

## The Dutch Future Self-Continuity Scale and its relation to Narrative Psychology

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## **Abstract**

The Future Self-Continuity (FSC) Scale was developed in 2009 by Ersner-Hershfield et al. for assessing perceived future self-continuity. The aim of this study was to construct a Dutch version and to research its potential relevance for narrative psychology. The FSC Scale was translated using the forward-backward method and subsequently pre-tested with a convenience sample comprised of seven respondents, using the Three-Step Test-Interview method. Feedback received during the pre-test was used to improve the scale, resulting in an understandable and culturally and semantically equivalent Dutch version. After this the associations between future self-continuity and resilience, flourishing, mental health, temporal discounting and the Big Five personality traits were researched in an online survey study (N=83, convenience sample). No significant correlations between future self-continuity and these constructs were found. Based on this study it remains unclear what the importance of future self-continuity for narrative psychology is. Possible explanations for the lack of significant correlations and future directions for research are discussed.

## **Samenvatting**

De Future Self-Continuity (FSC) Scale is in 2009 ontwikkeld door Ersner-Hershfield et al. om waargenomen toekomstige zelf-continuïteit te bepalen. Het doel van deze studie was om een Nederlandse versie te maken, die te pre-testen en de relevantie voor narratieve toekomstbeelding en positieve psychologie te onderzoeken. De FSC Scale werd vertaald volgens de forward-backward methode, waarna een pre-test werd uitgevoerd bij zeven respondenten volgens de Three-Step Test-Interview methode. De terugkoppeling die werd ontvangen uit de pre-test is gebruikt om de schaal te verbeteren, resulterend in een begrijpelijke en cultureel en semantisch equivalente Nederlandse versie. Hierna werden de associaties tussen toekomstige zelf-continuïteit en weerbaarheid, bloei, mentale gezondheid, temporele devaluering en de Big Five karaktertrekken onderzocht met behulp van een questionnaire onderzoek (N=83). Er werden geen significante correlaties gevonden tussen toekomstige zelf-continuïteit en deze constructen. Op basis van deze studie blijft het onduidelijk wat het belang is van toekomstige zelf-continuïteit voor narratieve en positieve psychologie. Mogelijke verklaringen voor het gebrek aan significante correlaties en richtingen voor toekomstig onderzoek worden behandeld.

Self-continuity is the sense that one retains continuity and identity through time, despite changes in appearance, personality, desires and the like (Lampinen, Odegard & Leding, 2004). A sense of self-continuity is crucial to learning, taking responsibility and planning future action (Sani, 2008). It can be shaken by life events that bring radical change, such as unemployment or death of a loved one. But ultimately it functions as a “backbone of the self” (Sadeh & Karniol, 2012, p. 93), giving stability amidst life’s changes. It is always there and we live by it, rarely giving it a second thought. Of course I will still stay ‘me’ throughout my life.

Matters are not that simple however. Research suggests that people tend to think about their future selves as they would about other people. Pronin and Ross (2006) discovered that people ascribe traits to their future self as they would to others (observer-like) as opposed to their current self (actor-like). This corresponds with Ersner-Hersfield, Wimmer and Knutson (2009), who found that neural activation when thinking about ones future self is similar to neural activation when thinking about others. Apparently how we see our current self now is not quite the same as how we see our future self.

Although quite a new subject in behavioral research, the concept of self-continuity is not new in the field of philosophy. A well-known thought experiment known as the Ship of Theseus illustrates this subject is not clear cut (Lampinen et al., 2004). Imagine yourself owning a ship made of wood. One day you discover one of the planks is rotten, and you replace it. If someone would ask you ‘Are you now the owner of a new ship?’ the answer of most people would be ‘No, of course not’. This is still the same ship, despite the fact that one part was replaced. Imagine that the next day you discover another plank to be broken, and you replace this one too. Now imagine doing this day after day for a long time, each day replacing another small part of the ship. When no single part of the ship remains original, is it still the same ship? And what if you did all the replacing in just one day, would that make a difference? If we extend this thought experiment to people, it gets interesting. People constantly change: children grow up, opinions are changed, certain character traits may appear or disappear through the years and the list of possible changes goes on. People generally have the idea that they are the same person throughout their existence, a sense of self-continuity, but are they really after change upon change? According to the philosopher Parfit (1971), one could even view one’s future self as a totally different person from one’s current self.

This subject of experiencing (dis)continuity with one's future self has come to be called future self-continuity in recent research (Ersner-Hershfield, Garton, Ballard, Samanez-Larkin & Knutson, 2009; Hershfield, 2011; Hershfield, Cohen & Thompson, 2012). This concept is not only philosophically interesting, but also has practical implications for decision making. Because when your future self is as close to you as a stranger, why would you put aside immediate gratification for the benefit of that future self? Different studies have shown that people who experience a high sense of future self-continuity tend to save more money in the bank compared to people who experience a low sense of future self-continuity (Ersner-Hershfield et al., 2009; Hershfield, 2011).

Lampinen et al. (2004) and McAdams (2004) suggest that a sense of a unified self is formed by the creation of a life story. This means that people derive their sense of unity, purpose and place in life from a continuously evolving narrative that places them in relation to the world around them. Every experience is learned from and added to this narrative, and therefore important to a sense of self-continuity. This suggests that the positive constructs that are important in the field of narrative psychology, such as flourishing and resilience, may also be related to future self-continuity. Sools and Mooren (2012) for example describe how narrative futuring (imagining one's own future) may enhance resilience. Indications that self-continuity may be related to constructs relevant in narrative psychology can also be found in different empirical studies. Since the subject of future self-continuity is relatively new in psychology, these studies do not provide definitive evidence, but do warrant further research because of the link with self-continuity.

Mental health and flourishing are closely related to each other, and may be related to future self-continuity. Mental health is described by Keyes (2005) as a state wherein people not only are free of psychopathology, but also transcend being 'mere' psychologically healthy. In that state people also experience high emotional, psychological and social wellbeing. In other words, they flourish. In a qualitative study, Bozinovski (2000) describes how elderly people who neglect to care for themselves were often doing so as a (counterproductive) way of maintaining self-continuity when they experience chaos, uncertainty or lack of information. This of course is not as to say that striving for self-continuity leads to self-neglect. In fact, this shows to what length people go and how much energy they will spend to preserve their perceived self-continuity. Furthermore, the self neglect of elderly people who experienced decreased self-continuity serves as an additional indication that self-continuity is not only a continuous goal for people, but also an important factor in mental health.

