		0.982	5.78		.72	.65**	1.048	6.16		.75	.29**	.29**	.20**
Conscientiousness[1]	10	8	1	41.26	3.301	41.26	.80	.72**	4.768	59.60	59.60	.90	.78**	.78**	.35**[4]
Self-efficacy[2]	12	10	2	50.61			.79	.79**			65.24	.88	.75**	.75**	.37**
Persistency	-	6		3.455	34.55		.79	.69**	4.956	49.57		.92	.75**	.75**	.32**
Self-confidence	-	4		1.606	16.06		.68	.72**	1.567	15.67		.73	.65**	.65**	.26**
Coping	21	19 (7)[3]	3	57.19			.85	.67**			80.74	.25	.57**	.57**	-
Emotion-oriented	8	8 (2)[3]		4.713	29.46		.88	.75**	1.363	19.47		.79	.57**	-	-
task-oriented	7	7 (3)[3]		2.808	17.55		.86	.69**	3.000	42.86		.86	.64**	-	-
Avoidant oriented	4	2 (2)[3]		1.775	10.19		.64	.68**	1.289	18.42		.69	.53**	-	-

[1] Originally 10 items and 4 factors: Organization (2), Diligence (2), Perfectionism (3), Prudence (3) [19]

[2] Originally 12 items and 3 factors initiative (3), effort (5) and persistence (4) [21]

[3] Number of items significant other scale

[4] the scale is normally distributed in the target group sample and non-normally distributed in the significant other sample, the Spearman's rho and Pearson correlations are respectively .35 and .36

structured model. For that reason, those items were rejected. A two-factor model with ten items explained in total 50.61% of the variance, with persistency contributing 34.55% and self-confidence contributing 16.06% in the target group sample and respectively 65.24, 49.57 and 15.67% in the significant other sample.

The internal consistency of the self-efficacy scale in total was .79, with alpha for the two subscales ranging from .68 to .79 for the self-report scale and respectively .88 and ranging from .73 to .92 for the observer scale.

The test–retest reliability of the complete self-efficacy scale was r = .79 with correlation coefficients' varying in the subscales between .69 and .79 for the self-report scale and r = .75 and from .65 to .75 for the observer scale.

The self-other correlation for the self-efficacy scale was .37, .83 for the intimate relationship and .35 for the work-related relationship, and the self-other correlation for the subscales varied from .26 to .32, varying from .43 to .61 for the intimate relationship, and varying from .24 to .30 for the work-related relationship.

The self-report scale and observer scale differed to a large extent, because we only included observable items in the observer scale. For that reason, the initial self-report scale included 21 items, whereas the observer coping scale included seven items. Nevertheless, we performed initial PCA of the self-report and observer coping scale, extraction was forced to three components in correspondence with the original coping scale. In the observer sample all items loaded in accordance with the three original components of the CISS-21 (Calsbeek et al., 2003), whereas in the self-report sample only two originally avoidance coping items loaded on the emotion-oriented coping component. We rejected these two items on this conflicting content ground. A repetition of the procedure after rejection of these two items resulted in a three-component solution with 19 items that explained 55.30% of the variance, with emotion-oriented coping, task-oriented coping, and avoidance coping contributing varying from 28.74 to 9.34% for the self-report coping scale. The three-component solution for the observer-report coping scale with seven items explained 80.74% of the variance, with task-oriented coping, emotion-oriented coping and avoidance coping contributing varying from 42.86 to 18.42%.

The internal consistency of the complete coping scale (19 items) was .86, with alpha for the two subscales ranging from .64 to .88 for the self-report scale, and respectively .25, with alpha for the three subscales ranging from .69 to .86 for the observer scale.

The test–retest reliability of the coping scale was r = .67 with correlation coefficients varying in the subscales between .68 and .75 for the self-report scale, and respectively r = .57 with correlation coefficients' varying in the subscales between .53 and .64 for the observer scale. Additionally, the inter-item correlation of the four-item avoidance coping subscale was examined because the Cronbach value was smaller than .7. The mean inter-item correlation was .31, which is an optimal inter-item correlation according to Briggs and Cheek (1986).

Discussion

In this first study we executed EFA to assess whether underling dimensions of the new scales were consistent with the dimensions in the original scales, and if the dimensionality of self-reports and observer-reports corresponded. Since there is no factor structure indicated of the original VCRS scale (Greig et al., 2004) in the literature, the consistency with the original scale could not be assessed. However, results showed similar dimensionality in the adapted mental ability scale in both, the target group sample and the significant other sample.

Although our results indicated that the dimensionality of the adapted conscientiousness scale and the adapted self-efficacy scale do not correspond with the original scales, EFA indicated corresponding dimensionality in the conscientiousness scale and in the self-efficacy scale in both, the target group sample and the significant other sample. Differences in factor structure between the newly developed and the original scales can be explained by the fact that we substantially changed the original scales. We deem the fact that the factor structure show corresponding dimensionality in both samples of greater importance. Furthermore, the factor structure of the self-report coping scale and the observer coping scale corresponded with the original coping scale. Although, the number of items in the self-report scale and the observer scale differ largely, we found similar factor patterns in both samples, and items loaded on corresponding dimensions.

The test–retest correlation of scores on the scales that were completed twice by the same people at T1, and at T2 indicated low to high correlations for both, the self-report scale and the observer scale. Longer time lags (> 1 month) yield lower test–retest correlations (r < .70). Test–retest correlations of > .5 over longer intervals appear to be reasonable for personality traits (De Vellis, 1991). Only one self-report subscale and one observer subscale yielded a small test–retest correlation.

Except for two subscales, the Cronbach's alpha coefficients of the majority of the self-report scales and subscales exceeded .7 indicating good internal consistency (De Vellis, 1991). The two exceptions concern two subscales with two and four items respectively, both subscales showed an optimal mean inter-item correlation.

With respect to the observer scales, excluding one coping subscale, all scales and subscales showed internal consistency. The lack of internal consistency of the total coping scale can be explained by the fact that the total observer scale consists only of seven items that reflect three different dimensions of coping. Moreover, two subscales of coping show good internal consistency. Although the Cronbach's alpha coefficient of the third factor was slightly below the cut-off point of .7, it showed an optimal inter-item correlation.

Finally, we calculated the self-other correlation in order to assess the accuracy of the observer ratings. Even though results show relatively low self-other correlations, this relatively low accuracy level can be clarified by the fact that more than 90% of the observers were work-related observers that accounted for relatively small correlations levels, while only 10% of the intimate-relation observers accounted for medium to large correlations. These results correspond with former research findings. A meta-analysis of Connelly and Ones (2010) showed that differences in accuracy in rating personality traits is dependent on interpersonal intimacy, the higher the frequency of interacting with the target, the higher the accuracy.

Study 2: Testing Factorial Validity

Measures

We used the measures for mental ability, conscientiousness, self-efficacy and coping resulting from the above described exploratory factor analysis to test their factorial validity.

Participants and Procedure

In order to test the factorial validity new data was collected on several schools (e.g. schools for practical education and a school for low-level vocational training) for youngsters of our target group (20%), and in training centres for work of people with LWC (80%). Questionnaires consisting of the tailored sales for mental ability, conscientiousness, self-efficacy and coping that resulted from study 1, were administered to people from the target group and their significant other. The target group sample consisted of 264 individuals (61.7% male). The mean age of the participants was 26.72 (SD = 9.86). The education level of the respondents varied from: 7.6% lack a diploma, 50.8% followed a low level of education, 31.8% finished a secondary vocational education, 2.8% finished higher levels, for 7.2% the level of education is missing. The significant other sample consisted of 221 individuals. Their relation to the target group varied from intimate (59.5%, such as a parent, partner or family member), personal coach (23.1%), to work related relation (17.2%, such as job coach, work supervisor or internship supervisor).

Analytic Strategy

In order to assess the quality of the factor structure, we applied confirmatory factor analyses (CFA) on the new data using Mplus Version 7.2. The CFA procedure consisted of an interactive process. In this process, we evaluated the measurement models resulting from study 1 by examination of fit indices, such as the Chi square test, the Comparative Fit Index (CFI), the Tucker–Lewis Fit Index (TLI, also known as the Non-Normed Fit Index NNFI), the root mean square of approximation (RMSEA) and the standardized square residual (SRMR). If necessary, we revised the models based on modification indices that derived from analyses, and afterwards, we re-evaluated the effects of the modifications.

Results

We performed CFA to cross-validate the five-factor structure of the mental ability scale. Examination of fit indices indicated a reasonable fit for the self-report scale (N = 260) (see Table 2). However, inspection of the modification indices indicated that a better fit could be obtained by inclusion of a residual covariance to the model. We accepted this residual covariance because both items are largely similar ('I know which task is most important.' and 'The most important task I do first.'). The model fit indices improved influential after this adaptation: Chi square test $\chi 2$ (108, N = 260) = 192.48, p = .000, CFI = .949, TLI = .936, RMSEA (90% CI) = .055 (.042–.067) and SRMR = .046. The fit indices primarily showed also a reasonable fit for five-factor structure the observer scale of mental ability. After inspection of the modification indices, we included the same residual covariance included as we allowed in the self-report scale. The model fit indices improved slightly after these adaptations:

Chi square test χ2 (108, *N* = 221) = 227.81, *p* = .000, CFI = .942, TLI = .927, RMSEA (90% CI) = .073 (.059–.086) and SRMR = .046.

Subsequently, we conducted CFA to test one-factor structure of the conscientiousness scale. The fit indices primarily indicated a poor fit in the self-report scale (*N* = 264). After inspection of the modification indices, we included one residual covariance to the model. The close relation between the two items could be explained by the fact that these two items were composed of one double-barrelled item in the original conscientiousness scale. The model improved influential after this adaptation: Chi square test χ2 (19, *N* = 264) = 27.99, *p* = .084, CFI = .974, TLI = .962, RMSEA (90% CI) = .042 (.000–.074) and SRMR = .041. Primarily CFA showed a poor fit also for the observer conscientiousness scale. After examination of the modification indices, we allowed the same residual covariance as in the self-report scale. The model fit indices improved after the modification: Chi square test χ2 (19) = 36.17, p = .010, CFI = .977, TLI = .966, RMSEA (90% CI) = .064 (.031–.096) and SRMR = .033.

After performing CFA on the two-factor structure of the self-efficacy scale the fit indices indicated a good fit for both, the self-report scale and the observer scale. The fit indices were respectively for the self-report self-efficacy scale: Chi square test χ2 (34, N = 262) = 55.45, p = .012, CFI = .968, TLI = .957, RMSEA (90% CI) = .049 (.023–.072) and SRMR = .048, and of the observer self-efficacy scale: Chi square test χ2 (34, N = 208) = 59.86, p = .004, CFI = .9782, TLI = .963, RMSEA (90% CI) = .60 (.034–.085) and SRMR = .036.

CFA on the self-report coping scale resulted primarily in a poor fit. However, after inspection of we stepwise removed three problematic items since these items cross-loaded on factors, which indicate that these items did not reflect clearly the underling psychological construct. Moreover, we included one residual covariance to the model. The close relation of these two items could also be clarified by the fact that also these two items consisted of one double-bared item in the original coping scale (Calsbeek et al., 2003). The fit indices improved influential: Chi square test χ2 (100, N = 264) = 164.29, p = .000, CFI = .952, TLI = .942, RMSEA (90% CI) = .049 (.035–.063) and SRMR = .068. The goodness of fit indices indicated a good fit of the observer coping scale. Chi square test χ2 (11, N = 221) = 15.13, p = .567, CFI = .993, TLI = .986 showed mediocre results, RMSEA (90% CI) = .041 (.000–.087) and SRMR = .034.

Discussion

For the evaluation of the goodness of fit, we examined fit indices such as the Chi square test. The smaller the Chi square, the better the fit (Hinkin, 1998), small non-significant Chi square values suggest a small misfit, while large significant Chi square values suggest a large misfit. Since the Chi square test is sensitive for the sample size, we verified the fit of the models with a relative high χ2 and significant χ2 as advocated; we divided the χ2 by its degrees of freedom (Kline, 2004 as cited in Lacobucci, 2010). All adjusted models demonstrated reasonable fits since the statistic adjusted by its degrees of freedom do not exceed 3.0. Furthermore, additional indices like CFI, TLI, RMSEA, and SRMR were included in our goodness of fit examination. Also these results meet the general guidelines (Briggs & Cheek, 1986; Byrne, 2016; Cohen, 1988; De Vellis, 1991; Furr, 2011) and showed well-fitting models for the self-report self-efficacy scale, the observer self-efficacy scale, and the observer coping scale without any adaptation. The two conscientiousness scales showed good fits after minor adaptations. The self-report and observer scales for mental ability, and the self-report coping scale showed reasonable to good fits after relatively few adaptations.

Table 2 *Fit indices confirmatory factor analysis*

Scale	Sample	Model	Chi-square test χ^2	df	CFI	TLI	RMSEA (90% CI)	SRMR
Mental Ability	Target group (N=260)	Model derived from EFA	241.86[a]	109	.920	.901	.068 (.057 - .080)	.049
		Modified model	180.83[a,1]	107	.956	.944	.052 (.038 - .064)	.045
	Significant other (N=211)	Model derived from EFA	423.05[a]	142	.880	.855	.097 (.086 - .108)	.065
		Modified model	227.81[a,1]	108	.942	.927	.073 (.059 - .086)	.046
Conscientiousness	Target group (N=264)	Model derived from EFA	61.17[a]	20	.883	.836	.088 (.064 - .114)	.054
		Modified model	28.22[b]	19	.974	.961	.043 (.000 - .074)	.041
	Significant other (N=219)	Model derived from EFA	65.22[a]	20	.940	.915	.102 (.075 - .130)	.042
		Modified model	36.17[c,1]	19	.977	.966	.064 (.031 - .096)	.033
Self-Efficacy	Target group (N=262)	Model derived from EFA	55.45[d,1]	34	.968	.957	.049 (.023 - .072)	.048
		Modified model	-	-	-	-	-	-
	Significant other (N=208)	Model derived from EFA	59.86[e]	34	.972	.963	.060 (.034 - .085)	.036
		Modified model	-	-	-	-	-	-
Coping	Target group (N=264)	Model derived from EFA	467.17[a]	149	.826	.800	.090 (.081 -.099)	.107
		Modified model	164.29[a,1]	100	.952	.942	.049 (.035 - .063)	.068
	Significant other (N=221)	Model derived from EFA	15.13[f]	11	.993	.986	.041 (.000 - .087)	.034
		Modified model	-	-	-	-	-	-

[a] p=.000; [b] p=.079; [c] p=.010; [d] p=.012; [e] p=.004; [f] p=.567

[1] χ^2 / df≤3

General Discussion

Labour participation is a necessity for all adults. Therefore, also people with limitations are entitled to participate in the labour market at their own level of capacity. An instrument that can indicate the mental work capability of people with LWC is lacking. Therefore, this study concerned the development of a work capability self-report and observer measure that can outline directions to address support in order to encourage the development of self-reflection of people with LWC and enhance occupational rehabilitation practices.

We conducted two studies. In the first study scales for mental ability, conscientiousness, self-efficacy and coping were selected on theoretical base. Subsequently they were adapted to the language level of people with LWC. The pre-test yielded face validity and gave confidence that the scales were appropriate for people with LWC. EFA yielded congruent factor structures of the adapted scales in both samples and high test–retest reliability, indicating that people with LWC are equally able to complete the questionnaires as their significant other. Moreover, the scales and subscales that evolved from EFA possess adequate internal consistency and observers accuracy correspond with former research. Based study 1 we concluded the developed scales to be appropriate and reliable measures for people with LWC and their significant other.

Finally, we explored factorial validity in study 2. CFA results indicated that factorial validity was established and demonstrated that measures performed as intended. The modifications in scales after CFA only slightly affected factor loadings, internal consistencies, and the test–retest reliabilities. The final instrument with its psychometric properties can be obtained from the authors.

In sum, these studies yielded high test–retest reliability, adequate internal consistent scales with reasonable to good fitting factor models for both, the self-report scales and the observer scales.

To conclude, we developed reliable well-suited measures that can help people with LWC to reflect on their strengths and weaknesses as a requirement for their personal and professional development. It is an instrument that, in addition to the already existing more therapeutic tools, that is expected to be useful in facilitating the transition from clinical support to support in daily work practice. More specific, this tool can strengthen methodical action of professionals in the field with respect to the individual support of people with LWC. The self-report and the observer questionnaire can be completed online or with paper and pencil. The duration of completion varies within the target group from 15 to 45 min, and for the significant other 15 min on average.

Further research is needed to examine criterion-related validity with respect to the work demands such as work behaviour and task performance.

Limitations and Future Research

Although this multi-source data- and multi-phase study assured that the adapted scales possess content validity and internal consistency reliability, we were not able to assess convergent and discriminant validity due to the limitations in the level of literacy of the target group. Moreover, this study does not cover the final step for scale validation of Hinkin (1998). Further research is required in order to assess criterion-related validity in order to explore if the measures possess predictive validity with respect to work behaviour or work performance.

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CHAPTER 3

Predicting and Assessing Work Performance of People with Limited Work Capacity (LWC): A Multi-Wave, Multi-Source Study

This chapter is based on: Van Ruitenbeek, G. M. C., Zijlstra, F. R. H., & Hulsheger, U. R. (2021). Predicting and assessing work performance of people with limited work capacity (LWC): A multi-wave, multi-source study. *Journal of Occupational Rehabilitation*, *31* (2), 360-375.

Abstract

Purpose Occupational integration is vital for the health of all people, also for people with Limited Work Capacity (LWC). Therefore, participation in regular work is a legal right for people that are restricted in their work capacity due to a disability and/or lack sufficient education. Full and effective integration is dependent on the person-job fit, and adequate vocational support should focus on meeting performance standards, as is common practice in traditional personnel selection and development programmes. Despite the huge amount of valid instruments for personnel selection and development, these tests are not suitable people with LWC. Recently, an instrument was developed for assessment and development purposes specifically for this target group. That study provided evidence for reliability and dimensionality this instrument. In our study, we add criterion-related measures to this instrument to demonstrate that assessment at T1 predict performance at T2, thus validating the instrument.

Method We conducted a four-source data study, two sources for independent and two for outcome variables, to test the predictive validity of this instrument in a multi-wave setup.

Results This study largely support the validity of the instrument in predicting work behaviour and task performance of people with LWC. More specific, when measures are tailored to this target group, this group is able to predict their work behaviour and task performance accurately just like the general population.

Conclusion We conclude that this instrument contributes to science, vocational support practices, and the personal and professional development of people with LWC, which is required for sustainable work.

Introduction

The psychological value of paid employment has been acknowledged for decades (Jahoda, 1981, 1982; Warr, 1987). Employment is generally viewed to be conducive to mental health (Schuring et al., 2017; Wanberg, 1995; Warr, 1994), whereas unemployment is associated with impaired mental health (Broom et al., 2006; Kim & Von dem Knesebeck, 2016; Paul, 2005; Paul et al., 2009; Warr, 1994), with lower physical health (McKee-Ryan et al., 2005), and with social isolation (World Health Organization, 2011). Employment should never be taken for granted, especially not for people with disabilities. The employment rate of people with disabilities remains far below that of people without limitations (Eurostat, 2014, 2019), despite all public policies and legislations aimed at enabling workplace inclusion of people with disabilities (Vornholt et al., 2018). We are referring to a group of people that has some kind of functional limitation. According to the International Classification of Functioning (ICF) (World Health Organization, 2001), this is a rather diverse group which encompasses people with disabilities, but also people with low intellectual abilities, people with chronic diseases, and people with mental health issues that may vary from severe to 'mild' issues, such as attention deficit hyperactivity disorder (ADHD).

Participation in regular work of this target group is increased, but their employment is often of short duration (Jehoel-Gijsbers, 2010; UWV, 2018). This is often caused by poor person-job fit (Zijlstra et al., 2017), or poor guidance concerning learning and development on the job (Bruyère et al., 2004; Inspectie SZW, 2018). Various approaches take the wishes and needs of specific target groups as point of departure in order to cover these concerns. Examples are the choose-get-keep approach (Danley & Anthony, 1987), supported employment (Bond et al., 2001), and individual placement and support (IPS) (Becker et al., 2007), all for people with severe mental illness. Instruments that support methodical action of support providers of a broader group of people are lacking. Moreover, we argue that the performance standards in regular work should be the starting point, since the purpose is sustainable participation in regular work. Over decades, personnel psychologists have developed instruments that can facilitate the person-job fit and that can predict work performance (Barrick et al., 2001; Salgado et al., 2002; Schmidt & Hunter, 1998), as these are important conditions for the duration of employment contracts. However, these instruments have been developed for the general population, and are not suitable for our target group. A person with functional illiteracy, for example, may be able to use familiar everyday expressions and very basic phrases, but is not able to fill-out complex questionnaires, and individuals with autistic spectrum disorders face difficulties with respect to metaphorical language often used in traditional personality questionnaires. Therefore, we need to design instruments with unambiguous and simple language.

In line with what the ICF model (World Health Organization, 2001) assumes, human functioning is a result of a dynamic interaction between the limitation, personal characteristics and external factors. The dynamic interaction means that interventions directed at one aspect can cause changes in other related aspects. We therefore plead for an instrument that includes both personal characteristics (such as coping style) and external factors (such as performance standards) in order to determine the direction of guidance.

Recently, Van Ruitenbeek et al. (2019) have developed the Maastricht Work Capacity Monitor (MW©M) in an endeavour to facilitate selection, placement, and development of individuals with LWC, individuals like people of our target group. Although they provided evidence for the reliability and construct validity, the predictive validity has remained unaddressed. The overall goal of the present study is twofold. First, we will evaluate the predictive validity of the MW©M on

performance standards such as work behaviour outcomes of our target group using a rigorous multi-source study in a longitudinal set-up (see Fig. 1). Second, we will extend the MW©M with measures of work behaviour and task performance that we adjusted to our target group. In doing so, we make the following contributions to the literature: first and foremost, we draw attention to an important and yet understudied population that has the legal right to work and participate in the labour market but that has largely been ignored in the work and organizational psychology literature (for a recent exception see Vornholt et al., 2018). This is problematic, as organizations that are willing to employ people from the target group have insufficient means to select, place and train these people within their organization because traditional personnel selection and development instruments are not designed for this specific population. We contribute to the work and organizational psychological literature as well as to the occupational rehabilitation literature, which will benefit from the availability of an adjusted and validated instrument to study the relationships between personality traits and work behaviour of people with LWC more accurately. Second, we expect that with our supplements, the MW©M can contribute to practice as it can enhance adequate assessment of the work capacity (personnel selection and matching person-job fit). We expect that it can contribute methodically to the continuous monitoring principle of supported employment interventions, such as IPS (Van Ruitenbeek, 2017). Third, we expect that our contribution will empower the field of work and organizational psychology and human resources practices to include people with LWC in paid employment.

