Attentional bias towards fatigue and vitality words
A difference between people low or high in fatigue

Masterthesis

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Preface

This master thesis is written for the master health psychology at the University of Twente and describes a study into measuring fatigue with an implicit method. I worked on this thesis from november 2015 to june 2016. It was a long but rewarding time and it taught me a lot. The subject is something that is close to me and something I studied a lot during my years at the university. I am glad for all the help I got to find more answers concerning fatigue.

I want to thank my supervisors for all their assistance, support and for letting me pick their brains when I got stuck. I also want to thank everybody who participated in this research, without you it would have never been possible to complete my research.

I also want to thank my friends and family for helping me when I thought I could never complete this thesis, for motivating me and for the kick in the butt I sometimes needed.

So with this I want to thank everybody who reads this, you at least read one page of my thesis. Thank You.

Enschede, the Netherlands
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Roos-Anne Pieterson

"The future is always beginning now"

-Mark Strand

Abstract

Introduction Fatigue has a high prevalence and can have a great impact on someone's life. Until now most research on fatigue used questionnaires. This is an explicit measure, according to the dual process model behavior, feelings and attitudes can be explained through a combination of the implicit and explicit components. A combination of explicit and implicit measures in order to measure fatigue more precisely could give additional information. The focus of this research was to find out if people who score higher on an explicit fatigue scale show an attentional bias for fatigue related stimuli relative to neutral stimuli on an implicit test in comparison with people who score lower on an explicit fatigue scale.

Method There was made use of a dot-probe task to measure reaction times on different word combinations (neutral-fatigue/vitality). To measure the explicit fatigue the checklist individual strength (CIS) was done. To get background information on the participants a questionnaire with general questions was done. A total of 34 participants completed the study.

Results There was a moderate positive correlation found between the bias index (BI) and CIS. When testing for the two different groups a strong positive correlation was found in the fatigue group but for the control group there was no significance found. These results indicate that participants who score higher on an explicit test score higher on an implicit test. When testing for a difference between fatigue and vitality words there was found that the results could be more stable when only tested with fatigue words.

Discussion With an implicit test next to an explicit test it could be easier to test for fatigue and see what kind of treatment would work best. People who score high on an explicit test and high on an implicit test could benefit from cognitive behavioral therapy while people who only have a high score on the explicit test might need a different treatment to decrease the amount of fatigue they experience. It could be that it is possible to mix fatigue and vitality words in an explicit questionnaire but this might not be possible with an implicit task.

Samenvatting

Introductie Vermoeidheid heeft een hoge prevalentie en kan een grote impact op iemands leven hebben.. Tot nu toe is het meeste onderzoek naar vermoeidheid met vragenlijsten. Dit is een expliciete manier van meten, volgens het dual process model kunnen gedrag, gevoelens en houding verklaard worden door een combinatie van impliciete en expliciete componenten. Een combinatie van expliciete en impliciete methode om vermoeidheid preciser meten zou meer informatie kunnen geven. De focus van dit onderzoek was om te kijken of mensen met een hoge score op een expliciete vermoeidheid vragenlijst een aandacht bias voor vermoeidheid gerelateerde stimuli hebben vergeleken met neutrale stimuli op een impliciete test in vergelijking met mensen die een lage score hebben op de expliciete vermoeidheid vragenlijst.

Methode Er werd gebruik gemaakt van een dot-probe taak om reactietijd te meten op verschillende woord combinaties (neutraal-vermoeidheid/vitaliteit). Om de expliciete vermoeidheid te meten werd er gebruik gemaakt van checklist individuele spankracht (CIS). Om meer achtergrond informatie te krijgen werd er een vragenlijst met algemene vragen afgenomen. Totaal hebben er 34 personen meegedaan aan deze studie.

Resultaten Er is een gematigd positieve correlatie gevonden tussen de bias index (BI) en de CIS. Wanneer er voor de twee verschillende groepen werd getest werd er een sterke positieve correlatie gevonden in de vermoeidheid groep maar voor de controle groep was er geen significant resultaat. Dit resultaat wijst uit dat personen die hoger op een expliciete test scoren hoger op een impliciete test scoren. Wanneer er getest wordt voor een verschil tussen vermoeidheid en vitaliteit woorden werd er gevonden dat de resultaten stabieler zouden kunnen zijn wanneer er alleen getest wordt met vermoeidheid woorden.

Discussie Met een impliciete test naast een expliciete test zou het makkelijker kunnen worden om te testen voor vermoeidheid en te kijken welke behandeling het beste werkt. Mensen die hoog scoren op een expliciete test en impliciete test zouden baat kunnen hebben bij cognitieve gedragstherapie terwijl mensen die alleen hoog scoren op een expliciete test misschien een andere behandelings nodig hebben om hun vermoeidheid te verlagen. Het kan mogelijk zijn dat het mogelijk is om vermoeidheid en vitaliteit woorden te mixen op een expliciete test maar dit kan misschien niet mogelijk zijn op een impliciete test.

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Introduction

Fatigue

In general fatigue is not very specific in its symptomatology, fatigue can be induced by different physical and psychological causes. It is often described as a feeling of tiredness and exhaustion (Shahid, Shen & Shapiro, 2010). Fatigue is a subjective experience that can be described as 'extreme and persistent tiredness, weakness or exhaustion—mental, physical or both' (Dittner, Wessely & Brown as cited in Nikolaus, Bode, Taal & Van De Laar, 2010). Fatigue is a common but disabling phenomenon that has a high prevalence (Franssen et all, 2003). Depending on the definition and differences in measurement techniques fatigue can been found somewhere between 7 and 45 percent the population (Franssen, Bültmann, Kant, & Van Amelsvoort, 2003). Fatigue can be divided in acute fatigue and chronic fatigue. In acute fatigue the source is mostly identifiable and is relieved by rest. Chronic fatigue is often a side effect of a medical illness, lasts longer than 6 months, often has multiple or unknown causes and is poorly relieved by rest (Swain, 2000). This long lasting fatigue can have a great impact on someone's life and have major social and economic cost, people who suffer from fatigue can be affected in their social activities and household chores (Stebbings & Treharne, 2010). In many cases fatigue is seen as one of the most important sources of disablement, often reported as one of the most severe symptoms (Shen, Barbera & Shapiro, 2006).When people are fatigued they show more signs of cognitive problems like concentration and attention problems (Neu et all.,2011, Boyle, Coulombe, Racine & Reid, 2009). Research showed that people who experience more fatigue symptoms have more trouble than healthy controls with cognitive and psychomotor tasks (like the digit span and symbol digit substitution test (both subtest from the WAIS)). Fatigue is a common reason to visit the general practitioner, 25 % of the patients who came to visit their doctor mentioned signs of fatigue (Cullen, Kearney & Bury, 2002).

Fatigue in women

When looking at people who visit their general practitioner for fatigue, research shows that more women than men suffer from fatigue. Women are more likely to be fatigued and visit their general practitioner more often for fatigue complaints (Cullen, Kearney & Burry, 2002). When the fatigue maintains for a longer period of time more women and older people show signs of fatigue (Bakker, Bensing, Cardol & Verhaak, 2005). When looking at context women who are

responsible for children under 6 are more likely to report fatigue. 50% of the women between 15 and 64 say that they have experienced fatigue in the last two weeks (Bakker, Bensing, Cardol & Verhaak, 2005). Because of this high fatigue rate in women this research will focus on fatigue in women.

