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# Development and Initial Validation of a Scale to Measure Momentary Self-Concept Clarity

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**Abstract**

Several studies have suggested that momentary self-concept clarity (SCC) levels are important for emotion regulation and self-control processes, but these studies have used unvalidated measures of momentary SCC. Here, we report on the development and preliminary validation of a brief self-report scale, the Momentary Self-Concept Clarity Scale (M-SCCS). One hundred and twenty-two adults completed momentary SCC items 6-7 times per day for two weeks. Multilevel factor analyses suggested the M-SCCS has good factorial validity. The scale also showed excellent between-person reliability, fair within-person reliability, and patterns of criterion relations that resemble other self-report measures of SCC. There was little measurement reactivity over time. The M-SCCS may be useful for future experience-sampling studies aimed at uncovering short-term self-regulatory processes involving SCC.

*Keywords:* self-concept clarity, experience sampling method, ecological momentary assessment, identity, measurement

**Development and Initial Validation of a Scale to Measure Momentary Self-Concept Clarity**

Self-concept clarity (SCC) is often defined as the extent to which one's "self-beliefs are clearly and confidently defined, internally consistent, and stable" (Campbell et al., 1996, p. 141). Abundant research has shown that SCC has important implications for the regulation of behavior and emotions. For instance, SCC has been shown to relate to individual differences in self-esteem (Bigler et al., 2001; Campbell et al., 1996; DeMarree & Bobrowski, 2017; Matto & Realo, 2001; Suszek et al., 2018; Usborne & Taylor, 2010; Wu & Watkins, 2009), neuroticism and emotion regulation (Alessandri et al., 2020; Bond et al., 2006; Campbell et al., 1996; Chang, 2001; Ellison, Gillespie, et al., 2020; Lear & Pepper, 2016; Matto & Realo, 2001; Parise et al., 2019; Usborne & Taylor, 2010), and impulsivity and compulsivity (Ellison & Levy, 2012; Israelashvili et al., 2012; Quinones-Garcia & Kakabadse, 2015). These studies have established SCC as an important personality trait and a central component of self-functioning.

It is also clear that SCC is a multifaceted construct whose correlates and implications depend on the method used to measure it. Most studies to date have used the original Self-Concept Clarity Scale (SCCS; Campbell et al., 1996), but other measures focus on specific aspects of SCC — for instance, the consistency or temporal stability of the self-concept, or how confidently it is defined — and show only small correlations with the SCCS (DeMarree & Bobrowski, 2017). When researchers have modified the SCCS to measure clarity about multiple specific self-aspects, SCC seems to be domain-specific and has divergent correlates (Stinson et al., 2008). Studies have also suggested that SCC can be broken down into subjective and objective, or explicit and implicit, parts (Guerrettaz & Arkin, 2016; Suszek et al., 2018). Thus, SCC researchers must carefully attend to measurement in order to understand the diverse aspects of SCC and its operations.

One important aspect of SCC that may not be captured well by existing measurement tools is its short-term temporal dynamics. The SCCS, along with most other measures, considers SCC as a trait-like individual difference. However, SCC also fluctuates within individuals on a rather short time scale, and this variation has important consequences. For instance, changes in SCC over a 24-hour period have relationships with daily experiences of interpersonal rejection and relationship conflict, mood, self-esteem, and goal resolve (Ayduk et al., 2009; Nezlek & Plesko, 2001; Schwartz et al., 2011; Wong & Vallacher, 2018). Even more rapid variation seems to be important in some cases. Scala and colleagues (2018) measured SCC every two hours in a sample of psychiatric outpatients using experience sampling and found that negative affect predicted self-injurious urges only when momentary SCC was low. Ellison, Gillespie, and Trahan (2020) found substantial variation in SCC even over 15-minute intervals, and these fluctuations related to (and predicted) momentary levels of negative affect and impatience; interestingly, these patterns varied from one person to another. Thus, a growing body of evidence suggests that SCC has short-term, dynamic functions within the personality system in addition to its importance as a static individual difference.

The six studies of state (daily or momentary) self-concept clarity reviewed above, however, have used six different scales to measure state SCC. All of these were *ad hoc* measurements, adapted from prior scales on a rational basis and not validated outside of the samples in which they were used. Therefore, the psychometric quality of these state SCC measures is largely unknown. In addition, the two studies with a higher measurement frequency than one survey per day used two different single-item measures of momentary SCC (Ellison et al., 2020; Scala et al., 2018). Although single-item measures can be reliable and valid, their validity may be more attenuated by idiosyncrasies in item wording than multi-item measures

(e.g., Robinson & Wilson, 2020). It can also be difficult for single-item measures to capture different aspects of a multifaceted construct like SCC. As a result, potential shortcomings in reliability and validity may hamper efforts to uncover SCC's temporal dynamics. The current study describes the development and initial validation of a multi-item measure of momentary self-concept clarity.

Specifically, we aimed to create a measure that would capture momentary, within-person variations in SCC in a general adult population. The measure would be concise enough to be usable in an experience-sampling context, where SCC would be measured multiple times a day. To achieve this, it would ideally consist of three or four items, in order to avoid undue burden to respondents and attendant costs to ecological validity. Some general comments about our approach are warranted. First, we did not expect that the items that best captured within-person variation over time would necessarily resemble the original SCCS or other measures of trait SCC. It is unlikely that every aspect of self-concept clarity varies much over a short time period; some parts of SCC might vary exclusively between persons or might change too slowly within persons to be of interest in experience sampling research. By the same token, some aspects of SCC that are not represented on the SCCS or other trait measures might be important parts of SCC's within-person variation. As a consequence, we attempted to gather as broad an initial pool of items as possible and to evaluate their performance empirically. Second, because our primary aim was to capture within-person variation, our investigation prioritized factorial validity and reliability, which we estimated at both between-person and within-person levels. Criterion-related validity was a secondary consideration; due to the small body of research on SCC's within-person relationships, criterion-related validity could only be assessed at the between-person level. Another secondary consideration was measurement reactivity, or whether the

repeated measurements might themselves influence individuals' SCC levels over time. This would be undesirable in naturalistic contexts such as experience sampling studies. Thus, we aimed to create a scale with minimal reactivity to repeated measurement.

## Method

### Scale Development

In order to draft items that represented the full breadth of how SCC levels might vary over time within individuals, a team of researchers including the first author (a Ph.D.) and undergraduate research assistants conducted a literature search to identify self-report measures of SCC and similar variables across social, personality, and clinical psychology. Five such scales were identified: the SCCS, the Self-Concept and Identity Measure (SCIM; Kaufman et al., 2015), the "confusion about self" subscale of the Life Problems Inventory (LPI; Rathus et al., 2015), the "identity diffusion" subscale of the Inventory of Personality Organization (IPO; Lenzenweger et al., 2001), and the Sense of Self Scale (SOSS; Flury & Ickes, 2007). These measures, which together contained 87 unique items, were reviewed by hand, and the major themes covered by them were identified on a rational basis. Five content domains were identified: (1) subjective clarity and internal coherence of the self-concept; (2) clarity and stability of goals and values; (3) temporal/cross-situational consistency of the self-concept; (4) dissociation from ongoing experience and alienation from others; and (5) positive/negative self-evaluation.

The research team then drafted items to capture how these domains of SCC might vary over time, within individuals. This was possible in most instances. However, it proved impossible to write items that captured the temporal/cross-situational content domain, as it refers to fluctuations of self-concept over time and thus cannot be assessed as a momentary state. We



drafted items with varied wordings, and with both positive and negative directions, in order to both capture diverse levels and aspects of momentary SCC and reduce the impact of systematic error due to item wording or direction (Clifton, 2020). Nine potential items were drafted at this stage.

Next, we assessed whether these items together adequately represented the full breadth of the self-concept clarity construct by asking experts in SCC for feedback on them. Two outside experts (both Ph.D.-level researchers and published authors on SCC) reviewed the list of items and offered comments on their coverage of SCC and content validity. In response to their comments, we removed one item on the grounds that it was too similar to self-esteem and wrote three additional items to expand our coverage of the first two content domains (subjective clarity and goal stability). This process resulted in a final pool of 11 candidate items.

