Self-Concept Clarity Lays the Foundation for Self-Continuity: The Restorative Function of Autobiographical Memory

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The current research concerns the relations among self-concept clarity, autobiographic memory, and self-continuity. We hypothesized, and tested in 7 studies, that low self-concept clarity would disrupt self-continuity, but resorting to autobiographic memory would counter this disruption, thus restoring self-continuity. In Studies 1 and 2, low or threatened self-concept clarity was associated with decreased, or led to a decrease of, self-continuity. In Study 3, participants low (vs. high) in self-concept clarity manifested a stronger preference for an autobiographical memory task (but not for a control task). In Study 4, a suppressed mediational model of autobiographical memory received empirical backing: Threatened self-concept clarity decreased self-continuity, but also increased the propensity to evoke autobiographical memory, which fostered self-continuity. By manipulating autobiographical memory in different ways, Studies 5 through 7 provided additional direct evidence for the capacity of autobiographical memory to restore self-continuity. Taken together, the results converge in support of the hypothesis.

Keywords: autobiographical memory, restorative memory, self-concept clarity, self-continuity

Supplemental materials: http://dx.doi.org/10.1037/pspp0000259.supp

A substantial literature has focused on two facets of the self. One is structural, referring, for example, to self-concept clarity, the extent to which different self-aspects are integrated into a well-defined whole (Campbell, 1990; Campbell, Assanand, & Di Paula, 2003; Campbell & Lavallee, 1993). Another facet is temporal, referring, for example, to self-continuity (Bluck & Alea, 2008; Habermas & Köber, 2014, 2015), "a sense of connection between one's past and one's present" (Sedikides, Green, Saunders, Skowronski, & Zengel, 2016, p. 525). We are concerned in this article with the relation between self-concept clarity and self-continuity.

The two constructs have a lot in common. They are related positively to meaning in life (Bigler, Neimeyer, & Brown, 2001; Landau, Greenberg, Sullivan, Routledge, & Arndt, 2009), good mood (Nezlek & Plesko, 2001; Troll & Skaff, 1997), and indices of psychological health (Ritchie, Sedikides, Wildschut, Arndt, & Gidron, 2011; Usborne & Taylor, 2010). They are also influenced similarly by ostracism (Ayduk, Gyurak, & Luerssen, 2009; Jiang, Chen, & Hou, 2019), relationship break-up (Burris & Rempel,

2008; Slotter, Gardner, & Finkel, 2010), and loneliness (Richman et al., 2016; Van Tilburg, Sedikides, Wildschut, & Vingerhoets, 2019). Finally, both self-concept clarity (Crocetti, Rubini, & Meeus, 2008; Schwartz et al., 2011) and self-continuity (Chandler & Lalonde, 1995; Neisser, 1988) have been considered foundations of identity (i.e., viewing the self as the same person in the midst of contextual or life changes; Gregg & Sedikides, 2018; Gregg, Sedikides, & Gebauer, 2011).

Despite the apparent links between these two constructs, corresponding lines of research have run in parallel. We bring those lines together in the current article by asking not only whether self-concept clarity and self-continuity are related, but, more importantly, whether the former influences the latter, how, and to what effect. In seven studies, we highlight how low (compared with high) self-concept clarity influences self-continuity, and we explicate the restorative function of autobiographical memory in disturbances of self-continuity by low self-concept clarity.

Self-Concept Clarity and Self-Continuity

Theorists have considered the link between self-concept clarity and self-continuity. We distill relevant theoretical arguments below. First, the development of self-continuity would require a clear sense of self. For example, developmental psychologists suggested that the self develops along the dimensions of sociality and temporality (Bird & Reese, 2008; Howe & Courage, 1993; Nelson, 2008). Self-continuity (temporality) cannot be constructed without awareness of the self as distinct from others (sociality), that is, without clear self-knowledge. Also, social and personality psychologists posited that a self-boundary is essential to maintain self-continuity, drawing a parallel between the basic properties of

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a single-celled organism and the human extended self (Burris & Rempel, 2004). Amoebas have two survival needs, protection from threats and procurement of resources. Amoebas' cell membrane helps them to meet these needs by differentiating *in* from *out*. Similarly, humans have needs for self-protection and self-expansion (Pyszczynski, Greenberg, & Solomon, 2000; Sedikides, 2012). These two needs are facilitated by a differentiated self, which in turn will conduce to the extended self (i.e., self-continuity).

Second, self-continuity would require that distinct aspects of the self be organized. For example, the superordinate identity structure is thought to integrate lower-level components of identity and unify them as a whole (Deaux, 1992). Also, the extended self may necessitate organization from within, namely, the differentiation and specialization of structures and functions into the physical, social, and spatial-symbolic domains (Burris & Rempel, 2004). Similarly, identities may typically be organized in a network, where past identities are being discarded and new identities are being added (Iyer, Jetten, & Tsivrikos, 2008). The structural integrity of superordinate identity, extended self, or identity network will promote self-continuity. Consistent with this notion, several theoretical formulations posit that greater unity in self-concept's structure affords a sense of enduring self over time (Erikson, 1994; James, 1890/1950; Rogers, 1959). A clear (Roberts, Wood, & Caspi, 2008) or coherent (Landau, Greenberg, & Solomon, 2008) self-concept may facilitate the enduring self.

However, no research as yet has addressed the relation between self-concept clarity and self-continuity (Dunlop, 2017). Based on the convergence of the above literature threads, we hypothesize that low or threatened self-concept clarity is associated with, or leads to, decreased self-continuity.

Self-Concept Clarity, Autobiographical Memory, and Self-Continuity

Turning to autobiographical memory may be a way of coping with low self-concept clarity. The elaboration of one's past is more than mere retrospection. This process not only provides information about bygone events, but also elucidates the self. Autobiographical memory, in particular, can address the question *Who am I?* (Habermas & Bluck, 2000; McAdams, 1993; Wang, 2013). For example, the strategy of reconsideration of commitment—revising nonfunctional commitments from one's past—is often enacted to counter threats to self-concept clarity (Crocetti, Rubini, Luyckx, & Meeus, 2008; Grotevant, 1987).