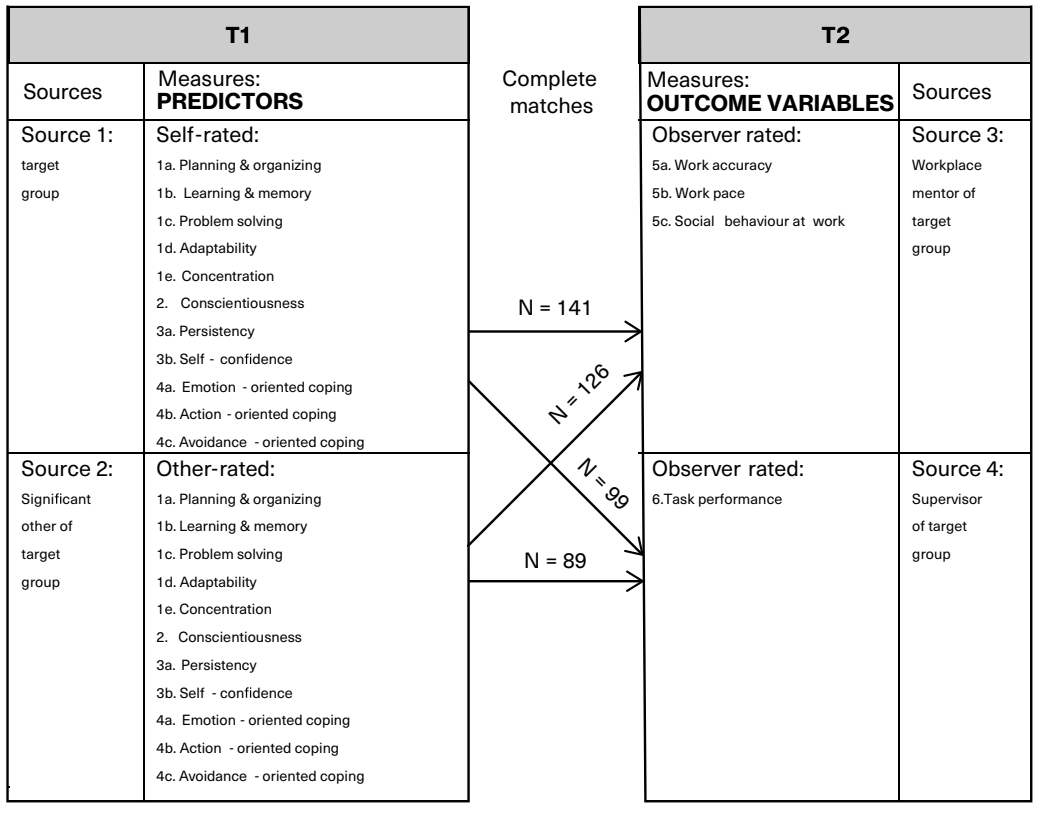

Fig. 1 Study setup and sample size

Finally yet importantly, our target group can learn to reflect on their own strengths and weaknesses with the help of this instrument that consists of self-, other-, and observer-ratings forms. This helps to get an understanding of one's own work behaviour that can serve future behaviour, as an important driving force for learning (Boud et al., 1985; Knipfer et al., 2013; Moon, 1999). This strengthens their personal and professional development, and sustainable integration into work.

Point of Departure; Assessing Performance Standards of People with LWC

As stated in the introduction, we argue that performance standards in regular work should be the point of departure when the purpose of our target group's sustainable participation in regular work. These standards are conditional for the continuation of their employment contract. There is a call for adequate and fair assessment instruments (Zijlstra, 2002), and for more narrow and job-focused measures of performance that can be used for formal job appraisals as well as providing feedback to employees (Arvey & Murphy, 1998). We argue that the task performance scale of Williams and Anderson (1991) fits these criteria. This task performance scale also focuses on important work aspects such as quality and efficiency. We therefore adapted the task performance measure of Williams and Anderson (1991) to reflect performance requirements for individuals with LWC.

Nearly every job, from cleaning services to ICT services, is performed in a customer or client service driven organization nowadays. People need to display certain behaviour at work in order to be able to deliver the expected performance (Roe & Zijlstra, 1991). For that reason, we measure aspects of work behaviour itself that are relevant and expected to be displayed as part of every job alongside task performance. We argue that work behaviour and functioning should be measured adequately and fairly (Zijlstra, 2002) for this specific population. The work behaviour inventory (WBI) (Bryson et al., 1997) is an adequate instrument that was developed for people with severe mental illness. We adapted the scale in order to make the scale more suitable for people with common mental disorders and disabilities. The specific properties of the work behaviour and the task performance scales that we used in this study are described in the method section.

Predictors of Work Behaviour of LWC

An important question that has kept psychologists busy over the years is: what predicts work behaviour for the general population (Barrick et al., 2001; Salgado et al., 2002; Schmidt & Hunter, 1998)? Special attention for predictors of work behaviour for people with LWC was seldom given. Van Ruitenbeek et al. (2019) deliberately selected personal characteristics and personality traits relevant to the work capacity of individuals with LWC, and developed the MW©M. In choosing personality traits, they built upon extensive evidence from the work and organizational psychology literature and combined this with insights from the occupational rehabilitation literature. In this section, we complement their work and revisit the theoretical rationale for the choice of predictor variables included in the MW©M: mental ability, conscientiousness, self-efficacy and coping.

Several studies consider *mental ability* to be the most valid predictor of job behaviour (Gottfredson, 1997; Schmidt & Hunter, 1998, 2004). General mental ability or intelligence reflects individuals' capability to reason logically, solve problems, make decisions, think abstractly, and learn (Schmidt & Hunter, 1998, 2004). Nevertheless, the type of work and its context define the importance of mental ability (Gottfredson, 1997), meaning that the required level of mental ability

depends on the level of job complexity. Although logical reasoning and sophisticated problem solving skills are relevant for complex jobs, simple or routinized tasks require basic mental ability skills. In line with Van Ruitenbeek et al. (2019), we argue that basic cognitive skills, such as planning and organizing, learning and memory, adaptability, concentration, and basic problem solving, are important predictors of work behaviour for people with LWC. These aspects cover the key cognitive elements that can affect the ability to function in the workplace, and are assumed to be important aspects to include in assessment of work-capability (Fadyl et al., 2010). Based on these considerations, we expect these five dimensions measured by self-rating and other-rating scales for people with LWC to be positively related to work behaviour and task performance.

Conscientiousness is one of the 'big five' personality traits that can be seen as a second powerful predictor of work behaviour (Barrick et al., 2001; Salgado et al., 2002; Schmidt & Hunter, 1998). Conscientious individuals are characterized by a high orientation to accomplish tasks, trustworthiness and cautiousness (Barrick et al., 2001; Barrick & Mount, 1991; Wanberg et al., 2002). Among the 'big five' traits, conscientiousness is the personality trait with the strongest predictive validity across different kinds of jobs and occupations including lower-level jobs (Barrick & Mount, 1991). We therefore argue, in line with Van Ruitenbeek et al. (2019), that conscientiousness measured by self-rating and other-rating scales for people with LWC will be positively related to work behaviour and task performance.

Several authors (Bono & Judge, 2003; Stajkovic & Luthans, 1998) have demonstrated the validity of self-efficacy. *Self-efficacy* can be seen as the tendency to believe in one's own capacities and effectiveness to meet work demands in a variety of work settings (Bosscher & Smit, 1998; Chen et al., 2004; Stajkovic & Luthans, 1998). Moreover, self-efficacy stipulates the course of action, the level of effort people put in, and their persistency (Bandura, 1977; Bosscher & Smit, 1998). It represents characteristics that demonstrated predictive validity to work-related behaviour for each level of task complexity across all included studies in a meta-analysis conducted by Stajkovic and Luthans (1998). The scales for people with LWC measure personal characteristics, such as self-confidence and persistence. These personal characteristics are important attributes for accomplishing work tasks (Van Ruitenbeek et al., 2019). In line with this reasoning, we expect that persistency and self-confidence measured by self-rating and other-rating scales for people with LWC will be positively related to work behaviour and task performance.

Finally, several authors consider self-regulation strategies to be important predictors of work behaviour (Becker et al., 2007; Cunningham et al., 2000; Frayne & Geringer, 2000; Michon et al., 2011). *Coping* can be seen as subset of self-regulation (Eisenberg et al., 1997). Coping refers to mental and behavioural effort people expose in order to master or decrease effects of stressors (Folkman & Lazarus, 1980; Schreurs et al., 1984). Coping also reduces the impact of any kind of limitation or problem individuals' face (Calsbeek et al., 2006) as a consequence of their disability or disorder. Previous research has provided evidence for the positive relationship between self-regulation or self-management skills and work behaviour (Frayne & Geringer, 2000). Although these studies have been conducted in the general population, Van Ruitenbeek et al. (2019) argue that coping is an important predictor of work performance especially for people with LWC, since they have to deal with serious restrictions due to their functional limitation. The coping scale for people with LWC (Van Ruitenbeek et al., 2019) is based on the shortened coping inventory for stressful situations (CISS-21) (Calsbeek et al., 2003). This three-factor structured coping scale refers to emotion-oriented coping, task-oriented coping, and avoidance-oriented coping. This model is grounded in the conceptualisation of coping that is viewed as a deliberate responses aimed at: (a) reducing

stress through emotional reactions (emotion-oriented coping), or (b) solving the problem and attempting to change the situation (problem-focussed or task-oriented coping), or (c) seeking support and protection from others (Compas et al., 2001), and avoiding the stressful situation through distracting oneself with other situations or tasks (avoidance-oriented coping) (Calsbeek et al., 2003). In general, problem-focussed or active coping (i.e. task-oriented coping) has been shown to correlate with better adjustment, whereas emotion-oriented coping and withdrawal (avoidance-oriented coping strategies) have been found to be associated with poorer adjustment (Calsbeek et al., 2006; Compas et al., 2001). Therefore, we expect task-oriented coping to be positively related to work behaviour and task performance, whereas we expect emotion-oriented and avoidance-oriented coping strategies to be negatively related to work behaviour and task performance.

Taken together, the arguments presented above suggest that mental ability, conscientiousness, self-efficacy and coping assessed by self- and other-ratings at time 1 predict work behaviour and task performance at time 2. We therefore hypothesise:

H1: *The self-rating form* of the MW©M measured at T1, consisting of scales for planning and organizing, learning and memory, problem solving, adaptability, concentration, persistency, self-confidence, emotion-oriented coping, task-oriented coping and avoidance-oriented coping, predicts both (a) work behaviour and (b) task performance measured at T2.

H2: *The other-rating form* of the MW©M measured at T1, consisting of scales for planning and organizing, learning and memory, problem solving, adaptability, concentration, persistency, self-confidence, emotion-oriented coping, task-oriented coping and avoidance-oriented coping, predicts both (a) work behaviour and (b) task performance measured at T2.

Method

We collected data from four different sources (i.e., target persons, significant others, workplace mentors and supervisors) in a multi-wave design in order to test the predictive validity of the MW©M-scales (Van Ruitenbeek et al., 2019) on work behaviour and task performance. Specifically, we used four different sources of data: self- and other-ratings of independent variables (MW©M-scales for mental ability, conscientiousness, self-efficacy and coping) measured at time 1, and ratings of the workplace mentor and the supervisor of outcome measures (such as work behaviour and task performance) at time 2 (see Fig. 1). People from the target group and their significant other (individuals that were chosen by the target persons themselves and who know the target person well, such as relatives or personal coaches) completed the self- and other-rating form of independent variables just before or in the first couple of days of work. After approximately 4 weeks of work, a workplace mentor completed a questionnaire assessing work behaviour, and the supervisor completed a questionnaire assessing task performance. The time span of approximately 4 weeks of work allows the target person to familiarise him- or herself with the work and work context, and provides mentors, colleagues and supervisor with the opportunity to get to know the target person and his or her work behaviour and task performance. This time span also allows professionals to give feedback to our target group about their work behaviour and task performance in the first couple of workweeks in case a change in behaviour is needed. We deliberately chose the perspective of both mentors

and supervisors because the workplace mentor observes of the target person's day-to-day work behaviour and interacts with them, while the supervisor has more insights into work outcomes and performance levels.

We recruited participants from three vocational support providers in the Netherlands and the Dutch Employee Insurance Agency (Uitvoeringsinstituut Werknemersverzekeringen, abbreviated UWV). We collected data between November 2014 and February 2018.

Procedure

We contacted several vocational support providers and the UWV who offer vocational rehabilitation for people of our target group, and we presented the outline of the research project. Seven agencies with interest in collaborating received detailed information about the study and we asked job coaches and rehabilitation consultants to coordinate the participation of people from the target group. These coordinators registered the participants online in order to receive a registration code that enabled the target person, their significant other, their workplace mentor and the supervisor to fill in the online questionnaires. Prior to the questionnaires, participants were informed about the procedure and their rights with respect to the research in the online survey. The coordinator guided this process, which included, if necessary, the direct guidance of our target group when they filled-out the online questionnaire. Only fully accountable participants were included. They signed the online informed consent themselves. At time point one, the link to the online questionnaires for the self-rating and other-rating were distributed by e-mail. Four weeks after the target person had started working (time point two), workplace mentors and supervisors received online invitations to fill in the work behaviour and work outcome scales, respectively. Participants obtained a report of their individual results when the questionnaires were completed. The local ethical review board has approved the study.

Participants

People from the target group (*N* = 267) and their significant other (*N* = 199) completed a questionnaire that consisted of mental ability, conscientiousness, self-efficacy and coping scales. On average after 5.3 weeks of the target person starting to work, a workplace mentor completed the work behaviour questionnaire and the supervisor completed the task performance questionnaire. This resulted in complete matches for the self- and other-rated predictors and observer-rated work behaviour, and task performance of *N* = 141, 126, 99, and 89 respectively.

The self-report sample of complete matches of self-report (T1) and observer-report (T2) consisted of 141 self-ratings (64.5% male, see Table 1). The mean age of the participants was 28.95 (*SD* = 10.02). More than three-quarters of the target group dealt with disabilities varying from a learning disability (25.9%), AD(H)D or autism spectrum disorders (24.5%), psychological disorder (15.8%), physical (7.2%) or other (3.6%; such as brain injury or dyslexia). Almost a quarter (23%) of the target group did not report a disability. More than twenty percent (21.9%) of the respondents reported comorbidity. Several people faced additional personal problems such as debts (7.1%), housing problems (2.4%), problems with childcare (0.8%) or other personal problems (3.1%; such as dealing with grief or a disabled partner in combination with one's own disability). The level of education varied from lack of or insufficient vocational education (72.3%), to low-level vocational education (13.9%), intermediate or secondary level vocational education (11.7%), and to high level education (2.2%). More than ten percent (11.9%) of the respondents had an employment contract, 32.2 percent had a learn-work agreement, 25.4 percent performed voluntary work, 25.4 percent worked in sheltered workplaces, and 5.1 percent worked during an internship. The work of the participants varied from simple duties in the care, service, or construction sector, to more complex administrative jobs.

The other-rating sample of complete matches of significant other (T1) and observer-report (T2) consisted of 126 other-ratings. Their relation to the target group varied from parent (31.2%), partner (5.6%), family member (8.8%), friend (10.4%), job coach (10.4%), and personal coach (29.6%) to a workplace mentor (4%).

Measures

Mental ability was measured with the Vocational Cognitive Ratings Scale of Greig and colleagues (2004), as adapted by Van Ruitenbeek et al. (2019), consisting of five subscales: planning and organizing, learning and memory, problem solving, adaptability, and concentration (e.g. "I complete tasks in a logical order.", "I can remember well how to do something.", or "I am easily distracted").[2]

Conscientiousness was measured with the Dutch HEXACO personality inventory of De Vries et al. (2008), as adapted by Van Ruitenbeek et al. (2019), consisting of nine items (e.g. "If I have to do something, I prepare it." or "I think carefully before making a decision.").

Self-efficacy was measured with the general self-efficacy scale (GSES-12) of Bosscher and Smit (1998), as adapted by Van Ruitenbeek et al. (2019), that consisted of two subscales: (a) persistency (six items, e.g. "Even if I don't like a task, I keep working on it until I'm done.") and (b) self-confidence (four items, e.g. "When I really want to do something, it goes wrong.").

The coping scale of Calsbeek and collegues (2003) (CISS-21), as adapted by Van Ruitenbeek et al. (2019), consisted of three subscales: (a) emotion-oriented coping (seven items, e.g. "If I have a problem or feel stressed, I blame myself for getting into that situation."), (b) task-oriented coping (six items, e.g. "If I have a problem or feel stressed, I try to remember if I have had the same problem before and how I solved it.", or "If I have a problem or feel stressed, I ponder if I can learn from it."), and (c) avoidance-oriented coping (three items, e.g. "If I have a problem or feel stressed, I buy something for myself.").

Work behaviour was measured with a scale that was inspired by the WBI (Bryson et al., 1997). The WBI was developed for people with severe mental illness. The WBI was developed for people with severe mental illness. We translated the original English scale into Dutch, and adapted the scale in order to make it more suitable for people with common mental disorders and disabilities. We dropped items that were specifically related to severe mental illnesses (e.g. "Does not appear overly distant or aloof" or "Does not become overexcited or aggressive"). We also dropped items that reflect mental ability because they overlap with the independent mental ability scale. Before using the scale, supported employment experts verified the suitability of the scale for our target group and its relevance and applicability to the work situation. Given the changes we made to the original WBI scale, we tested the factor structure of the adapted scale. We subjected the data to exploratory factor analysis (EFA) using SPSS version 24. This process yielded a three-factor solution

[2] Items for the other-rating forms are formulated in the third person.

Table 1 *Descriptive statistics about the study population and the relation to their significant other*

	Self-rated sample (N=141)				Significant other sample (N=126)	
	Mean	*SD*	Range	Missing	Percentage	Missing
Age (years)	28.95	10.02	16-58			
Gender (% men)	64.5					
Disability in percentages				2		
Not specified	23.0					
Learning disability	25.9					
AD(H)D/Autism spectrum disorder	24.5					
Psychological	15.8					
Physical	7.2					
Different	3.6					
Comorbidity	21.9					
Problems				14		
Housing	2.4					
Childcare	0.8					
Debts	7.1					
Different (not specified)	3.1					
Level of vocational education				4		
Lack or insufficient	72.3					
Low	13.9					
Secondary	11.7					
High	2.2					
Type of contract				23		
Regular contract	11.9					
Learn-work agreement	32.2					
Voluntary work	25.4					
Probation period/internship	5.1					
Sheltered workplace	25.4					
Branch/type of industry				20		
Administration	11.3					
Cleaning	3.5					
Care	12.2					
Catering	12.2					
Facilities	20.0					
Logistics	4.3					
Production	25.2					
Retail	5.2					
ICT/Media	5.2					
Different	0.9					
Relation to significant other						1
Parent					31.2	
Partner					5.6	
Family member					8.8	
Friend					10.4	
Job-coach					10.4	
Personal coach					29.6	
Workplace mentor					4.0	

measuring, (a) work accuracy (seven items, e.g. “Arrives on time.” And “Works precisely.”), (b) work pace (four items, e.g. “Can keep up the work pace.” and “When he/she has to work faster, he/she makes mistakes.”), and (c) social behaviour at work (10 items, e.g. “Pays attention when listening to others.” and “Consults with the person he/she works with.”). We conducted a series of confirmatory factor analyses (CFA) and tested alternative models using M*plus* version 7.3 following procedures recommended in literature (Byrne, 2016; Furr, 2011). Specifically, we tested a one-factor model with all items loading onto one factor ($\chi 2$ = 814.262, *df* = 189, $p < .000$; CFI = .649; TLI = .610; RMSEA = .151). We also tested this three-factor model with work accuracy loading on one, work pace on another and social behaviour at work loading on a third factor. Examination of fit indices indicated a poor fit for the work behaviour scale: $\chi 2$ = 530.395, *df* = 186, *p* =.000, CFI = .807, TLI = .785, RMSEA = .113. SRMR = .080 (*N* = 146). Inspection of the modification indices indicated that a better fit could be obtained by inclusion of four residual covariances. We accepted residual covariances because items were largely similar, but at the same time, they indicated important subtle differences. For example: “ They arrive on time.” and “They are present at work as agreed.”; “They work precisely.” and “They make sure they don’t skip anything.”; “They take care of their appearance.” and “They adjust clothing to the work.”; and finally “They work more slowly than others.” and “When they need to work faster, they make mistakes.”. The model fit indices improved substantially after this adaptation: $\chi 2$ = 328.333, *df* = 182, *p* = .000, CFI = .918, TLI = .905 RMSEA = .074, SRMR = .068. We therefore treated work behaviour as a three-dimensional construct in this study.

For task performance, we adapted the task performance scale of Williams and Anderson (1991). We re-worded a few items from this original task performance scale in order to make it more applicable to the context of the target group. For example, we used “The work is done on time.” Instead of “Engages in activities that will directly affect his/her performance evaluation”.

All scales were answered on a five-point Likert scale: 1 = never, 2 = almost never, 3 = regularly, 4 = almost always, 5 = always.

Analysis

In order to explore the criterion-related validity of the self-ratings and other-ratings of mental ability, conscientiousness, self-efficacy and coping on work behaviour and task performance, we first inspected zero-order correlations between the independent and dependent variables separately for each rating source.

Next, we conducted multiple regression analyses separately for the self- and other-ratings of independent variables using SPSS version 25. Since the traditional multiple regression approach has been criticized not to partition variance appropriately between various predictor variables, we also conducted relative weight analysis (RWA) (Johnson, 2000), as it enabled us to test the relative importance of variables (Tonidandel & LeBreton, 2011) using RWA-Web (Tonidandel & LeBreton, 2015). As recommended by Tonidandel and LeBreton (2015), confidence intervals for the individual relative weights (Johnson, 2004) and all corresponding significance tests were based on bootstrapping with 10,000 replications. Accelerated confidence intervals were used because of their superior coverage accuracy.

Before testing our hypothesis, we conducted a set of preliminary analyses to ensure that no violations of the assumptions of normality and linearity were made. We examined the critical Chi

square values for evaluating Mahalanobis distance on outliers by using the number of independent (11) variables as the degrees of freedom (Pallant, 2013; Tabachnick & Fidell, 2013). Results indicated three outliers with critical Chi square values above 31.26 in the self-rating sample. After deletion of these three cases, the final sample consisted of 138 participants.

Results

As can be seen from Table 2 (results of self-ratings) and Table 3 (results of other-ratings), results showed relatively low alphas for some independent variables. We therefore checked for the mean inter-item correlation for scales with alpha's below .7. The mean inter-item correlations of adaptability, conscientiousness and avoidance-oriented coping amounted respectively .35, .22 and. 32. As optimal mean inter-item correlation ranges from .2 to .4 (Briggs & Cheek, 1986), all three fit these criteria.

The dimensions concentration and persistency were positively related to all outcome variables in both samples. This applies also to the relation between planning and organizing and the outcome variables, except for the non-significant relation between planning and organizing and task performance in the self-report sample. In the other-rating sample, conscientiousness was positively related to all outcome variables as well, whereas in the self-report, there was only a positive relation between conscientiousness and social behaviour at work.

In the self-report, only the positive relation between conscientiousness and social behaviour at work was significant. While no significant relation of learning and memory was found in the other-ratings, learning and memory was positively related to work pace in the self-report sample. Problem solving, on the other hand, correlated positively with work pace in the other-ratings, whereas no significant relation was found between self-rated problem solving and any outcome variable. Adaptability and emotion-oriented coping showed positive relations with work pace in both self-rating and other-rating forms. Task-oriented coping showed only significant and positive relations in other-ratings. Only avoidance-oriented coping showed a negative relation with task performance. Self-confidence showed significant and positive relations with work pace and social behaviour at work in the other-rating sample.

Results of multiple regression and relative weight analysis are reported together in Table 4 (self-rating) and Table 5 (other-rating). When considered jointly in a multiple regression analysis, self-ratings of all 11 dimensions explained between 16% (work accuracy), 17% (work pace), and 20% (social behaviour at work) of variance in the respective aspects of work behaviour and 21% of variance in task performance. Owing to the intercorrelations between the 11 predictor dimensions, many individual beta-coefficients were not significant. A notable exception is self-reported avoidance-oriented coping, which was a significant negative predictor of all 4 outcome measures. Emotion-oriented coping was a significant negative predictor of work pace in multiple regression. Overall, multiple regressions regarding the self-rating report partly confirmed H1.

A somewhat different picture emerged when considering results of a multiple regression analysis in other-rating report. Here, other-rating reports of all 11 dimensions explained between 25% (work accuracy), 17% (work pace), and 16% (social behaviour at work) of variance in the respective aspects of work behaviour and 15% of variance in task performance. Owing to the intercorrelations between the 11 predictor dimensions, many individual beta-coefficients were not significant in the other-rating sample. Notable exceptions were concentration and conscientiousness, which were significant predictors of work accuracy. With this, H2 is also partly confirmed.

An examination of the relative weights analysis of the self-rating report revealed that persistency (RW = .08) made the strongest unique contribution to the dimension social behaviour at work. It explained a statistically significant amount of variance in social behaviour at work as for the tests of significance the 95% CIs did not contain zero.