Measuring fatigue

Measurements for fatigue have always measured a subjective feeling and no objective measure and assessment tools have been found (Shen, Barbera & Shapiro, 2006). Objective measurements are based on how people perform on a task, like stacking boxes, regardless of what they experience while doing the task. Subjective measurements are based on what people feel and say how they experience a task so what they feel while stacking the boxes. It should be considered that fatigue never really can be measured in a fully objective way because fatigue is a subjective experience.

Therefore the valid measurement of fatigue deserves attention. There are many rating scales that measure fatigue. Scales for fatigue mostly focus on one of two things namely severity of fatigue or impact of fatigue. The two most common questionnaires for this are the Fatigue Severity Scale (FSS) and the Modified Fatigue Impact Scale (MFIS). The FSS is a unidimensional scale, with a primarily physical focus, whereas the MFIS is a multidimensional scale that reports physical, psychological and cognitive aspects of fatigue (Learmonth, Dlugonski, Pilutti, Sandroff, Klaren & Motl, 2013). Severity focuses on what a person can or cannot do while impact looks at a broader spectrum and takes into account the psychological and cognitive problems that can come from fatigue. A limitation of questionnaires like these is that they are mostly developed for patients with a specific disease.

Most questionnaires are not tested in the general public but one that is is the checklist individual strength (CIS) **(**Vercoulen, Hommes, Swanink, Jongen, Fennis, Galama et al., 1996). The CIS measures the subjective fatigue and behavior related to fatigue in the past two weeks. It can be used in different patient populations but is also tested in the general public.

Bakker, Bensing, Cardol and Verhaak (2005) suggest that asking people if they experience trouble with a specific construct like fatigue people are more likely to report a higher level of fatigue. It could be that people are not experiencing more fatigue but instead they just report it more. Research showed that when people are more concerned with their health they are

more likely to report fatigue and other health complaints (Bakker, Bensing, Cardol & Verhaak, 2005). People who have more roles in daily life seem to have a higher chance to be fatigued, this seems especially the case for women with young children (Bakker, Bensing, Cardol & Verhaak, 2005). When more attention is given to fatigue it could increase the chance that people remember it and report it. So subjective measurements are available and validated but have some limitations like a bias and limited to accessible resources. When looking at fatigue as a subjective experience which can be influenced by the way people think or feel about it, it seems that fatigue is being influenced by multiple processes both implicit and explicit.

Dual process model

A model that supports the thought that multiple implicit and explicit processes are at work is the dual process model. This model says that behavior has two components an implicit, impulsive system and an explicit, reflective system (Houben, Nosek & Wiers, 2010). Until now most research has been done in finding ways to measure fatigue with questionnaires, questionnaires focus on the explicit reflective system. Recently the question has risen if this is the best way to measure fatigue. Some exploratory research has been done to see if it is possible to not only measure fatigue in an explicit manner but also in an implicit manner. A combination of explicit and implicit measures in order to measure fatigue more precisely is reasonable and should be favorable. According to this dual process model behavior, feelings and attitudes can be explained through a combination of the implicit and explicit components. When looking at the definition used by Shahid, Shen and Shapiro (2010) "a feeling of tiredness and exhaustion" fatigue is defined as a feeling the dual process model could be useful to find out why some people show a higher level of fatigue. Within the dual process model the thought is that people have a fast, associative, implicit, impulsive system and a slower, rule-based, explicit, reflective system. This implicit system includes automatic appraisal of stimuli in terms of their affective and motivational significance. So within this implicit system processes are not visible to the person, earlier experiences are seen as the base for automatic activations of cognitive schemas (e.g. an earlier experience with fatigue can recall the feeling with a similar situation). The explicit system which includes controlled processes related to conscious deliberations, emotion regulation and expected outcomes (e.g. thinking about what to answer to a question) (Houben, Nosek & Wiers, 2010). When looking at these different ways to answer questions it can be that it takes a lot of

self-control to act in an explicit way. Research shows that self-control is a resource that can be drained, when people need to control their self this can, in long-term, lead to an impaired self-control known as ego depletion (Hagger, Wood, Stiff & Chatzisarantis, 2010). People with a higher level of fatigue can have less self-control because they already have to deal with fatigue and therefore a reduced performance on draining implicit tasks (Hagger, Wood, Stiff & Chatzisarantis, 2010). The reflective explicit processes can be measured with self-report measurements like questionnaires but the impulsive implicit processes should be measured indirectly.

Implicit measuring methods

Measurements that test in an implicit way focus on what people do not say in explicit tests. Implicit tests use mostly a picture, word or phrase that people have to evaluate. This evaluating occurs in a spontaneous, automatic, or unconscious manner in contrast with self-reports where the person answers in a slower, rule-based, explicit, reflective manner (Harms & Luthans, 2012). Measuring in an implicit way has the benefits that results are less influenced by biases like the attentional bias (Fazio & Olson, 2003). Also because the test is not visibly focused on one subject it is harder to give a socially desirable answer (Harms & Luthans, 2012). At this point there has not been much research in implicit testing of fatigue, some exploratory research has been done but no good methods have been found. But there has been research towards implicit testing of other concepts like loneliness and addictive behaviors (Cacioppo, Balogh & Cacioppo, 2015, Glock, Müller & Krolak-Schwerdt, 2013, Houben, Nosek & Wiers, 2010).

Cacioppo, Balogh and Cacioppo (2015) showed that in an emotional Stroop task emotional words like alone, disliked and unwanted are named slower by people who are lonely than by non lonely people. Research from Wiers, Woerden, van Smulders and de Jong (2002) showed that in alcohol-related behavior the implicit and explicit processes are important. Heavy drinkers showed a positive excitement related association which can be seen in faster reaction times while light drinkers did not show this in an Implicit Association Test (IAT). A positive attitude towards alcohol was a predictor for using alcohol. These different approaches try to provide an evaluation of the construct without having to directly ask the participant for a verbal report (Fazio & Olson, 2003)

Another method to measure implicit processes is the dot-probe task. The dot-probe task is a visual probe detection task, people are shown a pair of stimuli for a short time at two different locations on the screen. One of the stimuli is a neutral stimuli and the other one is threatening, for example table vs fatigue (Koster, Crombez, Verschuere & de Houwer, 2004). After a short time the stimuli disappear and a dot probe appears at the location of the threatening stimulus (congruent) or at the location of the neutral stimulus (incongruent). It is suggested that response to the probe will be faster when attention is already focused on the location where the probe appears. This means that when people are fatigued and might have an attentional bias for fatigue related stimuli they could be more focused on fatigue related words and respond faster if a probe appears on the place of a fatigue word. This is found with people with anxiety problems, they respond faster to congruent trials than to incongruent trials (congruency effect) (Koster, Crombez, Verschuere & de Houwer, 2004). This can be seen as threat behavior, the people are oversensitive for words related to the threat they perceive. Information of the threat is prioritized and attention is focused on it in instead of neutral or positive information. This is called vigilance, vigilance for threatening information may lead to more attention for negative information. When more attention is given to one subject over another this is known as an attentional bias (Hou, Moss-Morris, Bradley, Peveler & Mogg, 2008). Such an attentional bias has been found in patients with severe fatigue problems like patients with chronic fatigue syndrome (CFS). Compared to a healthy control group the CFS group showed an enhanced attentional bias towards health-threat stimuli relative to neutral stimuli. Health-threat stimuli are any situation or factors that may be dangerous for the health of people, for example illness or being hospitalized (Hou, Moss-Morris, Bradley, Peveler & Mogg, 2008). In the case of fatigued people there will be looked at fatigue and vitality stimuli to see if people who are fatigued react more to this words than to neutral stimuli. Questionnaires on the subject of fatigue mix fatigue and vitality words and this might also be possible with an implicit task.