Moreover, autobiographical memory contributes to self-continuity through self-remembering, self-knowledge, and self-narratives (Bluck & Alea, 2008; Habermas & Köber, 2015). First, self-remembering involves reliving past experience from a first-person perspective, thus increasing the likelihood of a path between past and present (Prebble, Addis, & Tippett, 2013). Second, self-knowledge (i.e., knowledge about one's past and present self) can fill in the gaps of self-remembering, thus increasing the perceived similarities between one's past and present, and ultimately assimilating the former into the latter (Conway & Pleydell-Pearce, 2000). Indeed, self-knowledge can compensate self-remembering in maintaining self-continuity among older persons with deteriorating episodic memory (Dunlop, 2017; Habermas, Diel, & Welzer, 2013; McAdams, 2013). Third, when self-remembering and

self-knowledge fail to consolidate self-continuity, more intentional effort is called for. Self-narratives contribute to self-continuity by constructing an orderly and meaningful life story (Lampinen, Odegard, & Leding, 2004; McAdams, 1996). Here, individuals draw on their self-remembering and self-knowledge to organize and interpret discrete events and to make inferences about who they are and what their lives mean (Bauer & Bonanno, 2001; Habermas & Bluck, 2000). By interconnecting life events, self-narratives establish a link between life events and the self. Indeed, creating a narrative to bridge changes in life (Habermas & Köber, 2015) and generating a theme for one's life story (McLean & Fournier, 2008) are positively related to self-continuity. More relevant, lower self-concept clarity is associated with a stronger tendency to think about one's past life experience (Bluck & Alea, 2008; Liao, Bluck, Alea, & Cheng, 2016), which could further contribute to self-continuity.

However, no research thus far has addressed the links among self-concept clarity, autobiographical information, and self-continuity. Based on the above literature threads, we hypothesize that, when self-concept clarity is threatened, people will turn to autobiographical memory, a process that will counteract the threat and reestablish self-continuity.

Overview

We propose that self-concept clarity predicts, and leads to, self-continuity. If self-aspects are randomly assembled without a well-integrated or clear structure, individuals will be unable to generate meaningful, connective patterns, thus resulting in disruption of self-continuity (Chandler, Lalonde, Sokol, & Hallett, 2003; Dunlop, 2017; Dunlop & Walker, 2013). In particular, we rely on theoretical proposals and findings that the self-concept is multifaceted and dynamic—a set of traits, behaviors, images, theories, schemas, prototypes, goals, and close relationships (Markus, 1983; Sedikides & Gregg, 2003). Although these elements may be chronically accessible (Conway, Singer, & Tagini, 2004; Kihlstrom & Klein, 1994), at any given moment only a subset of them will be momentarily accessible, forming the working self-concept (Baumeister, 1999; Markus & Wurf, 1987). When the formation of the working self-concept is disarranged by threatened self-concept clarity, disruption in self-continuity will ensue. In this case, individuals will turn back to their autobiographical memory to clarify their confused self-concept. This process will help them to counteract low self-concept clarity and foster self-continuity.

Informed by the literature, we derived two hypotheses. First, low or threatened self-concept clarity will be related, or lead, to decreased self-continuity (H1). Second, when self-concept clarity is threatened, individuals will resort to autobiographical memory, a process that will counter the threat and restore self-continuity (H2).

We tested two hypotheses in seven studies. In Study 1, we looked for a naturalistic link between self-concept clarity and self-continuity. In Study 2, we manipulated self-concept clarity (low vs. high) and assessed self-continuity. In Study 3, we examined whether participants induced with low (vs. high) self-concept clarity would turn to autobiographical memory (vs. a general events task serving as control). In Study 4, we tested a suppressed mediational model (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002) displayed in Figure 1. We expected that low self-
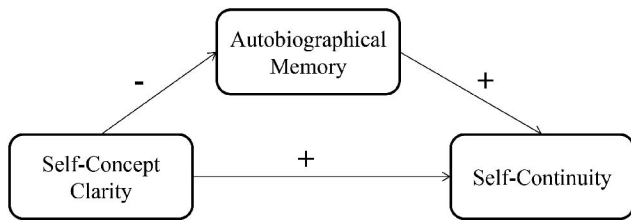
Figure 1. A suppressed mediational model depicting relations among self-concept clarity, autobiographical memory, and self-continuity.

concept clarity would undermine self-continuity, but would also strengthen the propensity to retreat to autobiographical memory, which would contribute to self-continuity restoration. In Study 5, we first assessed self-concept clarity, and then asked participants to engage in autobiographical versus nonautobiographical recall (i.e., recall of autobiographical events vs. general events). Subsequently, we measured self-continuity. Finally, in Studies 6 and 7, we orthogonally manipulated self-concept clarity and autobiographical memory (in terms of autobiographical events vs. general events and life story vs. environmental protection, respectively), so as to seek causal evidence for the suppressed mediational model.

Unless otherwise indicated, we used G*power (Faul, Erdfelder, Lang, & Buchner, 2007) to calculate power, although we oversampled in an effort to preempt attrition. In the MTurk studies (Studies 1–5, Study 7), we included the following attention check item: "Choose an answer for the question: People vary in the amount they pay attention to these kinds of surveys. Some take them seriously and read each question, whereas others go very quickly and barely read the questions at all. If you have read this question carefully, please do not respond to the scale below." In the Prolific study (Study 6), we included the abovementioned item in addition to: "For this question, please select number two to show you paid attention" and "For this question, please select number six to show you paid attention." We obtained ethical approval for our studies from the Human Research Ethics Committee (HREC; Reference Number: EA1709044; title: The Study on Self-Concept Confusion and Self-Continuity) at the University of Hong Kong.

Study 1

In Study 1, a cross-sectional investigation, we examined the covariation of self-concept clarity and self-continuity. This study begins to test H1, and in particular that lower self-concept clarity is associated with decreased self-continuity.