Examination of the relative weights of the other-rating report, revealed that both concentration (RW = .06) and conscientiousness (RW = .06) made the strongest contribution to work accuracy. Next in the contribution to work accuracy came learning and memory (RW = .03) and persistency (RW = .03). Adaptability made the strongest contribution to work pace (RW = .04).

Table 2 *Descriptive statistics and intercorrelations between study variables of self-rating*

	Correlations														
	1a.	1b.	1c.	1d.	1e.	2.	3a.	3b.	4a.	4b.	4c.	5a.	5b.	5c.	6.
1a. Planning & organizing	-														
1b. Learning & memory	.59**	-													
1c. Problem solving	.38**	.38**	-												
1d. Adaptability	.20*	.25**	.24**	-											
1e. Concentration	.43**	.32**	.14	.48**	-										
2. Conscientiousness	.68**	.45**	.37**	.06	.25**	-									
3a. Persistency	.69**	.51**	.34**	.20*	.42**	.61**	-								
3b. Self-confidence	.32**	.22**	.14	.51**	.45**	.18*	.23**	-							
4a. Emotion-oriented coping	.01	-.09	-.05	-.28**	-.23**	.06	-.05	-.60**	-						
4b. Task-oriented coping	.38**	.25**	.43**	.18*	.30**	.35**	.51**	.24**	-.07						
4c. Avoidance-oriented coping	.10	.10	.10	.13	-.02	.07	.08	.01	.04	.27**	-				
5a. Work accuracy	.25**	.08	-.04	.05	.19*	.16	.25**	-.03	.11	.06	-.15	-			
5b. Work pace	.21*	.23**	.11	.20*	.22**	.12	.23**	.15	-.22*	.14	-.13	.50**	-		
5c. Social behaviour at work	.27**	.10	.01	.06	.19*	.23**	.37**	.11	.03	.14	-.16	.73**	.54**	-	
6. Task performance	.16	.06	-.09	.06	.25*	.16	.27**	.05	.07	.10	-.23*	.57**	.45**	.50**	-
n	138	138	138	138	138	138	138	138	138	138	137	138	138	138	99
M	27.29	15.61	6.22	7.45	7.57	30.12	22.53	14.72	17.21	19.33	6.09	28.97	14.63	38.65	27.04
SD	5.07	2.83	2.03	1.82	1.89	4.53	4.34	3.15	6.33	5.25	2.61	5.10	3.67	7.02	5.69
α	.84	.77	.78	.51	.78	.69	.75	.74	.85	.84	.59	.87	.88	.87	.93

* $P < .05$ ** $P < .01$

Table 3 *Descriptive statistics and intercorrelations between study variables of other-rating*

	Correlations														
	1a.	1b.	1c.	1d.	1e.	2.	3a.	3b.	4a.	4b.	4c.	5a.	5b.	5c.	6.
1a. Planning & organizing	-														
1b. Learning & memory	.66**	-													
1c. Problem solving	.66**	.58**	-												
1d. Adaptability	.46**	.36**	.47**	-											
1e. Concentration	.63**	.42**	.40**	.55**	-										
2. Conscientiousness	.78**	.58**	.52**	.28**	.51**	-									
3a. Persistency	.80**	.50**	.52**	.43**	.50**	.75**	-								
3b. Self-confidence	.58**	.38**	.53**	.62**	.58**	.48**	.62**	-							
4a. Emotion-oriented coping	-.30**	-.19*	-.23*	-.49**	-.42**	-.16	-.27**	-.55**	-						
4b. Task-oriented coping	.68**	.50**	.56**	.42**	.41**	.65**	.65**	.53**	-.25**	-					
4c. Avoidance-oriented coping	-.36**	-.20*	-.34**	-.44**	-.28**	-.31**	-.44**	-.56**	.52**	-.41**	-				
5a. Work accuracy	.20*	-.03	.06	.05	.27**	.30**	.24**	.01	.04	.12	.04	-			
5b. Work pace	.21*	.14	.25**	.33**	.22*	.20*	.24**	.25**	-.29**	.18*	-.22*	.49**	-		
5c. Social behaviour at work	.25**	.05	.15	.23**	.22*	.29**	.30**	.21*	-.12	.25**	-.15	.71**	.57**	-	
6. Task performance	.25*	.10	.11	.20	.29**	.30**	.25*	.17	-.13	.18	-.12	.57**	.48**	.51**	-
n	124	125	124	124	123	125	126	125	126	126	126	126	126	126	89
M	25.23	14.94	6.00	7.27	7.38	29.03	21.10	14.37	4.81	9.21	5.30	28.97	14.65	38.69	26.67
SD	6.12	2.99	2.02	1.82	2.06	6.30	5.14	2.93	1.93	3.11	2.15	5.02	3.71	6.69	5.68
α	.90	.83	.85	.76	.78	.89	.87	.72	.74	.85	.75	.87	.87	.86	.93

* *P* < .05 ** *P* < .01

Table 4 *Summary of multiple regression and relative weight analysis of the self-rating form*

Predictor	*β*[a]	RW[b]	CI-L[b]	CI-U[b]	RS-RW (%)[b]
Criterion = work accuracy (R^2= .162; *F*[11,125] = .912, *p* < .018[a])					
1a. Planning & organizing	.26	.036	-.007	.105	22.26
1b. Learning & memory	-.10	.005	-.068	.015	3.07
1c. Problem solving	-.15	.010	-.034	.060	6.30
1d. Adaptability	.10	.004	-.060	.022	2.66
1e. Concentration	.10	.018	-.022	.088	11.11
2. Conscientiousness	-.02	.010	-.038	.037	6.35
3a. Persistency	.16	.031	-.008	.088	19.11
3b. Self-confidence	-.16	.008	-.045	.038	5.17
4a. Emotion-oriented coping	.06	.009	-.042	.051	5.78
4b. Task-oriented coping	.02	.004	-.062	.015	2.44
4c. Avoidance-oriented coping	-.18*	.026	-.012	.088	15.75
Criterion = work pace (R^2= .165; *F*[11,125] = .908, *p* < .016[a])					
1a. Planning & organizing	.15	.015	-.008	.070	9.19
1b. Learning & memory	.11	.020	-.006	.081	12.00
1c. Problem solving	-.05	.002	-.025	.025	1.25
1d. Adaptability	.16	.020	-.007	.088	12.16
1e. Concentration	.04	.014	-.008	.076	8.20
2. Conscientiousness	-.04	.004	-.025	.020	2.25
3a. Persistency	.07	.016	-.010	.067	9.35
3b. Self-confidence	-.20	.006	-.019	.026	3.73
4a. Emotion-oriented coping	-.25*	.036	-.004	.145	21.84
4b. Task-oriented coping	.10	.008	-.011	.057	5.04
4c. Avoidance-oriented coping	-.19*	.025	-.006	.129	14.99
Criterion = social behaviour at work (R^2= .204; *F*[11,125] = .866, *p* < .002[a])					
1a. Planning & organizing	.08	.027	-.031	.071	13.19
1b. Learning & memory	-.12	.007	-.065	.016	3.27
1c. Problem solving	-.11	.006	-.062	.020	3.02
1d. Adaptability	.03	.002	-.069	.012	.90
1e. Concentration	.01	.011	-.048	.043	5.25
2. Conscientiousness	.01	.018	-.046	.039	8.88
3a. Persistency	.39**	.083*	.009	.160	40.91
3b. Self-confidence	.07	.005	-.063	.020	2.50
4a. Emotion-oriented coping	.09	.004	-.066	.025	1.82
4b. Task-oriented coping	.01	.010	-.057	.030	4.90
4c. Avoidance-oriented coping	-.19*	.031	-.021	.105	15.36
Criterion = Task performance (R^2= .210; *F*[11,86] = .906, *p* < .030[a])					
1a. Planning & organizing	-.04	.009	-.078	.030	4.45
1b. Learning & memory	-.05	.004	-.091	.019	1.83
1c. Problem solving	-.21	.022	-.031	.112	10.67
1d. Adaptability	.06	.005	-.074	.029	2.25
1e. Concentration	.18	.035	-.016	.127	17.50
2. Conscientiousness	.07	.011	-.057	.039	5.40
3a. Persistency	.26	.042	-.026	.132	19.99
3b. Self-confidence	-.02	.003	-.089	.015	1.32
4a. Emotion-oriented coping	.13	.009	-.044	.063	4.27
4b. Task-oriented coping	.08	.010	-.059	.048	4.69
4c. Avoidance-oriented coping	-.26*	.058	-.025	.190	27.63

[a]Results from multiple regression analysis using SPSS version 25.

[b]Results form relative weight analysis using R.

b unstandardized regression weight, β standardized regression weight, RW raw relative weight (within rounding error raw weights will sum to R^2), CI-L lower bound of confidence interval used to test the statistical significance of raw weight, CI-U upper bound ofconfidence interval used to test the statistical significance of raw weight, RS-RW relative weight rescaled as a percentage of predicted variance in the criterion variable attributed to each predictor (within rounding error rescaled weights sum to 100 %).

Table 5 *Summary of multiple regression and relative weight analysis of other-ratings*

Predictor	β[a]	RW[b]	CI-L[b]	CI-U[b]	RS-RW (%)[b]
Criterion = work accuracy (R^2 = .247; F[11,109] = .829, p < .001[a])					
1a. Planning & organizing	-.10	.020	-.007	.043	8.23
1b. Learning & memory	-.34**	.030*	.001	.108	12.32
1c. Problem solving	.06	.006	-.023	.033	2.42
1d. Adaptability	.05	.006	-.024	.026	2.30
1e. Concentration	.33*	.055*	.006	.143	22.08
2. Conscientiousness	.37*	.057*	.013	.128	22.87
3a. Persistency	.26	.034*	.003	.087	13.76
3b. Self-confidence	-.31*	.017	-.006	.070	6.84
4a. Emotion-oriented coping	.02	.005	-.018	.043	2.08
4b. Task-oriented coping	-.03	.009	-.018	.034	3.72
4c. Avoidance-oriented coping	.11	.008	-.011	.060	3.38
Criterion = work pace (R^2 = .165; F[11,109] = .919, p < .039[a])					
1a. Planning & organizing	-.17	.006	-.036	.019	3.65
1b. Learning & memory	-.07	.003	-.037	.020	1.85
1c. Problem solving	.17	.019	-.011	.087	11.71
1d. Adaptability	.24	.043*	.003	.121	25.97
1e. Concentration	-.01	.008	-.015	.044	4.95
2. Conscientiousness	.18	.0111	-.014	.056	6.73
3a. Persistency	.15	.013	-.013	.059	7.75
3b. Self-confidence	-.13	.009	-.030	.030	5.37
4a. Emotion-oriented coping	-.22	.039	-.001	.126	23.63
4b. Task-oriented coping	-.06	.004	-.034	.019	2.49
4c. Avoidance-oriented coping	.01	.010	-.014	.058	5.89
Criterion = social behaviour at work (R^2 = .159; F[11,109] = .926, p < .051[a])					
1a. Planning & organizing	-.02	.015	-.040	.039	9.32
1b. Learning & memory	-.26*	.016	-.017	.082	9.97
1c. Problem solving	-.01	.005	-.061	.018	3.22
1d. Adaptability	.20	.022	-.019	.094	13.85
1e. Concentration	.03	.011	-.031	.052	6.70
2. Conscientiousness	.27	.034	-.013	.097	21.62
3a. Persistency	.15	.026	-.017	.077	16.52
3b. Self-confidence	-.08	.007	-.058	.025	4.09
4a. Emotion-oriented coping	-.03	.003	-.048	.023	1.97
4b. Task-oriented coping	.08	.017	-.022	.067	10.78
4c. Avoidance-oriented coping	.04	.003	-.059	.021	1.95
Criterion = Task performance (R^2 = .148; F[11,74] = .979, p < .326[a])					
1a. Planning & organizing	-.04	.014	-.102	.029	9.37
1b. Learning & memory	-.15	.006	-.109	.031	3.97
1c. Problem solving	-.06	.003	-.121	.022	2.30
1d. Adaptability	.16	.016	-.076	.060	10.65
1e. Concentration	.17	.032	-.043	.109	21.40
2. Conscientiousness	.34	.042	-.039	.133	28.75
3a. Persistency	.06	.016	-.080	.052	11.14
3b. Self-confidence	-.13	.005	-.120	.022	3.31
4a. Emotion-oriented coping	-.04	.004	-.105	.023	2.64
4b. Task-oriented coping	-.03	.007	-.105	.031	4.78
4c. Avoidance-oriented coping	-.00	.003	-.104	.024	1.68

[a]Results from multiple regression analysis using SPSS version 25.

[b]Results form relative weight analysis using R.

b unstandardized regression weight, β standardized regression weight, RW raw relative weight (within rounding error raw weights will sum to R^2), CI-L lower bound of confidence interval used to test the statistical significance of raw weight, CI-U upper bound of confidence interval used to test the statistical significance of raw weight, RS-RW relative weight rescaled as a percentage of predicted variance in the criterion variable attributed to each predictor (within rounding error rescaled weights sum to 100%).

Discussion

In this study, we aimed both to validate the predictive measures of the Maastricht Work Capacity Monitor (MW©M) of Van Ruitenbeek et al. (2019), and to supplement this instrument with measures for work behaviour and task performance, in order to enhance human resource practices with respect to assessing the work capacity and the development of people with LWC.

We examined the relationship between the various personal characteristics and these two criterion variables (performance measures). Results showed corresponding significant correlations between the personal characteristics and the three dimensions of work behaviour and task performance in both self-report and other-rating report. Multiple regression analyses indicated in line with what we hypothesized, that avoidance-oriented coping was negatively related to all three work behaviour dimensions and to task performance in the self-report sample. Furthermore, corresponding to what we hypothesised, emotion oriented coping was negatively related to work pace, and persistency was positively related to social behaviour at work. In the other-report sample, the expected positive relation between three predictors (learning and memory, concentration, and conscientiousness) and work accuracy was confirmed. However, in contrast with what we expected, self-confidence related negatively to work accuracy. This can be explained by the concern of practitioners that people from the target group tend to either over- (in this case) or underestimate themselves (Centraal Expertise Centrum UWV, 2010).

Although avoidance-oriented coping turned out to be the strongest predictor in multiple regression analyses, the relative weight analysis showed that persistency had the strongest unique contribution. This means that persistency has a stronger impact on behavioural outcomes than the tendency to walk away (avoidance-oriented coping), and that makes perfect sense.

Overall, results obtained with the self-rating and other-rating forms, showed a similar amount of variance explained by the models as a whole ranging from 14.8% to 24.7%. There were, however, some differences regarding the individual predictor-outcome relations between the self- and other-rating forms as well. This is in line with Connelly and Hülsheger (2012). These authors argue that research can benefit from collecting personality ratings from non-self-sources, such as significant others or other observers outside the work context. Our study also indicates that self- and other-rating perspectives are complementary. There is a strong tendency to look for self-other agreement in personality reports in literature (Kim et al., 2019), but we would like to make a case for 'celebrating the differences' in views. It is natural and functional that the 'self-perspective' differs from others' perspective. Therefore, we think that science and practice can be enriched by research that focusses on underlying reasons for the differences in perspectives instead of searching for the similarities.

It is interesting to note that self-rated avoidance-oriented coping showed negative predictive validity, whereas self-rated task-oriented coping showed no significant predictive validity in multiple regression. In the other-rating sample, however, positive correlations were found between task-oriented coping and two work behaviour dimensions. These findings can be explained by findings in a meta-analytic comparison of self- and informant report study of Kim and colleagues (2019), which implied that people are generally accurate but somewhat self-effacing when rating their own personality traits.

Taken together, this study largely supported the validity of the MW©M in predicting work behaviour and task performance of people with LWC. It indicated that people with LWC are able to predict their own work behaviour accurately, similar to what is found in literature (Kim et al., 2019) regarding the general population.

Practical implications

This study contributes to practice as self- and other perspectives of personal characteristics are essential to getting a grip on how people function. The different perspectives can sharpen one's view (Connelly & Hülsheger, 2012), so an instrument built upon multiple-source perspectives such as the extended MW©M, can enhance professional development of people with LWC. The fact that this study indicates that people with LWC are very well able to predict their work behaviour when scales are adapted is an important finding for professionals in the field (such as job coaches and vocational re-integration experts). These professionals can revise their persistent concern about the ability of people with LWC to reflect critically on their own behaviour and provide accurate responses. Professionals can now rely on validated measures that support talking with them instead of talking about them.

A noteworthy result is that self-rated avoidance-oriented coping stands out in negative predictive validity on all outcome variables. An explanation can be found in the fact that avoidance-oriented coping (e.g. looking for support from others, avoiding threat and searching security) is a natural coping response, whereas task-oriented coping (e.g. problem solving, and cognitive reframing or restructuring of a problem) is associated with more complex mental capacities (Compas et al., 2001). It indicates that learned helplessness (Seligman, 1972) is still a persistent phenomenon, and that the development of task-oriented coping gets too little attention. Apart from the above-mentioned practical implications, this indicates important directions for training, such as the call for practitioners to support people from the target group in the developing of task-oriented coping.

Limitations and Future Research Directions

A strength of our design was that we included multi-source measurements at two time points. A weakness may be that this leads to many dropouts, but we still have sufficient power in this study.

With respect to future directions of research, we think that the development over time of the work capacity of people with LWC needs to be monitored. This is precisely the added value of this instrument. Furthermore, Tables 2 and 3 showed high correlations between all three dimensions of work behaviour, and task performance. It would be worthwhile to explore this relation more accurately for people with LWC since this corresponds to the literature, stating that in order to be able to deliver the expected performance, people need to display certain behaviour at work (Roe & Zijlstra, 1991).

Conclusion

To conclude, this study largely support the predictive validity of the MW©M in predicting work behaviour and task performance. This study indicates that self- and other-rating perspectives are complementary to each other and it discusses the added value of research that focusses on the underlying reasons for disagreement between self- and other-report.

We argue that the extended MW©M enables adequate and fair performance evaluations of this specific population and contributes to science, by exploring the relationship between personality traits and work performance more accurately.

Moreover, this study contributes to vocational practices as it helps the continuous and methodological monitoring principle of supported employment interventions such as IPS (Van Ruitenbeek, 2017).

Finally, we argue that with the help of this instrument, our target group can learn to reflect on their own strengths and weaknesses. This enhances their personal and professional development and increases the chances for sustainable integration in work.

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CHAPTER 4

Workplace learning and development of people with limited work capacity

This chapter is based on: Van Ruitenbeek, G. M. C., Zijlstra, F. R. H., & Hülsheger, U. R. (2023). Workplace learning and development of people with limited work capacity. *Applied Psychology*. 1-27.

Abstract

Workplace learning and development is crucial for sustained employability, especially for people with limited work capacity (LWC). We explored the development in cognitive functioning and work behaviour of people with LWC and to which extent this is moderated by workplace acceptance and support. As suggested in literature, acceptance and support concern pre-conditions for development. Therefore, we expected them to influence the development of our target group. In total, 182 people with LWC and 172 workplace mentors provided data on dimensions of cognitive functioning and work behaviour at three time-points over 4 months. Furthermore, people with LWC provided data on workplace acceptance and support.

Results showed significant development over time for both, self- and observer-rated cognitive functioning, such as planning and organizing, learning and memory, problem solving, and for self-rated adaptability and concentration. Development over time emerged for the self-rated work pace, a work behaviour dimension. Moreover, the growth curves on self-rated variables such as learning and memory, work accuracy, social behaviour and work pace were moderated by workplace acceptance and support.

This study provides initial insight into growth patterns of cognitive functioning and work behaviour of people with LWC and illustrates the relevance of a supportive climate for development.

Introduction

Although the societal awareness is growing that people with disabilities also have the right to work (Vornholt et al., 2013), little attention is given to the need for leaning and development of this group of people. According to self-determination theory (SDT) (Deci & Ryan, 1985), human beings are growth oriented, and seek and engage in challenges in their environment and attempt to actualise their potentials and capacities. However, this tendency to develop oneself is also dependent on contextual factors.

In this paper, we want to shed light on development and contextual factors that can facilitate or hinder the development in work capacity of people with limited work capacity (LWC). This very diverse group of people refers to a large extent to the definition of the International Classification of Functioning (ICF) (World Health Organization, 2001) that conceptualises disability as an umbrella term for impairments, limitations in activity and restrictions in participation caused by the interaction between an individual (with a health condition) and contextual factors. The target group in this study encompasses both people with some kind of impaired health condition and individuals who experience participation restrictions that are not caused by an impaired health condition. The latter can experience restrictions in participation 'simply' because they dropped out of school, or have limited intellectual capacities, and therefore lack sufficient education or competencies to participate without help on the current complex labour market. These people are often labelled as 'people with a distance to the labour market'. This is a term from 'labour economics' and expresses how long it may take to find a job when unemployed. Technological and economical driven changes resulted in an increase in the required level of education in combination with a variety of competences (Ackerman & Kanfer, 2020; Fouarge, 2019; World Economic Forum, 2020). Consequently, the threshold to enter the labour market has become too high for an increasing group of people (Zijlstra et al., 2012). Although in many Western countries demographic developments made the labour market very tense, and although many organizations are trying to find alternative ways to recruit personnel, a large group of people stay unemployed. For example, the unemployment rate of persons with disabilities in the European Union is 17% compared with 10% of persons without disabilities (Lecerf, 2020). People with disabilities are two times less likely to be employed than people without disabilities, and if actually employed, they are less likely to have paid jobs (ILO, 2020). Furthermore, the level of education affects unemployment. In the European Union, the rate of early leavers from school and education is much higher for disabled people than for non-disabled: 31.5% compared with 12.3% (Eurostat, 2018). The lower the attained level of educational, the higher the unemployment rate. The gap in the unemployment rate between people with a high and people with a low educational level was 8.1% in 2019 in the general population (Eurostat, 2022). Abundant longitudinal evidence of Paul (2006) demonstrates that unemployment is highly likely to cause mental health problems (such as of feelings distress, depression and anxiety) with potential clinical severity. Therefore, we need to explore how people with LWC can be employed in regular work (Zijlstra et al., 2017), and because we want to strive for sustainable employment for this target group, we also need to have an eye on their opportunities for workplace learning and development. This refers to a process of learning new skills, attitudes and competencies during work, that can contribute to personal development (e.g., social behaviour) and professional development by acquiring more general work competencies (e.g., planning and organizing and work accuracy). Work has therapeutic aspects and is generally believed to provide opportunities for learning and development (Carlier et al., 2018; Schuring et al., 2017). However, the developmental process of people with LWC in regular work is hardly addressed in work and organizational literature, if at all.

In this study, we want to examine the development of the key factors for employment success of people with LWC. In this respect, one of the most important factors concerns cognitive functioning (Fadyl et al., 2010; McGurk & Mueser, 2004). Fadyl et al. (2010) identified cognitive abilities that greatly affect the ability of people with limitations to function in the workplace, such as planning and organizing, problem solving, concentration, memory skills and adaptability. The Vocational Cognitive Ratings Scale (VCRS) of Greig et al. (2004) as adapted by Van Ruitenbeek et al. (2019) covers these cognitive abilities and is designed for people with LWC to assess their cognitive functioning in actual work settings.

In addition, 'work behaviour' is recognised as a key determinant for employment success (Arvey & Murphy, 1998; Schmidt & Hunter, 1998; Williams & Anderson, 1991). Work behaviour takes a central position in the transformation process that takes place during work. In this process, work behaviour is considered as a vital link between one hand individual characteristics and work characteristics (input), and on the other hand work outcomes that can be profitable for the individual (e.g., work experience) as well as for the organization. The concept work behaviour refers to the behaviour that people display while at work. It is determined by individual characteristics of the employee at one hand and the characteristics of the task (and its context) on the other hand (Roe & Zijlstra, 1991). Those two determinants affect which strategy people apply at work and what outcomes work may have. Work behaviour concerns behaviours such as complying with (informal) rules and regulations, how accurately one works, collaborating with others, adapting to work habits and social situations at work (Williams & Anderson, 1991). In the literature, these kinds of behaviours are recognised as underdeveloped for people with mental health issues (Bond et al., 2001; Bond & Bunce, 2003; Bryson et al., 1997).