With regard to the connection between self-continuity and resilience, Sadeh and Karniol (2012) found that a sense of self-continuity was related to the ability to cope with unemployment and argued that self-continuity is a general resource for coping with crises. They assessed the coping abilities and sense of self-continuity among employed and unemployed Israeli's. Unsurprisingly they found that work loss resulted in a sense of decreased self-continuity. Interestingly they also found that the unemployed individuals who reported higher self-continuity also significantly more often reported the use of adaptive coping strategies, as opposed to the maladaptive coping strategies used by unemployed individuals who reported lower self-continuity. What Sadeh & Karniol (2012) describe is very similar to what Windle, Bennett and Noyes (2011) describe as resilience, or in other words, the ability to bounce back after a difficult or traumatic life event. Leontjevas, Op de Beek, Lataster and Jacobs (2014) recognize resilience as an important factor not only within the theoretical paradigm of positive psychology, but also in the practical realm of rehabilitation after traumatic events. Rasmussen, Wrosch, Scheier and Carver (2006) summarize a number of studies concerning the effect of optimism on physical recovery, emotional distress and life satisfaction of coronary and cancer patients. These studies show that optimism as opposed to pessimism leads to better and quicker physical results and higher reported satisfaction with life in recovering coronary patients. Optimism was inversely correlated with emotional distress in cancer patients. This corresponds with the effects of flourishing (Keyes, 2005; Diener et al., 2010) and resilience (Smith et al., 2008; Windle et al., 2011). As we have seen (Sadeh & Karniol, 2012), negative life events such as becoming unemployed can decrease the sense of self-continuity. The fact that flourishing, resilience and optimism are positively related to coping with negative life events suggests that these constructs may also be positively related to self-continuity.

Another example of a possible connection between positive constructs and self-continuity can be found in the research of Meevissen, Peters and Alberts (2011). They describe an intervention in which imagining one's best-possible-self increased levels of optimism. One group of respondents was instructed to imagine their best possible self's (BPS) every day for five minutes during two weeks. The control group was instructed to think about their daily activities every day for five minutes during two weeks. At baseline measurement, no significant differences between the control en experimental groups were found. The one week and two week measurement however showed that the experimental group reported significantly higher levels of optimism than the control group. This showed that the way a person sees himself has significant impact on his

level of optimism. As Peters, Flink, Boersma and Linton (2010) mention, imagining ones BPS leads to an increase in positive future expectancies and a decrease in negative future expectancies. Strahan and Wilson (2006) found that the presence of BPS through an intervention was a predictor of school attendance among young delinquents. Overall, they found that having a positive image of one's future self has a positive impact on behavior that impacts ones future (i.e. training, studying and saving). Although these studies were about ones BPS and not future self-continuity, this still is an indication that one's image of the self may have an effect on optimism and motivation, and thus indirectly on flourishing (Diener et al., 2010). The constructs of BPS and future self-continuity are both similar in the aspect that both are relevant for the future.

Compared with associations between self-continuity and positive psychological constructs, even less is known about the relation between personality traits and future self-continuity. However, this may provide interesting lines of research since personality traits can be important predictors. In a meta-study, Roberts, Kuncel, Shiner, Caspi and Goldberg (2007) concluded that personality traits are as important to predicting important life outcomes (marital happiness, occupational success, etc.) as are social-economic status and cognitive ability.

Closely linked to future self-continuity is temporal discounting (Bartels & Urminsky, 2011; Magen, Dweck & Gross, 2008; Hershfield, 2011), the principle that people tend to value immediate consequences more than future consequences. If one feels not connected to one's future self, the effect of temporal discounting is theorized to be greater compared to when one has a larger sense of connectedness (Ersner-Hershfield et al., 2009; Frederick, 1999). In fact, Ersner-Hershfield et al. (2009) found a connection between perceived future self-similarity and temporal discounting, confirming the theories. This suggested that participants with higher future self-similarity were less impulsive than participants with low future self-similarity. Van Gelder, Hershfield and Nordgren (2013) strengthened this notion by discovering that the ability to imagine one's future self was negatively correlated with the immediate gratification associated with delinquency. Participants in the experimental group were instructed to write a letter to their future self, which was intended to activate a vivid image of their future self. They, as opposed to the control group, made less delinquent choices when presented with various scenarios. Van Gelder et al. (2013) also reported another experiment in which participants in the experimental group viewed a computer model of how their future self might look like. They, as opposed to the control group, less often

cheated on a subsequent task. Although this construct is not related to narrative psychology, it apparently is relevant to future self-continuity.

Future self-continuity is most commonly measured using the Future Self-Continuity Scale (FSC Scale) made by Ersner-Hershfield et al. (2009). They were not the first to measure future self-continuity (Frederick, 1999), but they were the first to do so with a scale with reported reliability and validity. This scale has only been validated in English up to this date. They constructed the FSC Scale by adapting the Inclusion of Other in the Self (IOS) Scale used by Aron, Aron and Smollan (1992), without clearly justifying why future self-continuity could be measured using this specific IOS Scale as a format. The IOS Scale was used as a measure for closeness, but Ersner-Hershfield et al. (2009) quickly abandoned the meaning of connectedness that it had in Aron et al. (1992). There the IOS was found to effectively measure feeling close and behaving close in the context of parent-child and marital relationships. It was furthermore associated with scale ratings of love and friendship. Aron et al. (1992) always used the IOS as a measure for a relationship between two individuals. Instead Ersner-Hershfield et al. (2009) operationalized future self-continuity as perceived future self-similarity, applying the scale to an individual's image of himself. This was not the original intention of the scale, so the FSC Scale should not be directly accepted as a valid measure on the basis of it being an adaptation of the IOS Scale. Findings on the Me/Not Me Task they incorporated in their studies however validated the FSC Scale. Respondents ascribed character traits to their current self and their future self. Respondents with a high sense of future self-continuity ascribed significantly more the same traits to their current and future self (i.e. impulsive now and in the future), as opposed to respondents with a low sense future self-continuity. Ersner-Hershfield et al. (2009) also found a negative correlation between future self-continuity and temporal discounting. They furthermore found that people with a high sense of future self-continuity had more savings in the bank than people with a low sense of future self-continuity, even when corrected for age. These results are quite interesting, especially from an economic point of view. Hershfield et al. (2009) found neural indications that information relevant to one's current self activated the anterior cingulate cortex, which did not activate when participants were presented with information relevant to their future self. Furthermore, they found individual differences in the amount of brain activity in that area and discovered that these differences predicted the tendency to temporal discounting.