Method

Participants. We needed a minimum sample size of 96 to detect a medium effect ($\rho = .30$) with power of .85. Given that this study was a foray into the link between self-concept clarity and self-continuity, and being mindful of recommendations (on the basis of Monte-Carlo simulations) for the typical sample to approach 250 to yield stable estimates (Schönbrodt & Perugini, 2013), we tested 220 MTurk workers (U.S. citizenry, 80% and above human intelligence tasks [HITs] approval rate). We excluded five for not having completed the survey and three for failing the attention check question, leaving 212 participants in the

sample (107 men, 105 women; $M_{age} = 35.02$ years, $SD_{age} = 12.23$ years). Among them, 77.8% were White, 9.9% Asian, 9% African American, 0.5% American Indian or Alaskan Native, 1.4% from other ethnicities, and 1.4% from mixed ethnicities. Also, 7.5% of participants had a high school degree or equivalent, 27.8% some college education but no degree, 11.8% a community college degree, 35.8% a college degree, and 17% a graduate degree.

Procedure and materials. We assessed self-concept clarity with the 12-item self-concept clarity scale (Campbell et al., 1996). Sample items are: "In general, I have a clear sense of who I am and what I am" and "My beliefs about myself often conflict with one another" (1 = *strongly disagree*, 7 = *strongly agree*). After reverse-scoring 10 items, we averaged responses to form a composite ($\alpha = .92$). Higher scores indicated greater self-concept clarity ($M = 4.65$, $SD = 1.35$).[1]

We assessed self-continuity with the self-continuity index (Sedikides, Wildschut, Routledge, & Arndt, 2015). This 8-item index subdivides self-continuity into temporal and personal. The former involves abstract judgments about the relation between past and present ("I feel the past and present flow seamlessly together," "I feel the present is a mere continuation of the past," "I feel there is continuity between the past and present," and "I feel the past merges nicely into the present"), whereas the latter pertains to the relation between an individual's personal past and present ("I feel connected with my past," "I feel connected with who I was in the past," "There is continuity in my life," and "Important aspects of my personality remain the same across time"). We averaged participants' responses to the eight items (1 = *strongly disagree*, 7 = *strongly agree*) to create a composite ($M = 4.56$, $SD = 1.13$; $\alpha = .90$). The two types of self-continuity were positively related, $r(212) = .66$, $p < .001$. Separate analyses for the two types of self-continuity yielded results similar to the reported ones (online supplemental materials).

Results and Discussion

Self-concept clarity was significantly correlated with self-continuity, $r(212) = .32$, $p < .001$. Participants lower on self-concept clarity reported decreased self-continuity. We summarize this pattern in a scatter plot presented in Figure 2. The results were consistent with H1.[2]

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[1] We re-analyzed the data excluding four Self-Concept Clarity Scale (Campbell et al., 1996) items that seemed to assess temporal stability. The results involving this revised self-concept clarity index were identical to the reported ones in this and all other studies. See the online supplemental materials.

[2] Age has been found to be significantly associated with self-concept clarity (Campbell et al., 1996) and self-continuity (Brandtstädter & Greve, 1994; Erikson, 1959), and so we controlled for it across all studies. We did not do the same for participant sex. Researchers (Bono & McNamara, 2011) have suggested that justification is needed for the use of covariates, and have offered three guidelines: (a) theoretical rationale and evidence that the covariate is associated with the dependent variable; (b) an expectation that the covariate is correlated with the independent variable(s); and (c) a reason for why the covariate is peripheral to one's research objectives. Based on these guidelines, we considered it unnecessary to control for sex across the board, although we did control for it when we obtained a significant difference. We report, in the online supplemental materials, results where we control for participant age and, when relevant, participant sex.
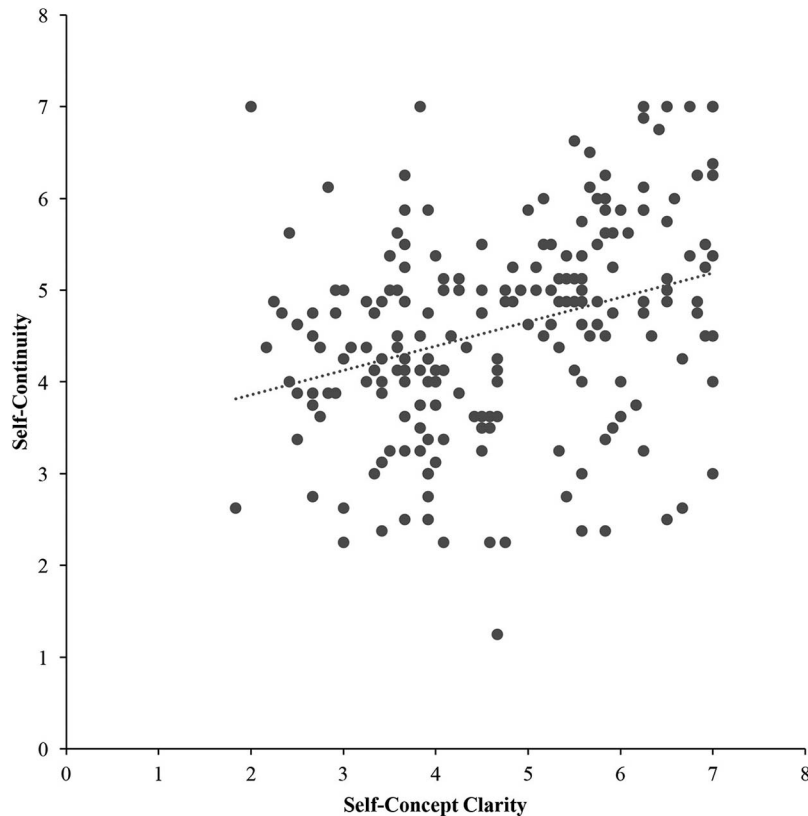
Figure 2. Scatter plot summarizing the relation between self-concept clarity and self-continuity in Study 1.

Study 2

In Study 2, we manipulated self-concept clarity and measured self-continuity, in an effort to assert the causal relation between the two constructs. Study 2, then, constituted a more rigorous test of H1.