### **Pilot Study**

Because finding items with adequate variability within persons is a requirement for an experience-sampling measure, we conducted an initial pilot study to examine the variability of each item over time and to screen out those that changed too little over the short term. This pilot study was approved by the Institutional Review Board at Trinity University (reference #480526). Twenty-seven undergraduate students ( $M = 18.56$  years of age, 89% female, 64% non-Hispanic White) completed the 11 candidate momentary SCC items 42 times over the course of one week (six times per day) in exchange for course credit in an introductory psychology class. Pilot data are available at <https://osf.io/6j5yx/>. Three items were removed from consideration on the basis of inadequate within-person variability. The remaining eight candidate items were then subjected to a full validation study aimed at constructing a multi-item scale of momentary SCC with

adequate reliability and validity and minimal measurement reactivity. The validation study was also approved by the Institutional Review Board at Trinity University (reference #623122).

## **Validation Study**

### ***Participants***

Participants in the full validation study were 128 adults. Ninety-one (71.1%) of these participants were recruited from an urban community in the Southwestern U.S. At first, community participants were recruited by means of flyers posted in city coffee shops, restaurants, gymnasiums, libraries, and community centers. The flyers solicited participation in “a study of thoughts and feelings and how they change over time.” After five individuals had enrolled in the study in response to these flyers, the COVID-19 pandemic halted in-person research activities and led to a shutdown of these recruitment venues. Thereafter, community participants were recruited by similar advertisements posted on Facebook Marketplace (a social media website) and Craigslist (an online-service website), both targeting individuals in the immediate geographical area. Community participants could earn up to \$60 for participating, depending on how many mobile surveys they returned. An additional 37 participants (28.9%) were undergraduates at a small university in the same city, all of whom were recruited by email during the pandemic and participated remotely. These participants were awarded various amounts of psychology course credit depending on the number of returned surveys. The sample ranged in age from 18 to 64 years ( $M = 31.2$ , median = 29,  $SD = 13.4$ , IQR = 19 to 42). Table 1 shows additional demographic characteristics of the sample.

### ***Procedure***

Participants engaged in an introductory session at which they were oriented to the study, given a survey link to complete static questionnaire measures, and sent an invitation to the

mobile survey application for experience sampling surveys. Experience sampling occurred on the SEMA3 platform (Koval et al., 2019). Participants were sent 6-7 prompts per day to complete mobile surveys every day for two weeks. The schedule of prompts was tailored according to each participant's typical sleep-wake schedule, which was ascertained in the introductory session. Prompts occurred within 30-minute windows on a pseudorandom schedule so that participants could not predict when they would occur. The interval between windows ranged from 75 to 105 minutes, and participants had 30 minutes to respond to a prompt before its expiration. In total, each participant was scheduled to receive 88 or 89 prompts, depending on the exact timing of their introductory session. Data for the project, as well as analytic syntax and output, are publicly available at <https://osf.io/6j5yx/>. The study's methods were not pre-registered.

## **Measures**

**Static Questionnaire Measures.** Before beginning experience sampling surveys, participants were asked to complete four measures that were included to enable tests of the momentary SCC scale's criterion-related validity at the between-person level.

***Self-Concept Clarity Scale (SCCS; Campbell et al., 1996).*** One obvious criterion for the validity of the momentary SCC items is a strong positive correlation with the original SCCS at the between-person level. The SCCS is a 12-item self-report measure designed to assess individual differences in self-concept clarity. Items are rated on a 5-point Likert-type scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). The SCCS shows measurement invariance across different races and between sexes (Cicero, 2020). Its internal consistency (Cronbach's  $\alpha$ ) in the current study was .86.

***Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965).*** SCC shows an especially strong relation with self-esteem (Bigler et al., 2001; Campbell et al., 1996; DeMarree &

Bobrowski, 2017; Matto & Realo, 2001; Usborne & Taylor, 2010; Wu & Watkins, 2009). To test whether momentary SCC showed this relation as well, we used the RSES, a 10-item self-report measure designed to assess individual differences in self-esteem. Items are rated on a 4-point Likert scale ranging from 1 (“strongly agree”) to 4 (“strongly disagree”). The internal consistency of the RSES in the current study was .90.

***Big Five Inventory-2 (BFI-2; Soto & John, 2017).*** SCC relates to some, but not all, of the traits of the five-factor model. Prior research suggests that SCC has a moderate to strong relationship with neuroticism, somewhat smaller relationships with conscientiousness, agreeableness, and extraversion, and a small to nonexistent relationship with openness to experience (Campbell et al., 1996; Fite et al., 2017; Matto & Realo, 2001; Usborne & Taylor, 2010). To validate the momentary SCC items against these expectations, we administered the BFI-2. It contains 60 items rated on a 5-point Likert scale from 1 (“disagree strongly”) to 5 (“agree strongly”). In the current study, BFI-2 subscale internal consistency values were  $\alpha = .86$  (Extraversion),  $\alpha = .72$  (Agreeableness),  $\alpha = .86$  (Conscientiousness),  $\alpha = .91$  (Neuroticism), and  $\alpha = .82$  (Openness).

***Positive and Negative Affect Schedule (PANAS; Watson et al., 1988).*** In line with prior research, we expected momentary SCC items to show a moderate positive relationship with positive affect and a moderate negative relationship with negative affect (DeMarree & Bobrowski, 2017; Steffgen & Silva, 2007; Wu & Watkins, 2009). The PANAS is a 20-item measure of individual differences in positive and negative affective experience. Items are rated on a 5-point Likert scale ranging from 1 (“very slightly or not at all”) to 5 (“extremely”). The internal consistency of the positive affect subscale in the current study was .88; for the negative affect subscale, this value was .89.

**Experience Sampling Measures.** With each mobile survey prompt, participants were asked to respond to each of the eight candidate momentary self-concept clarity items. In addition, five other items were included to explore the within-person correlates of SCC.

***Momentary Self-Concept Clarity Items.*** The remaining eight candidate items of the Momentary Self-Concept Clarity scale were included in each survey (Table 1). These items were rated on a five-point scale ranging from 1 (“Strongly disagree”) to 5 (“Strongly agree”). The order in which these items were presented was randomized at each survey.

***Positive and Negative Affect.*** Two positive affect (PA) and two negative affect (NA) items were included in each survey, derived from the full list of items on the PANAS. Positive affect items were “How excited do you feel right now?” and “How content do you feel right now?” Negative affect items were “How nervous do you feel right now?” and “How sad do you feel right now?” These items were chosen to be most suitable for the momentary context and to exemplify both high-arousal (excited, nervous) and low-arousal (content, sad) aspects of PA and NA (Feldman, 1995). These items were rated on a five-point scale from 1 (“Very slightly or not at all”) to 5 (“Extremely”). As with the SCC items, the order of item presentation was randomized at each survey.

***Self-Esteem.*** The Single-Item Self-Esteem measure (SISE; Robins et al., 2001) was used to assess momentary self-esteem at each survey. In the current study, the measure was modified to refer unambiguously to the immediate moment: “Right now, I have high self-esteem.” It was rated on a five-point scale from 1 (“Not very true of me”) to 5 (“Very true of me”).

## ***Analyses***

**Factor Analyses.** As a first step, we used multilevel exploratory factor analysis (EFA). Although we intended for the scale to be unidimensional, EFA would help us explore empirically

the factor structure of the eight candidate items and identify any multidimensionality that might be present. As an added benefit, EFA might also help us select items for retention or deletion, depending on the pattern of factor loadings. This analysis was conducted with a randomly selected half of the sample ( $k = 63$  individuals providing a total of  $n = 4009$  observations). We requested factor solutions with one, two, and three latent factors to describe the covariation of item responses at each level: between-subjects and within-subjects. This resulted in a total of nine models, because these structures were crossed across levels. We used global fit statistics to adjudge model fit. Our criteria were non-significant chi-square values, CFI and TLI values above 0.95, RMSEA values below 0.08, and SRMR values below 0.1 at both between- and within-person levels (Hu & Bentler, 1999). We used local statistics (factor loadings and standard errors, as well as factor intercorrelations; item descriptive statistics) and interpretability of factors to suggest items for deletion and preliminary factor solutions. As a second step, we submitted a smaller list of items to confirmatory factor analysis, using the other half of the sample ( $k = 62$  individuals who altogether provided  $n = 3879$  observations). Factor analyses were conducted in Mplus software, version 8.6 (Muthen & Muthen, 2021).