With recent research having established that future self-continuity is a relevant concept from an economical and neural standpoint, a logical next step is to further examine its relevance in narrative futuring and other psychological constructs. Therefore the aims of this study were to construct an online, Dutch version of the Future Self-Continuity Scale (FSC Scale) (Ersner-Hershfield et al., 2009) and to explore the relation between future self-continuity and several promising concepts prevalent in narrative and positive psychology: resilience, flourishing and mental health. The relation with temporal discounting is also examined to replicate the findings of Ersner-Hershfield et al. (2009). Connections with personality traits (as described by the Big Five) are also explored. Research surrounding this concept is still in the early stage and this study aims to contribute to the growing body of knowledge. A further benefit, besides advancing knowledge in this field, would be the creation of a single-item measuring device that can be used in fundamental research, screening procedures and behavioral predicting.

Based on the available research it is hypothesized that a valid measure of future self-continuity is at least moderately positively correlated with resilience, flourishing and mental health, and at least moderately negatively correlated with temporal discounting. No prediction is made about associations with personality traits, since that line of research is purely exploratory at this point.

## **Method**

### **Translation**

The Future Self-Continuity Scale used by Ersner-Hershfield et al. (2009) and its instruction were translated from English to Dutch following the forward-backward method described by Beaton, Bombardier, Buillemin and Ferraz (2000). First the FSC Scale was translated to Dutch by a content expert and methodological expert from the University of Twente, who both have Dutch as their first language. These translations were then discussed and synthesized into one version by the first translator and the author of this thesis. That version was translated back to English by an independent bilingual translator without domain-specific expertise on the concept being measured, and with English as his first language. His translation was reviewed and compared to the previous translations by the author of this survey. A pre-final version was then produced which was reviewed and approved by the first two Dutch translators. This procedure facilitated a thorough and semantically and culturally equivalent translation. Step 5, as described by Beaton et al. (2000) is outlined below as the pre-test phase of this research.

### **Pre-test**

A new or translated test is not per definition immediately ready for use. Respondents may have trouble comprehending, retrieving information, judging and responding to questions (Tourangeau, 1984; Beaton et al., 2000). A pre-test was used to identify potential problems with the FSC Scale. This was done using the Three-Step Test-Interview (TSTI) method as described by Hak, Van der Veer and Jansen (2008). The goal was to collect observational data of respondents interacting with the FSC Scale. Following three steps, the respondents were encouraged to think aloud while completing the scale, they were probed for any gaps in their thinking aloud process and they were asked to explain their response behavior and give feedback afterwards.

For this a total of seven people (two females) were observed, ranging from the age of seventeen to thirty-four. These were recruited via social media or via the personal network of the author. The first seven people who responded were interviewed. Respondents were presented with the translated scale (figure 1) on a computer screen, using the survey program Qualtrics.

Welk plaatje geeft het best weer in hoeverre u zich overeen voelt komen met uw toekomstige zelf (over 10 jaar)?

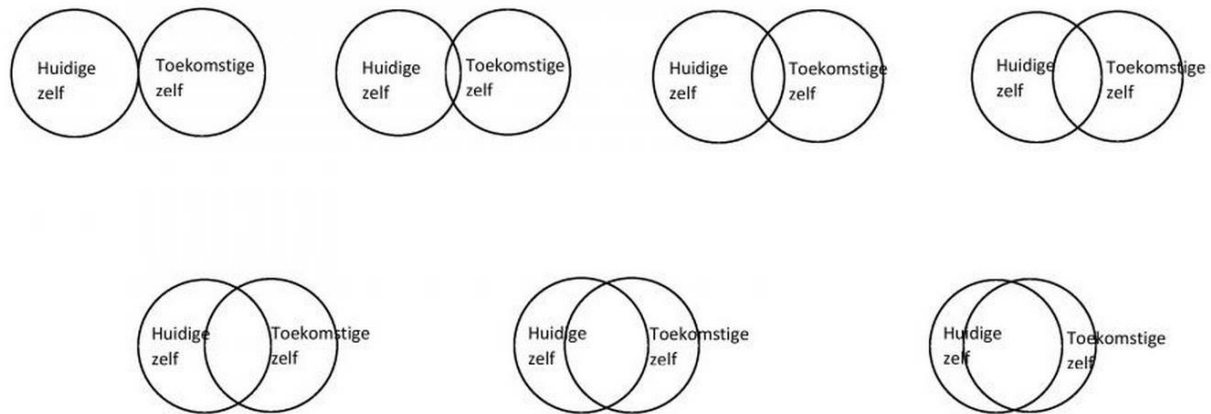


Figure 1. Future Self-Continuity Scale NL version 1

During the first step, respondents were instructed to complete the scale and at the same time ‘think aloud’. Thinking aloud was explained as ‘to say out loud anything that comes to mind while making this test.’ Respondents were encouraged to not give feedback or explanations about their thoughts. Prior to this step an exercise was done to get respondents used to thinking aloud. This was done by asking respondents to describe in detail their last visit to the supermarket (Hak et al., 2008). Responses to the FSC Scale were then recorded by the observer using paper and pen. Step two consisted of asking respondents about the gaps during which they did not think aloud, using the notes from step one. This was done to complement the data from step one. Step three was a semi-structured interview. Respondents commented on their own response and were asked to give possible explanations for their answers and the problems they encountered. They furthermore provided feedback about the content, wording and layout of the test. Recurring statements and opinions were noted.

