Introducing a Continuous Measure of Future Self-Continuity

Bart A. Kamphorst¹, Sanne Nauts¹, and Eve-Marie Blouin-Hudon²

Abstract

This article presents a continuous measure of future self-continuity (FSC-C) designed for use in web-based surveys. It allows researchers to assess on a continuous scale the similarity or connectedness that participants feel in relation to their future selves. The measure has an intuitive drag-and-drop interface, where participants can drag one circle over another circle to a certain degree of overlap to indicate closeness of the relation between their present self and their future selves. The measure is highly customizable and is therefore also attractive for researchers in other domains (e.g., to measure Inclusion of Other in the Self). In this regard, the measure is an alternative to that reported by Le, Moss, and Mashek in this journal. This article describes the motivation for the development of the measure as well as how it is constructed.

Keywords

future self-continuity, measurement, methodology, Inclusion of Other in the Self, choice behaviors

Some people consider their future self as a stranger, while others strongly identify with their future selves and consider them natural extensions of who they are today. Individual differences in future self-continuity predict troubling behaviors ranging from procrastination (Sirois & Pychyl, 2013) and failing to save for retirement (Bryan & Hershfield, 2012; Hershfield et al., 2011) to making unethical business decisions (Hershfield, Cohen, & Thomson, 2012). These data suggest that people with low future self-continuity may not always fully realize how their present behavior will affect themselves in the future.

To study future self-continuity, Ersner-Hershfield, Garton, Ballard, Larking, and Knutson (2009) have devised a psychometric measure of future self-continuity based on an existing measure of self-versus other-connectedness (the Inclusion of Other in the Self Scale; Aron, Aron, & Smollan, 1992). The Future Self-Continuity Scale uses a series of seven Venn diagrams that overlap to varying degrees to represent the degree of self-continuity.
degrees, representing the extent to which people feel that their future self is connected to (or similar to) their present self (see Figure 1).

The effective use of graphics makes the original future self-continuity scale fairly intuitive for participants to grasp in comparison to a 7-point Likert item, where the meaning of the individual answer options is highly abstract. Independent of usability, however, it is clear that the sensitivity of the measure, as well as its range, can be improved substantially by using a continuous instead of a discrete scale.

In this article, we therefore present a dynamic, continuous variant of Ersner-Hershfield et al.’s (2009) future self-continuity measure that can be used in online, web-based surveys, using only standard web technologies (HTML, Javascript, and Cascading Style Sheets [CSS]). In the past, three similar dynamic measures were developed by relationship researchers interested in studying Inclusion of Other in the Self (Hodges, Sharp, Gibson, & Tipsort, 2013; Le, Moss, & Mashek, 2007) or intertemporal choice (Bartels & Rips, 2010). To the best of our knowledge, however, only one of those measures was suitable for use in web-based surveys (Le et al., 2007). Unfortunately, since its release, the technology behind that dynamic Inclusion of Other in the Self (IOS) project, JFC/Swing Java applets, has largely been deprecated. In fact, most browsers nowadays have disabled support for these types of Java applets by default as a security measure, making dissemination of surveys with this measure on the web difficult, error-prone, and untenable for future research. In contrast, our future self-continuity measure depends only on the standard web technologies, HTML, Javascript, and CSS, which are unlikely to be displaced anytime soon. Additionally, the use of these technologies allows the measure to be easily embedded in popular survey tools such as Qualtrics.

In the “future self-continuity continuous” (FSC-C) scale presented here (see Figure 2 for an illustration), participants can drag and drop one circle (e.g., the “present self” circle) onto a second circle (e.g., the “future self” circle). The FSC-C then saves the distance traveled by the dragged
circle as well as the percentage of overlap between the circles. This dynamic, continuous version allows researchers to measure their construct of interest with much higher precision. Additionally, the range of possible answers is larger in the FSC-C than in the discrete version (see Figure 1). First of all, in the FSC-C, participants can indicate that they experience complete overlap between their future and present self, while this is not possible in the discrete version. Moreover, if so configured, participants can indicate that they experience a distance from their future self by dragging the present self circle away from the future self circle.

The code for the FSC-C, together with a live demo and tutorials for how to embed the code (e.g., in Qualtrics), is available on the authors’ project website (http://scaffoldingintentions.phil.uu.nl/instruments/fsc-c/) as well as on Github (https://github.com/bartkamphorst/fsc-c).

Using the Code

Researchers using the FSC-C in a web-based survey will have to add a few HTML elements to their web page, as illustrated in the following code example:

```html
<div class="circle-container">
  <div class="circles" id="circle-drag-year"><span>present self</span></div>
  <div class="circles">future self</div>
</div>
```

The outer `<div>` element with class “circle-container” is used to specify the width and height in CSS (see below) of the measure itself (whitespace plus circles). The inner `<div>` elements represent the circles: giving them the class “circles” ensures that they are styled correctly. The text within the `<span>` elements will be the labels of the circles (i.e., “present self” and “future self”; see Figure 2). The identifier (id) to the first circle has a special characteristic, as it has to start with the word “circle-drag” (e.g., “circle-drag-year” or “circle-drag-episode20”). Specifying different identifiers makes it possible to embed several of these measures with slightly different questions and keep the data separated. For example, a researcher could include a question asking participants to indicate the similarity they feel to their future self one week from now (Question 1) as well as another question asking participants to indicate how closely they identify with their future self one year from now (Question 2). By giving these questions different identifiers (e.g., “circle-drag-question1” and “circle-drag-question2”), participants’ responses to these questions will be saved separately in the data.