Taking all this into account, we address the following questions in this study: (a) do people with LWC develop in cognitive functioning and work behaviour during the first 4 months of work as they get more experience in their job?, and (b) which factors influence this development process of people with LWC at work?

It is generally believed that there is merit in capturing different perspectives when rating aspects of work behaviour (Connelly & Hulsheger, 2012). For that reason, we had the job incumbent and their workplace mentor to rate cognitive functioning and work behaviour one can create a more complete view. We therefore measure self-rated and observer rated cognitive functioning and work behaviour over a period of 4 months from the start of their work. In addition, we measure the degree in which people with LWC feel accepted and supported at work. In order to analyse the change over time of the longitudinal data and the moderation effects, we use a growth curve modelling approach.

The novelty of this research is that for the first time, the development in competencies though interaction with colleagues will be explored of people with LWC during work. Alongside a self-report measure, we include the ratings of a workplace mentor (as observer) in this study in order to create a more complete and objectified view and to determine whether people with LWC 'under, or overestimate' their work capacity. Furthermore, this is the first time that factors that can facilitate or hinder development in work competencies of people with LWC will be assessed. Insights in the development in work competencies and the factors that can influence the development process of people with LWC is of scientific and practical value. From a theoretical perspective, this study contributes to our understanding of the factors influencing the developmental process, particularly of people with LWC. In practice, these insights can help individuals with LWC, their job coaches

and their workplace mentor to set goals and directions for development and create acclimate that facilitates the development of work competencies. This can contribute to their professional and personal development and a more sustainable integration of these individuals into work.

Theory and hypotheses

Development in cognitive functioning and work behaviour of people with LWC

General mental ability (GMA) is one of the key determinants for employment success for the general population (Gottfredson, 1997; Judge et al., 2010; Schmidt & Hunter, 2004). GMA refers to the ability to reason logically solve problems, make decisions, and think abstractly and the ability to learn (Gottfredson, 1997). Impairments in these domains can therefore have a huge impact on the ability to work (Fadyl et al., 2010; McGurk & Mueser, 2004) and hamper integration and functioning of people with LWC in organizations. For that reason, Fadyl et al. (2010) advocate among other things assessment of cognitive functioning, such as planning, problem solving, organizing, memory, attention, concentration and adapting, to identify potential problems in this area in order to provide support that enables to people with limitations to perform satisfactorily in their work. In order to do so, the mental ability scale was developed for people with LWC (Van Ruitenbeek et al., 2019).

A second key factor for employment success is work behaviour (Arvey & Murphy, 1998). At the same time have several studies indicated that work behaviour can be a concern for people with mental health illness (Bond et al., 2001; Bond & Bunce, 2003; Bryson et al., 1997; Drake et al., 2016; Mueser et al., 2004; Su et al., 2008). Furthermore, authors indicated that long-term unemployment also has a detrimental effect on work-related skills of 'people with a distance to the labour market' (Van Kalken et al., 2012), and therefore they should also be regarded as 'People with Limited Work Capacity' (LWC). Most people with LWC generally have little or no experience in work settings, which means that they often have been deprived from learning, workplace-related behaviours and work-related social interactions. Therefore, people with LWC often have difficulties in displaying required work related skills and adapting to social situations at work. Bryson et al. (1997) identified several critical aspects of work behaviours, such as social skills, work habits and cooperativeness, and particularly people with mental illness generally show poor performance on these aspects.

Because cognitive functioning and work behaviour turn out to be the most important aspects of employment success, the most important question that we want to address in this study is whether people with LWC can develop these aspects during work. In line with the learning dimension of the job demand–control model (Karasek, 1979), we know that people can learn during work when they participate in active jobs. Cognitive development occurs in work when employees actively seek answers and solutions to daily problems and challenges (Weststar, 2009), which means addressing and developing someone's capabilities in the workplace through 'learning by doing' and interaction with peers and theirs and supervisors feedback (Engbersen et al., 2020).

With respect to the development of both, cognitive functioning and work behaviour, there are several indications in the literature. For example, some studies have shown improvement in cognitive abilities of adults on the autism spectrum due to supported employment (Baker-Ericzén et al., 2018; García-Villamisar & Hughes, 2007). With respect to work behaviour, people with mental impairments showed an improvement in vocational skills due to supported employment (Becker et

al., 2014; Dutta et al., 2008), and adults with autistic spectrum syndrome (ASS) increased their social skills (Baker-Ericzén et al., 2018; Hillier et al., 2011, McConaughy et al., 1989). There is evidence that work has a therapeutic function and work experience is generally believed to provide opportunities for learning and development (Carlier et al., 2018; Mamunet al., 2018; Schuring et al., 2017).

In line with the literature, we assume that people with LWC develop themselves during work as they gain experience in work-related skills and social interactions with colleagues at work. The Maastricht Work Capacity Monitor (MW©M) (Van Ruitenbeek et al., 2019, 2021) was developed to measure among other things cognitive functioning and work behaviour with people with LWC. The instrument measures the most important cognitive abilities as indicated by Fadyl et al. (2010) and the most critical work behaviours, such as accuracy at work, social behaviour, and work pace. Improvements in cognitive functioning and work behaviour should be reflected when study participants rate their own functioning and behaviours, and when observers (i.e., supervisors) rate the same aspects (Heidemeier & Moser, 2009). Measurements are collected at three time points during work: on T0 when people with LWC start working, on T1 approximately after 7 weeks of work and on T2 approximately after 4 months. This leads to the following hypotheses:

H1: Scores for cognitive functioning, such as planning and organizing, learning and memory, adaptability, concentration and problem solving of people with LWC, show an increase from T0, T1 to T2 in both (a) self-ratings and (b) observer ratings.

H2: Scores for work behaviour, such as work accuracy, social behaviour and work pace of people with LWC, show an increase from T0, T1 to T2 in both (a) the self-ratings and (b) observer ratings.

Factors that hinder or facilitate development of people with LWC

The SDT (Deci & Ryan, 1985) states that although all individuals have a natural tendency to develop themselves, personal growth and development can only occur when basic needs are fulfilled, such as autonomy, relatedness, and competence. Autonomy implies that people need to experience that they have a meaningful contribution (to society or the organization) in accordance with one's own interest and values. Relatedness implies that interaction with others is required, which also implicates sense of belongingness and connectedness to others. Competence implies that one feels confident in one's actions and sees opportunities to exercise and express one's capacities and feel that they master the situation (Deci & Ryan, 2000, 2002; Ryan & Deci, 2000).

According to SDT and Jahoda's Latent Deprivation theory (Paul et al., 2009), these basic needs can be fulfilled when people have the opportunity to participate in work settings and be part of an organization. However, people with LWC have often very little work experience in organizational settings and therefore often lack the basic conditions that are required to fulfil those needs and thus to develop those skills. We assume that when people with LWC have the opportunity to interact with colleagues, and have a supervisor, they will also develop the required skills. Approval and support by others is important to build self-confidence, and acquire the required skills. In particular, a supportive co-worker, who can provide a mentoring role and helps to navigate in the world of work, is important (Allen et al., 2004; Chiaburu & Harrison, 2008; Nisbet & Hagner, 1988). Such a workplace mentor facilitates a learning process that focuses on individual's job performance, and is depended on receiving feedback concerning performance and behaviour (Manuti et al., 2015).

In line with this reasoning, we expect that when people with LWC experience support from their workplace mentor, their developmental process will be facilitated. In order to evaluate the effect of workplace mentor support experienced by the people with LWC, we hypothesise the following:

H3a: Improvements in cognitive functioning, such as planning and organizing, learning and memory, adaptability, concentration and problem solving of people with LWC as rated by (a) themselves, and (b) their workplace mentor, will be moderated by workplace mentors' support experienced by people with LWC.

H3b: Improvements in work behaviour, such as work accuracy, social behaviour, and work pace of people with LWC as rated by (a) themselves, and (b) their workplace mentor will be moderated by workplace mentors' support experienced by people with LWC.

In addition, social acceptance is identified as a dominant variable that has a direct effect on learning outcomes (Park et al., 2014). Workplace acceptance encompasses two important preconditions for learning and development, such as belongingness and relatedness to a group of colleagues. Workplace acceptance implies that people feel accepted and comfortable as a member of a team of colleagues and that they feel appreciated and integrated in the professional and social activities at work (Vornholt et al., 2021). Therefore, we expect that workplace acceptance moderates the developmental process of people with LWC and thus growth in both, the self-ratings and observer-ratings of cognitive functioning and work behaviour. This leads to the following hypothesises:

H4a: Improvements in cognitive functioning, such as planning and organizing, learning and memory, adaptability, concentration and problem solving of people with LWC as rated by (a) themselves, and (b) workplace mentors will be moderated by workplace acceptance experienced by people with LWC.

H4b: Improvements in work behaviour, such as work accuracy, social behaviour, and work pace of people with LWC as rated by (a) themselves, and (b) their workplace mentor will be moderated by workplace acceptance experienced by people with LWC.

Method

In order to test our hypotheses, we collected data at three time-points after our target group (people with LWC) started working. In order to explore the personal growth of our target group, we use a recently developed instrument for measuring work capacity of people with LWC (Van Ruitenbeek et al., 2019), that has been shown to have adequate psychometric qualities (Van Ruitenbeek et al., 2021). This instrument takes into account problems that people of our target group need to deal with, such as low literacy or difficulties in understanding metaphorical language (e.g., individuals on the autism spectrum). The MW©M provides ratings from the employees (target group) themselves and ratings from their observer because the perception of employees themselves may deviate from the perception of their observer (a colleague or supervisor). Therefore, the observer rating will serve as a reference to which the self-rating can be compared and helps to determine whether people with LWC 'under, or overestimating' their cognitive functioning and work behaviour. We

measured development in cognitive functioning and work behaviour of people with LWC reflected in the self-rated and observer rated scores of the MW©M taken at three time points during work from the start of their work over a period of 4 months. In addition, we investigated factors that can encourage or challenge development at work, like the degree to which people feel accepted and supported in the workplace.

Data were collected between October 2014 and May 2020 from two different sources: people from the target group (self-rating) and their workplace mentor (observer rating). The observer rating served as an independent reference indicating actual observable change in this study.

Participants from the target group were recruited through job coaches from eight agencies that provide vocational support in the Netherlands, and the Dutch Employee Insurance Agency UWV. These organizations offer vocational rehabilitation services (like job coaches) for people with disabilities and limitations. The ethical research review board of our university has approved this study.

Procedure

Study participants were informed and instructed about the study, and after that, they filled in an informed consent. E-mails with links to the online questionnaires were sent on T0, T1 and T2 to participants from the target group and their workplace mentor. T0 was when participants started in their job, T1 was 7 weeks (mean 7.1) later, and T2 was after 16 weeks (mean 15.8 weeks) of employment. People from the target group completed self-rating forms, and their workplace mentor completed the 'observer-rating forms' of the MW©M (Van Ruitenbeek et al., 2019, 2021). In addition, at T1 people from the target group completed a questionnaire assessing the level of work acceptance and workplace mentors' support they perceived.

Participants obtained a personal report of their development process after each measurement, which they could discuss with their supervisor or job coach.

Participants

In total, 182 people from the target group participated, while 172 of their workplace mentors agreed to participate. Our dataset thus comprised 438 cases when considering self-ratings (the number of cases on T0, T1 and T2 was respectively 182, 147, and 109) and 405 cases when considering observer-ratings (respectively 172, 129, and 104). The self-report sample on (T0) consisted of 182 self-ratings (63% male); see Table 1.

Table 1 *Descriptive*

Variable	Mean or %	*SD*	Range	Missing
Age (years)	30.0	9.7	17-58	
Gender (% men)	63.0			1
Disability in percentages				5
No/not specified	22.6			
Learning disability	20.3			
AD(H)D/ASS	21.5			
Psychological	27.1			
Physical	7.9			
Different	0.6			
Comorbidity	22.9			3
Problems				1
Housing	2.8			
Childcare	1.1			
Debts	7.2			
Different	11.6			
Level of vocational education				5
Lack or insufficient	61.6			
Low	14.1			
Secondary	16.9			
High	7.3			
Motivation to work				17
Income	11.5			
Giving meaning to live	3.0			
Social contact	0.6			
Structure	1.8			
Personal development	11.5			
Multiple factors	71.5			
Type of contract				27
Regular contract	22.6			
Learn-work agreement	24.5			
Voluntary work	15.5			
Probation period	14.2			
Sheltered workplace	20.6			
Stage	1.3			
Not specified	1.3			
Branch/type of industry				24
Administration	20.9			
Cleaning	3.8			
Care	10.8			
Catering	9.5			
Facility	19.0			
Distribution	5.1			
Production	19.6			
Retail	4.4			
ICT/media	5.1			
Not specified	1.9			

The mean age of the participants was 30 (SD = 9.7). Participants in this sample had limitations that stem from neurodiversity varying from a learning disability (20.3%), limitations related to attention or (social) behaviour, such as attention deficit (hyperactivity) disorder (AD[H]D) or participants on the autism spectrum (21.5%), psychological disorder (27.1%), physical (7.9%), other disability (0.6%; not specified) and more than 22% of the participants did not disclose their disability or they experience participation restrictions that are not caused by an impaired health condition. Furthermore, 22.9% of the respondents had a second disability (i.e., comorbidity). Several participants had additional personal problems such as debts (7.2%), housing problems (2.8%), problems with childcare (1.1%) or other personal problems (11.6%). The majority of the respondents (61.6%) had insufficient schooling or training, 14.1% finished low-level vocational education, 16.9% followed intermediate or secondary level vocational education and 7.3% higher education. More than 20 % (22.6%) of the respondents had a regular employment contract, 24.5% had an apprenticeship agreement, 15.5% perform voluntary work, 14.2% was on probation period, and 20.6% worked in

sheltered workplaces, 1.3% worked during an internship, and of 1.3% the type of contract was not specified. Furthermore, the type of work participants perform was divers; administration (20.9%), cleaning (3.8%), care (10.8%), catering (9.5%), facility (19.0%), distribution (5.1%), production (19.6%), retail (4.4%), ICT/media (5.1%) and not specified (1.9%).

Measures

Cognitive functioning was measured at T0, T1 and T2 with the mental ability scale for people with LWC of Van Ruitenbeek et al. (2019, 2021). This scale is adapted from the Vocational Cognitive Ratings Scale (VCRS) of Greig et al. (2004) and covers cognitive abilities that greatly affect the ability of people with limitations to function in the workplace as addressed by Fadyl et al. (2010). The scale consists of 17 items with five subscales: planning and organizing (α = .86 for self-rated, and α = .90 for observer rated), learning and memory (respectively α = .76, and α = .91), problem solving (α = .81 for self-rated and α = .83 for the observer rated), adaptability (for self-rated and α = .54 inter-item correlation .37[3], and other-rated α = .75), and concentration (for both self-rated and observer rated: α = .81). Examples of items are 'Before I start working, I make sure that I have everything I need.' (planning and organizing); 'I know what to do after someone tells me how to do something.', 'I can remember well how something should be done.' (learning and memory); 'I can solve known issues on my own' (problem solving); 'I find it difficult if someone gives me another assignment when I'm already working on something.' (adaptability); 'After I get distracted, I find it difficult to concentrate again' (concentration)[4].

Work behaviour was measured at T0, T1 and T2 with the work behaviour scale of Van Ruitenbeek et al. (2021) that was developed for people with LWC. The scale consists of 21 items with 3 subscales, (1) work accuracy that addresses compliance with (informal) rules and regulations trust worthiness and cautiousness (α = .81 for self-rated scale, and α = .88 for observer rated scale), (2) social behaviour that addresses adapting to work habits and social situations at work, and collaboration (respectively α = .80, and α = .82), and (3) work pace (respectively α = .69, and α = .89). Examples of items are 'I arrive on time at work', 'I stick to rules and agreements.'(work accuracy),'I pay attention when listening to others' (social behaviour), and 'I can keep up my work pace.' (work pace).

We measured *workplace acceptance* with the 11-item scale of Vornholt et al. (2021) as reported by people with LWC at T1. This scale is validated for people with disabilities but can be used for a large range of groups that are at risk to be excluded from work (Vornholt et al., 2021). This scale measures an individual's perception of being accepted at work (α = .90). Examples of items are 'My colleagues treat me no different than other colleagues.', 'My colleagues take me seriously.', and 'I feel comfortable around my colleagues at work.'.

Support was measured by a newly developed scale of 3-items (α = .73) as reported by people with LWC at T1. Items are 'I discuss how I can improve my task performance with my workplace mentor.' and 'I am not afraid to discuss things that bother me with my workplace mentor'.

All scales were answered on a five-point Likert scale: 1 = never, 2 = almost never, 3 = regularly, 4 = almost always, 5 = always.

[3] Because the level of reliability of self-rated adaptability is low, we checked for the mean inter-item correlation. The mean inter-item correlations of self-rated adaptability amounted .37, this fits the criteria for optimal mean inter-item correlation in literature (Briggs & Cheek, 1986).
[4] Items for the observer-rating forms are formulated in the third person.

Analysis

Data were collected at three different time points. To analyse the change over time, we used a growth curve modelling approach following a typical sequence of steps used in multilevel modelling (Bliese & Ployhart, 2002). We have nested the data: Measurements were taken at various time points, and those time points were nested in persons. Therefore, Level 1 refers to the various time points, and Level 2 refers to the person level. Change in time variant variables (such as cognitive functioning and work behaviour) over time is modelled on Level 1. The predictors of the change over time (such as workplace acceptance and support) are modelled on Level 2 (see Figure 1). They concern time invariant variables and are assessed only once at the person level at T1 because people with LWC need some time spent in the workplace before they can experience workplace acceptance and support.

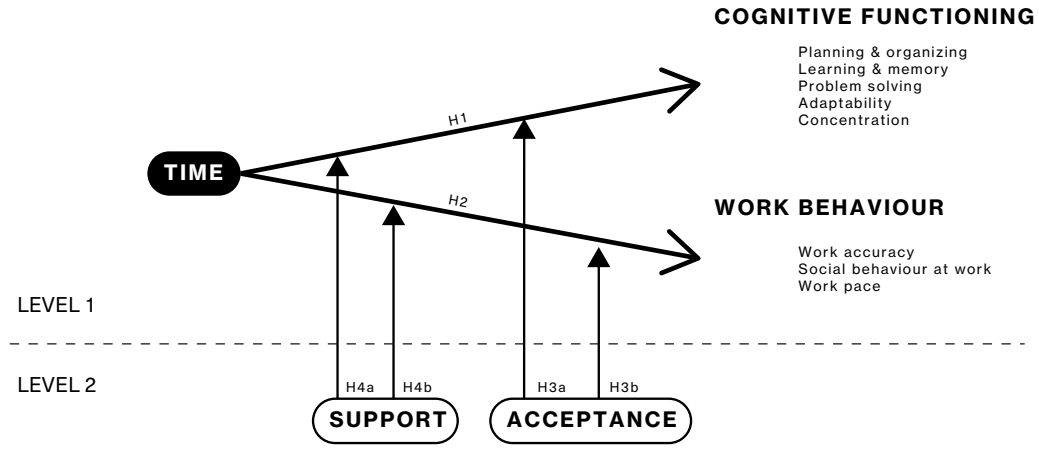

Figure 1 Research model

Data were analyzed in R using the nlme package (Bliese & Ployhart, 2002; Pinheiro & Bates, 2000). We started examining intraclass correlation coefficient (ICC) values and determining the amount of between- and within-person variation in all variables assessed at Level 1, that is, repeatedly over time. Second, we modelled error structures such as autocorrelation by including the correlation option in lme. Third, we modelled the fixed linear relationship between time (coded as T0 = 0, T1 = 1, T2 = 2 with 0 representing a meaningful starting point within 2 weeks after the start of employment) and the dependent variable. Fourth, we added a random effect for time and included support and workplace acceptance, respectively, as Level 2 covariates of the time slope, seeking to explain slope variation between individuals.

Results

Before starting with hypothesis testing, we inspected ICC values to assess the amount of within-person versus between-person variation. ICC's varied from .38 to .64, indicating that within-person variation was substantial and growth-curve modelling justified. Moreover, we calculated the correlations between study variables at the three time points. The intercorrelations between T0 and T1vary from .50 and .79, and between T0 and T2 from .48 to .72 in the self-rated sample, and in the observer rated sample between T0 and T1 between T0 and T2 from .42 to .62, and from .40 to .63. Because the intercorrelations are quite stable, only the intercorrelations between T0 and T2 of the self-rated sample are presented in Table 2 and from the observer rated sample in Table 3.

Growth curve modelling results are presented in Table 4. For both, self-ratings and observer ratings, significant positive linear time trends emerged for planning and organizing (self-rating: estimate = .06, $p < .01$; observer rating: estimate = .10, $p < .05$), learning and memory (self-rating: estimate = .05, $p < .05$; observer rating: estimate = .15, $p < .001$), and problem solving (self-rating: estimate = .16, $p < .001$; observer rating: estimate = .22, $p < .001$). Furthermore, there were significant positive linear time trends for concentration (self-rating: estimate = .08, $p < .05$) and for work pace (self-rating: estimate = .08, $p < .01$), but only for the self-ratings. Figure 2 provides an illustration of significant change trajectories. Thus, H1a was supported, and H1b, H2a were partially supported, while H2b was not supported.

In addition to participants' development of cognitive functioning and work behaviour over time, we were interested in the contribution of support by the mentor and feeling accepted in the developmental trajectories. These results are presented in Table 5. When looking at the self-ratings, workplace acceptance significantly moderated the trajectories of learning and memory (estimate = .08; $p < .05$), work accuracy (estimate = .06; $p < .05$) and social behaviour (estimate = .06; $p < .05$). Although support only moderated the trajectories in work pace (estimate = .06; $p < .05$), this indicates that individuals who reported higher workplace acceptance showed an increase in self-rated learning and memory, work accuracy and social behaviour over time. In contrast, individuals who reported low workplace acceptance showed a slight decrease in these determinants over time. Furthermore, individuals who reported to receive high levels of support showed a more pronounced increase in work pace over time, while the growth curve flatted for people who reported low levels of support. In contrast, workplace acceptance and support did not moderate any developmental trajectories in observer-rated outcomes.

Considering the self-ratings, H3b, H4a and H4b were partially supported, whereas H3a was not supported. When considering the observer ratings, H3a, H3b, H4a and H4b were not supported. Figure 3 illustrates all significant interaction effects.

Table 2 *Correlations of self-rated cognitive functioning and work behaviour between T0 and T2*

	T2							
T0	1.	2.	3.	4.	5.	6.	7.	8.
Planning & Organizing	.67**							
Learning & Memory	.44**	.68**						
Problem solving	.30**	.40**	.48**					
Adaptability	.20*	.23*	.18	.55**				
Concentration	.31**	.35**	.28**	.42**	.68**			
Work accuracy	.37**	.37**	.33**	.15	.15	.50**		
Work pace	.31**	.44**	.31**	.49**	.33**	.31**	.72**	
Social behaviour	.34**	.40**	.30**	.23*	.28**	.28**	.28**	.69**

** Correlation is significant at the .01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).

Table 3. *Correlations of observer rated cognitive functioning and work behaviour between T0 and T2*.