It has been found that this attentional bias and negative illness beliefs could be important for the onset and perpetuation of CFS. It was also found that in pain related behavior attentional bias is an important factor in pain detection. People who had an attentional bias for pain were more likely to report pain (Mohammadi, Dehghani, Khatibic, Sanderman & Hagedoorn, 2015). Pain is seen as a subjective experience like fatigue, this could mean that like in pain behavior there is an implicit desire to give attention to fatigue stimuli while ignoring other stimuli. When

people are focused on fatigue they could have an attentional bias for fatigue related words. With fatigue being a more reported symptom in the general population it seems reasonable to find a way to measure in an implicit way. The focus of this research is to find out if people who score higher on an explicit fatigue scale show an attentional bias for fatigue stimuli relative to neutral stimuli on an implicit test in comparison with people who score lower on an explicit fatigue scale. When this is the case people with a higher score on the explicit test should respond faster to fatigue related stimuli in comparison with neutral stimuli. Because of the explorative nature of this research multiple hypothesis were formed.

Hypothesis

1. There is a difference between the characteristics of the fatigue group and the control group on factors like BMI, comorbidity and daily roles

2. There is a positive moderate correlation between the score on the CIS and the score on the dot-probe test

3. People with a high explicit fatigue score on the CIS show a higher attentional bias for fatigue and vitality stimuli compared with low scoring control participants

4. There is a difference between the reaction time on the fatigue words versus the vitality words between the two groups

Methods

Participants

Earlier test on an attentional bias tasks concerning fatigue have shown that is recommended to have at least 14 to 20 people in each condition (Hou, Moss-Morris, Bradley, Peveler & Mogg, 2008, Yang,, Ding, Dai, Peng & Zhang, 2015). For this research the inclusion criteria were being female, over 18 and a high level of fatigue. Women were asked to indicate if they suffered from fatigue and if they did they were asked to participate. A total of 35 women were approached for participating in the test of whom 21 women with fatigue complaints volunteered to participate in the test. After explaining the test three people indicated that the test would be too exhausting and one did not want to participate in the test due to other reasons.

A total of 17 people who indicated to be fatigued were included. Healthy controls with similar demographic characteristics were recruited by asking the participants who suffer from fatigue to bring a female friend or family member who indicated not being fatigued (chain sampling) (Platt et all., 2006). The purpose of the control group was to make comparisons between people with a similar background. The procedure was the same in both groups. Three participants did not complete the attentional bias task due to software problems.

After reviewing the data 18 participants scored above the CIS score of 79 to be suffering from excessive fatigue (de Vries, Michielsen & van Heck, 2003). This led to two groups, the fatigue group with 18 participants (mean age 41.72 SD=11.64, CIS score >79) and a control group with 16 participants (mean age 34 SD=10.27, CIS score <79) with analysable data. The demographic health-related characteristics are described in table 1. Family situation and level of education are described in table 2.

The family situation and education level of the participants in the different groups did not show any significant difference between the groups, $X^2(4, N = 34) = 3.09$, $p = .54$, $X^2(4, N = 34) = 2.28$, $p = .68$. People were asked to indicate for how many different reasons they visited a doctor. In this research the reasons this is labeled comorbidity. The most common reasons for people to visit a doctor in the fatigue group were psychological reasons (39%), skin problems (28%), CFS (28%) and undescribed reasons (50%). The most common reasons for people to visit a doctor in the control group were allergies (25%), problems with the respiratory system (19%) and psychological reasons (19%). For the daily roles participants were asked to indicate how many hours a week they spend on a certain task (like caring for others or gardening).

Table 1. *Demographic health-related characteristics of participants*

	Fatigue group (n=18)		Control group (n=16)				
	Mean	**SD**	**Mean**	**SD**	**t**	**df**	**p**
Age	41,72	11,64	34	10,27	-2,04	32	.05
Comorbidity	2,67	1,46	1	1,37	-3,43	30,35	.002
Daily roles	16	4,10	16,5	2,85	,41	31,89	.68
BMI	28,73	6,51	25,75	7,62	-1,19	29,28	.24

Table 2. *Family situation and education level of the participants*

	Fatigue group (n=18) **Frequency (%)**	Control group (n=16) **Frequency (%)**	**p**
Family situation			.54
-Single	2(11,1%)	3 (18,8%)	
-Household with children (0-6)	1(5,6%)	3 (18,8%)	
-Household with children (6+)	6 (33,3%)	3 (18,8%)	
-Household with children (18+)	3(16,7%)	1 (6,3%)	
-Household without children	6 (33,3%)	6 (37,5%)	
Education level			.68
-Lower general secondary education	1 (5,6%)		
-Intermediate vocational education	3 (16,7%)	3 (18,8%)	
-High school educated	1 (5,6%)	3 (18,8%)	
-Higher Education	9 (50%)	7 (43,8%)	
-University educated	2 (22,2%)	3 (18,8%)	

Materials and procedure

Stimulus words

For the dot-probe 48 word pairs were picked, each pair consisted of one fatigue or vitality word and one neutral word, which both were matched in frequency. All words appeared twice, once with a probe following on the place of the just appeared word and once with a probe following on the other word of the pair. (Hou, Moss-Morris, Bradley, Peveler & Mogg, 2008). 30 fatigue and vitality related words were picked from dutch fatigue questionnaires (CIS, FSS, MFIS, MVI-20) and 18 words were picked by finding synonyms for the words found in the questionnaires. 22 words had a fatigue nature (e.g. "moe", "uitgeput" and "vermoeidheid") and 26 words had a vitality nature (e.g. "gezond", "levenslustig" and "energiek"). For the neutral words the list from the emotional dot-probe from MacLeod, Soong, Rutherford and Campbell (2007) were used (e.g. "ketting", "museum" and "seizoenen"). These words were translated in dutch and non-active words were chosen. For full list see appendix A.

Online attentional probe task configuration

The online attentional probe task was configured to deliver 96 trials, each exposing a stimulus word pair for 500 msec, and with trials separated by a 1,000-msec intertrial interval. Across these trials word position (upper vs. lower screen position), probe position (upper vs. lower screen position) and probe type ("<"vs." >") were balanced. Order of trial presentation was randomized for each participant (MacLeod, Soong, Rutherford & Campbell, 2007). The dot-probe task was programmed and presented using the Inquisit lab Millisecond software package (INQUISIT 1.28, 1998) on an Acer Aspire 5733 with a 15,6 inch full color screen. Inquisit has been tested and measures reaction times with a millisecond accuracy (De Clercq, Crombez, Roeyers, & Buysse, 2003). The screen resolution was 800x600, a separate keyboard was used with the 'E' and 'I' keys covered with a '<' and '>' sign so that it was clear which keys needed to be pressed.