**Between-Person and Within-Person Reliability.** Because of the two-level structure of the data, we considered separately the between-person reliability and within-person reliability of scale items using a Generalizability Theory framework (Shrout & Lane, 2012). For these analyses, we considered measurement occasions to be a random, rather than a fixed, variable because the survey times did not carry any specific meaning (that is, each participant began surveys on their own schedule, and we were not interested in SCC levels at any fixed dates or times). Reliability analyses were implemented using the “psych” package in R software (Revelle,

2020). Guidelines from Shrout (1998) were used to characterize these reliability values qualitatively. All data were used to calculate reliability statistics.

**Criterion-Related Validity.** In order to test whether the items in the candidate momentary self-concept clarity scale showed adequate criterion-related validity, we measured their between-person and within-person correlations against established measures of personality variables that have shown strong relationships with SCC. The “psych” package in R (Revelle, 2020) was used to produce separate between-person and within-person correlations among measures, using all available data. It is particularly important to distinguish between correlations at these two levels, as there is no necessary relationship between them (Cervone, 2005; Lamiell, 1981). Because prior literature has mainly focused on between-person relationships between SCC and other constructs, whereas within-person relationships are less established, the former correlations were the main object of hypotheses in the current study. The correlations between the candidate scale and the criterion measures were compared with those between the SCCS and criterion measures in this sample, using the method of Zou (2007) to account for dependency between these statistics due to overlapping data from the criterion measures.

**Measurement Reactivity.** Measurement reactivity is evaluated by testing whether scores tend to increase or decrease in a naturalistic fashion over time. Accordingly, we tested the reactivity of M-SCC scale scores by examining the effect of time on these scores within linear mixed-effects models, which were estimated in the lme4 package in R (Bates et al., 2014) using data from the full sample. In these models, both intercepts and slopes were allowed to vary randomly, because prior literature suggests that reflecting on one’s own self-concept may change SCC in different directions for different people (Csank & Conway, 2004; Guerrettaz & Arkin, 2015). We also tested two specific hypotheses. First, individuals low in initial (trait) SCC might

see their self-concept clarity increase when they reflect on their self-concept, whereas individuals with high baseline SCC would not experience an increase or might even see a decrease in SCC (Csank & Conway, 2004). Thus, we tested whether the measurement reactivity of the M-SCCS might be moderated by trait SCC. Second, we tested whether age moderated the reactivity of M-SCCS scores over time, as a recent review (Lodi-Smith & Crocetti, 2017) suggests several age-related trends in SCC. These trends include age-related differences in trait SCC (which may also be curvilinear; see Lodi-Smith & Roberts, 2010) as well as age-related differences in rank-order SCC stability.<sup>1</sup>

## Results

### Survey Compliance

Of the 128 individuals ( $M_{\text{age}} = 31.18$ ,  $SD_{\text{age}} = 13.43$ ) who enrolled in the study and completed self-report measures, six (4.7%) dropped out without beginning the experience sampling portion of the study. Three additional participants provided experience-sampling data without completing baseline self-report measures. Compliance for the experience sampling protocol was defined for each participant as the number of surveys returned divided by the number of prompts received. Median compliance for the individuals who began returning smartphone surveys was 74 surveys, or 84% of the intended 88 surveys (IQR: 46 to 82 surveys, or 69% to 93%). Demographic characteristics (age, gender, race, and ethnicity) were unrelated to both the number of surveys returned (all  $p$ -values  $> .11$ ) and compliance (all  $p$ -values  $> .24$ ). Likewise, baseline SCCS scores were unrelated to the number of surveys returned,  $r(125) = -.048$ ,  $p = .595$ , and to compliance,  $r(119) = -.016$ ,  $p = .865$ .

### Factor Analyses

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<sup>1</sup> We thank an anonymous reviewer for suggesting this analysis.



The exploratory factor analyses of models with three factors at the between-person or within-person levels did not converge on solutions, and modifying and increasing the model starting values did not cause the models to converge. This suggested either that three-factor models may not be appropriate for the between-person and within-person covariance, or that the sample size was inadequate for the recovery of a three-factor solution (especially as, with only eight indicators, the three factors would be somewhat underdetermined; MacCallum, Widaman, Zhang, & Hong, 1999). The four remaining models (with one and two factors at within-person and between-person levels) did produce interpretable factor solutions. However, global fit indices were poor (Table 2). Chi-square values were significant, RMSEA values were high, and CFI and TLI values were negative (negative CFI and TLI values indicate that the target models showed worse fit than a null model). We concluded that pruning the model by removing items that did not cohere with the rest was a reasonable step.

A preliminary examination of the models with two factors showed that five items loaded unambiguously onto a first factor at both between-person and within-person levels (Table 3). Moreover, this first factor was interpretable as self-concept clarity, and its content resembled previously used measures of state SCC (for example, the item “Right now, I have a clear sense of who I am”). In contrast, two other items (“Right now, I feel bored”, “Right now, I feel empty”) loaded more heavily onto a separate factor at both levels, and a third item (“Right now, I don’t feel like I have a sense of direction in life”) loaded more heavily onto this second factor at the between-person level and showed an ambiguous pattern of factor loadings at the within-person level. We interpreted this second factor as representing a primarily affective dimension, which could be called Burnout or Weariness. It showed moderately high correlations with the first factor at both between-person and within-person levels but nonetheless seemed theoretically

distinct from self-concept clarity. The three weariness items also loaded somewhat more weakly onto the single factors in the congeneric models. As a consequence, we decided to remove these three items from consideration.

The remaining items were difficult to distinguish based on the factor solutions themselves. Nevertheless, we considered it helpful to winnow the scale further, if possible, in order to reduce the burdensomeness of the scale and thereby enhance the ecological validity of the ratings obtained using it. An examination of the items' descriptive statistics showed that one item ("Right now, I have a clear sense of what is most important to me in life") had lower variance, a lower intraclass correlation coefficient, and higher skew and kurtosis than the other four items. Therefore, we removed this item and proceeded to examine the remaining four items ("Right now, I have a clear sense of who I am", "I'm not sure what I really believe in", "Right now, I feel that I am not really the person that I appear to be", and "Right now, I am wondering about what kind of person I really am") in a confirmatory factor model.

We conducted a multilevel confirmatory factor analysis with one latent factor at each level, using these four items as indicators. For this analysis, we used the second half of the data ( $k = 62$  individuals and  $n = 3879$  observations). The one-factor model showed excellent global fit to the four candidate items,  $\chi^2(4) = 1.919$ ,  $p = .751$ , CFI = 1.00, TLI = 1.00, RMSEA < 0.01, SRMR<sub>within</sub> = 0.009, SRMR<sub>between</sub> = 0.002, and factor loadings at both levels that were substantial and statistically significant. Table 4 shows standardized factor loadings and  $R^2$  values at both levels for this model.

### **Between-Person and Within-Person Reliability**

To calculate reliability statistics, the three negatively worded items were reverse-scored. The between-person reliability of the four-item M-SCCS was excellent ( $R_{KR} = 0.995$ ), suggesting

that these items cohere as a measure of an individual difference. The within-person reliability, or the reliability of the four-item scale in measuring within-person change over time, with time considered as a random variable nested within people, was fair ( $R_{CN} = 0.4$ ) (Shrout, 1998).

### Criterion-Related Validity

Table 5 shows the between-person correlations among variables used in the current study. Average M-SCCS scores were strongly related to scores on the SCCS, as expected, and this relationship was still significant when controlling for scores on the RSES, partial  $r(119) = .27, p = .003$ , or when controlling for average SISE scores, partial  $r(119) = .44, p < .001$ . In addition, correlations between the M-SCCS and all questionnaire measures were not statistically distinguishable from those between the SCCS and these measures. On the other hand, average M-SCCS levels were more strongly correlated with average ratings of the item “sad” as captured through experience sampling than were SCCS scores with this item (95% CI of the difference: -0.33 to -0.07). This was also true for the experience-sampling “content” (95% CI: 0.03 to 0.30) and single-item self-esteem (95% CI: 0.04 to 0.28) items. Notably, most between-person correlations were consistent with *a priori* expectations, but average momentary SCC scores showed a somewhat weaker correlation with agreeableness, and a somewhat stronger correlation with openness, than expected based on prior literature. However, as above, these correlations were consistent with those obtained with the SCCS in this sample.