	T2							
T0	1.	2.	3.	4.	5.	6.	7.	8.
Planning & Organizing	.44**							
Learning & Memory	.39**	.47**						
Problem solving	.26*	.20*	.40**					
Adaptability	.29**	.18	.26*	.46**				
Concentration	.47**	.35**	.35**	.44**	.63**			
Work accuracy	.45**	.22*	.16	.06	.35**	.54**		
Work pace	.50**	.37**	.38**	.33**	.48**	.39**	.58**	
Social behaviour	.45**	.23*	.18	.09	.38**	.49**	.26*	.62**

** Correlation is significant at the .01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).

Table 4 Changes over time in cognitive functioning and work behaviour

	Self-rated			Observer-rated		
Variable	Estimate	SE	Pseudo-R^2 [a]	Estimate	SE	Pseudo-R^2
Planning & organizing						
Intercept	3.90***	.05		3.51***	.07	
linear time trend	.06**	.02	.61	.10*	.04	.08
Learning & memory						
Intercept	3.95***	.05		3.71***	.06	
linear time trend	.05*	.02	.01	.15***	.04	.16
Problem solving						
Intercept	3.17***	.07		2.67***	.07	
linear time trend	.16***	.04	.19	.22***	.05	.18
Adaptability						
Intercept	3.65***	.06		3.80***	.06	
linear time trend	.14***	.04	.07	.01	.04	.03
Concentration						
Intercept	3.69***	.06		3.80***	.06	
linear time trend	.08*	.04	.06	.01	.04	.03
Work accuracy						
Intercept	4.41***	.04		4.19***	.05	
linear time trend	-.01	.02	.59	.00	.03	.12
Social behaviour						
Intercept	4.06***	.04		3.93***	.05	
linear time trend	.02	.02	.04	.03	.03	.09
Work pace						
Intercept	3.63***	.06		3.67***	.07	
linear time trend	.08**	.03	.05	.06	.04	.16

[a] Percentage of variance explained by linear time trend. For all Level 1 parameter estimates, the number of observations varied from 435 to 436 when considering self-ratings and from 396 to 399 when considering observer-ratings. * $p < .05$. ** $p < .01$. *** $p < .001$

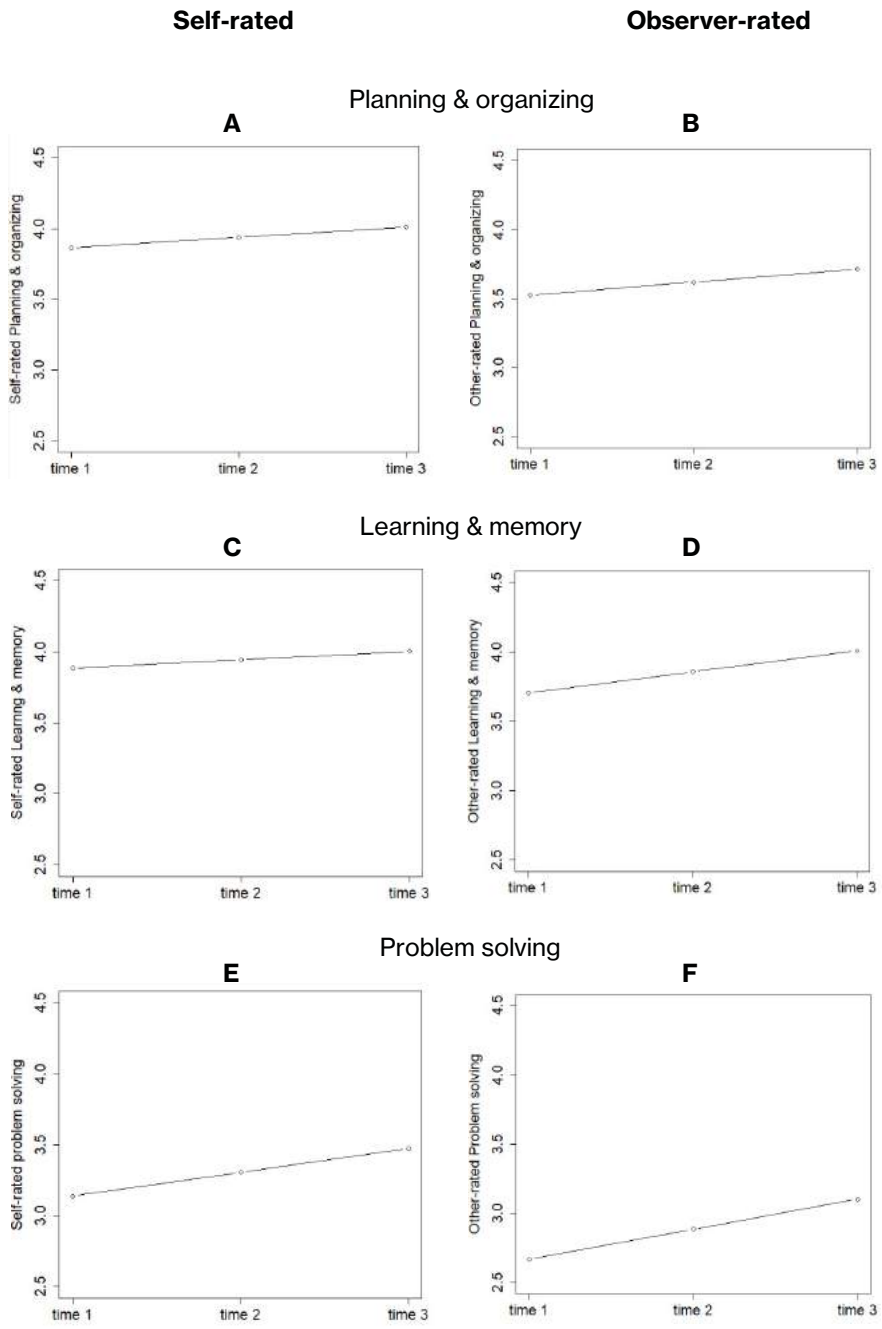

Figure 2 Significant change trajectories. (a) Self-rated planning and organizing. (b) Other-rated planning and organizing. (c) Self-rated learning and memory. (d) Other-rated learning and memory. (e) Self-rated problem-solving. (f) Other-rated problem-solving. (g) Self-rated adaptability. (h) Self-rated concentration. (i) Self-rated work pace

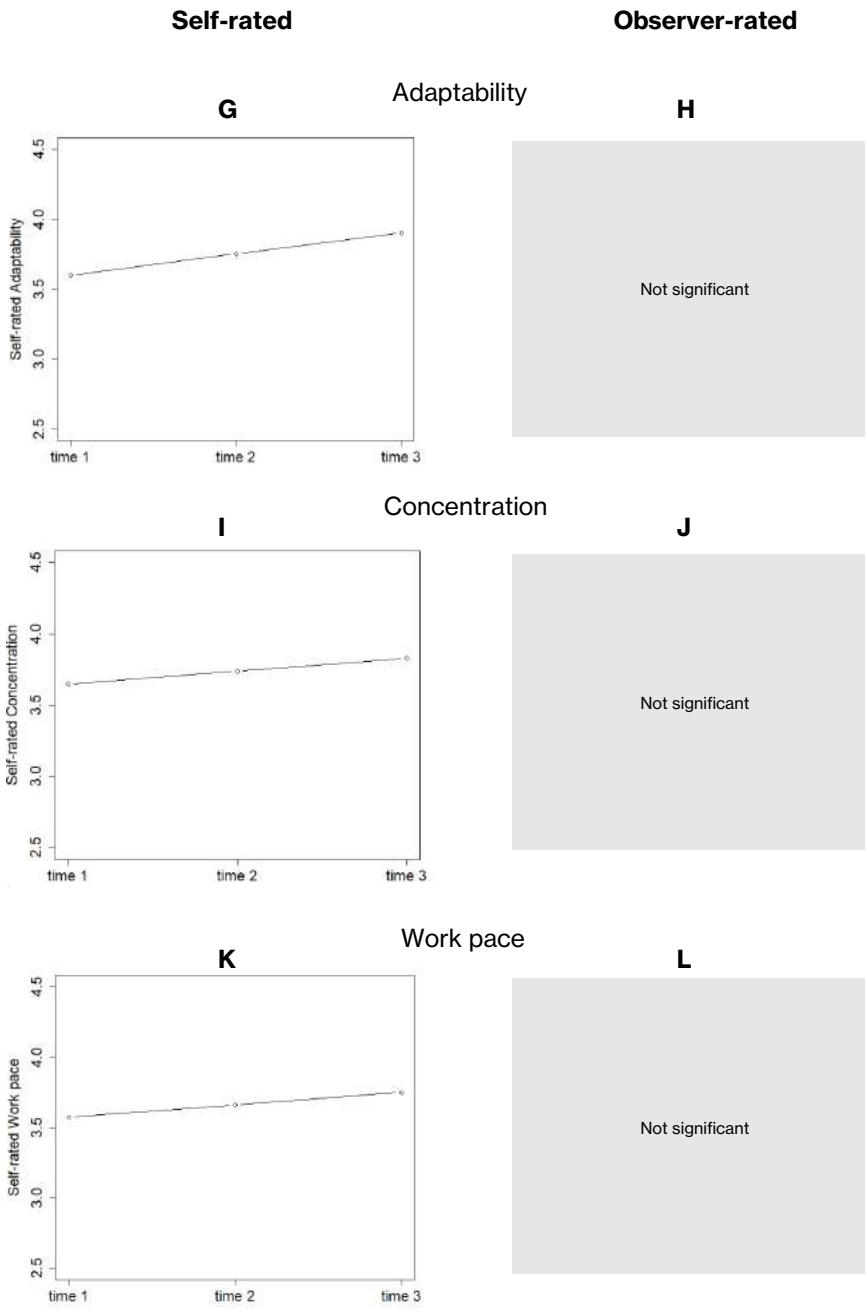

Figure 2 (continued)

Supplementary analysis

As our sample included people with different kinds of disabilities, one may wonder whether there are differences between these subgroups. The largest subgroups were people with a learning disability (20.3%), people with limitations related to attention or (social) behaviour such as AD(H)D or autistic spectrum syndrome (ASS, 21.5%), and people with a psychological disorder (27.1%). Therefore, we conducted a one-way multivariate analysis (MANOVA) and included a post hoc test in order to test the differences in means and the comparison between the subgroups in case of statistical significant MANOVA effects. The MANOVA revealed significant mean group differences in adaptability, concentration and social behaviour whereas no significant differences were found in planning and organizing, learning and memory, problem solving, work accuracy or work pace. As one may expect, results of these post hoc analyses (see Table 6) showed that people with limitations regarding attention or (social) behaviour such as AD(H)D or ASS scored significantly lower on adaptably, concentration and social behaviour at T0 than people with learning disabilities. Likewise, people with limitations regarding attention or (social) behaviour such as AD(H)D or ASS scored on T0 significantly lower on concentration than and people with psychological disorders.

As one may wonder if there are differences between self-ratings and observer ratings, we calculated correlations between self-ratings and observer ratings on T0 and T2 (see Tables 6 and 7). Correlations ranged from .18 to .30. Initially, a few significant correlations have lost their significance at T2.

Furthermore, in order to give an indication of the proportion of outcome variation explained, we calculated pseudo-R^2 statistics (Raudenbush & Bryk, 2002; Thoresen et al., 2004). It is important to note that in contrast to measures of R^2 obtained from ordinary least squares regression, pseudo R^2 statistics are only an approximation and less accurate. They can therefore have negative values in the case of which we set the value to 0 (Thoresen et al., 2004). As can be seen from Table 4, the linear time trend explained between 1% and 61% of within-person variation in self-ratings of cognitive functioning and work behaviour, and between 3% and 18% in respective observer-ratings. Variance explained by the Level 2 variables acceptance and support is indicated in Table 5. They explained between 0% and 26% of intercept variance in self-ratings and 0% to 29% in observer ratings. Furthermore, acceptance and support explained between 0% and 87% of variance in linear time trends in self-ratings and 0% to 18% in observer ratings.

Table 5 *Changes over time in cognitive functioning and work behaviour as a function of support and acceptance*

	Self-rated			Observer-rated		
Variable	Estimate	SE	Pseudo-$R^{2\,b}$	Estimate	SE	Pseudo-R^2
Planning & organizing						
Intercept	3.16***	.22	.00	2.79***	.27	.00
linear time trend	.01	.10		.19	.18	
Support	.22***	.06		.22**	.07	
Time:Support	.02	.03	.59	-.04	.05	.00
Intercept	2.41***	.28	.05	2.28***	.35	.00
linear time trend	-.11	.13		.40	.24	
Acceptance	.40***	.07		.34***	.09	
Time:Acceptance	.05	.03	.59	-.09	.06	.00
Learning & memory						
Intercept	3.72***	.20	.14	3.46***	.25	.00
linear time trend	.01	.10		.19	.16	
Support	.08	.05		.08	.07	
Time:Support	.01	.03	.00	-.02	.04	.08
Intercept	3.33***	.26	.18	3.31***	.33	.00
linear time trend	-.28*	.14		.13	.22	
Acceptance	.18**	.07		.12	.08	
Time:Acceptance	.08*	.03	.00	-.00	.05	.09
Problem solving						
Intercept	2.56***	.29	.11	2.26***	.31	.00
linear time trend	.24	.17		.24	.20	
Support	.17*	.08		.12	.08	
Time:Support	-.02	.05	.84	-.01	.05	.05
Intercept	2.16***	.38	.14	2.13***	.40	.00
linear time trend	-.04	.23		.50	.28	
Acceptance	.27**	.10		.15	.10	
Time:Acceptance	.05	.06	.85	-.07	.07	.13
Adaptability						
Intercept	3.63***	.28	.00	3.69***	.26	.00
linear time trend	.11	.16		-.01	.17	
Support	-.00	.07		.05	.07	
Time:Support	.01	.04	.00	.00	.04	.00
Intercept	2.90***	.36	.00	3.38***	.34	.03
linear time trend	.36	.22		.04	.23	
Acceptance	.19*	.09		.12	.09	
Time:Acceptance	-.06	.05	.00	-.01	.06	.00
Concentration						
Intercept	3.77***	.29	.00	3.53***	.24	.29
linear time trend	-.13	.15		-.10	.16	
Support	-.02	.08		.09	.06	
Time:Support	.06	.04	.00	.03	.04	.18
Intercept	3.62***	.39	.23	3.40***	.31	.29
linear time trend	-.15	.21		-.01	.21	
Acceptance	.02	.10		.12	.08	
Time:Acceptance	.06	.05	.28	.00	.05	.12
Work accuracy						
Intercept	4.11***	.14	.00	3.57***	.21	.00
linear time trend	-.13	.08		-.05	.13	
Support	.09*	.04		.18**	.06	
Time:Support	.03	.02	.00	.01	.03	.00
Intercept	3.59***	.18	.00	3.61***	.28	.00
linear time trend	-.25*	.11		-.08	.18	
Acceptance	.23***	.05		.16*	.07	
Time:Acceptance	.06*	.03	.00	.02	.04	.00
Social behaviour						
Intercept	3.33***	.16	.15	3.14***	.20	.00
linear time trend	-.08	.08		.03	.12	
Support	.21***	.04		.22***	.05	
Time:Support	.03	.02	.00	-.01	.03	.00
Intercept	2.79***	.20	.26	2.95***	.27	.00
linear time trend	-.21	.11		.16	.16	
Acceptance	.34***	.05		.26***	.07	
Time:Acceptance	.06*	.03	.00	-.04	.04	.00
Work pace						
Intercept	3.36***	.23	.01	3.23***	.28	.00
linear time trend	-.14	.10		.27	.16	
Support	.08	.06		.15	.08	
Time:Support	.06*	.03	.83	-.06	.04	.00
Intercept	2.82***	.30	.07	2.68***	.36	.00
linear time trend	-.17	.14		.36	.21	
Acceptance	.22**	.08		.28**	.09	
Time:Acceptance	.06	.04	.87	-.08	.05	.03

[b] Percentage of variance explained in linear time trend. Pseudo R^2 statistics are approximations and can have negative values; in these instances we set them to zero (see Thoresen et al., 2004). For parameters predicting intercept variation in Level 2 analyses, the number of observations amounted 384 in the self-rated sample and varied from 342 to 344 in the observer-rated sample. Overall patterns of results remained the same when interactions were included jointly with the exception that the effect of time*acceptance on work accuracy, time*acceptance on social behaviour and time*support on work pace did not reach statistical significance anymore. * $p < .05$. ** $p < .01$. *** $p < .001$ (two-tailed)

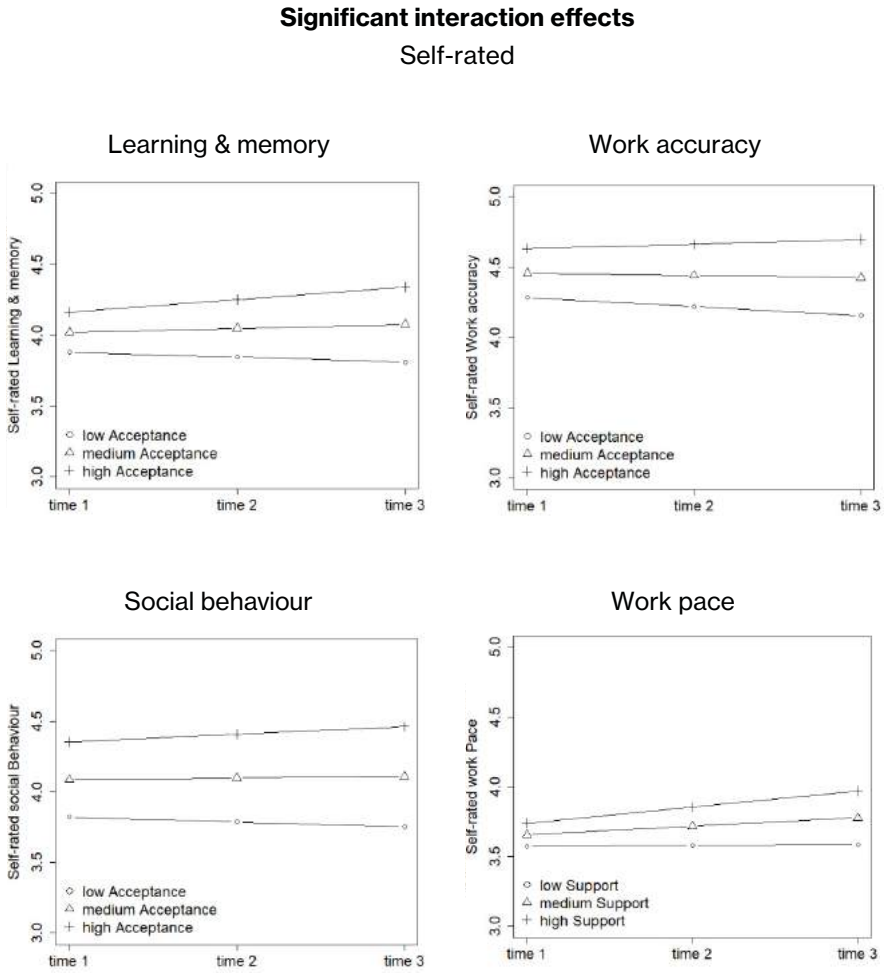

Figure 3 Significant interaction effects. (a) Interactions self-rated learning and memory. (b) Interactions self-rated work accuracy. (c) Self-rated social behaviour. (d) Interactions self-rated work pace

Table 6 *Mean differences between subgroups*

	Between groups of people with learning disabilities and autism/ AG(H)D		Between groups of people with psychological disorders and autism/ AG(H)D	
Dependent variable	Mean difference	P value	Mean difference	P value
Planning & Organizing	.07	.689	-.08	.614
Learning & Memory	-.15	.396	-.15	.348
Problem solving	.05	.838	.33	.130
Adaptability	.57**	.007	.37	.057
Concentration	.54*	.024	.45*	.042
Work accuracy	.18	.140	-.05	.666
Work pace	-.13	.439	.12	.452
Social behaviour	.42***	<.001	.19	.096

** Correlation is significant at the .01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).

Table 7 *Correlations between self-rated and observer rated cognitive functioning and work behaviour on T0*

	Self-rated							
Observer rated	1.	2.	3.	4.	5.	6.	7.	8.
Planning & Organizing	.10							
Learning & Memory	.08	.07						
Problem solving	-.09	-.07	.04					
Adaptability	.10	.15	-.03	.25**				
Concentration	.06	.06	.01	.20**	.29**			
Work accuracy	.18*	.11	.01	.07	.20**	.30**		
Work pace	.07	.13	.06	.19*	.23**	.18*	.32**	
Social behaviour	.20**	.12	.06	.11	.22**	.29**	.15	.23**

** Correlation is significant at the .01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).

Table 8 *Correlations between self-rated and observer rated cognitive functioning and work behaviour on T2*

	Self-rated							
Observer rated	1.	2.	3.	4.	5.	6.	7.	8.
Planning & Organizing	.18							
Learning & Memory	.12	.20						
Problem solving	.01	.07	.20					
Adaptability	.07	.02	.06	.09				
Concentration	.08	.04	.18	.06	.17			
Work accuracy	.15	.06	.04	-.14	-.02	.18		
Work pace	.04	.09	.06	.01	.12	-.07	.27*	
Social behaviour	.13	.02	.03	-.08	.03	.05	.04	.20

** Correlation is significant at the .01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).

Discussion

This study demonstrates that people with LWC develop during work. Our results show an increase in cognitive functioning and improvement in work behaviour, in particular work pace. Although the increase in cognitive functioning and in work pace is relatively small in terms of absolute numbers, the change is indeed significant.

Figures show that self-rating scores and observer rating scores point into the same direction (see Figure 2). This means that trends in both, self-ratings and observer ratings are the same. Furthermore, it is noteworthy that the ratings of the target group are higher, in absolute terms, but the ratings of the workplace mentors indicate a steeper increase in this period with regard to planning and organizing, learning and memory, and problem solving. It is also interesting to see that both, self-rating scores and the observer scores for learning and memory reach the same level after this 4-month period. Thus, both people with LWC and their workplace mentor appear to agree on the performance level of learning and memory after 4 months. Apparently, it takes a bit longer for an observer to notice the improvement in functioning in externally observable behaviour. With respect to work behaviour, the same phenomenon is noticeable: initially slightly higher scores on two work behaviour dimensions. All together, these results do not show clear indications of overestimation or underestimation of one's own cognitive functioning or work behaviour, as many assumed would be the case for the target group (Capella et al., 2002; Dunning et al., 2003; Harris & Rempfer, 2020; Moore & Healy, 2008; Slemon, 1998; Stone & May, 2002). Also the fact that trends in both self-ratings and observer ratings are the same indicates that people with LWC are more capable to reflect on their situation than job coaches think. Job coaches or vocational experts' regularly question the self-reflective ability and their ability to answer accurately self-report questionnaires of people with LWC (Van Ruitenbeek et al., 2019).

In line with the literature (Kahn, 1990; Van de Rijt et al., 2012), the growth trajectories, particularly of learning and memory, work accuracy and social behaviour appeared to be moderated by the level of workplace acceptance that participants with LWC experience in the workplace (H3a and H3b see Figure 3). As expected, the linear time trend of participants who felt accepted showed an increase over time, whereas the linear time trend decreased over time when participants did not experience workplace acceptance. This confirms how important it is to cultivate a climate of acceptance at the workplace of participants with LWC. Research indicated that when all employees were treated fair and respectful this was also very beneficial for employees with disabilities (Schur et al., 2009).

We argued that the extent to which participants are able to develop themselves is important for sustainable employment, and we hypothesised that the developmental process of people with LWC could benefit from support. Our results showed that support moderated only one dimension of work behaviour. Although literature is clear about the role of support regarding learning and development, the moderating effect of support on this dimension was limited in this study. This can be explained by the fact that the scale we used to measure support is ambiguous. The three-item scale for support used in this study addresses, for example, both positive and negative feedback. However, positive and negative feedback evoke different emotions that subsequently have an adversative effect on attitudes and work behaviour (Belschak & Den Hartog, 2009). In addition, research indicates that top-down feedback (from supervisors to followers) and lateral feedback (between peers), as we measured in our study, can give rise to feelings of threat and thus can hinder functioning (Deelstra et al., 2003; Kim & Kim, 2020). Because positive feedback and negative feedback are measured at the same time in this study, it could have wiped out the moderating effect.

Furthermore, it is clear that a period of 4 months is a relatively short period in terms of development of this specific group of people to become noticeable. Evidently, a longer period is likely to yield stronger results. Yet decisions with respect to continuation or extension of employment contract for people with LWC are often already made after a few months. For that reason, the current time frame is, from a practical perspective, very realistic. Organizations could then expand the probation period for this group of people based on scientifically based grounds that people from the target group need a longer timeframe to develop themselves in de workplace for example.