### Online survey study

Phase 3 consisted of researching correlations with FSC Scale. Respondents were recruited using social media and email. An open link to the survey was posted on social media (two times, one week apart) and sent along with the emails containing the request if the reader/receiver would complete this survey. Inevitably this means that a large portion of the respondents came from the

social network of this thesis' author. Of the 117 people who started the survey, 83 (70.9%) also completed it. In this survey, correlations of future self-continuity with resilience, flourishing, mental health, impulsivity and the Big Five personality traits were investigated. This was done by combining the Future Self-Continuity Scale (FSC Scale), Brief Resilience Scale (BRS), Flourishing Scale (FS), Mental Health Continuum – Short Form (MHC-SF), Delay Discounting Task (DDT) and the Ten Item Personality Inventory-r (TIPI-r) into one online survey. Based on the available literature, we expected to find at least moderate correlations ( $.3 < r < .5$ ) between the FSC Scale and the BRS (Sadeh & Karniol, 2012), FS and MHC-SF (Van Gelder et al., 2013; Rasmussen et al., 2006). A negative moderate correlation was expected for the DDT (Ersner-Hersfield et al., 2009; Hersfield, 2011). Using Qualtrics to make the survey allowed for coding in such a way that half of the respondents received the FSC Scale as their first question and the other half received it as their last question. This distribution was done randomly. Since most of the tests required respondents to think about themselves, their own character, their relations with others and much more, we suspected this would have a priming effect on responses on the FSC Scale (Strack, 1992; DeMoranville & Bienstock, 2003). The random distribution was done to negate that effect.

### **Brief Resilience Scale – Dutch Version**

The Brief Resilience Scale (BRS) (Smith et al., 2008) is a short measure, aimed at assessing the ability to bounce back or recover after stress. The designers specifically made a conceptual and statistical distinction between recovering after stress and other resilience resources, such as the ability to adapt or thrive. The scale consists of six items, of which three are to be reverse coded. Participants recorded their answer on a 5-points Likert scale, from 'strongly disagree' to 'strongly agree'. The final score was calculated by taking the mean of all items. High scores were indicative of more resilience. Validation was done using two student samples, a cardiac patient sample and a chronic pain patient sample. Internal consistency was good with Cronbach's alpha ranging 0.80 to .91. Test-retest reliability (using intra-class correlation) was also good with scores of .69 and .62 in two different samples. Using an array of resilience-, personal-, coping-, social- and health related measures, the BRS was found to correlate positively with i.a. optimism ( $r=.45$ ), acceptance ( $r=.43$ ), positive reframing ( $r=.40$ ) and positive affect ( $r=.46$ ) in the first sample. Negative correlations were found for i.a. perceived stress ( $r=-.60$ ), anxiety ( $r=-.46$ ), depression ( $r=-.41$ ) and negative

affect ( $r=-.34$ ). In a large review of resilience related measures Windle et al. (2011) assessed the BRS to have a Cronbach's alpha between .70 and .95 in four different samples, making it one of the better alternatives in this field.

The Dutch version used in this research was found to be accurate in recognizing the absence of depression and anxiety, in fact more so than the RSnl (Resilience Scale Dutch version). Internal consistency was good with a Cronbach's alpha of .83. In line with the English version, the BRSnI was related to positive outcomes and inversely related to negative outcomes such as depression, anxiety and negative affect (Leontjevas et al. 2014).

### **Flourishing Scale – Dutch Version**

The Flourishing Scale (FS) was developed by Diener et al. (2010) to measure one's self-perceived success in areas like relationships, optimism, self-esteem and purpose. The total score on its eight items form a psychological well-being score. Respondents answered each item on a 1-7 scale, ranging from 'strong disagreement' to 'strong agreement'. High scores in this case indicate a high level of self-perceived flourishing. Using a large sample size ( $N=689$ ) Diener et al. (2010) found a Cronbach's alpha of .87. The factor loadings ranged from .61 to .77, suggesting one strong factor being measured. When compared to other well-being scales, the FS correlated with the Satisfaction With Life scale ( $r=.62$ ), Life Orientation Test (assesses optimism, low score is optimistic) ( $r=-.59$ ) and the University of California Los Angeles Loneliness Scale ( $r=-.28$ ). Hone, Jarden and Schofield (2014) further validated the FS using a large sample New Zealanders ( $N=10009$ ). They confirmed the one-factor structure and found correlations with happiness ( $r=.67$ ,  $p<.01$ ) and life satisfaction ( $r=.64$ ,  $p<.01$ ). A Portuguese study (Silva & Ceatano, 2014) reported similar results, correlating the FS with the Subjective Happiness Scale ( $r=.58$ ,  $p<.01$ ) and Satisfaction with Life Scale ( $r=.49$ ,  $p<.01$ ). They also confirmed the one-factor structure found by Diener et al. (2010).

### **Mental Health Continuum – Short Form – Dutch Version**

The Mental Health Continuum–Short Form (MHC-SF) is a categorical measure for the presence and absence of mental health. Keyes et al. (2008) validated it using a large group ( $N=1050$ ) South Africans. The three relevant factors are emotional, psychological and social well-being. This measure consisted of fourteen items of six-points Likert scales. Answers ranged from 'never' to 'every day' at which respondents reported the frequency of a certain feeling during that month.

The total score was the sum of all item scores, with items 1-3 forming the subscale emotional wellbeing, items 4-8 social wellbeing and items 9-14 psychological wellbeing. The Cronbach's alpha for the total MHC-SF was .74. Correlations were found i.a. with the Affectometer Positive Affect Scale ( $r=.52$ ,  $p<.001$ ), Generalized Self-Efficacy Scale ( $r=.39$ ,  $p<.001$ ) and the Satisfaction With Life Scale ( $r=.37$ ,  $p<.001$ ) (Keyes et al. 2008).

Lamers, Westerhof, Bohlmeijer, Ten Klooster and Keyes (2011) translated the MHC-SF to Dutch. Content and scoring remained the same. A sample of 1662 Dutch respondents took part in that research. Internal consistency was found to be high for the total MHC-SF ( $\alpha=.89$ ), the emotional well-being subscale ( $\alpha=.83$ ), the psychological well-being subscale ( $\alpha=.83$ ) and adequate for the social well-being subscale ( $\alpha=.74$ ). Correlations were found for the Satisfaction With Life Scale ( $r=.36$ ,  $p<.001$ ), for happiness ( $r=.36$ ,  $p<.001$ ), positive affect ( $r=.29$ ,  $p<.001$ ), self-esteem ( $r=.34$ ,  $p<.001$ ) and mental illness ( $r=-.33$ ,  $p<.001$ ). Lamers et al. (2011) furthermore confirmed the three-factor model found by Keyes et al. (2008).