Table 6 shows the within-person descriptive statistics and correlation coefficients for the experience-sampling measures. M-SCCS scores were significantly correlated with each criterion measure at the within-person level. The root mean square successive difference (RMSSD; Jahng, Wood, & Trull, 2008) gives the expected difference between one survey and the next and

showed that M-SCCS scores varied by about half a point on the 5-point scale on successive measurement occasions.

### Measurement Reactivity

There was no fixed effect of time on momentary self-concept clarity as measured by the four M-SCCS items,  $b = 1.108 \times 10^{-3}$ ,  $SE_b = 9.934 \times 10^{-4}$ ,  $t(7745) = 1.12$ ,  $p = 0.26$ , suggesting that there was little overall measurement reactivity of the M-SCCS. In the random-effects portion of the model, the covariance between the slope and intercept was negative ( $r = -0.18$ ), which could indicate that lower initial levels of M-SCC were associated with a greater degree of (positive) change in momentary SCC over time. Indeed, a second model showed that baseline SCC levels moderated the rate of change of the scale,  $b = -8.814 \times 10^{-3}$ ,  $SE_b = 2.749 \times 10^{-4}$ ,  $t = 3.21$ ,  $p = .001$ . Consistent with expectations, lower baseline SCCS scores were associated with increases in M-SCCS scores over the course of the measurement period, on average (Figure 1). Changes for most low-SCC individuals were relatively small, however (estimated at 0.12 points on the five-point response scale over two weeks for an individual 1 *SD* below the mean on the SCCS).

In addition, a separate model suggested that the rate of change in M-SCCS values was also moderated by participant age,  $b = 4.407 \times 10^{-5}$ ,  $SE_b = 1.872 \times 10^{-5}$ ,  $t = 2.354$ ,  $p = .015$ . Older participants' M-SCCS scores went up more than younger participants' scores did (Figure 2). Again, this interaction effect was rather small: an individual 42 years of age (at the 75<sup>th</sup> percentile of the current sample) would be expected to show an increase in momentary SCC by 0.12 points on the five-point measurement scale over the two-week sampling period, whereas young adults' momentary SCC scores would not increase, on average. Notably, age was not significantly correlated with SCC at baseline, either in a linear ( $r = .169$ ,  $p = .079$ ) or curvilinear

( $b = -.001$ ,  $t = 1.546$ ,  $p = .125$ ) fashion, so the age-related increase in SCC does not occur because of different baseline SCC values among individuals of different ages. In sum, although M-SCCS scores do not show appreciable reactivity in general, they do have a small degree of *local* measurement reactivity; momentary SCC shows a slight increase over time, but this effect shrinks for younger individuals and for those with average-to-high baseline SCC.

### Discussion

Results of the current study suggested that a four-item measure of momentary self-concept clarity had good factorial validity, excellent between-person and fair within-person reliability, negligible overall measurement reactivity over a two-week period (though this was higher for older individuals and those with lower than average baseline SCC), and criterion relations at the between-person level that closely align with those of the original SCCS. Accordingly, this measure (the M-SCCS) may be of use to researchers who are interested in short-term variation in SCC and its causes and consequences. In particular, using the M-SCCS may be an improvement over the heretofore common practice of using unvalidated one- or two-item measures of momentary SCC in experience sampling and daily diary studies. Of course, it is not always the best strategy to aggregate items. For example, some researchers may justifiably use single-item measurements of momentary SCC because they are interested in a single component of it, or they wish to minimize participant burden (Eisele et al., 2020). In these cases, the potential benefits to reliability and construct coverage gained by using a multi-item scale may be outweighed by other considerations. On the other hand, it is our experience that the reliability and validity of measurements are often neglected in experience-sampling studies. Using a single-item scale may carry unrecognized threats to research conclusions due to low validity or

reliability. The four-item scale derived here may be useful for research aimed at testing hypotheses about the short-term dynamics of subjective SCC as a construct.

It should be noted that the current results are preliminary, and ongoing validation research will be needed to increase confidence in the usefulness of the M-SCCS. There are several reasons to be cautious about the results described here. First, the factor models are each based on a relatively small sample of individuals. Specifically, our sample size was smaller than would likely be needed to reliably recover a three-dimensional model from a dataset with eight items using EFA (de Winter, Dodou, & Wieringa, 2009). Even though a four-item subset of our initial pool subsequently showed good psychometric properties as a unitary scale, a higher-dimensional structure cannot be ruled out and might be theoretically interesting, especially in a larger item pool, which might be better suited to the overdetermination of three factors without simple structure (MacCallum et al., 1999). Second, although the sample was relatively diverse in terms of age, gender, and ethnicity, it was recruited from a single metropolitan area in the United States. Thus, replication of these results in a larger and more geographically diverse sample is certainly warranted. Third, the within-person reliability of the M-SCCS was only fair. This suggests that there is still room for improvement in the scale as a measure of short-term, within-person fluctuations in SCC over time. It should be noted that the reliability values obtained in the current study are in the same range as other studies using brief scales to measure momentary states with experience sampling (e.g., affective states, impulsivity, relationship satisfaction; Brose et al., 2020; Schönbrodt et al., 2021; Tomko et al., 2014). Researchers who are especially concerned with within-person reliability might be able to minimize this limitation by extending the number of measurement occasions or sampling at a higher frequency than required, and then aggregating M-SCCS scores across occasions (Brose et al., 2020). A final limitation of the

current scale is that it covers only a part of the full SCC construct; notably absent are objective aspects of self-clarity (e.g., temporal inconsistency in the self-concept) and the dissociative/alienation theme identified in several measures of self-concept confusion. It is possible that these aspects of SCC do not vary sufficiently on a momentary basis or would be better captured by other methods. Nonetheless, our results suggest that the aspects of momentary SCC that are captured by the M-SCCS may have important roles in emotion and behavior regulation.

The overall alignment of the M-SCCS with the SCCS was evident in the strong correlation between these two measures at the between-person level, as well as between-person relations between the M-SCCS and other variables (self-esteem, five-factor personality traits, and positive and negative affect) that are highly consistent with prior literature based on the SCCS and other measures of trait SCC. The exceptions to this general finding were the correlations between the M-SCCS and both agreeableness and openness, both of which were stronger than expected based on prior literature. The fact that the correlations between these variables and the SCCS were also quite strong suggests that this was not due to the M-SCCS *per se*. This finding may be due to a characteristic of the current sample, or perhaps to the use of the BFI-2, which (because it is a relatively new measure) has rarely been used alongside self-concept clarity measures.

When compared directly in this sample, average M-SCCS scores showed correlations with other variables that were not statistically different from the correlations between the SCCS and these variables, which again speaks to the correspondence of these two SCC measures at the between-person level. There were three exceptions, however: average state sadness, average state contentment, and average state self-esteem had stronger relationships with average M-SCCS scores than with SCCS scores. It may be that the correlations of these variables with the M-

SCCS are inflated by method variance and the fact that these data were collected at the same time period. Nevertheless, it remains possible that there is a meaningful difference that makes the M-SCCS more strongly related to these variables than the SCCS.

Also of note, the M-SCCS correlated strongly with self-esteem at both the between-person and within-person levels. DeMarree and Bobrowski (2017) suggest that this overlap is typical in studies of SCC and suggest that SCC researchers routinely measure self-esteem in order to account for this covariation. The current study suggests that this recommendation would be prudent for momentary SCC as well. On the other hand, SCC and self-esteem are empirically not redundant with one another (DeMarree & Bobrowski, 2017), and consistent with this notion, the within-person correlation between momentary SCC and momentary self-esteem was appreciably weaker than the between-person correlation. As Campbell (1990) notes, there are several potential reasons for the link between SCC and self-esteem. For instance, an individual with low self-esteem might experience low self-concept clarity because of conflict between affective rejection of negative self-relevant feedback and cognitive acceptance of it. There might also be a causal process in the other direction: low SCC might lead to low self-esteem by making an individual more susceptible to negative feedback. These processes might also be reciprocal. The M-SCCS may aid in efforts to understand the short-term, dynamic links between these two variables.