With regard to the differences in means between subgroups, results were in line with one can expect. People with limitations regarding attention or (social) behaviour such as AD(H)D or ASS scored at T0 significantly lower on adaptably, concentration and social behaviour than people with learning disabilities. The fact that this group, compared with people with psychological disorders, only had lower scores on concentration can be explained by comorbidity. That means, in this case, that a substantial number (>31%) of people have reported both a psychological disorder and limitations regarding attention or (social) behaviour (such as AD[H]D or ASS) as comorbidity condition. Although people with limitations regarding attention or (social) behaviour such as AD(H)D or ASS have lower scores on T0, they may develop themselves over time (Baker-Ericzen et al., 2018; Hillier et al., 2011; McConaughy et al., 1989).

Tables 7 and 8 show that at T0 there are some significant correlations between self-ratings and observer ratings, which have disappeared at T2. The fact that the correlations have disappeared over time indicates that the assessments have diverged. It is a well-known that self-ratings and other ratings only align to a moderate extent (Connelly & Hulsheger, 2012) and people tend to overestimate themselves (Moore & Healy, 2008). However, in our target group, 'underestimation' is also a well-known phenomenon (Capella et al., 2002; Dunning et al., 2003; Harris & Rempfer, 2020; Slemon, 1998; Stone & May, 2002). We therefore used second source data (observers) in addition to self-ratings, as a point of reference, because observers can provide a more adequate judgement (Funder, 1995). As previously discussed, the trends in the growth curves for both, self-ratings and observer ratings are similar, that is, showing improvement of performance (Figure 2). Our target group initially scores higher than the observers, which could be caused by the fact that they tend to overestimate their performance, and this is not different in the general population (Moore & Healy, 2008). At T2, the ratings seem to be more in line with each other; however, the correlations seem to have lost their significance, which might be due to a larger variation in scores.

We see quite some variation in the proportion variance explained (pseudo R^2) in the results of self-ratings and observer ratings of cognitive functioning and work behaviour. With respect to the proportion of intercept variance and the variance in linear time trends explained by acceptance and support this applies even more. To some extent, this may also be due to the fact that the Pseudo R^2 statistics are just an approximation (Thoresen et al., 2004) and a substantial part of the values were negative and had to be set to 0.

Study limitations

In this study, we did not include a control group in our study because it is not meaningful to measure development in work settings with people who are not working. Instead, we used observer ratings as a reference point. In addition, we already know from other studies on re-employment that people that are employed are better off than those that are unemployed (Carlier et al., 2018; Schuring et al., 2017).

Although, it was not our aim to compare various subgroups, our sample included people with different types of work limitations. It would be interesting to see whether the various groups had different growth curves. However, our sample was too small to analyse the difference in development over time between the different subgroups.

We believe that common method variance did not play a role because we used two different sources of information, self-ratings and observer ratings, and in addition, we had measurement at three different time points.

Implications for practice

This research showed that people with LWC are developing themselves while at work, and thus benefit from being employed. Our study also demonstrated that a supportive environment and feelings of acceptance could stimulate the development of people with LWC. With respect to belongingness and workplace acceptance, the study of Schur et al. (2009) indicated that organizations that are responsive to the needs of all their employees are also good for people with disabilities. Thus, in fact, what is beneficial for all is also beneficial for people with LWC.

Concerning learning and development, it is important that people with LWC get adequate insight in their actual cognitive functioning and work behaviour and learn to reflect on that. Discussions at the individual level about differences between self-ratings and observer ratings can therefore be very helpful. The MW©M (Van Ruitenbeek et al., 2019, 2021) provides a personal report concerning development process after the measurements at the various time points. This report can be used to discuss relevant issues with their supervisor or job coach.

Conclusion

Psychological needs and social-economic circumstances force organizations to provide solutions that enable people with LWC to development professional knowledge and skills during work in order to participate sustainable in work. Our findings show that participants with LWC are able to develop cognitive functioning and their work behaviour during work. This development process is moderated by workplace acceptance and support experienced by participants with LWC. More profound research is needed in order to evaluate which kind of support and feedback is most beneficial for people with LWC.

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CHAPTER 5

General discussion

This dissertation aimed to answer the central research question regarding how the work capacity of people with limited work capacity (LWC) can be measured, and how their development can be monitored during work. Validated measures were lacking for assessing work capacity of people with LWC. Therefore, this dissertation contributes to science and practice through the development of measures for the assessment of psychological resources of this target group aiming to facilitate their inclusion in paid work that fits their work capacity. Moreover, in order to go beyond inclusion of people with LWC, they should be enabled to develop their capacities while working so that they can participate in a sustainable way. To this end, measures are needed that can monitor the development of people with LWC during work. This resulted in the following research questions:

1. What are the most relevant measures for psychological resources in relation to work outcomes, and what is needed to make these measures accessible and reliable for people with LWC?
2. What are the most relevant work outcomes of people with LWC, and how can the relation between the psychological resources and these work outcomes be explored in order to test the predictive validity, and thus validate the measures?
3. How can the development in work capacity of people with LWC be measured during work, and to what extent is their development influenced by contextual factors?

This chapter presents an overview of the main findings. The theoretical and practical implications of this thesis, and the added value of this research for the target group, practitioners, and science will be discussed. Subsequently, the strengths, limitations and directions for future research will be discussed. Finally, this general discussion ends with the main conclusion of this thesis.

Main findings and implications

Chapter 2 addressed the first research question of this thesis: What are the most relevant measures for psychological resources in relation to work outcomes, and what is needed to make these measures accessible and reliable for people with LWC? This chapter builds on a solid knowledge base about assessment of psychological work resources of the general population in relation to (future) work demands from the discipline of work and organizational psychology, and combines this with insights about the specific needs of the target group from the discipline of occupational rehabilitation. Measures were selected that are assumed to predict work outcomes (e.g. work performance) in literature, specifically mental ability, conscientiousness, self-efficacy, and coping. Subsequently, these measures were adjusted through simplifying the language level and avoiding metaphorically written language to make the scales accessible for people with low literacy and people who face difficulties in understanding metaphorically written language, such as people with autism. Herewith possible barriers for the target group to give adequate answers in the questionnaires were eliminated. By doing so, the target group is enabled to make their own judgment about the psychological work resources that are generally supposed to be most predictive in relation to work outcomes, just like the general population. Alongside the self-report measures, observer-report measures were developed in order to address concerns of professionals in the field that people with LWC might not be able to critically reflect on their behaviour and to provide accurate answers in self-report questionnaires. These observer-ratings served as a reference to self-ratings in this study. A pre-test was conducted in which the comprehensibility, relevance and suitability of scales were tested for people with LWC. Furthermore, in order to test the reliability of the adjusted

self-report and observer-report measures such as mental ability, conscientiousness, self-efficacy and coping, two studies were conducted. In study 1, the adapted measures were administered twice to people with LWC and their significant other (the individual's relative or personal coach). Subsequently, the psychometric properties of the self- and observer-reported scales were statistically tested with respect to dimensionality and reliability and the scales were refined. In study 2, new data were collected from both sources and confirmatory factor analysis (CFA) was conducted on the refined scales. CFA confirmed the factorial validity of the scales. These two studies yielded measures with high test–retest reliability for both the self- and observer-report measures, with a congruous factor structure. Furthermore, the scales and subscales of the measures turned out to be internally consistent with adequate content validity. Analysis of the response patterns indicate that when measures are tailored to this target group, people with LWC seem to be just as capable as their significant other to provide adequate answers to questionnaires for psychological work resources.

To conclude and answer the first research question: the adjusted self-report and the observer-report questionnaires for mental ability, conscientiousness, self-efficacy, and coping are reliable measures and well suited to assess the work capability of people with LWC. Findings suggest that the adapted measures are reliable and that people with LWC are as capable as their 'significant other' to provide adequate answers to questions in the adapted questionnaires.

Chapter 3 aimed to answer the second research question: What are the most relevant work outcomes of people with LWC, and how can the relation between the psychological resources and these work outcomes be explored in order to test the predictive validity, and thus validate the measures? Adequate and sustainable inclusion of people with LWC in regular organizations is dependent on the person-job fit and adequate vocational support aimed at displaying required work behaviour and meeting performance standards. Therefore, a task-focused measure of Williams and Anderson (1991), that is commonly used in the general population, was selected for assessing task performance. A few items were re-worded from the original task performance scale in order to make it more applicable to the work requirements of the target group. In addition, because work in regular work settings requires reliability with regard to compliance with agreements and procedures and since almost every job is customer or client service driven, a certain behaviour needs to be displayed at work. For that reason, work behaviour was considered a second important work outcome that needs to be measured adequately and fairly for the target group. For this, the work behaviour inventory (WBI, Bryson et al., 1997) that is specifically developed for people with severe mental illness was selected. Subsequently, this scale was adapted to make the scale more suitable for the broad group of people with LWC. These two adapted scales for the assessment of work behaviour and task performance served as outcome variables to test the predictive validity of the adapted measures for psychological resources for mental ability, conscientiousness, self-efficacy, and coping (see chapter 2). The following hypotheses have been formulated:

> H1: The self-rating of planning and organizing, learning and memory, problem solving, adaptability, concentration, persistency, self-confidence, emotion-oriented coping, task-oriented coping and avoidance-oriented coping at T1 predicts both (a) work behaviour and (b) task performance measured at T2.
>
> H2: The other-rating of planning and organizing, learning and memory, problem solving, adaptability, concentration, persistency, self-confidence, emotion-oriented coping, task-oriented coping and avoidance-oriented coping at T1 predicts both (a) work behaviour and (b) task performance measured at T2.

In order to test these hypotheses, data was collected from four sources: two sources for independent variables and two for outcome variables. The sources for the independent variables were people from the target group and their significant other (individual's relative or personal coach). Both completed a questionnaire when the person from the target group started working (T1). The workplace mentor and the supervisor of the person from the target group served as sources for the outcome variables, and completed questionnaires after 4 weeks of work (T2). The workplace mentor assessed work behaviour, and the supervisor assessed task performance. Subsequently, the criterion-related validity was examined through multiple regression analyses using SPSS version 25. In addition, in order to investigate the relative importance of various predictor variables, a relative weight analysis (RWA) was conducted. Results of multiple regression of self-ratings of all 11 dimensions explained between 16% (work accuracy), 17% (work pace), and 20% (social behaviour at work) of variance in work behaviour, and 21% of variance in task performance. Owing to intercorrelations between the 11 predictor dimensions, many individual beta-coefficients were not significant. A notable exception is self-reported avoidance-oriented coping, which was a significant negative predictor of all 4 outcome measures. Emotion-oriented coping was a significant negative predictor of work pace in multiple regression. Overall, multiple regressions regarding the self-rating report partly confirmed H1. Results of multiple regression analysis in the observer-rating report of all 11 dimensions explained between 25% (work accuracy), 17% (work pace), and 16% (social behaviour at work) of variance of work behaviour and 15% of variance in task performance. Corresponding to findings of the self-ratings, due to the intercorrelations between the 11 predictor dimensions, many individual beta-coefficients were not significant in the observer-rating sample. Notable exceptions were concentration and conscientiousness, which were significant predictors of work accuracy. With this, H2 is partly confirmed.

To conclude and answer the second research question, this study yielded insight into the most relevant work outcomes of people with LWC, such as work behaviour and task performance. Moreover, exploration of the relation between the psychological resources and these work outcomes indicated good predictive validity of the psychological resources, such as mental ability, conscientiousness, self-efficacy, and coping. Furthermore, this study indicated that when measures are tailored to people with LWC, this group of people is just as capable as the general population of predicting their work behaviour and task performance accurately. Nevertheless, the results showed some small differences regarding the individual predictor-outcome relations between the self- and observer-rating forms. Although there is a strong tendency to look for agreement between 'self' and 'observer' ratings in personality reports in literature (Kim et al., 2019), the finding that the 'self-perspective' differs from the observers' perspective in our study is consistent with the findings of Connelly and Hülsheger (2012) in the general population. These authors argue that different perspectives can sharpen one's view. In congruence with this statement, both people with LWC and observers can learn from each other when they evaluate their different viewpoints. Evaluation interviews can stimulate reflection on one's strengths and weaknesses, which can facilitate development in work capacity of people with LWC.

Chapter 4 addressed the last research question of this thesis: How can the development in work capacity of people with LWC be measured during work, and to what extent is their development influenced by contextual factors? Because mental ability (or cognitive functioning) and work

behaviour turn out to be key factors for employment success in literature, development of these aspects was explored in people with LWC while they were working. The following hypotheses were formulated:

H1: Scores for cognitive functioning, such as planning and organizing, learning and memory, adaptability, concentration and problem solving of people with LWC, show an increase from T0, T1 to T2 in both (a) self-ratings and (b) observer ratings.

H2: Scores for work behaviour, such as work accuracy, social behaviour and work pace of people with LWC, show an increase from T0, T1 to T2 in both (a) the self-ratings and (b) observer ratings.

Moreover, since 'acceptance' and 'support' are viewed as important preconditions for development, these two factors were expected to influence the development in cognitive functioning and work behaviour of our target group. The following hypotheses were formulated:

H3a: Improvements in cognitive functioning, such as planning and organizing, learning and memory, adaptability, concentration and problem solving of people with LWC as rated by (a) themselves, and (b) their workplace mentor will be moderated by workplace mentors' support as experienced by people with LWC.

H3b: Improvements in work behaviour, such as work accuracy, social behaviour, and work pace of people with LWC as rated by (a) themselves, and (b) their workplace mentor will be moderated by workplace mentors' support as experienced by people with LWC.

H4a: Improvements in cognitive functioning, such as planning and organizing, learning and memory, adaptability, concentration and problem solving of people with LWC as rated by (a) themselves, and (b) their workplace mentor will be moderated by workplace acceptance as experienced by people with LWC.

H4b: Improvements in work behaviour, such as work accuracy, social behaviour, and work pace of people with LWC as rated by (a) themselves, and (b) their workplace mentor will be moderated by workplace acceptance as experienced by people with LWC.

In order to test these hypotheses, data was collected at three time points after the target group started working. People with LWC, as well as their workplace mentor, completed questionnaires using the validated self- and observer-rating measures for cognitive functioning (or mental ability) and work behaviour (see Chapter 2 and 3) at three time points over a period of 4 months from the moment the individual with LWC started working. In addition, the target group completed a questionnaire measuring the degree to which they felt accepted and supported in the workplace. To investigate their development, the change over time for the five factors of cognitive functioning (planning and organizing, learning and memory, adaptability, concentration and problem solving), and the three factors of work behaviour (work accuracy, social behaviour, and work pace) was analysed. Therefore, a growth curve modelling approach was used following a typical sequence of steps in multilevel modelling (Bliese & Ployhart, 2002). Results showed significant development of people with LWC in planning and organizing, learning and memory, and problem solving in both self- and other-rated scores over a period of approximately four months during work. In addition, development in self-reported adaptability and concentration was significant. Observer-reported

scores on these aspects were not significant. With regard to development in aspects of work behaviour, only self-reported work pace showed significant development over a four-month period during work, which implies that H1a was supported, and H1b and H2a were partially supported, while H2b was not supported.

As hypothesized, the growth curves on self-rated variables learning and memory, work accuracy, and social behaviour were moderated by workplace acceptance, and work pace was moderated by support. Considering the self-ratings, H3b, H4a and H4b were partially supported, whereas H3a was not supported, and considering the observer-ratings, none of the moderation hypotheses were supported. This implies that self-reported development in a dimension of cognitive functioning (learning and memory) and dimensions of work behaviour (work accuracy and social behaviour) was influenced by workplace acceptance, and one of the self-reported dimensions of work behaviour (work pace) is influenced by support. In contrast, observer-ratings of cognitive functioning and work behaviour did not show any significant influences on workplace acceptance or support.

These findings indicate that with the help of the adapted measures, it is possible to measure the development of people with LWC over time. Moreover, results showed that self-rated and observer-rated scores pointed in the same direction over the four-month period. Thus, the trends in development in both self- and observer ratings were the same. At the start, the ratings of the target group in absolute scores were higher than observer-ratings, but the observer-ratings indicated a steeper increase in growth for planning and organizing, learning and memory, and problem solving over a period of approximately four months. It is also noteworthy that both the self-rating scores and observer scores for learning and memory reached the same level after this four-month period. Thus, both people with LWC and their workplace mentor appear to agree on the performance level of learning and memory after four months. Contrasting to what one sees in the literature (Capella et al., 2002; Dunning et al., 2003; Harris & Rempfer, 2020; Moore & Healy, 2008; Slemon, 1998; Stone & May, 2002), the results did not show clear indications for over- or underestimation by the target group. Moreover, results also indicated that workplace acceptance and support significantly influenced self-rated development of learning and memory, work accuracy, social behaviour, and work pace. These findings illustrate the relevance of a supportive climate for the development of people with LWC in the workplace.

To conclude and answer the third research question, with the help of validated self- and observer-rating measures for cognitive functioning (or mental ability) and work behaviour, it is possible to measure the development of people with LWC over time. Moreover, results indicated that workplace acceptance and support significantly influenced self-rated development of learning and memory, work accuracy, social behaviour, and work pace. Their development was affected in such a way that individuals who reported high workplace acceptance showed an increase in self-rated learning and memory, work accuracy and social behaviour over time. In contrast, individuals who reported low workplace acceptance showed a slight decrease in these determinants over time. Moreover, individuals who reported receiving high levels of support showed a more pronounced increase in work pace over time, while the growth curve flattened for people who reported low levels of support.

Implications for science

During this research project, defining the target group turned out to be challenging. In literature, the ICF-framework (WHO, 2001) is the most commonly cited model to define disability, and it provides a conceptual framework for impaired participation. Although the ICF-framework recognizes that participation restrictions stem from a misfit between a person and their environment, rather than just health problems, health issues need to be one of the components in order to define disability or limited functioning within this framework. However, people can also experience participation restrictions in the current complex and rapidly changing labour market because of a poor fit between a person and their environment caused by insufficient education or a lack of competencies without any (diagnosed) health related issues. In addition, within the ICF-framework, the behaviour and functioning of a person is defined in comparison to what is generally accepted as normal, or most prevalent in the general population. This means that individuals' functional performance is evaluated based on how much it differentiates from the 'standardized' performance of the general population. This kind of evaluation is criticized to an increasing extent for its medicalizing effect of cognitive varieties of a minority, and calls for reframing neurocognitive diversity as a normal and healthy appearance of biodiversity (Chapman, 2021). These insights can give rise to the need to reconsider the conceptual basis of the biopsychosocial ICF-framework. In this study, I define people with limited work capacity (LWC) as a very diverse group of people with a large variety of skills and competences, who cannot find and keep paid work that fits their capacity in the current labour market without support. The limitations in work capacity should be considered in relation to contextual factors that do not match that person's actual capacities. For example, in the current labour market, the work demands have increased considerably and faster than people's capacities and competencies (Zijlstra et al., 2012). This has a 'disabling' effect on people. In line with social-relational models, limited work capacity should not be viewed as a feature or characteristic of an individual, but rather as something that arises from the interaction between the individual and their work context. One of the most important implications of this research is that with the help of the new instrument, people can be included in work that fits their work capacities, and that they are able to develop their work capacities in a supportive work climate.

Furthermore, the changes in work and work demands in the labour market, and especially the shift from physical to psychological demands, necessitates us to focus on psychosocial functioning and psychological resources, instead of only focusing on biomedical functioning in work capacity assessment. However, the biomedical perspective and the medical model are still dominant in research in occupational rehabilitation. The findings and the instrument that derives from this dissertation may help to make this necessary shift and incorporate psychosocial functioning and psychological resources in relation to work outcomes in research in this discipline.

Nowadays in work and organizational psychology, research is increasingly focusing on assessment and development of competences aimed at adapting to the rapidly changing world of work, and sustainable employment of the general population. When it comes to diversity and inclusivity, research into gender and cultural differences gets most of the attention. However, research into minority groups that differ from the general population in behavioural and functional aspects (i.e. people with LWC) still lags behind in diversity research. This group of people have been underrepresented in research in particular as far as their work behaviour and work capacities are concerned. In aiming for inclusion and development of this minority group in regular work, existing measures for psychological resources in relation to work outcomes are adapted, and can be used in any traditional personnel selection and development practices for the general population. Using

self-report measures for psychological resources, as is common for the general population in work and organizational psychology, also appears to be useful and applicable for people with LWC. This is contrary to what is generally believed. This dissertation indicates that when measures are tailored to the needs of people with LWC, this group is able to reflect on their own behaviour and provide adequate answers in questionnaires just like any other group (see Chapter 2) and predict their work behaviour and task performance as accurately as the general population (see Chapter 3). Furthermore, corresponding to what is found in the general population (Moore & Healy, 2008), the target group initially tended to overestimate their performance (see Chapter 4). However, analysis of longitudinal data on development over time demonstrated that the self-ratings and observer-ratings showed a similar trend, and actually converged. These findings suggest a level of accuracy in people with LWC that corresponds with the general population in self-rated assessment of work behaviour and task performance over a four-month period. These insights are important for science, because now one can give room for self-report measurements of this target group in research. However, combining self- and observer-report measures appears to give the best results (Connelly & Hülsheger, 2012), as was also discussed in Chapter 3.

Science can now rely on validated measures to accurately study psychological resources in relation to work outcomes of people with LWC. This is highly relevant in the quickly changing world of work, where the labour market constantly demands new and different skills and competencies. Being able to assess and monitor the psychological resources of the group of people with LWC is very important because those people might be indispensable for the labour market in the near future. Not only do we need *all* people to contribute to society but we particularly need a larger variety in perspectives. People with neurodiversity can offer such a variety of perspectives. To date the talents and creativity of, for example, people with autism or attention deficit hyperactivity disorder (ADHD) are ignored (Doyle & McDowall, 2020), or they do not get the chance to flourish or develop because they differ neurologically from the general population. Their rates of dropping out of school is relatively high (Eurostat, 2019), and they often leave high school without the skills, experiences, and support that lead to meaningful employment (Carter et al., 2012).

Implications for practice

The short duration of employment contracts for people with LWC is a major concern in practice (ILO, 2020; UWV, 2017; WRR, 2020). This is caused by poor person-job fit (Zijlstra et al., 2017) and poor guidance and supervision on the job (Bruyère et al., 2004; SZW, 2019). The newly developed instrument, called the Maastricht Work Capacity Monitor (MW©M), is accessible for professionals in vocational support practices. With help of this instrument, professionals can improve their vocational support practices and assess work capacity aimed at realizing a good person-job fit for people with LWC. Moreover, with the help of this instrument, practitioners can facilitate the inclusion and development process of people with LWC during work. Such a development process generally takes place at the workplace where mentors or supervisors try to coach people with LWC. Moreover, the instrument can contribute to assessing and monitoring the needs of people with LWC. People with mental health problems in particular can benefit from more structured guidance and supervision on the work floor, for example during individual placement and support practices (IPS) (Weeghel & Michon, 2018). With the help of the MW©M, effective learning and development can be facilitated with involvement of all stakeholders. The MW©M meets the requirements as stated by Thurlings and colleagues (2013) with respect to involvement of the target group, and giving formative, accurate, concrete, specific, frequent, and/or goal-oriented feedback.

Furthermore, the findings of this dissertation are also important for practitioners and professionals in the field, because these findings indicate that when communication is clear and understandable, people with LWC are as capable as the general population to reflect on their own capacities. Professionals should change their beliefs that people with LWC would have difficulties reflecting critically on their behaviour. Professionals should take good notice of the perspectives and insights of people with LWC regarding their own developmental process. Just as anyone in the general population, it is possible that they over- or underestimate their capacities in comparison to observers, but in the end their assessment appears to be no less accurate. When there are differences in assessments between an individual and their observer, this can help to get a clearer view on one's capacities (Connelly & Hülsheger, 2012). People with LWC and their observers can learn from each other when they evaluate and discuss their different viewpoints. This can provide a clearer picture of strengths and weaknesses, and it can provide insight into the elements of performance that need to be improved.