### **Delay Discounting Task**

Kirby & Marakovic (1996) created a delay-discounting task to measure impulsivity. In this task respondents ( $N=627$ ) were presented with twenty-one financial choices. Each item forced the respondent to choose between a) a monetary reward received directly and b) a greater monetary reward received after a delay. By varying the amounts of money and the delay it was possible to calculate discount-parameter for each individual. Kirby and Marakovic used both a hyperbolic function ( $V=A/(1 + kD)$ ) and exponential function ( $V=Ae^{-kD}$ ), function for this, to check for differences between these functions. In these functions  $V$  is the present value of the delayed reward,  $A$  is the amount of the delayed reward,  $D$  is the delay and  $k$  is the discounting rate parameter. However, results on these two different functions did not differ significantly. Respondents were assigned to one of twenty-two impulsiveness ranges bases on their score.

No Dutch version was available, so the author of this research translated the instructions himself. Dollar signs were replaced with Euro signs, the amounts of money remained the same. Because of the complex scoring involved in Kirby & Marakovic's (1996) test, the author of this survey chose to follow the procedure of Magen et al. (2008). Scores were defined as the sum of the respondent's choices for the delayed reward as opposed for the direct reward.

### **Ten-Item Personality Inventory-r – Dutch Version**

The TIPI-r (Denissen, Geenen, Selfhout & Van Aken, 2007) is a measure aimed at assessing the Big Five personality traits in social network designs. It consists of five bipolar items, each assessing a different trait. The TIPI-r is an adaptation of the TIPI (Gosling, Rentfrow & Swann, 2003), which measures the same traits but uses ten unipolar items. Translation to Dutch and adaptation of the TIPI-r was done by Denissen et al. (2007). Items are scored on a 7-points Likert scale, which gives a 1-7 score on each Big Five trait. The sample used for reliability and validity research consisted of 205 psychology freshmen. Factor loadings for Extraversion, Neuroticism, Openness, Conscientiousness and Agreeableness were .75, .78, .77, .72 and .71 respectively. This corresponds with Cronbach's alphas of .56, .61, .59, .52 and .50 respectively. Test-retest reliability was found to be .75, .73, .70, .71 and .58 respectively. Validation was done by comparing results on the TIPI-r with results on the Big Five Inventory. Correlations were .68, .59, .66, .70 and .68 respectively ( $p < .01$  in all cases).

### **Analyses**

All tests were checked for internal consistency using Cronbach's Alpha, except for the FSC Scale and the TIPI-r since that are single-item tests. Normal distributions of the responses on the tests were checked using the Kolmogorov-Smirnov test. Correlations between the FSC Scale and the other tests were examined using Spearman's Rho.

## **Results**

### **Translation**

The concepts of ‘current self’ and ‘future self’ were translated as ‘huidige zelf’ and ‘toekomstige zelf’. On this the translators agreed separately. They also translated the instruction ‘Which picture best describes how similar you feel with your future self (ten years from now)?’ Both translations were very similar, except for the translation of the concept of similarity. The first translator translated this as ‘vergelijkbaar’, the second as ‘verwantschap’. However, ‘vergelijkbaar’ was difficult to use in a grammatically correct manner and ‘verwantschap’ was thought to be too ambiguous after discussion with the first translator. After discussion with the first translator the instruction was synthesized to ‘Welk plaatje geeft het best weer in hoeverre u zich overeen voelt komen met uw toekomstige zelf (over 10 jaar)?’.

The bilingual translator translated this back to English, posing two options. The first one was ‘Which image best represents how you see your future self (in 10 years)?’ The second was ‘Which image best represents to what extent you feel yourself matching up to your future self (in 10 years)?’ His first translation did not fully capture the intended content since perceived similarities between the present and the future are not clearly addressed in that question. His second translation however does contain that intention. It makes the distinction between a present self and a future self and inquires about the relation between them.

### **Pretest**

Respondents in the TSTI phase ranged from seventeen to thirty-four years old and all had higher (HBO) or academic (WO) education. There were significant differences regarding the time it took people to answer, the shortest time being just a few seconds and the longest time being approximately two minutes. Two out of seven were female. Overall there were only minor problems with understanding the question. Five respondents remarked that the item’s layout caused confusion. This had to do with either the fact that the seven possible answers were presented in two rows, or the hard to find ‘next question’ button. Four of the respondents made a distinction between personality and external circumstances such as future place of residence, future job, marriage and unexpected life events. All four marked personality as stable and circumstances as subject to change.



One respondent thought the wording ‘overeen komen’ to be very general and ambiguous. Another respondent reported trouble with the words ‘...u zich overeen voelt komen...’ because he felt this should be a more objective than subjective question. The remaining five reported no difficulty regarding the semantics or concept of the question, even when probed.

The wording did not need to be changed after this phase. However, the feedback concerning the layout was used to update the scale. The words positioned in the circles in the first version of the scale (figure 1) were often seen as confusing, as was the fact that the seven options were presented in two rows. In the second (and final) version (figure 2) the words were replaced by colors, yellow for ‘jouw huidige zelf’ and blue for ‘jouw toekomstige zelf’ (‘your current self’ and ‘your future self’ respectively). A legend was added to explain the meaning of the colors.