CIS

The Checklist Individual Strength (CIS) (Vercoulen et. al, 1994) quantifies subjective fatigue and related behavioral aspects. The CIS consists of 20 statements for which the person has to indicate on a 7-point scale to what extent the particular statement applies to him or her (ranging from "ja

dat klopt" left to "nee dat klopt niet" right). The statements refer to four fatigue aspects: (1) subjective fatigue (e.g., Ik voel mij moe), (2) reduced concentration (e.g., Als ik ergens mee bezig ben, kan ik mijn gedachten er goed bijhouden), (3) reduced motivation (e.g.,De zin om dingen te ondernemen ontbreekt mij) and (4) reduced activity (e.g., Lichamelijk voel ik met uitgeput). The CIS is well validated within the clinical setting (Vercoulen, Hommes, Swanink, Jongen, Fennis, Galama et al., 1996). It can be used in different patient populations but is also tested in the general public. The dutch version was used. The CIS contains out of 20 statements that check how the participant felt for the last two weeks. The total score for the CIS is calculated by adding the score on all the items and will vary between 20 and 140. A higher score indicates a higher level of fatigue. For the total CIS score the cutoff for severe fatigue lies with a score of 76 or more (de Vries, Michilsen & van Heck, 2003). The dutch version of the CIS was acquired via www.meetinstrumentenzorg.nl see appendix B

In this research a cronbach's alpha of .948 was found. The cronbach's alpha of the subscales were .959 for subjective severity .869 for reduced concentration, .804 for reduced motivation and .681 for reduced physical activity. This is consistent with results found in earlier research (Beurskens et all., 2000)

For the fatigue group the following cronbach's alphas was found .796. The cronbach's alpha of the subscales were .816 for subjective severity .652 for reduced concentration, .696 for reduced motivation and .676 for reduced physical activity.

For the control group the following cronbach's alphas was found .835. The cronbach's alpha of the subscales were .921 for subjective severity .721 for reduced concentration, .772 for reduced motivation and .698 for reduced physical activity.

Questionnaire

To get more background information questions about age ("Wat is uw geboortedatum?"), current family situation ("Wat is gezinssamenstelling?"), number of reasons people visited a healthcare professional ("Kruis **elke** aandoening aan waarvoor u het **afgelopen jaar** onder behandeling bent geweest van een huisarts of medisch specialist"), education level (" Wat is uw hoogst genoten opleiding?") and daily roles questions (e.g."Hoeveel uur per week besteedt u gemiddeld aan werk") regarding these subjects were asked. The questions were based on a questionnaire

developed by Arends, Bode, Taal and van de Laar (2013). The questionnaire can be found in Appendix C. Both questionnaires were done online through http://www.thesistools.com/.

Procedure

The participants received information about the experiment before starting and had to agree with an informed consent before they could go further with the questionnaire. If they agreed to participate they were asked to take 20 min without pausing for the completion of all aspects of the experiment. Participants then were given the questionnaires before being provided with directions concerning the probe task. After completion of the questionnaires they were presented with a frame by frame demonstration of a trial, and instructed to indicate whether a "<" or ">" probe was presented by pressing either the "E" or the "I"arrow key, respectively, responding as quickly but as accurately as possible. The "E" and "I" key were covered with a paper indicating the "<" or ">" probe. This was done to make it clear for the participants which key was supposed to be pressed. They were told to place their index fingers on the two response keys and to press space to begin.

"Plaats uw wijsvingers op de volgende twee toetsen < en >
Twee woorden zullen kort op het scherm verschijnen boven en onder de drie kruizen (+++) de woorden worden gevolgd door een < of >.
Wanneer u een < ziet druk dan op de < toets
Wanneer u een > ziet druk dan op de > toets
Deze test wordt getimed. Probeer zo snel mogelijk op de toets te drukken met zo weinig mogelijk fouten.
Nu krijgt u eerst een aantal oefeningen. Wanneer u een fout maakt zal er een rood kruis verschijnen in het midden van het scherm.
(Oefenen)
Het oefenen is over mocht u nog vragen hebben dan kunt u deze nu aan de onderzoeker stellen."

The participants were asked to complete 2 trials, a practice trial and a neutral-fatigue/vitality words pairs trial. Figure 1, 2 and 3 show the images that would appear. After completion participants were thanked for their participation and provided with debriefing information.

Figure 1. Three plus signs

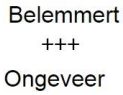

Figure 2. Fatigue/vitality and neutral word

Figure 3. Probe

Statistical analyses

The statistical analyses were performed using IBM SPSS Statistics version 22 for Windows (IBM, 2013).For the attentional probe task, the dependent measure was the response latency timed from the appearance of each probe until detection of the associated response. This means that there was looked at the time it took between the appearance of the probe and the time the participant responded. A bias index (BI) was computed for each participant, by subtracting median response time to probes presented on the place of fatigue and vitality words (congruent) from median response time to probes presented on the place of control word (incongruent), using

a similar procedure adopted in previous research (cf. MacLeod & Mathews, 1988). To calculate this BI the mean reaction time for congruent trials (mean congruent) and mean reaction time incongruent trials (mean incongruent). The mean congruent was subtracted from the mean incongruent this led to a positive, negative or a near zero score. A positive BI indicates attentional vigilance for fatigue and vitality words, and a negative BI indicates attentional vigilance for neutral words. A score around zero means that no bias seems to be present, the person has the same reaction time for all words without favoring one of the two categories (cf. MacLeod & Mathews, 1988). All scores were in milliseconds. One score on the attentional bias task was excluded because the participant got distracted.

To use the CIS scores a couple of items needed to be rescaled so that a high score on the CIS ment a higher fatigue level. The next items needed to be rescaled, item 1, 3, 4, 9, 10,13, 14, 16,17, 18 and 19. After rescaling all the items were counted for a total CIS score and the scores on the four different subscales on the CIS.

In both groups a skewness test was done for the CIS and BI the data was found to have a normal distribution for the scores on the CIS but not for the scores on the BI. This means that for the second hypothesis Spearman's rank-order correlation had to be done.

To answer the first hypothesis *there is a difference between the characteristics of the fatigue group and the control group on factors like BMI, comorbidity and daily roles* an independent-samples t-test was conducted to compare BMI, comorbidity and daily roles in the fatigue and control conditions. For the second hypothesis *There is a positive moderate correlation between the score on the CIS and the score on the dot-probe test* a Spearman's rank-order correlation was done on the BI, CIS, and subscales of the CIS. Because of the non normal distribution of the BI score it was needed to do a Spearman's rank-order correlation. A positive correlation indicates that people with a higher score on the the CIS also have a higher score on the BI while a negative correlation indicates that people with a higher score on the the CIS have a lower score on the BI. To answer the third hypothesis *"people with a high explicit fatigue score on the CIS show a higher attentional bias for fatigue and vitality stimuli compared with low scoring control participants"*an One-way Anova was done to see if there were significant differences between the two groups on CIS total, BI, mean reaction time congruent trials (mean congruent) and mean reaction time incongruent trials (mean incongruent). After this there was looked if covariants age and the combination age and comorbidity were of influence on the score.

For answering the last hypothesis "*There is a difference between the reaction time on the fatigue words versus the vitality words between the two groups*" a few steps had to be taken. The data needed to be sorted in a fatigue group file and a control group file. After this the data of the fatigue and control group was merged in two files and the words were labeled fatigue or vitality. After this the data was split by congruence and an one-way ANOVA was done to see if there was a significant difference between the fatigue and vitality words in the two different groups. A fatigue bias index (FBI) and a vitality bias index (VBI) were computed to see if a set of words caused any significant results.

Results

An independent-samples t-test was conducted to compare age, BMI, comorbidity and daily roles in the fatigue and control conditions. As shown in table 1 there was a significant difference in the scores for comorbidity ($p = 0.002$) and for age ($p = 0.05$) in the direction of the fatigue group. These results suggest that age and comorbidity are associated with the level of fatigue experienced. The fatigue group had significantly older participants with more comorbidities. No significant difference was found for BMI and daily roles. Table 3 shows a difference between the two groups in the scores on the CIS and the BI. As expected, the fatigue group shows a higher score on all aspects when compared with the control group.