Although M-SCCS scores did not change in general over the two-week study period, there were indications of more localized measurement reactivity. Individuals who were low in SCC at the beginning of the study saw an increase in their momentary SCC over the course of the two-week measurement period, on average. It is certainly possible that completing the surveys caused low-SCC individuals to reflect on their self-concept more than they otherwise



would, thereby causing their SCC to increase in a meaningful way. This would be consistent with prior research (Csank & Conway, 2004; Guerrettaz & Arkin, 2015) suggesting that self-reflection has different effects on individuals with different initial levels of SCC. On the other hand, these changes would also be consistent with regression to the mean. Future research will be needed to disentangle these two alternative explanations. In addition, age moderated the rate of increase in M-SCCS scores over time, such that older participants' scores increased slightly, while younger participants' scores did not. It is possible that the younger people in the sample may have already been more engaged in identity-related exploration, such that completing the measure made little overall difference (Lodi-Smith & Crocetti, 2017). In contrast, for older individuals, completing the measure several times per day may have prompted them to think about their self-concept when they otherwise would not have, leading to an increase in momentary SCC. Further research will be needed to clarify the causes for these results, but they may suggest further avenues for research into how SCC changes in the short term in response to self-reflection. As a practical matter, future researchers using the M-SCCS may also wish to account for linear changes in scores in these subpopulations.

In sum, the current study suggests that the M-SCCS may be a reliable and valid way to measure short-term fluctuations in self-concept clarity in experience-sampling studies. Future research could profitably investigate the use of this scale in populations for which momentary SCC might be particularly relevant. For example, some recent studies suggest that momentary disturbances in self-concept clarity might be important in understanding the dynamic patterns of some individuals with Borderline Personality Disorder (Ellison, Levy, et al., 2020; Mneimne et al., 2021), and yet these studies have used one- or two-item measurements of SCC. The M-SCCS might be a more reliable tool to explore these patterns, perhaps in combination with validated

measures of momentary impulsivity (Tomko et al., 2014) or affective instability (Coifman et al., 2012). To achieve this, validation of the M-SCCS in this clinical population would be an important step. It would also be crucial to investigate person-specific models of momentary SCC variation using the M-SCCS, as prior research suggests that these patterns may differ from one person to another (Ellison, Gillespie, et al., 2020). Overall, this study provides preliminary evidence that the M-SCCS enables the assessment of short-term variation in SCC in a psychometrically sound and efficient way and may be an important tool in future research on SCC dynamics.

**Declaration of Interest Statement.** The authors do not have any conflict of interest related to this article.

**Data and Materials Availability.** The underlying research materials for this article can be accessed at <https://osf.io/6j5yx/>.

**References**

- Alessandri, G., Longis, E. D., & Golfieri, F. (2020). Can self-concept clarity protect against a pandemic? A daily study on self-concept clarity and negative affect during the COVID-19 outbreak. *Identity*. <https://doi.org/10.1080/15283488.2020.1846538>
- Ayduk, Ö., Gyurak, A., & Luerksen, A. (2009). Rejection sensitivity moderates the impact of rejection on self-concept clarity. *Personality and Social Psychology Bulletin*, 35(11), 1467–1478. <https://doi.org/10.1177/0146167209343969>
- Bates, D., Mächler, M., Bolker, B., & Walker, S. (2014). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, 67(1), 1–48.
- Bigler, M., Neimeyer, G. J., & Brown, E. (2001). The divided self revisited: Effects of self-concept clarity and self-concept differentiation on psychological adjustment. *Journal of Social and Clinical Psychology*, 20(3), 396–415. <https://doi.org/10.1521/jscp.20.3.396.22302>
- Bond, A. J., Ruaro, L., & Wingrove, J. (2006). Reducing anger induced by ego threat: Use of vulnerability expression and influence of trait characteristics. *Personality and Individual Differences*, 40, 1087–1097.
- Brose, A., Schmiedek, F., Gerstorf, D., & Voelkle, M. C. (2020). The measurement of within-person affect variation. *Emotion*, 20(4), 677–699. <https://doi.org/10.1037/emo0000583>
- Campbell, J. D. (1990). Self-esteem and clarity of the self-concept. *Journal of Personality and Social Psychology*, 59(3), 538–549.
- Campbell, J. D., Trapnell, P. D., Heine, S. J., Katz, I. M., Lavallee, L. F., & Lehman, D. R. (1996). Self-concept clarity: Measurement, personality correlates, and cultural boundaries. *Journal of Personality and Social Psychology*, 70(1), 141–156.

- 530 Cervone, D. (2005). Personality architecture: Within-person structures and processes. *Annual*  
531 *Review of Psychology*, 56(1), 423–452.  
532 <https://doi.org/10.1146/annurev.psych.56.091103.070133>
- 533 Chang, E. C. (2001). Life stress and depressed mood among adolescents: Examining a cognitive-  
534 affective mediation model. *Journal of Social and Clinical Psychology*, 20(3), 416–429.
- 535 Cicero, D. C. (2020). Measurement invariance of the self-concept clarity scale across race and  
536 sex. *Journal of Psychopathology and Behavioral Assessment*, 42, 296–305.
- 537 Clifton, J. D. W. (2020). Managing validity versus reliability trade-offs in scale-building  
538 decisions. *Psychological Methods*, 25(3), 259–270. <https://doi.org/10.1037/met0000236>
- 539 Coifman, K. G., Berenson, K. R., Rafaeli, E., & Downey, G. (2012). From negative to positive  
540 and back again: Polarized affective and relational experience in borderline personality  
541 disorder. *Journal of Abnormal Psychology*, 121(3), 668–679.  
542 <https://doi.org/10.1037/a0028502>
- 543 Csank, P. A. R., & Conway, M. (2004). Engaging in self-reflection changes self-concept clarity:  
544 On differences between women and men, and low- and high-clarity individuals. *Sex*  
545 *Roles*, 50(7/8), 469–480.
- 546 DeMarree, K. G., & Bobrowski, M. E. (2017). Structure and validity of self-concept clarity  
547 measures. In J. Lodi-Smith & K. G. DeMarree (Eds.), *Self-Concept Clarity* (pp. 1–17).  
548 Springer International Publishing. [https://doi.org/10.1007/978-3-319-71547-6\\_1](https://doi.org/10.1007/978-3-319-71547-6_1)
- 549 de Winter, J. C. F., Dodou, D., & Wieringa, P. A. (2009). Exploratory factor analysis with small  
550 sample sizes. *Multivariate Behavioral Research*, 44, 147–181.  
551 [doi:10.1080/00273170902794206](https://doi.org/10.1080/00273170902794206)

- 552 Eisele, G., Vachon, H., Lafit, G., Kuppens, P., Houben, M., Myin-Germeys, I., & Viechtbauer,  
553 W. (2020). The effects of sampling frequency and questionnaire length on perceived  
554 burden, compliance, and careless responding in experience sampling data in a student  
555 population. *Assessment*, 107319112095710. <https://doi.org/10.1177/1073191120957102>
- 556 Ellison, W. D., Gillespie, M. E., & Trahan, A. C. (2020). Individual differences and stability of  
557 dynamics among self-concept clarity, impatience, and negative affect. *Self and Identity*,  
558 19(3), 324–345. <https://doi.org/10.1080/15298868.2019.1580217>
- 559 Ellison, W. D., & Levy, K. N. (2012). Factor structure of the primary scales of the Inventory of  
560 Personality Organization in a nonclinical sample using exploratory structural equation  
561 modeling. *Psychological Assessment*, 24(2), 503–517. <https://doi.org/10.1037/a0026264>
- 562 Ellison, W. D., Levy, K. N., Newman, M. G., Pincus, A. L., Wilson, S. J., & Molenaar, P. C. M.  
563 (2020). Dynamics among borderline personality and anxiety features in psychotherapy  
564 outpatients: An exploration of nomothetic and idiographic patterns. *Personality*  
565 *Disorders: Theory, Research, and Treatment*, 11(2), 131–140.  
566 <https://doi.org/10.1037/per0000363>
- 567 Feldman, L. A. (1995). Valence focus and arousal focus: Individual differences in the structure  
568 of affective experience. *Journal of Personality and Social Psychology*, 69(1), 153–166.
- 569 Fite, R. E., Lindeman, M. I. H., Rogers, A. P., Voyles, E., & Durik, A. M. (2017). Knowing  
570 oneself and long-term goal pursuit: Relations among self-concept clarity,  
571 conscientiousness, and grit. *Personality and Individual Differences*, 108, 191–194.  
572 <https://doi.org/10.1016/j.paid.2016.12.008>