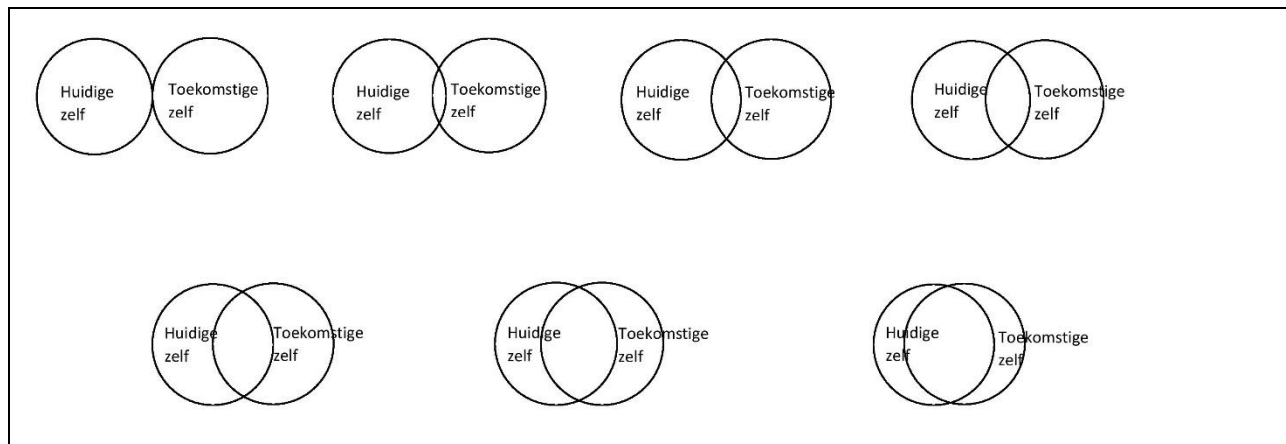


Figure 1. Future Self-Continuity Scale Version 1

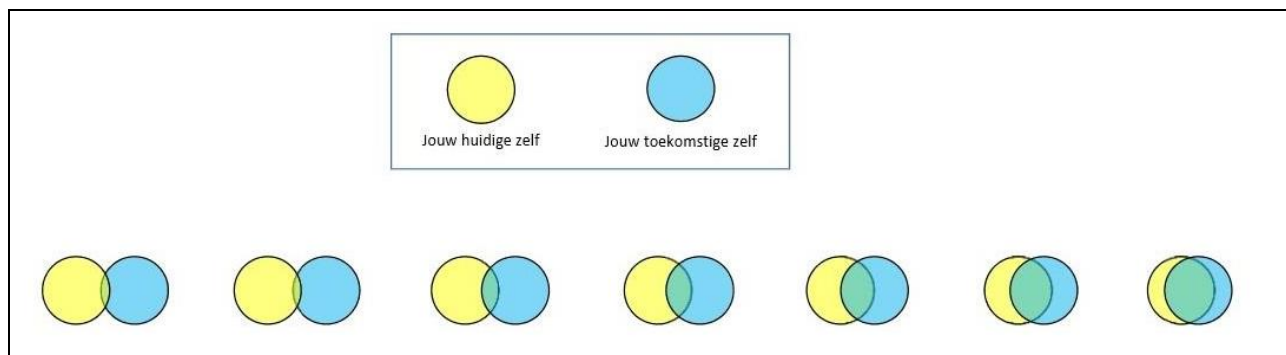


Figure 2. Future Self-Continuity Scale Final Version

## Online survey study

### Respondents and Scores

Age and education levels in this sample were relatively skewed towards low age and high education (Table 1). Kolmogorov-Smirnov tests showed that neither age ( $p < .001$ ) nor education ( $p < .001$ ) were distributed normally. The range of 18-24 years accounted for 60% of the respondents. High education levels (HBO or WO) accounted for 77% of the respondents.

*Table 1: Gender, education and age distribution of respondents*

<i>Variable</i>	<i>n (%) or M (SD)</i>
Gender, n (%)	
Female	41 (49.4)
Male	42 (50.5)
Education, n (%)	
Low	1 (1.2)
Medium	18 (21.7)
High	64 (77.1)
Age in years, M (SD)	34 (19)

*Note:* Low education was defined as Geen opleiding, Basisonderwijs and Lager beroepsonderwijs (huishoudschool, LTS, etc.). Medium education was defined as MAVO, MULO, VMBO, MBT, MTS, HBS, HAVO, atheneum and gymnasium. High education was defined as HTS, HBO and WO (universiteit).

*Table 2: Scores on the FSC Scale, BRS, FS, MHC-SF, DDT and TIPI-r*

<i>Test</i>	<i>M (SD)</i>	<i>Range</i>
FSC Scale	4.70 (1.96)	6.00
BRS	3.13 (0.70)	3.50
FS	44.10 (5.97)	34.00
MHC-SF	3.90 (0.79)	4.00
DDT	12.63 (5.49)	21.00
TIPI-r E	3.63 (1.62)	6.00
TIPI-r A	2.92 (1.22)	5.00
TIPI-r C	2.77 (1.53)	6.00
TIPI-r N	4.80 (1.54)	6.00
TIPI-r O	3.92 (1.66)	6.00

*Note:* Mean, standard deviation and range of scores on the Future Self-Continuity Scale, Brief Resilience Scale, Flourishing Scale, Mental Health Continuum Scale – Short Form, Delay Discounting Task and the Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness subscales of the Ten Item Personality Inventory-r.

### **Normality**

Normality could not be assumed for the psychometric tests in this survey, since most of the tests were quite short (Pallant, 2007). Using Kolmogorov-Smirnov it was found that none of the tests were normally distributed ( $p$  ranging from 0 to .006), save for the BRS ( $p=.064$ ). However, after looking at the histogram for the BRS it was decided to also use non-parametric analyses in analyzing the BRS. The FSC Scale also was not distributed normally ( $p<.001$ ), which can be seen in figure 3. Notably, the majority of the respondents selected option 3 or 7, and none of the respondents selected option 5.

### *Distribution of scores on the FSC Scale*

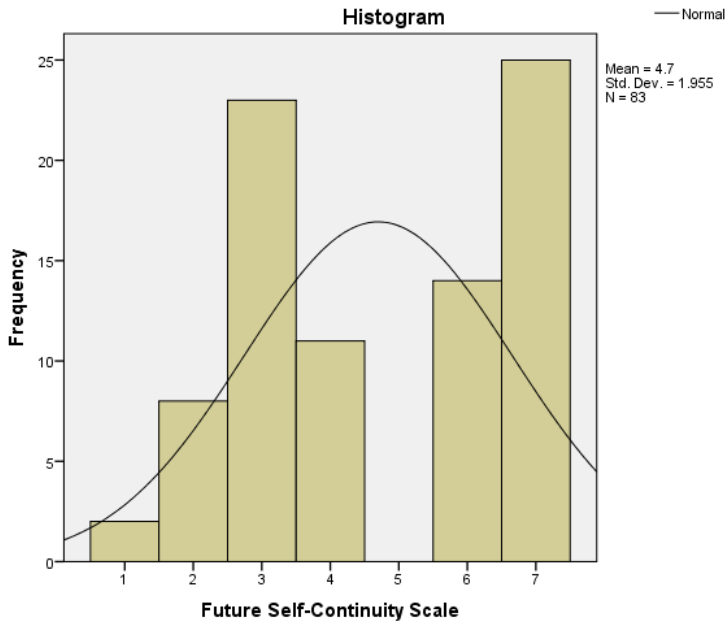


Figure 3. Distribution of scores on the Future Self-Continuity Scale with added normal curve.