Method

Participants and design. A sample size of at least 102 participants would be needed to detect a medium effect ($f = .30$) with power of .85. We recruited 111 MTurk workers (U.S. citizenry, 80% and above HITs approval rate). We excluded one for not completing the study and two for not following instructions (e.g., a participant in the high self-concept clarity condition wrote "Now, in the following space, please describe two aspects of your personality or two self-beliefs that are coherent with each other"), leaving 108 participants in the sample all of whom passed the attention check (72 women, 36 men; $M_{age} = 35.22$ years, $SD_{age} = 12.46$ years). Among them, 72.2% were White, 8.3% Asian, 7.4% African American, 3.7% from other ethnicities, and 8.3% from multiple ethnicities. Also, 2.8% of participants had a high school or lesser degree, 26.9% some college education, 15.7% a community college degree, 40.7% a college degree, and 13.9% a graduate degree. We randomly assigned participants to the low self-concept clarity ($n = 64$) or high self-concept clarity ($n = 44$) condition.

Procedure and materials. All participants read that the self-concept is multidimensional. Next, in the low self-concept clarity condition, participants learned that sometimes people feel that

different aspects of their personality conflict with each other, which would make them confused about who they are. Subsequently, they were instructed to "please describe two aspects of your personality or two self-beliefs that conflict with each other. You have to describe what they are, how you feel the two conflict with each other, and the confusion that the conflict brings to you." In the high self-concept clarity condition, participants learned that sometimes people feel that different aspects of their personality are coherent with each other, which would clarify for them who they are. Subsequently, they were instructed to "please describe two aspects of your personality or two self-beliefs that are coherent with each other. You have to describe what they are, how you feel the two are coherent with each other, and the clarity that the coherence brings to you." On average, participants wrote 69.04 words in their essays ($SD = 42.08$).

Subsequently, participants responded to three manipulation check items: "My beliefs about myself conflict with one another," "I did not experience conflict between the different aspects of my personality," and "I feel that I am not really the person that I appear to be" (1 = *strongly disagree*, 7 = *strongly agree*). After reverse-scoring the first and third item, we averaged responses to form a composite ($M = 4.32$, $SD = 1.61$; $\alpha = .77$). Higher scores reflected greater self-concept clarity. Finally, as in Study 1, participants completed the self-continuity index (Sedikides et al., 2015; 1 = *strongly disagree*, 9 = *strongly agree*; $M = 5.79$, $SD = 1.57$; $\alpha = .91$). Also as in Study 1, the two types of self-continuity were positively related, $r(108) = .68$, $p < .001$. Separate analyses

for them yielded results similar to the ones we report below (online supplemental materials).

Results and Discussion

Word count. The number of essay words that participants in the low ($M = 70.30$, $SD = 46.73$) versus high ($M = 67.20$, $SD = 34.66$) self-concept clarity condition wrote did not differ significantly, $F(1, 106) = .14$, $p = .71$, $\eta_p^2 = .001$, 90% CI [.0000, .0330].[3] Nevertheless, we used word count as a covariate in the following Analyses of Covariance (ANCOVAs).

Manipulation check. Participants in the low self-concept clarity condition ($M = 3.60$, $SD = 1.30$) reported reduced self-concept clarity than those in the high self-concept clarity condition ($M = 5.38$, $SD = 1.45$), $F(1, 105) = 43.99$, $p < .001$, $\eta_p^2 = .295$, 90% CI [.1778, .3989]. The manipulation was effective. Also, self-concept clarity (i.e., the manipulation check index) was significantly and positively associated with self-continuity, $r(108) = .41$, $p < .001$.

Self-continuity. Participants in the low self-concept clarity condition ($M = 5.50$, $SD = 1.59$) reported decreased self-continuity relative to their high self-concept clarity counterparts ($M = 6.22$, $SD = 1.46$), $F(1, 105) = 5.61$, $p = .020$, $\eta_p^2 = .051$, 90% CI [.0043, .1318]. Low self-concept clarity undermined self-continuity. The results are consistent with H1.[4]

Study 3

In Study 3, we examined the immediate memorial consequence of low self-concept clarity. We manipulated self-concept clarity and assessed the extent to which participants turned to autobiographical memory. In accord with H2, we expected that threatened self-concept clarity would heighten preferences for an autobiographical memory (vs. control) task.

Method

Participants and design. We needed at least 102 participants to detect a medium effect ($f = .30$) with power of .85. We recruited 213 MTurk workers (US citizenry, 90% and above HITs approval rate, not having taken part in our prior studies). We excluded one participant for not completing the study, 14 for failing the attention check, and 13 for not following instructions (e.g., a participant in the low self-concept clarity condition wrote "wow, this is a very difficult task. I don't even know how to answer this to be quite honest," and another in the high self-concept clarity condition wrote "no aspects of my personalirty are in conflisct. i am not conflicted about who i am"). The resulting sample consisted of 185 participants (120 women, 65 men; $M_{age} = 37.95$ years, $SD_{age} = 13.33$ years). Of them, 77.3% were White, 7.6% African American, 7.6% Asian, 1.6% American Indian or Alaskan Native, 1.6% from other ethnicities, and 4.3% from multiple ethnicities. In addition, 0.5% of participants had less than high school degree, 5.9% a high school degree or equivalent, 24.9% some college education but no degree, 11.4% a community college degree, 38.9% a college degree, and 18.4% a graduate degree. We randomly assigned them to the conditions of a 2 (self-concept clarity: low, high) × 2 (task: autobiographical, control) mixed-design, with the first factor being between-subjects and the second being within-subjects. The cell sizes of the between-subjects factor were 73 (low self-concept clarity) and 112 (high self-concept clarity).

Procedure and materials. We manipulated self-concept clarity and assessed responses to the manipulation check ($M = 4.65$, $SD = 1.54$; $\alpha = .73$), as in Study 2 (on average, participants wrote 54.09 essay words [$SD = 32.94$]). Subsequently, we informed participants of two impending tasks. One would be autobiographical, in which they would think about their past and write down at least five life events that were important to them. The other would be general, in which they would think about their society and write down at least five general events. Then, participants expressed their preferences for carrying out each task ($0 = not\ at\ all$, $10 = extremely$) along with their perceived difficulty of each task ($1 = quite\ easy$, $7 = quite\ difficult$). This concluded the experiment; that is, no task was involved.

Results and Discussion

Word count. The number of essay words that participants wrote in the low ($M = 54.33$, $SD = 33.50$) versus high ($M = 53.93$, $SD = 32.72$) self-concept clarity condition, $F(1, 183) = .01$, $p = .94$, $\eta_p^2 < .001$, 90% CI [.0000, .0050] did not differ significantly. Nonetheless, we covaried out word count in subsequent analyses.