Although the focus of this dissertation is on supporting sustainable inclusion at the individual level, inclusion also needs to be facilitated at the organizational level. As previously described in this dissertation, developments in the labour market have made jobs more complex, and have increased the requirements for participation in paid work (Zijlstra et al., 2012). For a large group of people, these requirements are too high, and consequently these people cannot find a job without help or support from a professional. Professionals are employing various approaches that can contribute to the inclusion of people with LWC, such as 'job carving' or 'Inclusive Work Redesign' (IWR). Job carving (Griffin, 1994) is an approach in which a job is created around the unique skills, abilities and interests of a person with a disability by carving some (elementary) tasks out of other positions (Griffin, Hammis, & Geary, 2007). However, this approach is not without risks. Carving activities out of existing jobs can result in an incomplete job that consists of simple and monotonous tasks without perspective for development. Nowadays, jobs are even 'carved' out of vacancies to make the job accessible for people with LWC in an attempt to solve labour market shortages. This means that people with LWC that are hired for this 'carved job', do not fulfil all the duties of the original job, work less hours or may be less productive. This kind of 'job creation' can increase the work pressure and work intensity of colleagues because in the end, they are responsible for finishing all the work. Moreover, this approach can disturb the flow of work processes, which can affect organizational efficiency (Zijlstra et al., 2017). In contrast, Inclusive Work Redesign (IWR, in Dutch: Inclusief Herontwerp van Werk, IHW) is a strategy for redesigning work, and creating opportunities for inclusion in close collaboration with staff. Since this is a participative approach, it is more likely to result in qualitatively good work for both current and new staff (such as people with LWC), and chances of acceptance by both groups are higher. In addition, it leaves more room to take notice of the organizational needs, such as contributing to efficiency in the organization (Mulders et al., 2022; Van Ruitenbeek et al., 2013; Zijlstra et al., 2012, 2016, 2017). The IWR approach aims at designing inclusive work of good quality by taking a number of important design aspects concerning health, safety and psychological wellbeing into account. This implies creating meaningful work with opportunities for development and the prevention of physical or psychological overload. Opportunities for development in work are often neglected for people with LWC. Being able to use and develop one's capacities is a basic human need (Deci & Ryan, 1985), no matter whether people have limitations or not. For that reason, good quality work that stimulates learning and development during work, preferably through learning by doing, is needed.

Finally, well-designed work for people with LWC does not guarantee successful inclusion. In this respect, it is also important to pay attention to organizational culture, norms, policies and leadership. Successful inclusion means for example that new employees are accepted as a team member and in the organization (Vornholt et al., 2018), and that they become 'insiders' of the organization. This process is usually referred to as 'organizational socialization' (Colella, 1994; Corbière et al., 2014). In order to perform well in a new job, people need to be informed about their job and role, and expectations with respect to interpersonal and group relationships, and the nature of the organization as a whole need to be clarified. Socialization tactics can facilitate this socialization process (Medina & Gamero, 2017) for people with LWC. However, whether a new employee becomes a full team member also depends on the attitudes and behaviours displayed by co-workers. Co-workers' behaviour seems to be pivotal to workplace inclusion (Sanclemente et al., 2022). Workplace inclusion means that people with disabilities or limitations are accepted, helped, and treated as equal by co-workers (Colella & Bruyère, 2011). An inclusive climate is considered an important antecedent of inclusive behaviour as it encompasses group norms that guide inclusive behaviours. Research has shown that employees who embrace these norms seem to be more inclined to display inclusive behaviour towards people with disabilities. Moreover, an inclusive climate at team level can overrule individual characteristics because employees will abide to group norms (Nelissen, 2017). Leaders that share inclusive norms and values and facilitate inclusion of people with LWC by creating a disability-friendly environment are essential.

Strengths, limitations and directions for future research

A strength of this research is that the capacities instead of *in*capacities of people with LWC have been taken as point of departure for assessing their work capacity. Although this seems logical, this is in contrast to common practice in work capacity assessment of people with LWC to date. Moreover, the measures of work capacity for people with LWC are grounded in scientific insights gathered in research on the general population and adapted for people with LWC. Self-report and observer-report measures were developed for assessing psychological resources in relation to work outcomes. Due to this, people with LWC could be included in this research and their data were triangulated with data collected from other sources at multiple time points in regular work settings. Although the multiple measurements can be considered a strength in itself, it also created a weakness, because this has led to quite some dropouts in the studies described in Chapters 3 and 4. Despite this, the studies still have sufficient statistical power.

Another strength of this study is that the measures are developed for a broad group of people that are limited in their work capacity, since the starting point is not their limitation or their specific medical diagnosis, but rather the work behaviour and task performance required in the current labour market. The measures focus on observable behaviour like task performance, which is more standardized and can be assessed more objectively.

With respect to future directions in research, Hinkin (1998) advocated that replication of the predictive validity of measures is important. Therefore, more attention should be paid to the replication of measuring development over time, and the factors that can affect development of people with LWC during work. With the help of these measures, science can get more in-depth information about development patterns of people with LWC and the factors that can hinder or facilitate the development of this group. I would advocate that the discipline of work and organizational psychology increases research into the inclusion and development of people with LWC during work. I believe a solid scientific base will empower human resources practices in assessing the work capacity of this specific group in order to create a better person-job fit. This, in turn, will help to encourage

organizations to sustainably include individuals with LWC in paid employment at their own level of work capacity. This way, science can contribute to the universal right to participate in work (United Nations, 2006), and the societal mission of integrating everyone who has the capacity and willingness in good and sustainable work as advocated by the OECD (2018) and the Netherlands Council for Government Policy (WRR, 2020).

Furthermore, it could be beneficial to enrich this qualitative research with more qualitative data about the content of the supervision process. With help of the MW©M instrument, an individual assessment report can be generated after each measurement that reflects the individual's view on work resources and work behaviour, as well as any discrepancy with the observer's view. These reports are meant to be a starting point for a discussion between various parties, and can stimulate a developmental process in which people with LWC can learn to reflect on their strengths and weaknesses, set new learning goals, and understand what one needs to meet these goals. Follow-up reports are provided after each follow-up measurement, and these give insight into a person's development of work capacity over time. They can be used to discuss to what extent the learning goals have been met. The combination of quantitative data and qualitative data in particular helps to get more in-depth information about the guiding process in daily practice. Quantitative data can be collected via our measures and qualitative data can be collected via interviews. This provides valuable information about how performance evaluations and support practices of people with LWC take place in daily practice, and how the roles of people with LWC, their vocational support professional, their workplace mentor and supervisors are divided. And, last but not least, this kind of research can give insight into how the development process of people with LWC can be optimized.

Main conclusion

In this dissertation, the central research question is answered: How can the work capacity of people with limited work capacity (LWC) be measured in relation to work outcomes, and how can their development be monitored during work? First, measures for psychological work resources for the general population were selected in literature. Subsequently these measures were adapted to the needs of people with LWC through simplifying the language level and avoiding metaphorically written language. Results showed that the adjusted measures for psychological resources, such as mental ability, conscientiousness, self-efficacy, and coping were reliable measures and well suited to assess the work capability of people with LWC (see Chapter 2). Chapter 3 largely supports the validity of the measures for psychological resources in predicting work outcomes, such as 'work behaviour' and 'task performance'. In addition, contrary to what professionals in the field of vocational rehabilitation (job coaches and vocational experts) generally expect, findings indicate that with the help of these adapted measures, people with LWC predict their work behaviour and task performance as accurately as the general population. Finally, the validated measures for cognitive functioning and work behaviour were used to measure people with LWC's development during work (see Chapter 4). Results showed significant development over time of people with LWC in several dimensions of cognitive functioning and work behaviour. A comparison between longitudinal self-reported and observer-reported data on development over time suggests similar levels of accuracy in estimating performance over time by people with LWC and their workplace mentor. Exploration of the extent to which their development was influenced by acceptance and support led to the conclusion that feelings of acceptance and support can stimulate the development of people with LWC during work.

To conclude, with this research and the newly developed instrument, the path is paved to study the psychological resources of people with LWC in relation to work outcomes more accurately in order to include people with LWC in work that fits their capacity, and to go beyond inclusion and thus facilitate their development during work. This supports the natural developmental tendency of each individual, and can smoothen the path to sustainable employability of people with LWC. Therefore, this research is of added value for the target group, practitioners and science.

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A

Summary

It is generally recognized that employment contributes to psychological wellbeing and health gains. There is even a scientific tendency to consider work as medicine. And although the labour market shortages are intense and growing, people with limited work capacity face difficulties in finding and keeping a job. In this dissertation, I define people with limited work capacity (LWC) as a very diverse group of people with a large variety of skills and competences, who cannot find and keep paid work that fits their capacity without support in the current labour market. In line with the view of the social-relation model of ICF-framework that assumes that people are not disabled as such, but disability arises only from a poor person-environment fit, limitations in work capacity should also be considered in relation to contextual factors that do not match that person's actual capacities. As a result of technology-driven and economically driven developments, the work requirements in the labour market have increased significantly in recent decades. Consequently, the competences of a growing group of people do not match with the demands of the labour market, which has a 'disabling' effect on people. Thus, limited work capacity should not be viewed as a feature or characteristic of an individual, but rather as something that arises from the interaction between the individual and their work context. In order to increase inclusion of this group of people into paid work that fits their capacity, insight into their work capacities in relation to work outcomes is needed. Validated assessment instruments and measures for this target group were lacking. In addition, as the title of this dissertation indicates, I want to go beyond inclusion and enable people with LWC to contribute to society on the long term according to their capacity. Because this group of people cannot find and keep a paid job in the current labour market without help, they receive professional guidance, for example through supported employment and individual placement and support (IPS). These approaches address support aimed at successful inclusion in an organization, and training of the necessary skills after placement. However, a methodical approach to monitor and guide the process of developing skills and behaviours aimed at improving work performance and professional development is missing. A methodical approach aimed at improving work performance of people with LWC is crucial because meeting the performance standards is an important requirement for extending the contract. To date, instruments and measures needed to achieve this aim are lacking. This dissertation aims to fill this gap so that professionals in the field can use a methodical approach in supporting people with limited work capacity. For that reason, this dissertation focuses on the assessment of capacities, skills and development potential that is required for sustainable inclusion in paid work of a large group of people that has been ignored thus far. The following central research question is formulated: How can the work capacity of people with limited work capacity (LWC) be measured in relation to work outcomes, and how can their development be monitored during work?

Aiming to answer the research question, insight is given into how work capacity should be viewed. I build upon the definition of Sengers and colleagues (2022). They define work capacity as a dynamic multidimensional phenomenon that is based on both individual aspects and effects of the interaction between individual, psychosocial, behavioural and environmental conditions. This definition meets a number of essential theoretical criteria. It acknowledges the role of the environment that determines the outcome in interaction with individual characteristics. This recognition is in line with the approach to work analysis of Roe and Zijlstra (1991), which is based on the action regulation theory. In their view, the interaction between the characteristics of an individual (e.g. capacities) and the individual's work situation (e.g. work requirements) is essential for work outcomes at the individual level (e.g. development) and at the organizational level (e.g. productivity). Furthermore, Sengers and colleagues (2022) view work capacity as a dynamic phenomenon that develops under influence of both the individual and their context. The recognition that people can develop their work capacity and that this development is dependent on contextual factors is in line

with self-determination theory (Deci & Ryan, 1985). This theory assumes that all humans have a natural tendency to develop themselves, and therefore seek and engage in challenges in their environment, which provokes learning and development. Finally, the acknowledgement of the dynamic interaction between persons and their environment corresponds to the learning dimension of the job demand–control model (Karasek, 1979).

Three research questions, aimed at the development of instrument for the assessment of work capacities of people with limited work capacity, and measures that can monitor their development of work capacities over time, were formulated. These are discussed in chapter 2, 3 and 4.

Chapter 2 addresses the first research question of this thesis: What are the most relevant measures for psychological resources in relation to work outcomes, and what is needed to make these measures accessible and reliable for people with LWC? This chapter builds on a solid knowledge base about assessment of psychological work resources of the general population in relation to (future) work demands from the discipline of work and organizational psychology, and combines this with insights about the specific needs of the target group from the discipline of occupational rehabilitation. Measures were selected that are assumed to predict work outcomes (e.g. work performance) in literature, specifically mental ability, conscientiousness, self-efficacy, and coping. These measures were made accessible for people with LWC through simplifying the language level and avoiding metaphorically written language. In addition, observer-report measures were developed in order to address the concerns of professionals in the field of occupational rehabilitation (such as job coaches and vocational experts) about the ability of people with LWC to reflect critically on themselves and to provide accurate answers on self-report questionnaires. Therefore, these observer-ratings served as a reference to self-ratings in this study. A pre-test was conducted to test the comprehensibility, relevance and suitability of scales for people with LWC. Subsequently, two studies were conducted. In study 1, the dimensionality and reliability of adapted self- and observer-reported scales were explored. In study 2, new data were collected from both sources for confirmatory factor analysis (CFA). Results indicate that when measures are tailored to this target group, people with LWC seem to be just as capable as their significant other to provide adequate answers to questionnaires regarding psychological work resources. To conclude and answer the first research question: the adjusted self-report and the observer-report questionnaires for mental ability, conscientiousness, self-efficacy, and coping are reliable measures and well suited to assess the work capability of people with LWC.

Chapter 3 aims to answer the second research question: What are the most relevant work outcomes of people with LWC, and how can the relation between the psychological resources and these work outcomes be explored in order to test the predictive validity, and thus validate the measures? Since adequate and sustainable inclusion of people with LWC is dependent on meeting performance standards, a measure for task performance of Williams and Anderson (1991) was selected. This scale is commonly used in the general population, and has been adapted to the target group. In addition, since work behaviour was considered a second important work outcome, I adapted the work behaviour inventory (Bryson et al., 1997) to make the scale more suitable for the broad group of people with LWC. The two adapted scales for the assessment of work behaviour and task performance served as criterions in order to test the predictive validity of the measures for psychological resources for mental ability, conscientiousness, self-efficacy, and coping (see chapter 2). To test the predictive validity statistically, data was collected from four sources at two time points. People from the target group and their significant other (e.g. the individual's relative or personal coach) completed questionnaires addressing psychological resources when the individual from the target group started working (T1). The workplace mentor and the supervisor of the person from the target group served as sources for the outcome variables work behaviour and task performance, and completed questionnaires after 4 weeks of work (T2). Subsequently, the criterion-related validity was examined through multiple regression analyses. In addition, in order to investigate the relative importance of various predictor variables, a relative weight analysis was conducted. Overall, results indicate to a large extent the validity of the psychological resources in predicting work behaviour and task performance of people with LWC. To conclude and answer the second research question, this study yielded insight into the most relevant work outcomes of people with LWC, specifically work behaviour and task performance. Moreover, exploration of the relation between the psychological resources and these work outcomes indicated good predictive validity of the psychological resources, specifically mental ability, conscientiousness, self-efficacy, and coping. Furthermore, this study indicated that when measures are tailored to people with LWC, this group of people is just as capable as the general population to accurately predict their work behaviour and task performance. Nevertheless, the results showed some small differences regarding the individual predictor-outcome correlations between the self- and observer-rating forms. The finding that the 'self-perspective' differs from observers' perspective in our study is consistent with the findings in the general population.

Chapter 4 addresses the last research question of this thesis: How can the development in work capacity of people with LWC be measured during work, and to what extent is their development influenced by contextual factors? In literature, mental ability (or cognitive functioning) and work behaviour are viewed as key factors for employment success. Therefore, development of these aspects in people with LWC was explored while they were working. Moreover, 'acceptance' and 'support' are indicated as contextual factors that can influence the development of our target group. In order to investigate these assumptions, data was collected at three time points after the target group started working. People with LWC as well as their workplace mentor completed questionnaires using self- and observer-rating measures for cognitive functioning (or mental ability) and work behaviour. They completed these questionnaires at three time points over a period of 4 months from the moment the individual with LWC started working. In addition, the target group completed a questionnaire measuring the degree to which they felt accepted and supported in the workplace. In order to explore the development of people with LWC, the change over time for the five factors of cognitive functioning (planning and organizing, learning and memory, adaptability, concentration and problem solving), and the three factors of work behaviour (work accuracy, social behaviour, and work pace) was analysed. A growth curve modelling approach was used for the statistical analysis. Results showed significant development over time for both self- and observer-rated cognitive functioning, specifically planning and organizing, learning and memory, problem solving, and for self-rated adaptability and concentration. Development over time emerged for the self-rated work pace, which is a work behaviour dimension. Moreover, the growth curves on self-rated variables of learning and memory, work accuracy, social behaviour and work pace were moderated by workplace acceptance and support. To conclude and answer the third research question, with the help of validated self- and observer-rating measures for cognitive functioning (or mental ability) and work behaviour, it is possible to measure the development of people with LWC over time. Moreover, results also indicated that workplace acceptance and support significantly influenced self-rated development of learning and memory, work accuracy, social behaviour, and work pace. Their development was affected in such a way that individuals who reported high workplace acceptance showed an increase in self-rated learning and memory, work accuracy and social behaviour over time. In contrast, individuals who reported low workplace acceptance showed a slight decrease in these determinants over time. Moreover, individuals who reported receiving high levels of support

showed a more pronounced increase in work pace over time, while the growth curve flattened for people who reported low levels of support. This study provided initial insight into growth patterns of cognitive functioning and work behaviour of people with LWC, and how this is affected by workplace acceptance and support.

Finally, *chapter 5* provides a summary and an overview of the main findings of each chapter, and discusses the scientific and practical implications and the main conclusion of this entire dissertation. This dissertation yielded insight into the work capacity and development potential of a large group of people that has been ignored up till now. It concerns a very diverse group of people with a large variety of skills and competences that do not match with the work requirements of the current labour market. However, this dissertation indicates that with the help of the new instrument, people can be included in work that fits their work capacities, and that they are able to develop their work capacities in a supportive work climate. Moreover, contrary to what is generally believed, when using measures tailored to the needs of people with LWC, this group is just as capable as the general population to provide accurate answers on self-report measures for psychological resources. This also implies that science can now rely on validated measures to study psychological resources of this understudied population in relation to work outcomes. Being able to assess and monitor the psychological resources of the group of people with LWC is very important because they might be indispensable for the labour market in the near future. Not only do we need *all* people to contribute to society, but we need a larger variety in perspectives in the quickly changing world of work that demands for new and different skills and competences in particular. The development and validation in this dissertation of a new instrument also implies that practitioners can make use of this instrument, called the Maastricht Work Capacity Monitor (MW©M), in order to realize a good person-job fit for people with LWC. Moreover, with the help of this instrument, practitioners can facilitate the development process of people with LWC during work. With respect to directions for future research, chapter 5 emphasises the importance of replication. I believe a solid scientific base will empower human resources practices to assess the work capacity of this specific population in order to create a better person-job fit. In turn, this will help to encourage organizations to include individuals with LWC in paid employment at their own level of work capacity. This way, science can contribute to the universal right and the societal mission of integrating everyone who has the capacity and willingness in good and sustainable work. Finally, the main conclusion of this dissertation is provided in chapter 5. I conclude that with the newly developed instrument, the path is paved to include people with LWC in work that fits their capacity, and to go beyond inclusion and thus facilitate their development during work. This supports the natural developmental tendency of each individual, and can smoothen the path to sustainable employability of people with LWC.

Samenvatting

Over het algemeen wordt erkend dat het hebben van betaald werk bijdraagt aan psychologisch welzijn en betere gezondheid. In de wetenschap is er zelfs een tendens om werk als medicijn te beschouwen. Maar ondanks het feit dat de tekorten op de arbeidsmarkt steeds groter worden, ondervinden mensen met beperkte werkcapaciteit belemmeringen bij het vinden en behouden van werk. In dit proefschrift definieer ik mensen met beperkte werkcapaciteit als een zeer diverse groep mensen met een grote verscheidenheid aan vaardigheden en competenties, die op de huidige arbeidsmarkt zonder ondersteuning geen betaald werk kunnen vinden en behouden dat past bij hun capaciteiten. Beperkte werkcapaciteit is echter geen eigenschap of kenmerk van een individu, maar moet beschouwd worden in relatie tot contextuele factoren die niet passen bij de eigenlijke capaciteiten van de persoon. Deze visie komt overeen met het sociaal-relationele model van ICF. Ook dit model gaat ervan uit dat mensen in basis niet gehandicapt zijn, maar dat een handicap pas ontstaat in interactie met een niet-passende omgeving. In de afgelopen decennia zijn als gevolg van technologisch en economisch gedreven ontwikkelingen de eisen op de arbeidsmarkt aanzienlijk toegenomen. Hierdoor sluiten de vaardigheden van mensen niet meer aan op de eisen van de arbeidsmarkt, wat een 'beperkend' effect heeft op een groeiende groep mensen. Om de inclusie van deze groep mensen in betaald werk dat past bij hun capaciteit te vergroten, is inzicht nodig in hun werk*capaciteiten* in relatie tot hun werkresultaten. Gevalideerde meetinstrumenten ontbraken echter voor deze doelgroep. Bovendien wil ik verder gaan dan inclusie alleen en wil ik een bijdrage leveren om mensen met beperkte werkcapaciteit in staat te stellen om duurzaam en naar eigen vermogen bij te dragen aan de samenleving, dus 'going beyond inclusion' zoals de titel van dit proefschrift aangeeft. Omdat de doelgroep een groep mensen betreft die op de huidige arbeidsmarkt zonder hulp geen betaalde baan kan vinden en behouden, ontvangt men professionele begeleiding, zoals jobcoaching of Individuele Plaatsing en Steun (IPS). Deze benaderingen zijn gericht op ondersteuning om succesvolle inclusie te realiseren en het aanleren van de benodigde vaardigheden na plaatsing in een organisatie. Er ontbreekt echter een methodische aanpak om het ontwikkelingsproces van vaardigheden en gedrag te kunnen monitoren en begeleiden dat gericht is op het verbeteren van de werkprestaties en professionele ontwikkeling tijdens werk. Een methodische aanpak gericht op het verbeteren van de werkprestaties van mensen met beperkte werkcapaciteit is echter cruciaal, omdat het voldoen aan de prestatienormen een belangrijke vereiste is voor contractverlenging en dus de duurzaamheid van het contract. Tot op heden ontbreken daarvoor valide instrumenten. Dit proefschrift beoogt dit hiaat op te vullen, zodat professionals in het vakgebied van arbeidsrehabilitatie gebruik kunnen maken van een valide instrument dat *methodische* ondersteuning van de ontwikkeling van mensen met beperkte werkcapaciteit faciliteert. Om die reden richt dit proefschrift zich op het ontwikkelen van een meetinstrumenten voor capaciteiten, vaardigheden, en ontwikkelingspotentieel. Dit zijn vereisten voor de duurzame inclusie in betaald werk van een grote groep mensen die tot nu toe is genegeerd. De centrale onderzoeksvraag voor dit proefschrift is als volgt geformuleerd: Hoe kan de werkcapaciteit van mensen met beperkte werkcapaciteit in relatie tot hun werkresultaten worden gemeten, en hoe kan hun ontwikkeling tijdens werk gemonitord worden?