Table 3. *CIS and BI scores of participants*

	Fatigue group (n=18)		Control group (n=16)				
	Mean	**SD**	**Mean**	**SD**	**t**	**df**	**p**
CIS total	99.1	13.6	52.9	15.1	-9.3	30.39	<.001
CIS subjective fatigue	45.5	7.0	22.7	9.9	-7.7	26.7	<.001
CIS reduced activity	26.8	11.5	13.6	13.5	-3.0	29.7	.005
CIS reduced concentration	24.6	4.5	13.1	5.0	-6.9	30.4	<.001
CIS reduced motivation	14.7	5.6	8.1	3.9	-4.0	30.6	<.001
BI	53.5	78.4	3.9	18.0	-2.4	15.5	.03

To answer the second hypothesis “There a positive moderate correlation between the score on the CIS and the score on the dot-probe test” a Spearman's rank-order correlation was executed on the BI, CIS, and subscales of the CIS. The results can be seen in table 4.

Table 4. *Spearman's rank-order correlation between BI, CIS and the four subscales of the CIS both groups (N=34)*

	BI	CIS total	Subjective fatigue	Reduced concentration	Reduced motivation	Reduced activity
BI	1	,41*	,46*	,29	,32	,13

Note: *P < .05 **P < .01 (2-tailed)

As seen in table 4 a moderate positive correlation was found between the BI and the CIS (r = 0.41, p=.02) and between the BI and the subscale subjective fatigue on the CIS (r = 0.46, p=.01). So a higher score on the CIS indicating more fatigue, is associated with a higher bias. People with a higher fatigue score have a higher attentional bias for fatigue and vitality related stimuli when looking at the whole group. In table 5 the correlation for the different subgroups are shown. As seen in table 5 for the fatigue group a moderate-strong positive correlation was found between the BI and the CIS (r = 0.57, p=.03) and between the BI and the subscale subjective fatigue on the CIS (r = 0.69, p=.004). When looking at the control group no significant correlation between the BI and any of the CIS scale was found (r = -0.35, p=.21). There was a negative coefficient found, this could indicate that there some form of bias in the other direction. This would mean that people in the control group focus more on neutral words instead of fatigue and vitality words. Figure 4 shows a slight u shape in the results, showing that people who have a lower score on the CIS have a slightly elevated score on the dot probe test. The results could indicate that participants who indicated to be more fatigued on an explicit test score higher on an implicit test.

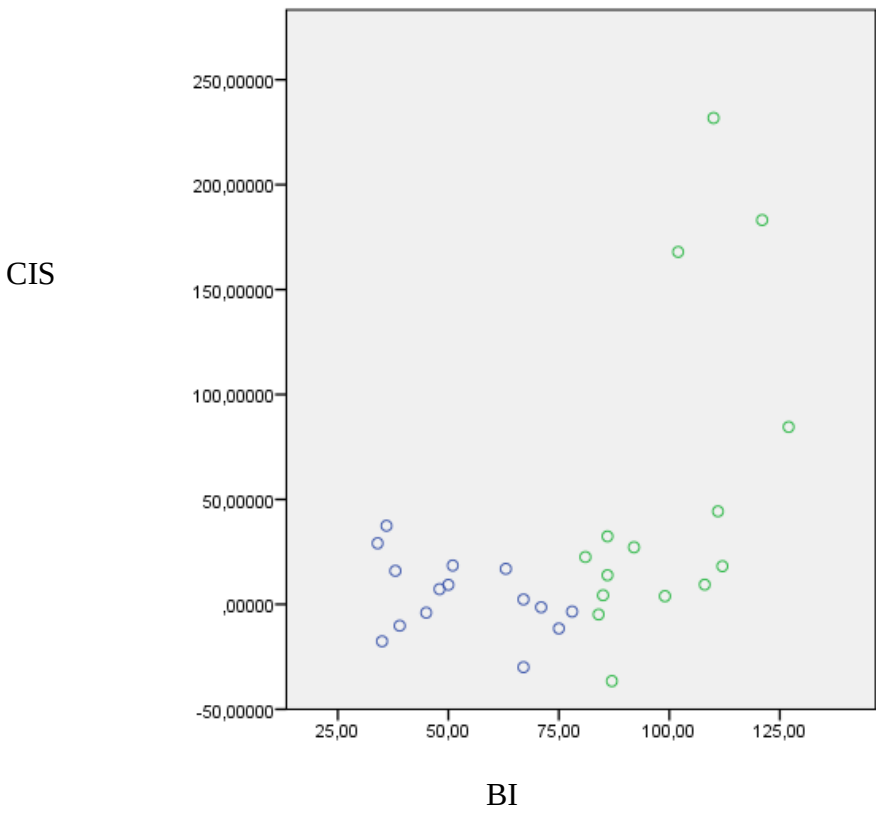

Figure 4. CIS and BI scores shown for all participants

Table 5. *Spearman's rank-order correlation between BI, CIS and the four subscales of the CIS*

	BI	CIS total	Subjective fatigue	Reduced concentration	Reduced motivation	Reduced activity
BI fatigue group	1	,57*	,69**	,17	,51	-,18
BI control group	1	-,35	-,23	-,27	-,14	-,08

Note: *P < .05 **P < .01 (2-tailed)

To see if there is a significant difference between the two groups on CIS total, BI, mean reaction time congruent trials (mean congruent) and mean reaction time incongruent trials (mean incongruent) an one-way Anova was executed. This was done to answer the third question "people with a high explicit fatigue score show an enhanced attentional bias for fatigue stimuli compared with low scoring control participants". In table 6 is the outcome of this one-way Anova is represented for CIS total, BI, mean congruent and mean incongruent between the fatigue and control group. When looking at the difference between the fatigue and control group there seems to be a significant difference between the two groups on the CIS, BI and mean incongruent. These results correspond with the expectation that the two groups have a significant difference in the attentional bias for fatigue and vitality stimuli. Meaning that the fatigue group showed a higher bias for fatigue related content.

The score on the BI is computed by subtracting the score of the mean congruent from the score on the mean incongruent. This score shows if there is a difference between reaction time between the two groups of words. A score around zero indicates that there is no difference between the scores of the two groups. The mean congruent (when the probe is on the fatigue/vitality place) and mean incongruent (when the probe is on the neutral place) are computed by adding all the response times on the dot probe for the two categories and dividing them by the amount of items.

When looking at the results in table 6 it showed that the groups do not show a significant difference on the mean congruent but do show a significant difference on the mean incongruent . When looking at the means of responding on the probe it is visible that the control group does not show a difference when responding to the probe (M=484.9 SD=142.0 and M=490.4 SD=135.3)

while the fatigue groups shows a big gap in response time (M=520.4 SD=174.0 and M=571.6 SD=232.0). This supports the hypothesis that the fatigue group has an enhanced attentional bias for fatigue and vitality related stimuli.

Two Multivariate Analysis of Covariance were done to see if the factors age and comorbidity were of influence on the significance of the results. When corrected for age no significant results were found between the two groups. When corrected for comorbidity the score on the mean incongruent was still significant.