Manipulation check. Participants in the low self-concept clarity condition ($M = 3.84$, $SD = 1.28$) reported decreased self-concept clarity than those in the high self-concept clarity condition ($M = 5.18$, $SD = 1.47$), $F(1, 182) = 40.20$, $p < .001$, $\eta_p^2 = .181$, 90% CI [.1031, .2612]. The manipulation was effective.

Tasks difficulty. A 2 × 2 ANCOVA on task difficulty produced a nonsignificant interaction, $F(1, 182) = 1.74$, $p = .19$, $\eta_p^2 = .009$, 90% CI [.0000, .0456], and a nonsignificant self-concept clarity main effect, $F(1, 182) = 1.36$, $p = .24$, $\eta_p^2 = .007$, 90% CI [.0000, .0412]. However, the task main effect was significant, $F(1, 182) = 9.28$, $p = .003$, $\eta_p^2 = .049$, 90% CI [.0102, .1075]. Participants regarded the autobiographical memory task ($M = 3.32$, $SD = 1.83$) as easier than the control task ($M = 3.89$, $SD = 1.69$). We present descriptive statistics in Table 1. In the analysis below, we control for task difficulty (along with word count).

Task preferences. A 2 × 2 ANCOVA on task preferences yielded a marginally significant interaction, $F(1, 180) = 3.06$, $p = .082$, $\eta_p^2 = .017$, 90% CI [.0000, .0597] (see Figure 3). Participants in the low self-concept clarity condition ($M = 6.89$, $SD = 2.37$) tended to express a stronger preference for the autobiographical memory task than those in the high self-concept clarity condition ($M = 5.85$, $SD = 2.57$), $F(1, 181) = 5.12$, $p = .025$, $\eta_p^2 = .027$, 90% CI [.0018, .0773]. However, participants in the low ($M = 6.15$, $SD = 2.71$) and high ($M = 5.88$, $SD = 2.47$) self-concept clarity conditions did not differ significantly in their preferences for the control task, $F(1, 181) = .53$, $p = .47$, $\eta_p^2 = .003$, 90% CI [.0000, .0296]. The main effect of self-concept clarity, $F(1, 180) =$

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[3] The value of r^2 or η^2 are squared, and thus they could not be negative. Computing 95% CI entails a high probability of including 0, even when the results are significant. As Steiger (2004) pointed out, 95% CI for Cohen's d remains the same as 90% CI for η^2. To avoid confusion, we report 90% instead of 95% CI for r^2 or η_p^2 throughout our manuscript.

[4] In the online supplemental materials, we report results controlling for participant age.

Table 1
Means and Standard Deviations for Task Preferences and Task Difficulty in Study 3

Clarity	AM task preference		Control task preference		AM task difficulty		Control task difficulty	
	M	SD	M	SD	M	SD	M	SD
High self-concept clarity	5.85	2.57	5.88	2.47	3.50	1.82	3.90	1.75
Low self-concept clarity	6.89	2.37	6.15	2.71	3.04	1.83	3.88	1.60

Note. AM = autobiographical memory.

2.66, $p = .11$, $\eta_p^2 = .015$, 90% CI [.0000, .0558], was not significant. The main effect of task was significant, $F(1, 180) = 7.06$, $p = .009$, $\eta_p^2 = .038$, 90% CI [.0054, .0928].

In all, participants' task preferences were independent of task difficulty. The perceived difficulty differences between the autobiographical memory task and the control task could not account for why participants preferred the former to the latter. Taken together, Study 3 provides initial support for H2, namely, that low self-concept clarity can prompt a retreat to autobiographical memory (rather than an alternative source of memory, such as general events).[5]

Study 4

In Study 4, we probed the restorative function of autobiographical memory. As part of H2, we posited that low self-concept clarity would be associated with a reduction in self-continuity, but also with a rise in self-continuity via autobiographical memory.

Method

Participants and design. We used the Monte Carlo Power Analysis for Indirect Effects application (https://schoemanna.shinyapps.io/mc_power_med/; Schoemann, Boulton, & Short, 2017) to determine the sample size for our proposed suppressed mediational model. We needed at least 168 participants to reach a power of 0.85, assuming correlations of $r = .3$ among the independent variable self-concept clarity, the dependent variable self-continuity, and the putative mediator autobiographical memory. We recruited 184 MTurk workers (US citizenry, 80% and above

Figure 3. Task preferences as function of self-concept clarity and memory in Study 3. Error bars represent ±1 *SE*.

HITs approval rate, not having taken part in our previous studies). We excluded six for not completing the survey and five for failing the attention check, leaving 173 participants in the sample (90 men, 83 women; $M_{age} = 36.66$ years, $SD_{age} = 11.19$ years). Of them, 75.1% were White, 7.5% African American, 6.9% Asian, 1.7% American Indian or Alaskan Native, 0.6% Native Hawaiian or other Pacific Islander, 3.5% from other ethnicities, and 4.6% from multiple ethnicities. Also, 1.7% had less than a high school degree, 12.1% a high school degree or equivalent, 17.3% some college education but no degree, 10.4% a community college degree, 46.8% a college degree, and 11.6% a graduate degree.

Procedure and materials. We measured self-concept clarity with the 12-item self-concept clarity scale (Campbell et al., 1996), as in Study 1 ($M = 4.89$, $SD = 1.37$; $\alpha = .94$). To assess the extent to which individuals turn to autobiographic memory in the face of low self-concept clarity, we used the eight-item self-function subscale of the Thinking about Life Experience questionnaire (TALE: self; Bluck & Alea, 2008). Sample items are: "When I want to remember a lesson I learned in the past, I think back over or talk about my life or certain periods of my life" and "When I want to reinterpret old events in the light of things that have happened since, I think back over or talk about my life or certain periods of my life" ($1 = almost\ never$, $7 = very\ frequently$). We formed a composite ($M = 4.24$, $SD = 1.22$; $\alpha = .93$), with higher scores reflecting a stronger propensity to reflect on one's past. Finally, we measured self-continuity (Sedikides et al., 2015), as in Studies 1 and 2 ($1 = strongly\ disagree$, $9 = strongly\ agree$; $M = 5.84$, $SD = 1.74$; $\alpha = .94$). Again, the two types of self-continuity were positively associated, $r(173) = .74$, $p < .001$. Separate analyses for them yielded results similar to the reported ones (online supplemental materials).