### **Reliability of the BRS, FS, MHC-SF and DDT**

Internal consistency for all multi-item scales were good. Cronbach's Alpha was .802 for the BRS, .858 for the FS, .882 for the MHC-SF and .930 for the DDT. Internal consistency could not be computed for the FSC Scale and the TIPI-r since they are single-items tests.

### **Correlations between measures: FSC Scale, BRS, FS, MHC-SF, DDT and TIPI-r**

The correlations between the FSC Scale and the other tests were investigated using Spearman's Rho, results are presented in table 2.

Table 3: Correlations of the FSC Scale with the BRS, FS, MHC-SF, DDT and TIPI-r

Test	Pearson's Rho	P (2-tailed)
BRS	.082	.461
FS	-.058	.605
MHC-SF	-.004	.968
DDT	-.083	.454
TIPI-r E	.065	.558
TIPI-r A	.089	.426
TIPI-r C	.001	.992
TIPI-r N	.035	.756
TIPI-r O	-.056	.613

Note: Pearson's Rho correlations between the Future Self-Continuity Scale, Brief Resilience Scale, Flourishing Scale, Mental Health Continuum Scale – Short Form, Delay Discounting Task and the Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness subscales of the Ten Item Personality Inventory-r.

Contrary to expectations, none of the tests correlated significantly with scores on the FSC Scale. That means that the hypotheses of positive moderate correlations between the FSC Scale and the BRS, FS and MHC-SF and a negative moderate correlation between the FSC Scale and the DDT can be rejected. The insignificant correlation between the FSC Scale and the TIPI-r subscales suggests there is also no relation between future self-continuity and any of the personality dimensions.

### Other measures

Next correlations were computed between the FSC Scale and age ( $r=.136$ ,  $p=.221$ ), gender ( $r=-.009$ ,  $p=.933$ ) and education ( $r=-.036$ ,  $p=.744$ ). Since neither of these were normally distributed in this sample Spearman's Rho was used again. None of these demographic variables correlated significantly with scores on the FSC Scale. Because of the sharp contrast in low and high scores on the FSC Scale, an independent samples t-test was conducted to see if there was a significant difference between participant low scores (1-4) and high scores (5-7) on the FSC on any of the other tests. As can be seen in table 4, this did not yield any significant results, which means that the distribution of low and high scores on the FSC Scale is not the cause of the insignificant correlational results.

Table 4: Independent samples t-test for low and high scores on the FSC Scale

Variable	M (SD)		<i>t</i> (two-tailed)	95 % CI	
	<i>FSC-low</i>	<i>FSC-high</i>		<i>LL</i>	<i>UL</i>
BRS	3.083 (.761)	3.188 (.634)	.501	-.413	.203
FS	44.730 (6.151)	43.380 (5.743)	.309	-1.267	3.952
MHC-SF	3.987 (.830)	3.799 (.748)	.283	-.158	.535
DDT	8.180 (5.691)	8.590 (5.310)	.738	-2.821	2.006
TIPI-r E	3.390 (1.434)	3.900 (1.789)	.153	-1.216	.194
TIPI-r A	2.860 (1.231)	2.97 (1.224)	.683	-.648	.427
TIPI-r C	2.800 (1.651)	2.740 (1.390)	.878	-.619	.723
TIPI-r N	4.700 (1.636)	4.900 (1.429)	.571	-.868	.482
TIPI-r O	4.050 (1.555)	3.770 (1.784)	.453	-.453	1.005

*Note:* Results of an independent samples t-test of low (1-4) and high (5-7) scores on the Future Self-Continuity Scale when compared with Brief Resilience Scale, Flourishing Scale, Mental Health Continuum Scale – Short Form, Delay Discounting Task and the Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness subscales of the Ten Item Personality Inventory-r. CI = Confidence Interval; LL = Lower Limit; UL = Upper Limit

## **Discussion**

### **Overall conclusion**

Recent research suggests a possible connection between future self-continuity and prevalent concepts of narrative and positive psychology. This study developed a Dutch version of the Future Self-Continuity (FSC) Scale and examined associations with resilience, mental health, flourishing, temporal discounting and the Big Five personality traits. The results of the study showed that future self-continuity was not significantly associated with any of the researched constructs.

During the first phase of this research, a Dutch version of the Future Self-Continuity Scale (Ersner-Hershfield et al., 2009) was developed, successfully using the forward-backward method described by Beaton et al. (2000), to produce a semantically and culturally equivalent translation. During the second phase, this Dutch version of the FSC Scale was pre-tested on seven participants, using the thinking aloud procedure as described in the Three-Step Test-Interview (TSTI) method (Hak et al., 2008). In the third phase, an online questionnaire was distributed to research correlations between future self-continuity and resilience, flourishing, mental health, temporal discounting and the Big Five personality traits. It was hypothesized that at least a moderate positive correlation would be found between future self-continuity and resilience, flourishing and mental health (Sools & Mooren, 2012; Sadeh & Karniol, 2012; Bozinovski, 2000; Keyes, 2005, Rasmussen et al., 2006). At least a moderate negative correlation was hypothesized between future self-continuity and temporal discounting (Ersner-Hershfield et al., 2009; Hershfield, 2011; Van Gelder et al., 2013). No predictions were made about associations with the Big Five personality traits, since that line of research is purely exploratory at this point. None of the expected correlations were found in this research, none of the constructs was significantly associated with future self-continuity.

### **Possible explanations**

There are a number of possible explanations for the unexpected results found in this study. However, there are a number of factors that contribute to the reliability of this study.

First is the fact that scientific methods were used during the translation and pre-testing phase of the construction of the Dutch version of the FSC Scale.

A second factor is that possible priming effects in the questionnaire were negated by distributing participants randomly among two different versions. Random distribution took place, however it was not possible with the used survey program (Qualtrics) to record which participant had received which version. Podsakoff, P.M., MacKenzie, Lee and Podsakoff, N.P. (2003) describe how an item in a questionnaire can make information that is related to that item more salient to the respondent. In this current research that means that if a respondent is required to answer items about his resilience, mental health and so forth, and then at the end of the questionnaire is presented with the FSC Scale, his answer could be influenced by the thoughts that became salient by answering the previous items (Salancik, 1984; Strack, 1992; DeMoranville & Bienstock, 2003). Of course this effect also takes place when the order of the questionnaire were to be reversed, the FSC Scale would cause priming for the rest of the items. This was especially relevant in this current study, since the researched constructs were theorized to be related. Therefore priming could produce artificial covariation between these constructs (Podsakoff et al., 2003). The priming effects could not be assessed due to the way the survey was coded in Qualtrics, but the possible priming effects were, at least partially, negated.