Table 6. *One-way Anova CIS total, BI, mean reaction time congruent trials (mean congruent) and mean reaction time incongruent trials (mean incongruent) between the fatigue and control group*

	M (sd) fatigue	**M (sd) control**	**dF**	**F**	**N**	**Sig.**
CIS total	99.1 (13.6)	52.9 (15.1)	1,32	88.03	33	<.001
BI	53.5 (78.4)	3.9 (18.0)	1,28	5.70	29	.02
Mean congruent	520.4 (174.0)	484.9 (142.0)	1,28	6.07	29	.02
Mean incongruent	571.6 (232.0)	490.4 (135.3)	1,28	2.89	29	.10

Table 7. *Multivariate Analysis of Covariance CIS total, BI, mean reaction time congruent trials (mean congruent) and mean reaction time incongruent trials (mean incongruent) corrected for age between the fatigue and control group*

	F	**df**	**Sig.**
CIS total	.06	1	.81
BI	.01	1	.94
Mean congruent	.88	1	.36
Mean incongruent	1.23	1	.28

Table 8. *Multivariate Analysis of Covariance CIS total, BI, mean reaction time congruent trials (mean congruent) and mean reaction time incongruent trials (mean incongruent) corrected for comorbidity between the fatigue and control group*

	F	**df**	**Sig.**
CIS total	1.47	1	.24
BI	.20	1	.66
Mean congruent	2.15	1	.15
Mean incongruent	4.53	1	.04

An one-way between subjects ANOVA was conducted to compare the effect of fatigue and vitality words on latency in the congruent and incongruent trials for the two different groups. To see if there was a difference between the two groups of words a fatigue bias index (FBI) and a vitality bias index (VBI) was computed. There was no significant effect found for fatigue or vitality words in the different groups. With no significance found it suggests that there is no difference between the reaction time on fatigue and vitality words on latency for the two different groups. But when looking at the score on the incongruent trials, when the probe appears on the neutral place, from the fatigue group it shows a significance level of .06 this is almost significant. Table 9 shows the FBI and VBI scores, there seems to be a difference between the two scores on

the type of words used. The FBI seems to be a stable score with a small standard deviation while the VBI has a big standard deviation. This could mean that the results would be more stable when only tested with fatigue words.

Table 9. *FBI and VBI scores for the control and fatigue group*

	M (sd) Control (N=16)	M (sd) Fatigue (N=18)
FBI	3.3 (14.8)	27.7 (7.2)
VBI	8.0 (19.1)	71.5 (108.3)

Discussion

This study shows that, consistent with the dual process model, fatigue has both an explicit (conscious) and an implicit (unconscious) process. Support was found that an attentional bias for fatigue and vitality words is involved in people with severe fatigue complaints. A moderate positive correlation was found between the bias index and CIS. When testing for the two different groups a strong positive correlation was found in the fatigue group but for the control group there was no significance found. These results indicate that participants who score higher on an explicit test score higher on an implicit test. In earlier research it was shown that people suffering from CFS who had a enhanced score on an explicit test had an enhanced score on an implicit test concerning health-threat information (Hou, Moss-Morris, Bradley, Peveler & Mogg, 2008). This suggests that the two processes of fatigue (the explicit CIS and the implicit bias index) go hand in hand and that it is possible to complement explicit testing of fatigue with an implicit test.

The main question of this research "people with a high explicit fatigue score on the CIS show a higher attentional bias for fatigue and vitality stimuli compared with low scoring control participants"was answered by looking at the difference between the fatigue and control group. The two groups seem to have a significant difference the CIS, bias index and mean incongruent score. These results correspond with the expectation that the two groups have a significant difference in the attentional bias for fatigue and vitality stimuli. Meaning that the fatigue group showed a higher bias for fatigue and vitality content. It takes them more time to respond to the

probe when the probe is shown on the place of a neutral word instead of on the place of a fatigue related word. In contrast the control group showed no enhanced attentional bias. It does not take them more time to respond to the probe when the probe is shown on the place of a neutral word instead of on the place of a fatigue related word. This corresponds with earlier research where there was found an attentional bias in patients with severe fatigue problems (Hou, Moss-Morris, Bradley, Peveler & Mogg, 2008). This outcome supports the theory that the dual process model is at work here. When people score higher on an explicit test they also score higher on an implicit test concerning the same subject. Information on fatigue is prioritized and attention is focused on it in instead of neutral information. This is vigilance for threatening information and may lead to more attention for negative information (Hou, Moss-Morris, Bradley, Peveler & Mogg, 2008). People prioritize the fatigue stimuli over the neutral stimuli when they have a higher score on the explicit test. This could mean that it is a good idea to next to an explicit test an implicit test should be done to see how to treat the fatigue complaints. A decrease in the focus on fatigue could help make people feel less fatigued. A theory that supports this is the treatment of chronic fatigue syndrome with cognitive behavioral therapy. In a research by Wiborg, Knoop, Prins and Blijenberg (2011) it was found that when people with a high level of fatigue are trained to focus less on this fatigue this leads to a significant reduction of fatigue severity. People who score high on an explicit test and high on an implicit test could benefit from cognitive behavioral therapy while people who only have a high score on the explicit test might need a different treatment to decrease the amount of fatigue they experience.

To see if it was important what kind of fatigue related words were used there was made a difference between fatigue and vitality words. There was looked at the question "there is a difference between the reaction time on the fatigue words versus the vitality words between the two groups". There was no significance found but there was a significance level of .06 found in the fatigue group. When looked at the fatigue bias and vitality bias scores it shows that there seems to be a difference between the two scores on the type of words used. The fatigue bias seems to be a stable score with a small standard deviation while the vitality bias seems to have a big standard deviation. This could mean that the results would be more reliable when only tested with fatigue words. In this research there was no clear significance between the two groups of words but it would be recommended in further research to make a clear distinction between the two groups of words and repeat the research with only fatigue words. At this point the fatigue and

vitality words were taken from dutch fatigue questionnaires (CIS, FSS, MFIS, MVI-20) and to fill the list there was looked at synonyms. It could be that it is possible to mix fatigue and vitality words in an explicit questionnaire but this might not be possible with an implicit task. A more validated set of words and two different sets for fatigue and vitality could lead to a more distinct score on the dot probe task and a clearer difference between the two groups.

The results suggested that age and comorbidity were associated with the level of fatigue experienced. A MANCOVA for age showed that any significant results disappear when corrected for age. A MANCOVA for comorbidity showed that significant results for the CIS and BI disappear but the significance for the mean incongruent remains. This shows that age is a bigger factor and only correcting for age would be enough. In earlier research it was shown that older people are more likely to show signs of fatigue (Bakker, Bensing, Cardol & Verhaak, 2005). In this research the fatigue group was significantly older but not elderly as described by Sugarman (2004). The two groups are around the same age group, early adulthood (18-40) and middle adulthood (40-60), so age should not be a big factor in this. It could not be explained why age was a big factor in this research. Fatigue is a common complaint when dealing with chronic diseases the fatigue group had a higher amount of people with diseases that were chronic of nature like CFS (Swain, 2000). The groups did not show a difference in BMI and daily roles. People with more daily roles have been shown to be more fatigued but that was not the case in this research (Bakker, Bensing, Cardol & Verhaak, 2005).

There were some limitations in this research, a first population limitation was that the two groups were significantly different on age and comorbidity. As shown in table 1 the fatigue group was significantly older and research showed that older people have a higher chance to be suffering from fatigue (Bakker, Bensing, Cardol & Verhaak, 2005). This could also explain why the fatigue group had a higher comorbidity rate, older people tend to have more medical issues (Stenholm et. all, 2015). The participants were asked to bring their own control person, some participants brought their younger female relatives this could explain the difference in age and comorbidity. Next to this for this research 35 women were approached of whom 21 wanted to participate of whom 4 did not participate mainly because of being fatigued and lack of energy. It could be that there is a selection bias in the people who did participate in the research and that this influenced the results. It would be recommended to repeat the research with a larger group to see if it leads to the same results.