- 573 Flury, J. M., & Ickes, W. (2007). Having a weak versus strong sense of self: The sense of self  
574 scale (SOSS). *Self and Identity*, 6(4), 281–303.  
575 <https://doi.org/10.1080/15298860601033208>
- 576 Guerrettaz, J., & Arkin, R. M. (2015). Who am I? How asking the question changes the answer.  
577 *Self and Identity*, 14(1), 90–103. <https://doi.org/10.1080/15298868.2014.955049>
- 578 Guerrettaz, J., & Arkin, R. M. (2016). Distinguishing the subjective and the objective aspects of  
579 self-concept clarity. *Social and Personality Psychology Compass*, 10(4), 219–230.  
580 <https://doi.org/10.1111/spc3.12243>
- 581 Hu, L., & Bentler, P. (1999). Cutoff criteria for fit indexes in covariance structure analysis:  
582 Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55.
- 583 Israelashvili, M., Kim, T., & Bukobza, G. (2012). Adolescents' over-use of the cyber world –  
584 Internet addiction or identity exploration? *Journal of Adolescence*, 35, 417–424.
- 585 Jahng, S., Wood, P. K., & Trull, T. J. (2008). Analysis of affective instability in ecological  
586 momentary assessment: Indices using successive difference and group comparison via  
587 multilevel modeling. *Psychological Methods*, 13(4), 354-375. doi:10.1037/a0014173
- 588 Kaufman, E. A., Cundiff, J. M., & Crowell, S. E. (2015). The development, factor structure, and  
589 validation of the Self-Concept and Identity Measure (SCIM): A self-report assessment of  
590 clinical identity disturbance. *Journal of Psychopathology and Behavioral Assessment*,  
591 37(1), 122–133. <https://doi.org/10.1007/s10862-014-9441-2>
- 592 Koval, P., Hinton, J., Dozo, N., Gleeson, J., Alvarez, M., Harrison, A., Vu, D., Susanto, R.,  
593 Jayaputera, G., & Sinnott, R. (2019). *SEMA3: Smartphone Ecological Momentary*  
594 *Assessment* (Version 3) [Computer software]. <http://www.sema3.com>

- 595 Lamiell, J. T. (1981). Toward an idiographic psychology of personality. *American Psychologist*,  
596 36(3), 276–289.
- 597 Lear, M. K., & Pepper, C. M. (2016). Self-concept clarity and emotion dysregulation in  
598 nonsuicidal self-injury. *Journal of Personality Disorders*, 30(6), 813–827.
- 599 Lenzenweger, M. F., Clarkin, J. F., Kernberg, O. F., & Foelsch, P. A. (2001). The Inventory of  
600 Personality Organization: Psychometric properties, factorial composition, and criterion  
601 relations with affect, aggressive dyscontrol, psychosis proneness, and self-domains in a  
602 nonclinical sample. *Psychological Assessment*, 13(4), 577–591.  
603 <https://doi.org/10.1037/1040-3590.13.4.577>
- 604 Lodi-Smith, J., & Crocetti, E. (2017). Self-concept clarity development across the lifespan. In J.  
605 Lodi-Smith & K. G. DeMarree (Eds.), *Self-concept clarity: Perspectives on assessment,*  
606 *research, and applications* (pp. 67-84). Cham: Springer.
- 607 Lodi-Smith, J., & Roberts, B. W. (2010). Getting to know me: Social role experiences and age  
608 differences in self-concept clarity during adulthood. *Journal of Personality*, 78(5), 1383-  
609 1410. doi:10.1111/j.1467-6494.2010.00655.x
- 610 MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor  
611 analysis. *Psychological Methods*, 4(1), 84-99.
- 612 Matto, H., & Realo, A. (2001). The Estonian Self-Concept Clarity Scale: Psychometric  
613 properties and personality correlates. *Personality and Individual Differences*, 30(1), 59–  
614 70. [https://doi.org/10.1016/S0191-8869\(00\)00010-6](https://doi.org/10.1016/S0191-8869(00)00010-6)
- 615 Mneimne, M., Emery, L., Furr, R. M., & Fleenor, W. (2021). Symptoms as rapidly fluctuating  
616 over time: Revealing the close psychological interconnections among borderline

- 617 personality disorder symptoms via within-person structures. *Journal of Abnormal*  
618 *Psychology*. <https://doi.org/10.1037/abn0000656>
- 619 Muthen, & Muthen. (2021). *Mplus* (8.6) [Computer software].
- 620 Nezlek, J. B., & Plesko, R. M. (2001). Day-to-day relationships among self-concept clarity, self-  
621 esteem, daily events, and mood. *Personality and Social Psychology Bulletin*, 27(2), 201–  
622 211. <https://doi.org/10.1177/0146167201272006>
- 623 Parise, M., Canzi, E., Olivari, M. G., & Ferrari, L. (2019). Self-concept clarity and psychological  
624 adjustment in adolescence: The mediating role of emotion regulation. *Personality and*  
625 *Individual Differences*, 138, 363–365.
- 626 Quinones-Garcia, C., & Kakabadse, N. K. (2015). Self-concept clarity, social support, and  
627 compulsive internet use: A study of the US and the UAE. *Computers in Human Behavior*,  
628 44, 347–356. <https://doi.org/10.1016/j.chb.2014.11.019>
- 629 Rathus, J. H., Wagner, D., & Miller, A. L. (2015). Psychometric evaluation of the Life Problems  
630 Inventory, a measure of borderline personality features in adolescents. *Journal of*  
631 *Psychology & Psychotherapy*, 5(4), 1000198. [https://doi.org/10.4172/2161-](https://doi.org/10.4172/2161-0487.1000198)  
632 0487.1000198
- 633 Revelle, W. (2020). *psych: Procedures for psychological, psychometric, and personality*  
634 *research* (2.0.9) [R]. Northwestern University. [https://CRAN.R-](https://CRAN.R-project.org/package=psych)  
635 [project.org/package=psych](https://CRAN.R-project.org/package=psych)
- 636 Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem:  
637 Construct validation of a single-item measure and the Rosenberg Self-Esteem Scale.  
638 *Personality and Social Psychology Bulletin*, 27(2), 151–161.  
639 <https://doi.org/10.1177/0146167201272002>



- 640 Robinson, K., & Wilson, M. S. (2020). Open to interpretation? Inconsistent reporting of lifetime  
641 nonsuicidal self-injury across two common assessments. *Psychological Assessment*,  
642 32(8), 726–738. <https://doi.org/10.1037/pas0000830>
- 643 Scala, J. W., Levy, K. N., Johnson, B. N., Kivity, Y., Ellison, W. D., Pincus, A. L., Wilson, S. J.,  
644 & Newman, M. G. (2018). The role of negative affect and self-concept clarity in  
645 predicting self-injurious urges in borderline personality disorder using ecological  
646 momentary assessment. *Journal of Personality Disorders*, 32(Supplement), 36–57.  
647 <https://doi.org/10.1521/pedi.2018.32.supp.36>
- 648 Schönbrodt, F. D., Zygad-Hoffmann, C., Nestler, S., Pusch, S., & Hagemeyer, B. (2021).  
649 Measuring motivational relationship processes in experience sampling: A reliability  
650 model for moments, days, and persons nested in couples. *Behavior Research Methods*.  
651 Advance online publication. <https://doi.org/10.3758/s13428-021-01701-7>
- 652 Schwartz, S. J., Klimstra, T. A., Luyckx, K., Hale, W. W., Frijns, T., Oosterwegel, A., van Lier,  
653 P. A. C., Koot, H. M., & Meeus, W. H. J. (2011). Daily dynamics of personal identity and  
654 self-concept clarity. *European Journal of Personality*, 25(5), 373–385.  
655 <https://doi.org/10.1002/per.798>
- 656 Shrout, P. E. (1998). Measurement reliability and agreement in psychiatry. *Statistical Methods in*  
657 *Medical Research*, 7, 301–317.
- 658 Shrout, P. E., & Lane, S. P. (2012). Psychometrics. In *Handbook of research methods for*  
659 *studying daily life* (pp. 302–320). Guilford.
- 660 Soto, C. J., & John, O. P. (2017). The next Big Five Inventory (BFI-2): Developing and  
661 assessing a hierarchical model with 15 facets to enhance bandwidth, fidelity, and