Om deze onderzoeksvraag te kunnen beantwoorden wordt inzicht gegeven in mijn visie op werkcapaciteit. Daarvoor bouw ik voort op de definitie van Sengers en collega's (2022). Zij definiëren werkcapaciteit als een dynamisch multidimensionaal concept dat gebaseerd is op zowel individuele aspecten alsook de effecten van de interactie tussen individuele, psychosociale, gedrags- en omgevingscondities. Deze definitie voldoet aan een aantal essentiële theoretische criteria: zo wordt erkend dat de interactie tussen de persoon en omgeving bepalend is voor de uitkomst. Deze erkenning sluit aan bij de benadering van Roe en Zijlstra (1991) in de arbeidsanalyse, die gebaseerd is op de handelingstheorie. In deze benadering is de interactie tussen de kenmerken

van een individu (bijv. capaciteiten) en de werksituatie (bijv. werkeisen) essentieel voor werkresultaten op individueel niveau (bijv. ontwikkeling) en op organisatieniveau (bijv. productiviteit). Bovendien beschouwen Sengers en collega's (2022) werkcapaciteit als een dynamisch concept dat zich ontwikkelt onder invloed van het individu en diens context. De erkenning dat mensen hun werkcapaciteit kunnen ontwikkelen en dat deze ontwikkeling afhankelijk is van contextuele factoren, sluit aan bij de zelf-determinatietheorie (Deci & Ryan, 1985). Deze theorie gaat ervan uit dat alle mensen een natuurlijke neiging hebben om zichzelf te ontwikkelen en daarom uitdagingen zoeken en aangaan in hun omgeving, met leren en ontwikkelen als gevolg. Ten slotte komt de erkenning van de dynamische interactie tussen personen en hun omgeving overeen met de leerdimensie van het job demand-control model (Karasek, 1979).

Voor dit proefschrift zijn drie onderzoeksvragen geformuleerd die gericht zijn op de ontwikkeling van een instrument voor het meten van werkcapaciteiten van mensen met beperkte werkcapaciteit en voor het monitoren van de ontwikkeling van deze werkcapaciteit over tijd. Deze onderzoeksvragen worden besproken in hoofdstuk 2, 3 en 4.

Hoofdstuk 2 richt zich op de eerste onderzoeksvraag van dit proefschrift: Wat zijn de meest relevante bestaande meetinstrumenten voor psychologische hulpbronnen in relatie tot werkresultaten, en wat is nodig om deze meetinstrumenten toegankelijk en betrouwbaar te maken voor mensen met beperkte werkcapaciteit? Dit hoofdstuk bouwt op een solide kennisbasis over het meten van psychologische hulpbronnen van de algemene bevolking in relatie tot (toekomstige) werkeisen vanuit het vakgebied van arbeids- en organisatiepsychologie, en combineert dit met inzichten over de specifieke behoeften van de doelgroep uit het vakgebied van arbeidsrehabilitatie. Verschillende meetinstrumenten zijn geselecteerd zoals mentale capaciteit, consciëntieusheid, zelfeffectiviteit en coping, waarvan in de literatuur wordt verondersteld dat zij werkresultaat (bijv. werkprestaties) voorspellen. Deze meetinstrumenten zijn vervolgens toegankelijk gemaakt voor mensen met beperkte werkcapaciteit door het taalniveau te vereenvoudigen en metaforisch taalgebruik te vermijden. Tevens zijn er observator-vragenlijsten ontwikkeld. Dit is gedaan om tegemoet te komen aan de zorgen van professionals uit het vakgebied van arbeidsrehabilitatie (zoals jobcoaches en arbeidsdeskundigen) over het onvermogen van mensen met beperkte werkcapaciteit om kritisch op zichzelf te reflecteren en accuraat antwoord te kunnen geven op vragenlijsten. Daarom dienden in deze studie de observator-vragenlijsten als referentie voor eigen beoordeling. Voorafgaand aan de dataverzameling is een pre-test uitgevoerd om de begrijpelijkheid, relevantie en geschiktheid van de vragensets voor mensen met beperkte werkcapaciteit te toetsen. Vervolgens zijn twee studies uitgevoerd. In studie 1 zijn de dimensionaliteit en betrouwbaarheid van de aangepaste eigen- en observatorschalen getest. In studie 2 zijn via deze beide bronnen nieuwe data verzameld voor een confirmatorische factoranalyse (CFA). De resultaten van deze studie wijzen uit dat wanneer de vragenlijsten worden afgestemd op deze doelgroep, mensen met beperkte werkcapaciteit even adequaat vragen kunnen beantwoorden over psychologische hulpbronnen als hun naasten. De conclusie en tevens het antwoord op de eerste onderzoeksvraag is: de aangepaste eigen- en observatorvragenlijsten voor mentale capaciteit, consciëntieusheid, zelfeffectiviteit en coping blijken geschikte en betrouwbare meetinstrumenten te zijn om de werkcapaciteit van mensen met beperkte werkcapaciteit te meten.

Hoofdstuk 3 heeft tot doel de tweede onderzoeksvraag te beantwoorden: Wat zijn de meest relevante werkresultaten voor mensen met een beperkte werkcapaciteit, en hoe kan de relatie tussen de psychologische hulpbronnen en deze werkresultaten worden onderzocht, zodat de voorspellende validiteit getest kan worden en dus de meetinstrumenten gevalideerd kunnen

worden? Omdat effectieve en duurzame inclusie van mensen met een beperkte werkcapaciteit afhankelijk is van het voldoen aan prestatienormen, is een vragenset voor werkprestatie van Williams en Anderson (1991) geselecteerd. Dit veelgebruikte instrument voor de algemene bevolking is aangepast voor de doelgroep. Aangezien daarnaast werkgedrag als een tweede belangrijk werkresultaat wordt beschouwd, is de vragenlijst voor werkgedrag van Bryson en collega's (1997) eveneens geselecteerd en aangepast om het instrument geschikt te maken voor de brede groep mensen met beperkte werkcapaciteit. Deze twee aangepaste vragensets voor de beoordeling van werkgedrag en werkprestatie dienden als criteria om de voorspellende validiteit te meten van de vragensets voor psychologische hulpbronnen zoals mentale capaciteit, consciëntieusheid, zelfeffectiviteit en coping (zie hoofdstuk 2). Om de voorspellende validiteit statistisch te testen, zijn op twee momenten data van vier bronnen verzameld. Mensen uit de doelgroep en een naaste (bijv. een familielid of een persoonlijke coach) vulden vragenlijsten in over psychologische hulpbronnen nadat de persoon uit de doelgroep gestart was met werken (T1). De werkbegeleider en de leidinggevende van de persoon uit de doelgroep fungeerden als bronnen voor de uitkomstvariabelen, namelijk werkgedrag en werkprestatie. Zij vulden vragenlijsten in nadat de persoon uit de doelgroep 4 weken aan het werk was (T2). Vervolgens werd de criterium-gerelateerde validiteit onderzocht door middel van meervoudige regressieanalyses. Tevens is een analyse uitgevoerd om het relatieve belang van verschillende voorspeller-variabelen te onderzoeken. De resultaten tonen grotendeels de validiteit aan van de meetinstrumenten voor psychologische hulpbronnen in het voorspellen van werkgedrag en werkprestatie van mensen met beperkte werkcapaciteit. De conclusie en tevens het antwoord op de tweede onderzoeksvraag is: deze studie heeft inzicht geboden in de meest relevante werkresultaten van mensen met beperkte werkcapaciteit, namelijk werkgedrag en werkprestatie. Verder wijst onderzoek een voorspellende validiteit uit van de psychologische hulpbronnen, zoals mentale capaciteit, consciëntieusheid, zelfeffectiviteit en coping voor de werkresultaten, het werkgedrag en de werkprestatie. Deze studie toont aan dat wanneer vragenlijsten aangepast worden op mensen met beperkte werkcapaciteit, deze groep mensen eigen werkgedrag en taakprestaties even accuraat kan voorspellen als de rest van de bevolking. Desalniettemin toonden de resultaten enkele kleine verschillen tussen de voorspeller-uitkomstcorrelatie in de eigen- en observatorscore. De bevinding dat het 'eigen perspectief' kan verschillen van het perspectief van waarnemers, is consistent met bevindingen in de algemene bevolking.

Hoofdstuk 4 adresseert de laatste onderzoeksvraag van dit proefschrift: Hoe kan de ontwikkeling van de werkcapaciteit van mensen met beperkte werkcapaciteit worden gemeten tijdens het werk, en in hoeverre wordt hun ontwikkeling beïnvloed door contextuele factoren? In de literatuur worden mentale capaciteit (of cognitief functioneren) en werkgedrag beschouwd als sleutelfactoren voor succes in betaald werk. Daarom is de ontwikkeling van deze aspecten bij mensen met beperkte werkcapaciteit onderzocht terwijl ze aan het werk waren. Tevens worden 'acceptatie' en 'ondersteuning' beschouwd als contextuele factoren die de ontwikkeling van onze doelgroep kunnen beïnvloeden. Om deze veronderstellingen te onderzoeken, zijn data verzameld op drie meetmomenten nadat de doelgroep begonnen was met werken. Zowel mensen met beperkte werkcapaciteit alsook hun werkbegeleider vulden vragenlijsten in voor cognitief functioneren (of mentale capaciteit) en werkgedrag. Ze vulden deze vragenlijsten in op drie momenten binnen 4 maanden vanaf het moment dat de persoon met beperkte werkcapaciteit begon met werken. Verder hebben de mensen uit de doelgroep een vragenlijst ingevuld over de mate waarin zij zich geaccepteerd en gesteund voelden op de werkplek. Om de ontwikkeling van mensen met beperkte werkcapaciteit over tijd te onderzoeken, is de verandering door de tijd van de vijf factoren van cognitief functioneren (planning en organisatie, leren en onthouden, aanpassingsvermogen, concentratie en probleemoplossend vermogen) en van de drie factoren van werkgedrag (accuratesse, sociaal

gedrag en werktempo) geanalyseerd. Een groeicurve-modellering is toegepast voor de statistische analyse. De resultaten toonden een significante ontwikkeling over tijd in zowel de eigen- als de observatorscore van cognitief functioneren, namelijk planning en organisatie, leren en onthouden en probleemoplossend vermogen, en eveneens in de eigen score van aanpassingsvermogen en concentratie. Ontwikkeling over tijd trad op in de eigen score van werktempo (een van de dimensies van werkgedrag). De groeicurves van de variabelen leren en onthouden, accuratesse, sociaal gedrag en werktempo werden beïnvloed door de mate waarin men zich geaccepteerd en gesteund voelde op de werkplek. De conclusie en tevens het antwoord op de derde onderzoeksvraag is: met behulp van gevalideerde eigen- en observatorvragenlijsten voor cognitief functioneren (of mentale capaciteit) en werkgedrag is het mogelijk om de ontwikkeling van mensen met beperkte werkcapaciteit over tijd te meten. Bovendien toonden de resultaten van de eigen score ook aan dat de mate waarin men acceptatie en ondersteuning ervaarde, invloed had op het ontwikkelingsproces van leren en onthouden, accuratesse, sociaal gedrag en werktempo. Hun ontwikkeling werd op een zodanige manier beïnvloed dat individuen die hoog scoorden op acceptatie, een positieve ontwikkeling over tijd lieten zien van leren en onthouden, accuratesse en sociaal gedrag. Individuen die daarentegen laag scoorden op acceptatie, lieten over tijd een lichte afname zien in ontwikkeling van deze determinanten. Daarnaast lieten individuen die hoog scoorden op ondersteuning over tijd een duidelijkere groei zien in werktempo, terwijl de groeicurve afvlakte voor mensen die laag scoorden op ondersteuning. Deze studie geeft initiële inzichten in groeipatronen van cognitief functioneren en werkgedrag van mensen met beperkte werkcapaciteit, en hoe deze groeipatronen worden beïnvloed door acceptatie en ondersteuning op de werkplek.

Tot slot biedt *hoofdstuk 5* een samenvatting en een overzicht van de belangrijkste bevindingen van elk hoofdstuk. Tevens worden in dit hoofdstuk de wetenschappelijke en praktische implicaties en de belangrijkste conclusie van dit proefschrift besproken. Dit proefschrift geeft inzicht in de werkcapaciteit en het ontwikkelingsvermogen van een grote groep mensen die tot nu toe is genegeerd. Het betreft een zeer diverse groep mensen met een grote verscheidenheid aan vaardigheden en competenties die niet aansluiten bij de eisen van de huidige arbeidsmarkt. Dit proefschrift laat echter zien dat deze mensen met behulp van het nieuwe instrument geïncludeerd kunnen worden in werk dat aansluit bij hun werkcapaciteit, en dat zij in staat zijn hun werkcapaciteiten te ontwikkelen in een stimulerende werkomgeving. Bovendien is deze groep met behulp van de aangepaste vragenlijsten net zo goed in staat als de rest van de bevolking om accuraat antwoord te geven op zelf-gerapporteerde vragenlijsten voor psychologische hulpbronnen. Dit is in tegenstelling tot wat doorgaans wordt gedacht. Dit betekent tevens dat de wetenschap nu kan vertrouwen op gevalideerde meetinstrumenten om de psychologische hulpbronnen van deze onderbelichte groep mensen in relatie tot hun werkresultaten te bestuderen. Het is belangrijk om de psychologische hulpbronnen van mensen met beperkte werkcapaciteit te kunnen beoordelen en monitoren, omdat zij onmisbaar zijn voor de arbeidsmarkt. Niet alleen is het noodzakelijk dat iedereen kan bijdragen aan de samenleving, maar er is ook behoefte aan een grotere variëteit aan perspectieven, vaardigheden en competenties op deze continu veranderende arbeidsmarkt. De ontwikkeling en validatie van een nieuw instrument betekent ook dat er in de praktijk gebruik gemaakt kan worden van dit instrument, genaamd de Maastricht Werkcapaciteit Monitor (MW©M), om een goede persoon-werk-fit te realiseren voor mensen met beperkte werkcapaciteit. Bovendien kan met behulp van dit instrument het ontwikkelingsproces van mensen met beperkte werkcapaciteit tijdens het werk gefaciliteerd worden. Richtinggevend aan toekomstig onderzoek wordt in hoofdstuk 5 het belang van herhalen of repliceren van dit onderzoek benadrukt. Ik denk dat een solide wetenschappelijke basis de HR-praktijk kan ondersteunen om de werkcapaciteit van deze specifieke groep mensen te beoordelen en zo een betere match te kunnen realiseren tussen persoon en werk. Dit zal tevens helpen om organisaties aan te moedigen om mensen op hun eigen niveau van werkcapaciteit te includeren in betaald werk. Zo kan de wetenschap bijdragen aan het realiseren van het universele recht en de maatschappelijke missie om iedereen die wil en kan werken, te integreren in goed en duurzaam werk. Ten slotte wordt in hoofdstuk 5 de hoofdconclusie van dit proefschrift verwoord. Ik concludeer dat met het nieuw ontwikkelde instrument de weg is geëffend om mensen met beperkte werkcapaciteit te includeren in werk dat past bij hun capaciteiten en om de ontwikkeling in hun werk te faciliteren, dus ‘to go beyond inclusion’. Daarmee wordt tegemoetgekomen aan de natuurlijke ontwikkelingsneiging van elk individu en wordt de weg naar duurzame inzetbaarheid van mensen met beperkte werkcapaciteit gefaciliteerd.

Impact addendum

This dissertation aimed to explore how the work capacity of people with limited work capacity (LWC) can be measured, and how their development during work can be monitored. People with LWC are defined as a very diverse group of people with a large variety of skills and competences, who cannot find and keep a paid job that fits their capacity in the current labour market without help. Insight into the work capacities of people with LWC is needed in order to help them find paid work that fits their work capacity. Moreover, in order to enable them to contribute to society according to their capacity on the long term, support is needed for the development of their capacities while working. Therefore, measures for psychological work resources for the general population found in literature were selected. Subsequently, these measures were adapted to the needs of people with LWC through simplifying the language level and avoiding metaphorically written language. Findings indicated that the adjusted measures for psychological resources, specifically mental ability, conscientiousness, self-efficacy, and coping, were reliable measures and well suited to assess the work capability of people with LWC. Moreover, this study largely supports the validity of measures for psychological resources in predicting work outcomes such as 'work behaviour' and 'task performance'. In addition, contrary to what professionals in the field of vocational rehabilitation (such as job coaches and vocational experts) generally expect, findings indicate that when measures are tailored to people with LWC, this group is able to reflect on their own behaviour and provide adequate answers in questionnaires just like everybody else. Finally, the validated measures for cognitive functioning and work behaviour were used to measure development of people with LWC during work over time. Results showed significant development of people with LWC over time in several dimensions of cognitive functioning and work behaviour. Their development was influenced by the degree to which they felt accepted and supported in the workplace.

This dissertation is relevant for the discipline of work and organizational psychology (WOP) and the discipline of occupational rehabilitation. The discipline of WOP can now rely on validated measures to study psychological resources of this understudied population in relation to work outcomes. With the help of these measures, WOP can get more in-depth information about development patterns of people with LWC and the factors that can hinder or facilitate their development in the workplace. A solid scientific base can empower human resources practices to assess this group's work capacity and to support their development during work. In turn, this will help to encourage organizations to sustainably include individuals of this population at their own level of work capacity in paid employment. The discipline of occupational rehabilitation can make use of the insights and measures presented in this dissertation to focus on capacity instead of incapacity of people. Moreover, the changes in work and work demands in the labour market necessitate focusing on psychosocial functioning and psychological resources, instead of only focusing on biomedical functioning in work capacity assessment. The findings and the instrument that derive from this dissertation may help to make this necessary shift and incorporate psychosocial functioning and psychological resources in relation to work outcomes in this discipline.

This study contributes to societal challenges as the instrument that derives from this dissertation supports sustainable participation of people with LWC in paid work. This is necessary in order to reduce government spending regarding social benefits. Furthermore, it contributes to the universal right to participate in work (United Nations, 2006) of people with limited work capacity. Moreover, since citizens have a duty to work according to one's capacity in the Netherlands (Dutch participation act), being able to assess work capacity is relevant. This study contributes to the societal mission of integrating everyone who has the capacity and willingness to work in good and sustainable work as advocated by the OECD and the Netherlands Council for Government Policy. Finally, being able to assess and monitor the psychological resources of people with LWC

is very important because they are indispensable for the labour market. In times of labour market shortages and quickly changing work, the labour market constantly demands new and different skills and competencies. Therefore, not only do we need *all* people to contribute to society but we need a larger variety in perspectives in particular.

The Dutch Employee Insurance Agency (UWV) supported the research project. The instrument that derived from this dissertation is developed *for* and *with* professionals in the field of vocational rehabilitation (such as job coaches and vocational experts). The purpose of the instrument is to fill a gap they experienced with respect to a methodical approach to support people with limited work capacity aimed at sustainable inclusion. Sustainable inclusion of people with limited work capacity in regular organizations is dependent on an adequate person-job fit and adequate vocational guidance during work. A person-job fit necessitates insight into a person's capacities in relation to work outcomes. Adequate vocational guidance requires insight into the relation between work resources and work outcomes (behaviour and task performance), and how this develops during work. A methodical approach aimed at improving work performance of people with LWC is crucial because meeting performance standards is an important requirement for extending the contract. The short duration of employment contracts for people with LWC is a major concern in practice. The newly developed instrument, called the Maastricht Work Capacity Monitor (MW©M)[5], is accessible for professionals in vocational support practices. With help of this instrument, professionals can improve their vocational support practices and assess work capacity in order to realize a good person-job fit for people with LWC. Moreover, with the help of this instrument, practitioners can facilitate the inclusion and development process of people with LWC during work[6]. This development process generally takes place in the workplace where mentors or supervisors try to coach people with LWC. With the help of the MW©M, effective learning and development can be facilitated with involvement of all stakeholders. The MW©M meets the requirements with respect to involvement of the target group and giving formative, accurate, concrete, specific, frequent, and/or goal-oriented feedback.

Furthermore, the findings of this dissertation are also important for practitioners and professionals in the field, because these findings indicate that people with LWC are as capable as the general population to reflect on their own capacities when communication is clear and understandable. Professionals should change their beliefs that people with LWC have difficulties reflecting critically on their behaviour. Professionals should take notice of the perspectives and insights of people with LWC regarding their own developmental process. Just as anyone in the general population, it is possible that they over- or underestimate their capacities in comparison to observers, but in the end their assessment appears to be no less accurate. When there are differences in assessments between an individual and their observer, this can help to get a clearer view of one's capacities. People with LWC and their observers can learn from each other when they evaluate and discuss their different viewpoints. This can provide a clearer picture of strengths and weaknesses, and it can provide insight into the elements of performance that need to be improved.

Last but not least, the findings and the instrument that derive from this dissertation are highly relevant for people from the target group themselves. With the help of this instrument, they can be supported in finding work that fits their capacity. Moreover, the instrument facilitates improvement of work performance and professional development during work, which meets their natural developmental tendency. The MW©M facilitates people with LWC's inclusion in their work capacity assessment and their development process, which complies with the statement 'nothing about them, without them'. Altogether, this can smoothen the path to sustainable employability of people with LWC, which increases the chance that they can earn a living and that employment contributes to their psychological wellbeing and health gains.

[5] See for more practical information: https://www.inclusievearbeidsorganisatie.org/methoden-instrumenten/maastrichtse-werkcapaciteit-monitor-mwcm

[6] Such as follow-up care that professionals in regional employer services in the Netherlands need to provide to people with LWC according to the SUWI act (2020).

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Lieve zusjes Maria, Caroline en Brigitte jullie onvoorwaardelijke liefde, steun en vertrouwen is me zo waardevol. We delen veel met elkaar, waaronder het jaarlijks familiediner. Een waardevolle door pa en ma ingezette traditie met onze broers Jan, Jos en Rob, jullie partners Frans, Cees en Ivo, en onze schoonzusjes Edith en Sabina, en natuurlijk mijn Maarten niet te vergeten. Etentjes die altijd goed zijn om bij te praten en voor discussies waar de gemoederen bij op kunnen lopen.

Brede maatschappelijke en politieke discussies zijn mij met de paplepel ingegeven en hebben mij gevormd, mij inzicht gegeven in andere perspectieven, en mij geleerd stelling te kunnen en durven nemen. Jan, dat ik jou maar liefst een kleine 40 jaar later zou opvolgen met een promotietraject, had destijds niemand kunnen bevroeden, ook ik niet. Ik heb de speech die pa na jouw promotie geschreven heeft er nog eens op nagelezen. Het lijkt erop dat de 'spelregels' voor de openbare verdediging niet gewijzigd zijn. Helaas kan pa nu geen verslag meer uitbrengen. Mijn herinneringen aan Pa en Ma zijn vol liefde. Ik ben hen dankbaar voor alle onvoorwaardelijk liefde en vertrouwen die ik van hen heb mogen ontvangen.

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Curriculum vitae

Gemma van Ruitenbeek was in born November 20th 1964 in Nijmegen, the Netherlands. After completing the havo she started with in-service-education for nursing in 1984. During this work-study program, she has gained experience as a student nurse at Canisius Wilhelmina hospital and the St. Maartenskliniek in Nijmegen. After becoming Nurse, she obtained her bachelor degree in Occupational health care at the HAN in 1989. Before her graduation, she already started as occupational nurse at the Occupational healthcare service (Dutch: Bedrijfsgezondheidsdienst, abbreviated BGD) in Nijmegen. Due to her move to Haarlem, she switched-over as advisor Work & Health to the occupational health and safety service of Arbo Unie in Haarlem in 1995. Two and a half years later, she moved to Maastricht, switched-over to another branch, and worked as location manager for Dactylo employment agency in Brunssum for one year. Because she missed work content in this job, she started again as advisor Work & Health for ArboNed in Maastricht in 1999. After a reorganisation of ArboNed, she worked as an independent advisor Work &Health in 2005. She graduated for the Masters degree Public Health, Work & Health at the Faculty of Health (FHML), Medicine and Life sciences of Maastricht University in 2009. In the same year, she worked as a researcher at FHML for 6 month. Since 2010, she works as a researcher in de department of Work and Social Psychology of the Faculty Psychology and Neuroscience. She is co-founder of the Centre of Expertise for Inclusive Organisations (Dutch: Centrum Inclusieve ArbeidsOrganisatie, abbreviated CIAO). This is a Maastricht University based institute that was founded in close collaboration with the Dutch Employee Insurance Agency, UWV (Uitvoeringsinstituut WerknemersVerzekeringen) in 2016. CIAO offers a platform of knowledge to all parties working professionally towards promoting sustainable participation in the labour market, both for those working and those searching for jobs, and especially those who are not able to participate in the current labour market independently. At CIAO she fulfils the function of managing director.

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