A second limitation when looking at the participant and how they experienced the dot probe is that most participants, regardless of which group they belonged to, thought the dot probe test took 10 minutes or more. The test took approximately 5 minutes but it should be taken into account that people think the test takes a long time and this may influence their reaction time in the later trials, however this was not found in this research. A check of the reaction times showed that the reaction times stayed constant during the research. Another frequently heard remark was that the test made people tired. A last remark, mostly made in the control group was that they noticed the word "glijbaan" this was intended as a neutral word but it seems that people recognized it as an activity. It could be that this word is too active and needs to be replaced.

When looking at the time and place the test was done this was not the same for all participants. The test was done at their own home at a time that suited them best. Because of this test were done during the morning, afternoon and early evening. This could be a factor in the scores that people had. It is reasonable to assume that someone who worked all day and takes the test at night is experiencing a higher level of fatigue. The expectation is that this should not influence the implicit test but it should be taken into account. It would be better to try and keep all the conditions the same for all participants. The explicit CIS is not influenced by this because in this there was asked to give an answer over the last two weeks.

A technical problem with this study was that the laptop on which the dot probe test was done had sometimes a technical failure which made the laptop freeze and the participant could not complete the full trial. This problem was of technical nature and the program was tested before hand.

A last point of concern were the scores on the CIS. Participants had to answer 20 questions and got a score between 20-140. 8 of these questions were concerning subjective fatigue. When looking at the total score this is more heavily influenced by the score on the subject subjective fatigue than any of the other three factors (reduced concentration, reduced motivation and reduced activity). The CIS is well validated within the clinical setting (Vercoulen, Hommes, Swanink, Jongen, Fennis, Galama et al., 1996) and is a good measure to measure explicit fatigue but subjective fatigue is the biggest factor tested. This could explain why in this research when a significant score was found between the CIS and another factor there also was a significant score between the CIS subscale subjective fatigue and this factor. It could be that the score was more influenced by subjective fatigue and that this could have influenced the results.

The results of this research indicate that participants who indicated to be more fatigued on an explicit test score higher on an implicit test, meaning that their attentional focus is on words in the meaning context of fatigue and vitality words. It has been found that an attentional bias and negative illness beliefs could be important for the onset and perpetuation of chronic fatigue in people. With this outcome it seems that people who have a higher level of fatigue show an attentional bias for fatigue stimuli. A decrease in the focus on fatigue could help make people feel less fatigued. A theory that supports this is the treatment of CFS with cognitive behavioral therapy. In a research by Wiborg, Knoop, Prins and Blijenberg (2011) it was found that when people with a high level of fatigue are trained to focus less on this fatigue this leads to a significant reduction of explicit assessed fatigue severity.

In conclusion, this research was one of the first steps in finding out if people who score higher on an explicit fatigue scale show an attentional bias for fatigue stimuli relative to neutral stimuli on an implicit test in comparison with people who score lower on an explicit fatigue scale. The expectation that people with a higher score on the explicit test score higher on an implicit test has been met. Benefits from testing in an implicit manner include less change to give a desirable answer and less influenced by an attentional bias (Harms & Luthans, 2012, Fazio & Olson, 2003). It is harder to fake a score on an implicit test then on an explicit test (Steffens, 2004). This research showed that people with a higher fatigue score have a higher attentional bias for fatigue related stimuli while people with a lower fatigue score do not show this bias. It could also help people when visiting their general practitioner with fatigue problems. Not all fatigue complaints come to the attention of general practitioners because they are either not reported by the patient or not recorded by the general practitioner. In the Netherlands 6.3% of the visits are recorded as having to do with fatigue, while 29% of the people who visited a general practitioner in the last two weeks report to be suffering from fatigue (Meeuwesen, Bensing & van den Brink-Muinen, 2002). With an implicit test next to an explicit test it could be easier to test for fatigue and see what kind of treatment would work best. People who score high on an explicit test and high on an implicit test could benefit from cognitive behavioral therapy while people who only have a high score on the explicit test might need a different treatment to decrease the amount of fatigue they experience. Future research should look at questions that came up in this research on the subject of different word types (fatigue versus vitality), being fatigued and showing an attentional bias for fatigue and different treatment methods for different types of fatigue.

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Appendix

Appendix A

<item threatwords>	<item neutralwords>
/1 = "Moe"	/1 = "Bordeaux"
/2 = "Activiteit"	/2 = "Variabelen"
/3 = "Zwaar"	/3 = "Ketting"
/4 = "Moeite"	/4 = "Edities"
/5 = "Uitgeput"	/5 = "Planeet"
/6 = "Fit"	/6 = "Kustlijn"
/7 = "Doen"	/7 = "Kantine"
/8 = "Bezig"	/8 = "Planken"
/9 = "Sloom"	/9 = "Recepten"
/10 = "Slap"	/10 = "Avocado"
/11 = "Concentreren"	/11 = "Glijbaan"
/12 = "Uitgerust"	/12 = "Gang"
/13 = "Aandacht"	/13 = "Wezen"
/14 = "Sterk"	/14 = "Aanbevelen"
/15 = "Conditie"	/15 = "Museum"
/16 = "Plannen"	/16 = "Geregeld"
/17 = "Ondernemen"	/17 = "Getint"
/18 = "Zin"	/18 = "Nippen"
/19 = "Dwalen"	/19 = "Context"
/20 = "Gemotiveerd"	/20 = "Toewijzen"
/21 = "Vermoeidheid"	/21 = "Opmerking"
/22 = "Lichaamsbeweging"	/22 = "Vouw"
/23 = "Vermoeid"	/23 = "Volledig"
/24 = "Moeheid"	/24 = "Overgieten"
/25 = "Functioneren"	/25 = "Uitkomst"
/26 = "Problemen"	/26 = "Flessen"
/27 = "Inspannen"	/27 = "Kiezer"
/28 = "Belemmert"	/28 = "Ongeveer"
/29 = "Verantwoordelijkheden"	/29 = "Fluit"
/30 = "Hinderen"	/30 = "Middag"
/31 = "Oplettend"	/31 = "Rug"
/32 = "Beperkt"	/32 = "Lotus"
/33 = "Vitaal"	/33 = "Geometrisch"
/34 = "Energiek"	/34 = "Microscopisch"
/35 = "Loom"	/35 = "Lawaai"
/36 = "Afgemat"	/36 = "Instrumentaal"
/37 = "Doodop"	/37 = "Momenteel"

/38 = "Lamlendig" /39 = "Afgepeigerd" /40 = "Levendig" /41 = "Druk" /42 = "Dynamisch" /43 = "Gezond" /44 = "Levenslustig" /45 = "Ondernemend" /46 = "Bekaf" /47 = "Flauw" /48 = "Machteloos"	/38 = "Seizoenen" /39 = "Wagens" /40 = "Handtekening" /41 = "Openhaard" /42 = "Tomaten" /43 = "Textuur" /44 = "Zomers" /45 = "Waterdicht" /46 = "Keurmerk" /47 = "Vraag" /48 = "Satijn"

Vitality words	Fatigue words
"Activiteit" "Fit" "Doen" "Bezig" "Concentreren" "Uitgerust" "Aandacht" "Sterk" "Conditie" "Plannen" "Ondernemen" "Zin" "Gemotiveerd" "Lichaamsbeweging" "Functioneren" "Inspannen" "Verantwoordelijkheden" "Oplettend" "Vitaal" "Energiek" "Levendig" "Druk" "Dynamisch" "Gezond" "Levenslustig" "Ondernemend"	"Moe" "Zwaar" "Moeite" "Uitgeput" "Sloom" "Slap" "Dwalen" "Vermoeidheid" "Vermoeid" "Moeheid" "Problemen" "Belemmert" "Hinderen" "Beperkt" "Loom" "Afgemat" "Doodop" "Lamlendig" "Afgepeigerd" "Bekaf" "Flauw" "Machteloos"