- 662 predictive power. *Journal of Personality and Social Psychology*, 113(1), 117–143.  
663 <https://doi.org/10.1037/pspp0000096>
- 664 Steffgen, G., & Silva, M. D. (2007). Self-Concept Clarity Scale (SCSS): Psychometric properties  
665 and aggression correlates of a German version. *Individual Differences Research*, 5(3),  
666 230–245.
- 667 Stinson, D. A., Wood, J. V., & Doxey, J. R. (2008). In search of clarity: Self-esteem and  
668 domains of confidence and confusion. *Personality and Social Psychology Bulletin*,  
669 34(11), 1541–1555. <https://doi.org/10.1177/0146167208323102>
- 670 Suszek, H., Fronczyk, K., Kopera, M., & Maliszewski, N. (2018). Implicit and explicit self-  
671 concept clarity and psychological adjustment. *Personality and Individual Differences*,  
672 123, 253–256.
- 673 Tomko, R. L., Solhan, M. B., Carpenter, R. W., Brown, W. C., Jahng, S., Wood, P. K., & Trull,  
674 T. J. (2014). Measuring impulsivity in daily life: The Momentary Impulsivity Scale.  
675 *Psychological Assessment*, 26(2), 339–349. <https://doi.org/10.1037/a0035083>
- 676 Usborne, E., & Taylor, D. M. (2010). The role of cultural identity clarity for self-concept clarity,  
677 self-esteem, and subjective well-being. *Personality and Social Psychology Bulletin*,  
678 36(7), 883–897. <https://doi.org/10.1177/0146167210372215>
- 679 Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures  
680 of positive and negative affect: The PANAS scales. *Journal of Personality and Social*  
681 *Psychology*, 54(6), 1063–1070.
- 682 Wong, A. E., & Vallacher, R. R. (2018). Reciprocal feedback between self-concept and goal  
683 pursuit in daily life. *Journal of Personality*, 86(3), 543–554.  
684 <https://doi.org/10.1111/jopy.12334>

- 685 Wu, J., & Watkins, D. (2009). Development and validation of a Chinese version of the self-  
686 concept clarity scale. *Psychologia*, 52(1), 67–79. <https://doi.org/10.2117/psysoc.2009.67>
- 687 Zou, G. Y. (2007). Toward using confidence intervals to compare correlations. *Psychological*  
688 *Methods*, 12(4), 399-413. doi:10.1037/1082-989X.12.4.399
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**Table 1***Demographic Characteristics of Sample*

Characteristic	<i>N</i>	%
Gender		
Female	75	59.1
Male	47	37.0
Non-binary/genderqueer/non-conforming	4	3.1
Prefer not to say	1	0.8
Race		
African American/Black	15	12.1
American Indian/Alaska Native	5	4.0
Asian/Pacific Islander	7	5.6
European American/White	82	66.1
More than one race	15	12.1
Ethnicity		
Hispanic/Latinx	47	39.2
Non-Hispanic/Latinx	73	60.8
Race/Ethnicity		
White Non-Hispanic/Latinx	51	42.1
All Other	70	57.9

**Table 2***Fit Statistics for Multilevel Exploratory Factor Models*

Number of Factors		$\chi^2$	df	<i>p</i>	CFI	TLI	RMSEA	SRMR <sub>between</sub>	SRMR <sub>within</sub>
Between	Within								
1	1	5570.17	40	<.0001	0 <sup>a</sup>	0 <sup>a</sup>	0.132	0.061	0.040
1	2	2734.52	33	<.0001	0 <sup>a</sup>	0 <sup>a</sup>	0.102	0.061	0.028
2	1	6020.91	33	<.0001	0 <sup>a</sup>	0 <sup>a</sup>	0.152	0.027	0.040
2	2	3489.44	26	<.0001	0 <sup>a</sup>	0 <sup>a</sup>	0.130	0.027	0.028

*Note.* CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = root mean square

error of approximation; SRMR = standardized root mean square residual.

<sup>a</sup> CFI and TLI values were negative for all models and are reported as zero.

**Table 3***Standardized Item Loadings from Multilevel Exploratory Factor Analysis*

Item	Two-Factor Model					
	One-Factor Model		Within		Between	
	Within	Between	Factor 1	Factor 2	Factor 1	Factor 2
Right now, I have a clear sense of what is most important to me in life.	-.463*	-.845*	-0.474*	-0.004	-0.984*	0.089
<b>I'm not sure what I really believe in.</b>	.440*	.899*	0.417*	0.034*	0.687*	0.190*
Right now, I feel bored.	.264*	.586*	0.042	0.270*	-0.106	0.879*
Right now, I feel empty.	.530*	.874*	0.001*	0.780*	0.017	0.970*
Right now, I don't feel like I have a sense of direction in life.	.388*	.912*	0.279**	0.129*	0.368*	0.605*
<b>Right now, I have a clear sense of who I am.</b>	-.490*	-.930*	-0.683*	0.170*	-0.962*	-0.008
<b>Right now, I feel that I am not really the person that I appear to be.</b>	.436*	.855*	0.407*	0.041*	0.483*	0.404*
<b>Right now, I am wondering about what kind of person I really am.</b>	.384*	.930*	0.385*	0.010	0.563*	0.397*

\*Statistically significant factor loading.

*Note.* For the two-factor models, we used Geomin (oblique) rotation at both levels. factor correlations were 0.602 within persons and 0.641 between persons, both of which were statistically significant at the  $\alpha = 0.05$  level. Items retained in the final scale are in boldface type.

707 **Table 4**708 *Standardized Item Loadings from Multilevel Confirmatory Factor Analysis*

	Within		Between	
	Loading	$R^2$	Loading	$R^2$
I'm not sure what I really believe in.	.595	.35	.854	.73
Right now, I have a clear sense of who I am.	-.441	.20	-.838	.70
Right now, I feel that I am not really the person that I appear to be.	.631	.40	.859	.74
Right now, I am wondering about what kind of person I really am.	.617	.38	.933	.87

709 *Note.* All loadings were significant at the  $p < .001$  level, and all  $R^2$  values were significant at the  
710  $p < .05$  level.

**Table 5***Pearson Correlations at the Between-Person Level among Study Variables*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. M-SCCS	1														
2. excited	0.28	1													
3. nervous	-0.52	0.05	1												
4. sad	-0.62	-0.16	0.76	1											
5. content	0.51	0.58	-0.35	-0.43	1										
6. SISE	0.69	0.46	-0.45	-0.60	0.65	1									
7. SCCS	0.65	0.24	-0.44	-0.43	0.35	0.55	1								
8. RSES	0.68	0.36	-0.46	-0.50	0.49	0.69	0.74	1							
9. PA	0.50	0.46	-0.27	-0.33	0.39	0.56	0.56	0.68	1						
10. NA	-0.58	-0.23	0.50	0.58	-0.42	-0.60	-0.59	-0.65	-0.37	1					
11. BFI-2 E	0.37	0.31	-0.26	-0.29	0.25	0.40	0.42	0.52	0.70	-0.31	1				
12. BFI-2 A	0.16	0.18	-0.08	-0.17	0.13	0.11	0.15	0.19	0.11	-0.30	-0.01	1			
13. BFI-2 C	0.32	0.17	-0.25	-0.22	0.21	0.27	0.35	0.39	0.49	-0.25	0.37	0.14	1		
14. BFI-2 N	-0.49	-0.31	0.47	0.46	-0.48	-0.62	-0.62	-0.69	-0.56	0.73	-0.39	-0.27	-0.30	1	
15. BFI-2 O	0.28	0.13	-0.06	-0.13	0.15	0.23	0.25	0.32	0.38	-0.18	0.17	0.26	0.10	-0.28	1

*Note.* Correlations involving variables 1-6 represent correlations among means of ratings delivered via experience sampling.