Researchers will also need to make sure to add the Javascript and the CSS stylesheet to their HTML page. This can either be done internally—by putting the Javascript between HTML `<script>` tags and the CSS between HTML `<style>` tags—or externally by uploading the Javascript and CSS files to a server and including the proper references to those locations in the HTML page.

The Javascript code, which uses the JQuery library, makes it possible to drag-and-drop one circle over another by listening for and responding to “draggable stop” events. Each time a circle is dragged and dropped, the distance traveled by the circle from its starting position is calculated (which, by default, is in a range from −100 to 100, given that the diameter of the circles is 100 pixels) as well as the percentage of overlap with the other circle (0–100%). Both values are stored temporarily as variables that can later be stored more permanently through a variety of methods (see below). As Le, Moss, and Mashek (2007) also mention for the Inclusion of Other in Self Scale, the distance traveled and the percentage of overlap are highly correlated. The percentage score is the most consistent with the theory on future self-continuity, but the distance traveled is included because it also allows researchers to measure negative scores if the draggable circle is dragged away from the other circle to the left.
Styling and Customization

Figure 2 contains two representations of the styled measure. Many of the baseline features, such as the size, colors, and position of the circles relative to each other, can be easily customized through the use of CSS. For example, changing the color of the left circle from green to red could be realized by adding an HTML style attribute to the first inner `<div>` (the one with id “circle-drag-year”) to override the default green background color of that circle (as specified in the CSS stylesheet). That line of code would then look as follows:

```html
<div class="circles" id="circle-drag-year"
    style="background:#FF0000"> <span>present self</span></div>
```

Storing the Data

As mentioned previously, once the movable circle is dragged and dropped, the measure stores two values in variables. These variables are given names that are prefixed with the identifiers of the HTML element, followed by “-distance” or “-overlap” (e.g., a question with id “drag-circle-year” would generate two variables, “drag-circle-year-distance” and “drag-circle-year-overlap”). In these variables, the distance traveled by the circle and the percentage of overlap between the two circles are stored, respectively. Researchers can then decide how they want to store these data more permanently by making small adjustments to the Javascript. As an example, the online survey tool Qualtrics offers a Javascript API, with a method called “setEmbeddedData(name, value).” Storing the data in Qualtrics is as easy as adding two lines at the end of the Javascript, calling that “setEmbeddedData(name, value)” method with the appropriate arguments. However, it would be just as easy to store the values in two hidden HTML form fields, which can then be sent to a server through a web form.

Conclusion

The FSC-C provides researchers with a continuous measure of future self-continuity for use in web-based surveys. Its customizability makes the FSC-C a versatile measure, as the labels of the circles can be easily modified to make them represent different entities. Because of this, the FSC-C is also attractive for researchers studying Inclusion of Other in the Self as an alternative to Le et al.’s (2007) Java-based measure.

Finally, the fact that the FSC-C is a continuous rather than a discrete measure makes it possible for researchers to gather more fine-grained data on future self-continuity. This additional precision of measurement may lead to a better understanding of which troubling behaviors are related to people’s not fully realizing how their present conduct will affect their future self.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Research for this article was supported by grant #12013 from the Technology Foundation STW’s “Healthy Lifestyle Solutions” Partnership programme, which is jointly funded by the Netherlands Initiative on Brain and Cognition (NWO) and Philips Research.

References


**Author Biographies**

**Bart A. Kamphorst** is a PhD candidate at the Department of Philosophy and Religious Studies of Utrecht University, the Netherlands. His research focuses on the effects that the prolonged use of “e-coaching systems” can have on people’s lives. Relevant research topics include action theory, decision-making, and human–computer interaction. He holds an MSc in Artificial Intelligence (cum laude), a BA in Philosophy, and an LLB in Law (with honors). Email: b.a.kamphorst@uu.nl.

**Sanne Nauts** is a postdoctoral researcher at the Department of Clinical and Health Psychology at Utrecht University, the Netherlands. Her research interests include procrastination (in particular related to going to bed on time), planning, and person perception. She holds a PhD in Social Psychology from Radboud University Nijmegen, the Netherlands. Email: s.nauts@uu.nl.

**Eve-Marie Blouin-Hudon** is a PhD student in the Department of Psychology at Carleton University, Canada. Broadly speaking, she is interested in understanding the psychological processes that serve to sustain well-being and facilitate our ability to adapt and flourish. Relevant research topics include cognitive processes, affect, temporal aspects of self, personality, daydreaming, and empathy. She holds an MA in Psychology from Carleton University, Canada. Email: evemarieblouinhudon@cmail.carleton.ca.