Results and Discussion

As in Study 1, lower self-concept clarity was linked to decreased self-continuity, $r(173) = .33$, $p < .001$. In addition, self-concept clarity was negatively associated with autobiographical memory, $r(173) = -.29$, $p < .001$: Participants lower on self-concept clarity reported a stronger inclination to turn to autobiographical memory. Moreover, autobiographical memory was positively, yet marginally, associated with self-continuity, $r(173) = .13$, $p = .079$: Participants who turned to autobiographical memory tended to report greater self-continuity. We present relevant scatter plots in Figure 4.

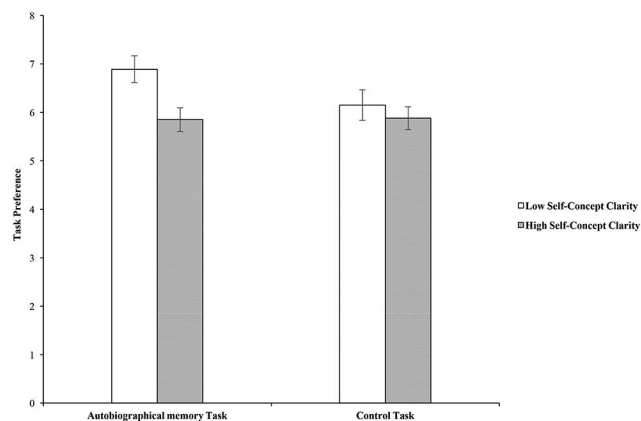[5] In the online supplemental materials, we report results controlling for participant age and sex.
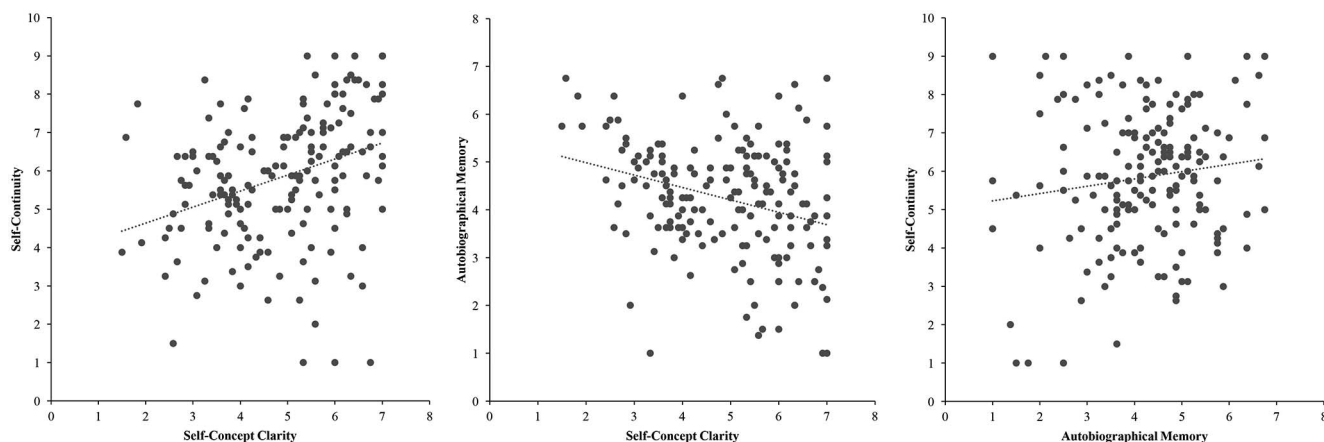
Figure 4. Scatter plots summarizing the relations among between self-concept clarity, autobiographical memory, and self-continuity in Study 4.

We proceeded to test the mediating role of autobiographical memory in the relation between self-concept clarity and self-continuity. We conducted a bootstrapping analysis with 5,000 iterations using PROCESS Macro (Preacher & Hayes, 2008). We entered self-concept clarity as independent variable, autobiographical memory as mediator, and self-continuity as a dependent variable in Model 4. The indirect effect was significant ($b = -.09$, $SE = .04$), given that the 95% confidence interval for this effect $[-.1962, -.0277]$ did not include 0 (see Figure 5). However, the indirect effect ($b = -.09$, $SE = .04$) was in the opposite direction to the direct effect of self-concept clarity, indicating that autobiographical memory suppressed the relation between self-concept clarity and self-continuity (MacKinnon et al., 2002). Study 4, then, revealed a suppressed mediating effect of autobiographical memory on self-continuity.

We tested a plausible alternative model, with self-continuity as independent variable and self-concept clarity as dependent variable (i.e., self-continuity ⇒ autobiographical memory ⇒ self-concept clarity). The indirect effect was not significant ($b = -.04$, $SE = .03$), given that the relevant 95% confidence interval $[-.0990, .0103]$ included 0. Thus, this model was unsupported. We conclude that the findings are consistent with the possibility that autobiographical memory plays a restorative role in disturbances of self-continuity which are associated with fluctuations in self-concept clarity.[6]
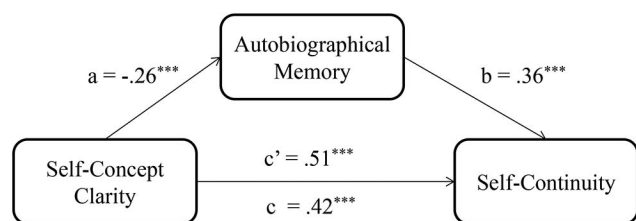
Study 5

In Study 5, we aimed to replicate and extend the Study 4 results in a further test of H2. Specifically, we tested more directly the restorative function of autobiographical memory, namely, that it offsets the adverse influence of low self-concept clarity and fosters self-continuity. After assessing self-concept clarity, we manipulated memory (autobiographical vs. control), and measured self-continuity. We expected that, when participants lower (vs. higher) on self-concept clarity are given the opportunity to engage in an autobiographical memory (vs. control) task, they will report an increase in self-continuity.