Correlations with an absolute value of 0.17 or above are statistically significant at the  $\alpha = 0.05$  level. For descriptive statistics for questionnaire items, see the study repository at <https://osf.io/6j5yx/>.



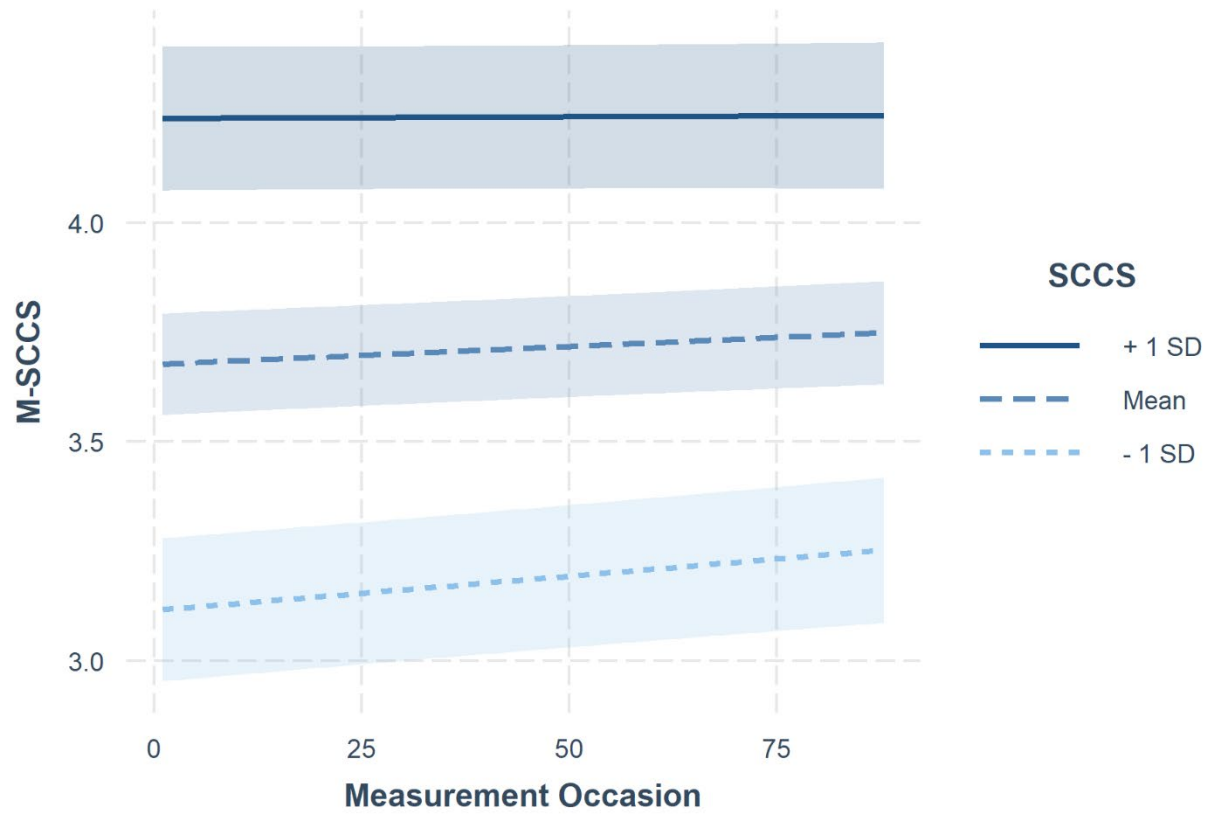
**Table 6**

*Descriptive Statistics and Pearson Correlations for Experience Sampling Variables at the Within-Person Level*

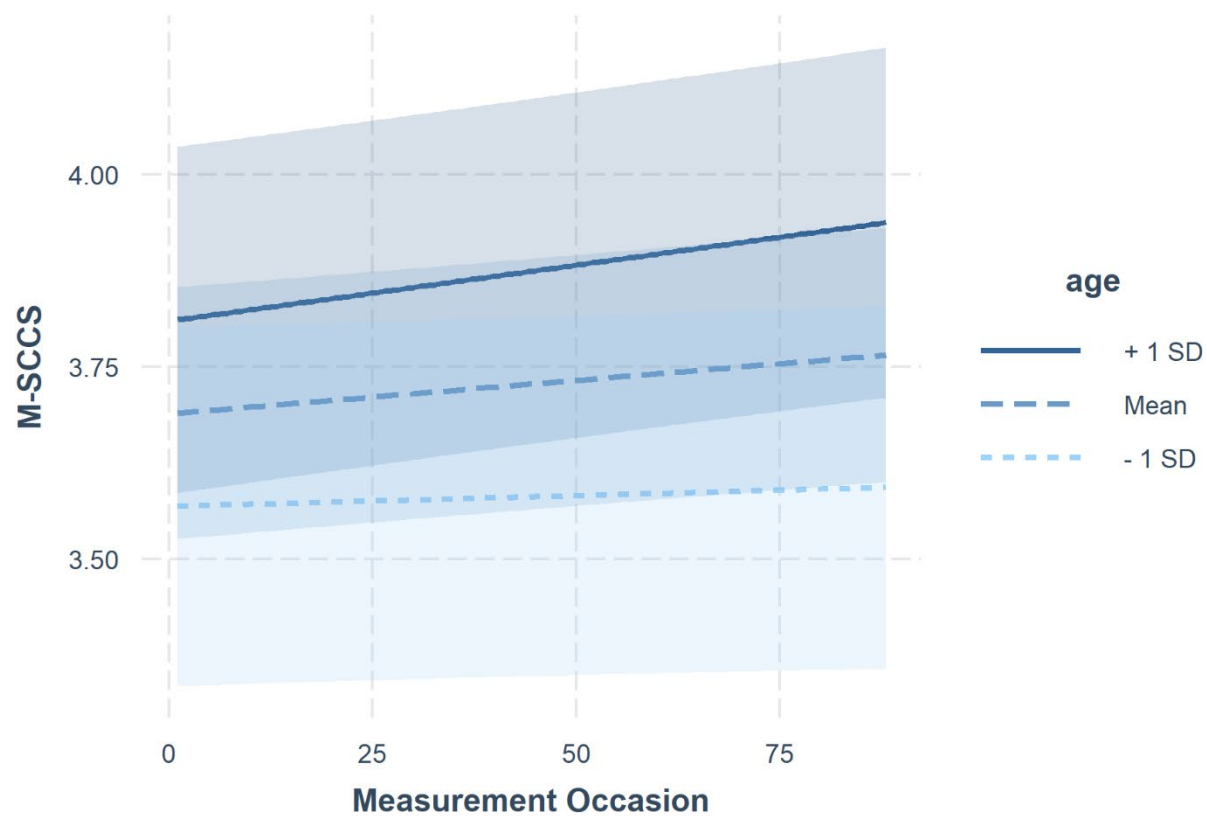
	<i>M</i>	RMSSD	1	2	3	4	5	6
1. M-SCCS	3.74	0.46	1					
2. excited	2.13	0.93	0.25	1				
3. nervous	1.88	0.87	-0.14	-0.01	1			
4. sad	1.69	0.76	-0.26	-0.22	0.36	1		
5. content	2.60	0.93	0.31	0.50	-0.20	-0.31	1	
6. SISE	3.30	0.69	0.37	0.32	-0.15	-0.28	0.37	1

*Note.* RMSSD = root mean square successive difference (see Jahng, Wood, & Trull, 2008).

Means and RSSMD values are averages across participants, weighted by the number of surveys returned per participant. All correlation coefficients are statistically significant at the  $\alpha = 0.05$  level except the one between the items “nervous” and “excited.”

**Figure 1**

*Note.* Ribbons around the estimates show 95% confidence intervals.

**Figure 2**

*Note.* Ribbons around the estimates show 95% confidence intervals.

***Figure Captions.***

Figure 1: Estimated Change in Momentary Self-Concept Clarity Scores as a Function of Baseline SCCS Score

Figure 2: Estimated Change in Momentary Self-Concept Clarity Scores as a Function of Age