Coding the results of the Delay Discounting Task, used to measure temporal discounting, as described by Kirby and Marakovic (1996) proved to be mathematically challenging. Instead the choice was made to use the method described by Magen et al. (2008). An individual's discount rate was indexed by counting the number of delayed choices. It is not likely that the use of this method caused the insignificant correlation with the FSC Scale in this research, since Ersner-Hershfield et al. (2009) used that same method. In fact, the similar method of coding can be considered a strength of this study because it enhances the comparability between these two studies. It is recommended that the method of Magen et al. (2008) is used, since that method has proved useful in the aforementioned studies and is easier and quicker to use compared to Kirby and Marakovic's method.

Another strength of this study is that all of the used tests (except for the FSC Scale and TIPI-r since they are single-item tests) were computed to have good internal reliability (between .802 and .930), despite having few items.

There are a few factors to this study which might explain the unexpected outcome. First and foremost is the composition of the samples used in pre-testing and correlational research. The pre-testing sample was relatively small, consisting of seven people. The TSTI model of Hak et al.



(2008) is quite thorough because participants are probed about their opinions. However, Blair and Conrad (2011) found that significantly less problems were reported when comparing pre-tests with a small sample size (five respondents) and pre-tests with a large sample size (fifty respondents). This is not to say that the results of small samples are unreliable, but that they might be incomplete, leaving possible problems undiscovered. It is also not certain that this caused the insignificant correlations, especially since the pre-testing was done thoroughly (Hak et al., 2008), but it is recommended that a larger sample size is used for pre-testing in future research.

Both the pre-testing sample and the correlational research sample were skewed toward young individuals with high education. Therefore the results of this research are representative for that group, but not as much for other populations. However, these young and highly educated samples do correspond with the samples that Ersner-Hershfield et al. (2009) used to find a relation between future-self continuity and temporal discounting. This means that the present results on the DDT have their value, not in being representative for the Dutch population, but in comparing with the results of Ersner-Hershfield et al. (2009). However, this does not explain the unexpected results found in this study. Ersner-Hershfield et al. (2009) found this relation multiple times, both when using hypothetical money and when using real money as an incentive for completing the DDT. Therefore the use of hypothetical money in this current study probably does not serve as an explanation for the unexpected results. Further research with samples that are more representative of the general Dutch population is required to gain more insight in the dynamics of future self-continuity.

Another problem with this sample may be found in Erikson's description of life's stages (Erikson & Erikson, 1997). Here Erikson poses that adolescence, which entails the majority of this study's sample, is characterized by the psychological struggle to form a sense of identity. The FSC Scale used in this study requires respondents to imagine their future self ten years from now. Considering Erikson, this question may be especially difficult for adolescents since their struggle for identity might not be completed. This does not make their answer less valid, but it does make it less representative for the Dutch population in general. Continuing this line of reasoning, results on the FSC Scale may only be representative within each life's stage. This is especially relevant for elderly people, since they might not expect to live for another ten years. The FSC Scale in its current form would be unsuitable for that age group.

A third remark about the current sample is that students might not have an idea of their future beyond the completion of their studies. This may make them a particular short term focused subsample of the adult population. It must be remarked that the ten years used in the Dutch version of the FSC Scale was copied from Ersner-Hersfield et al. (2009). However, they did not justify that number, making it an arbitrary number. Frederick (1999) reported using periods of 5, 10, 15 and 20 years. Further research on this subject is required, for example a comparative study of the FSC scores of several samples, with the amount of years as a variable.

Another explanation of the unexpected results may be our limited understanding of how to operationalize future self-continuity. Ersner-Hersfield et al. (2009) for example initially not only used future self-similarity, but also future self-connectedness to predict temporal discounting. However, future self-caring and future self-liking were not predictive of temporal discounting. Hersfield (2011) also found vividness of the future self and positivity towards the future self to influence decision making. It is clear the operationalization of future self-continuity is not yet unambiguously defined. It is suggested that qualitative research is conducted to better define the underlying construct of future self-continuity.

### **Recommendations future research**

One of the things to be investigated is the lacking dimension of meaningful relationships and social support within the FSC Scale, compared to mental health, flourishing and resilience. The MHC-SF (Lamers et al., 2011) and the FS (Diener et al., 2010) specifically inquire about the existence and quality of meaningful and supportive relations. Smith et al. (2008) in their description mention that the BRS was not intended to measure social support, in their attempt to clearly define a very multidimensional construct (Windle et al., 2011). However, they do recognize social support as a resilience resource. In the thought experiment of the Ship of Theseus (in which, in this case, the parts of a ship stand metaphorically for the different parts that give a person a sense of self), the builders that actually make the ship can be seen as meaningful relations that provide social support. This means that the FSC Scale could possibly better assess future self-continuity if a dimension for measuring perceived social support were added.

Another possible improvement to be researched is the addition of an affective connectedness dimension to the FSC Scale. A number of respondents during the pre-test phase marked a distinction between life's circumstances and character development. However, they did

not report specific affections for their future selves. Seeing as affect plays a key part in our everyday lives, it might be fruitful to research what effect affect has on the image of our future self.

Scores on the FSC Scale were not normally distributed, with the majority of respondents selecting option 3 or 7, and none selecting option 5. The great number of selections of option 7 may be understood by the fact that some respondents are prone to answer in extremes when filling out self-report measures (He, van de Vijver, Espinosa & Mui, 2014). There are currently no clear explanations for the divergent distribution of answers on the other options. Further research with different samples is required to better understand whether this is typical or atypical on this test.

A last possible conclusion is that there simply is not as strong a relation between future self-continuity and narrative psychology as was expected based on recent research and literature. However, the earlier mentioned limitations of this thesis and recommendations for future research should be carefully considered before such a conclusion is drawn. This thesis contributes to a better understanding of future self-continuity by providing a scientifically translated and pre-tested Dutch version of the Future Self-Continuity Scale and by providing correlational research that gives cause to further inspect this concept, with the possibility in mind that the suspected relations do not exist.

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