Method

Participants and design. We needed at least 102 participants to detect a medium effect size ($f = .30$) with power of .85. We recruited 143 MTurk workers (U.S. citizenry, 80% and above HIT approval rate, not having taken part in prior studies). We excluded seven participants for not completing the study, and 13 for not following instructions (one participant in the autobiographical memory condition wrote: "Future of the country," "Childrens future," "Economy," "Finances," "Finding a job I enjoy," "Health," "Comfort," "I would talk about my travels," "My experience with family issues"). The final sample comprised 123 participants, all of whom passed the attention check (64 women, 59 men; $M_{age} = 36.70$ years, $SD_{age} = 13.06$ years). We assigned them randomly to the autobiographical memory ($n = 59$) or control ($n = 64$) condition. Of participants, 77.2% were White, 10.6% Asian, 5.7% African American, 1.6% American Indian or Alaskan Native, and 4.9% from multiple ethnicities. Additionally, 0.8% of participants had less than a high school degree, 8.1% a high school degree or equivalent, 22.8% some college education but no degree, 6.5% a community college degree, 50.4% a college degree, and 11.4% a graduate degree.

Figure 5. Suppressed mediational model in Study 4. *** $p < .001$. The coefficients are unstandardized.

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[6] In the online supplemental materials, we report results controlling for participant age, and involving the eight-item index of the self-concept clarity scale.

Procedure and materials. We assessed self-concept clarity as in Studies 1 and 4 (Campbell et al., 1996; $M = 4.86$, $SD = 1.35$; $\alpha = .92$). The memory manipulation followed. Participants in the autobiographical memory condition recalled and listed at least five (of a maximum of 20) autobiographical events, whereas participants in the control condition recalled and listed at least five (of a maximum of 20) general events (e.g., news they heard about recently) unrelated to their personal lives. As in Studies 2 and 3, we counted the words that participants wrote in their essays ($M = 69.96$, $SD = 83.19$). Finally, we measured self-continuity as in Studies 1, 2, and 4 (Sedikides et al., 2015; 1 = *strongly disagree*, 9 = *strongly agree*; $M = 6.45$, $SD = 1.57$; $\alpha = .93$). The two types of self-continuity were positively related, $r(123) = .78$, $p < .001$, with separate analyses producing results similar to the reported ones (online supplemental materials).

Results and Discussion

The word count of participants in the memory condition ($M = 102.19$, $SD = 105.48$) was significantly higher than that of participants in the control condition ($M = 40.25$, $SD = 35.88$), $F(1, 121) = 19.62$, $p < .001$, $\eta_p^2 = .139$, 90% CI [.0564, .2341].

We coded the autobiographical memory condition as 1 and the control condition as -1. We standardized scores on self-concept clarity and word count. We then conducted a general linear model with self-continuity as a dependent measure controlling for the standardized scores of word count. $R^2 = .057$, 90% CI [.0082, .1404]. Neither the self-concept clarity main effect ($b = .17$, $SE = .14$, $t(118) = 1.20$, $p = .23$, $\eta_p^2 = .012$, 90% CI [.0000, .0631]) nor the autobiographical memory main effect ($b = .12$, $SE = .15$, $t(118) = .80$, $p = .43$, $\eta_p^2 = .005$, 90% CI [.0000, .0471]) was significant. The critical interaction, though, was significant, $b = -.33$, $SE = .14$, $t(118) = -2.32$, $p = .022$, $\eta_p^2 = .043$, 90% CI [.0033, .1163] (see Figure 6). In the autobiographical memory condition, self-concept clarity was unrelated to self-continuity, $b = -.16$, $SE = .19$, $t(118) = -.83$, $p = .41$, $\eta_p^2 = .006$, 90% CI [.0000, .0485]. However, in the control condition, self-concept clarity was significantly and positively related to self-continuity, $b = .50$, $SE = .21$, $t(118) = 2.39$, $p = .018$, $\eta_p^2 = .046$, 90% CI [.0042, .1204]. The results lend further causal evidence to the hypothesis that autobiographical memory offsets the adverse influence of low self-concept clarity on self-continuity.[7]

Study 6

Study 6 constituted the decisive test of H2. We manipulated self-concept clarity and autobiographical memory, and then assessed self-continuity. Our prior studies indicated that low self-concept clarity undermines self-continuity, and that low self-concept clarity strengthens the reliance on autobiographical memory, thus restoring self-continuity. We extended the scope of those studies. We expected that low (compared with high) self-concept clarity participants would manifest greater self-continuity, if offered the opportunity to resort to autobiographical memory (but not to a control task).

Method

Participants and design. We needed at least 102 participants to detect a medium effect ($f = .30$) with power of .85. We recruited

214 participants (U.S. citizenry) from Prolific. We excluded 17 for failing the attention check, seven for not completing the studies and another eight for not following the instructions carefully (e.g., we deleted one participant in the low self-concept clarity condition for writing: "There are many aspects of people. I think that is just expected. As people grow then things will change."). The final sample comprised 182 participants (98 women, 84 men; $M_{age} = 34.41$ years, $SD_{age} = 10.81$ years). Among them, 19.7% were White, 8.2% Asian, 6% African American, 2.2% Hispanic, 0.5% Native American, 0.5% Pacific Islander, and 2.7% from other ethnicities. Also, 0.5% of participants had less than a high school degree, 7.7% a high school degree or equivalent, 20.3% some college education but not a degree, 6.6% a 2-year college degree, 44.5% a 4-year college degree, 15.4% a Master's degree, 2.7% a Doctoral degree, and 2.2% a professional degree. We randomly assigned participants to the conditions of a 2 (self-concept clarity: low, high) × 2 (memory: autobiographical, control) between-subjects design. Cell sizes ranged from 40 to 49.

Procedure and materials. We used the same manipulation and manipulation check of self-concept clarity ($M = 4.11$, $SD = 1.44$; $\alpha = .72$), as in Studies 2 and 3.