Appendix B

CHECKLIST INDIVIDUELE SPANKRACHT

Instructie: U ziet een lijst van 20 uitspraken. Met behulp van deze uitspraken willen we een indruk krijgen van hoe u zich de laatste twee weken heeft gevoeld. Er staat bijvoorbeeld de uitspraak:

Ik voel me ontspannen

Wanneer u dat vindt dat het helemaal klopt dat u zich de laatste twee weken ontspannen heeft gevoeld, plaatst u een kruisje in het linker hokje; dus zo

Ik voel me ontspannen

ja, dat klopt

X

nee,dat klopt niet

Wanneer u vindt dat het helemaal niet klopt dat u zich de laatste twee weken ontspannen heeft gevoeld, plaatst u een kruisje in het rechter hokje; dus zo

Ik voel me ontspannen

ja, dat klopt | | | | | | | | **nee,**dat klopt niet

Wanneer u vindt dat het antwoord niet "ja, dat klopt, maar ook niet "nee, dat klopt niet" is, zet dan een kruisje in het hokje dat het meest overeenkomt met uw gevoel.

Bijvoorbeeld als u zich wel wat ontspannen voelt, maar niet zo erg ontspannen, kunt u het kruisje in een van de hokjes zetten die in de buurt staan van de antwoordmogelijkheid "ja, dat klopt". Dus bijvoorbeeld als volgt:

Ik voel me ontspannen

ja, dat klopt								**nee,**dat klopt niet

Sla geen uitspraak over en plaats telkens één kruisje bij iedere uitspraak.

Ik voel me moe.

Ja, dat klopt								**Nee**, dat klopt niet

Ik zit vol activiteit.

Ja, dat klopt								**Nee**, dat klopt niet

Nadenken kost me moeite.

Ja, dat klopt								**Nee**, dat klopt niet

Lichamelijk voel ik met uitgeput.

Ja, dat klopt								**Nee**, dat klopt niet

Ik heb zin om allerlei leuke dingen te gaan doen.

Ja, dat klopt								**Nee**, dat klopt niet

Ik voel me fit.

Ja, dat klopt								**Nee**, dat klopt niet

Ik vind dat ik veel doe op een dag.

Ja, dat klopt								**Nee**, dat klopt niet

Als ik ergens mee bezig ben, kan ik mijn gedachten er goed bijhouden.

Ja, dat klopt								**Nee**, dat klopt niet

Ik voel me slap.

Ja, dat klopt								**Nee**, dat klopt niet

10. Ik vind dat ik weinig doe op een dag.

Ja, dat klopt								**Nee**, dat klopt niet

11. Ik kan me goed concentreren.

Ja, dat klopt								**Nee**, dat klopt niet

12. Ik voel me uitgerust.

Ja, dat klopt								**Nee**, dat klopt niet

13. Het kost me moeite ergens mijn aandacht bij te houden.

Ja, dat klopt								**Nee**, dat klopt niet

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14. Lichamelijk voel ik me in een slechte conditie.

Ja, dat klopt								**Nee**, dat klopt niet

15. Ik zit vol plannen.

Ja, dat klopt								**Nee**, dat klopt niet

16. Ik ben snel moe.

Ja, dat klopt								**Nee**, dat klopt niet

17. Er komt weinig uit mijn handen.

Ja, dat klopt								**Nee**, dat klopt niet

18. De zin om dingen te ondernemen ontbreekt mij.

Ja, dat klopt								**Nee**, dat klopt niet

19. Mijn gedachten dwalen makkelijk af.

Ja, dat klopt								**Nee**, dat klopt niet

20. Lichamelijk voel ik me in een uitstekende conditie.

Ja, dat klopt								**Nee**, dat klopt niet

Appendix C

Vragenlijst onderzoek vermoeidheid

Datum van onderzoek:

1. Wat is uw geboortedatum?

2. Wat is uw geslacht?
   - o Man
   - o Vrouw

3. Wat is gezinssamenstelling?
   - o Eenpersoonshuishouden
   - o Huishouden met thuiswonende kinderen (0-6 jaar)
   - o Huishouden met thuiswonende kinderen (6+)
   - o Huishouden met kinderen uit huis
   - o Huishouden zonder kinderen

4. Wat is uw hoogst genoten opleiding?
   - o Geen opleiding
   - o Basisonderwijs (lager onderwijs)

- o Lager beroepsonderwijs (LBO, huishoudschool, LEAO, LTS, etc.)
- o MAVO, (M)ULO, 3-jarige HBS, VMBO
- o Middelbaar beroepsonderwijs (bijv, MTS, MEAO)
- o 5-jarige HBS, HAVO, MMS, atheneum, gymnasium
- o Hoger beroepsonderwijs (bijv. HTS, HEAO)
- o Wetenschapelijk onderwijs (universiteit)

5. Wat is de beste omschrijving van uw huidige situatie?
   - o Fulltime werk
   - o Partime werk
   - o Huishouden
   - o School of studie
   - o Werkloos
   - o Arbeidsongeschikt (WAO/WIA)
   - o Gepensioneerd (AOW/VUT)

Hoeveel uur per week besteedt u gemiddeld aan volgende activiteiten?

	niet van toepassing	Gemiddeld meer dan 0 en minder dan 3 uur per week	Gemiddeld meer dan 3 en minder dan 10 uur per week	Gemiddeld meer dan 10 en minder dan 20 uur per week	Gemiddeld meer dan 20 en minder dan 30 uur per week	Gemiddeld meer dan 30 uur per week
Werk						
Studie						
Huishouden(koken, boodschapp en, was,schoon maken)						

Verzorging van mensen in eigen huishouding (bv.kinderen, zieke partner, ouder, etc.)						
Verzorging van mensen buiten eigen huishouding						
Vrijwilligers werk						
Huisdieren						
Tuinieren						

Kruis **elke** aandoening aan waarvoor u het **afgelopen jaar** onder behandeling bent geweest van een huisarts of medisch specialist

- o Infectieziekten (bijv. Ziekte van lyme, malaria, hepatitus, AIDS/HIV
- o Kwaadaardige aandoening of kanker
- o Bloedziekte of aandoening afweersysteem (bijv. stollingsstoornis, sikkelcelanemie)
- o Stofwisselingsaandoening (bijv. diabetes, aandoening aan de (bij)schildklier)
- o Psychische aandoening (bijv. depressie, angststoornis)
- o Aandoening van het zenuwstelsel (bijv. epilepsie, Parkinson, M.S., hernia)
- o Aandoening van de zintuigen (gezichts- of gehoorproblemen)

- Aandoeningen van het hart- of vaatstelsel (bijv. agina pectoris, hartinfarct)
- Aandoening van het ademhalingsstelsel (bijv. astma, longemfyseem, COPD)
- Aandoening van het het spijsverteringsstelsel (maag-, darm-, of leverproblemen)
- Aandoening van de huid (bijv. eczeem, psoriasis)
- Aandoening van urinewegen of geslachtsorganen (bijv. nieraandoening)
- Allergie (bijv. hooikoorts, allergie voor huisstofmijt, voedselallergie)
- Letsel, vergiftiging of gevolgen na een ongeluk/ongeval
- Chronische vermoeidheid (bijv. C.V.S. of M.E.)
- Reumatische aandoening (bijv. atrose, fibromyalgie, reumatoïde atritis)
- Andere hiervoor niet genoemde aandoening