We proceeded with the memory manipulation. Same with Study 5, participants in the autobiographical memory condition recalled and listed at least five (out of a maximum of 20) autobiographical events, whereas participants in the control condition recalled and listed at least five (out of a maximum of 20) general events (e.g., things they noticed or news they heard about today) unrelated to their personal lives. As in Studies 2, 3, and 5, we counted the words participants wrote. On average participants in the low and high self-concept conditions wrote 85.18 essay words ($SD = 49.48$). Also, on average, participants in the autobiographical memory and control conditions wrote 67.16 essay words ($SD = 52.65$). Subsequently, as in former studies, we assessed self-continuity with the self-continuity index (Sedikides et al., 2015; 1 = *strongly disagree*, 7 = *strongly agree,* $M = 4.82$, $SD = 1.09$; $\alpha = .89$). The two types of self-continuity were positively related, $r(182) = .69$, $p < .001$, and separate analyses yielded results similar to the reported ones (online supplemental materials).

Results and Discussion

Word count. The word count of participants in the low ($M = 90.18$, $SD = 54.06$) and high ($M = 79.84$, $SD = 43.73$) self-concept clarity conditions did not differ significantly, $F(1, 180) = 2.00$, $p = .16$, $\eta_p^2 = .011$, 90% CI [.0000, .0490]. However, the word count of participants in the memory condition ($M = 84.02$, $SD = 66.49$) was significantly higher than that of participants in the control condition ($M = 51.02$, $SD = 26.19$), $F(1, 180) = 19.72$, $p < .001$, $\eta_p^2 = .099$, 90% CI [.0398, .1709].

Manipulation check. Controlled for the word count of self-concept clarity (low vs. high) tasks, participants in the low self-concept clarity condition ($M = 3.39$, $SD = 1.16$) reported lower self-concept clarity than those in the high self-concept clarity condition ($M = 4.88$, $SD = 1.31$), $F(1, 179) = 63.25$, $p < .001$, $\eta_p^2 = .261$, 90% CI [.1733, .3433], thus establishing the effective-

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[7] In the online supplemental materials, we report results controlling for participant age and word count. Further, we report results regarding the revised self-concept clarity index.
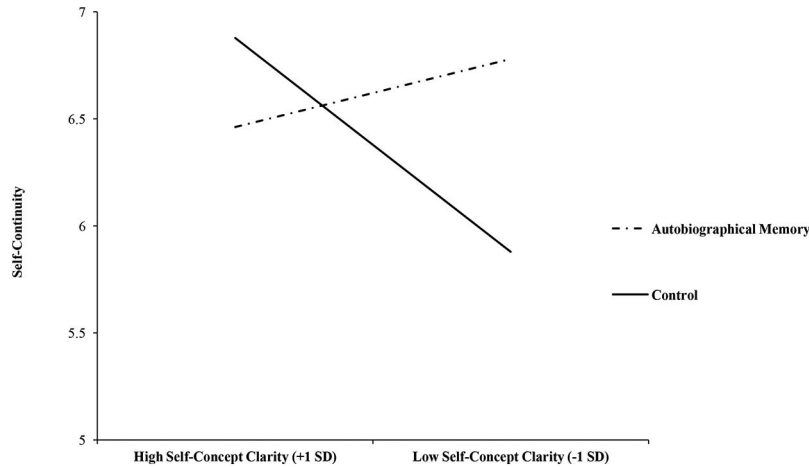
Figure 6. Self-continuity as a function of self-concept clarity and memory in Study 5.

ness of the manipulation. The self-concept clarity manipulation check index was significantly and positively associated with self-continuity, $r(182) = .28$, $p < .001$.

Low self-concept clarity, autobiographical memory, and self-continuity. Controlling for the word count of both self-concept clarity (low vs. high) and memory (memory vs. control) tasks, we obtained no significant main effect of self-concept clarity, $F(1, 176) = .40$, $p = .53$, $\eta_p^2 = .002$, 90% CI [.0000, .0279], or memory, $F(1, 176) = 2.17$, $p = .14$, $\eta_p^2 = .012$, 90% CI [.0000, .0519].

We did obtain, though, the theoretically important interaction, $F(1, 176) = 4.18$, $p = .042$, $\eta_p^2 = .023$, 90% CI [.0004, .0713] (see Figure 7). In the memory condition, there was no significant difference in reported self-continuity between high ($M = 4.88$, $SD = 1.06$) and low ($M = 5.06$, $SD = 1.11$) self-concept clarity participants, $F(1, 176) = .92$, $p = .34$, $\eta_p^2 = .005$, 90% CI [.0000, .0367]. However, in the control condition, high self-concept clarity participants ($M = 4.88$, $SD = 1.07$) reported greater self-continuity than low self-concept clarity ones ($M = 4.44$, $SD = 1.04$), $F(1, 176) = 3.81$, $p = .053$, $\eta_p^2 = .021$, 90% CI [.0000, .0680], though the difference was marginally significant.
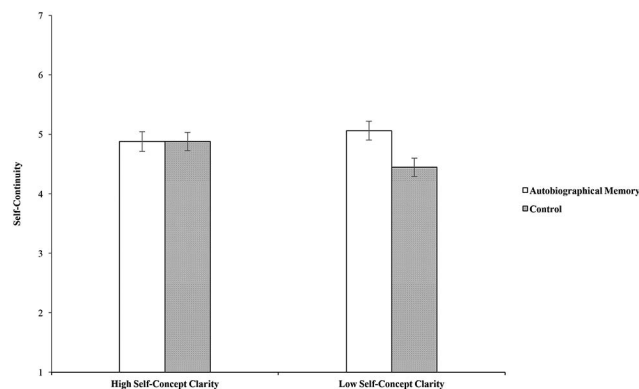
Summary. By manipulating orthogonally self-concept clarity and autobiographical memory, Study 6 conceptually replicated and extended findings from the previous five studies furnishing causal evidence.[8]

Study 7

Study 7 aimed to test the replicability of the critical Study 6 findings using a different autobiographical memory manipulation, that is, life narratives (Habermas & Köber, 2015; McAdams, 2001) versus environmental protection. After being exposed to self-concept clarity and autobiographical memory manipulations, participants wrote about their life story versus environmental protection. Assessment of self-continuity followed. Same with Study 6, we expected that low (compared with high) self-concept clarity participants would exhibit greater self-continuity, if given an opportunity to resort to autobiographical memory (but not to environmental protection memory).

Method

Participants and design. We required at least 102 participants to detect a medium effect ($f = .30$) with power of .85. We recruited 190 MTurk workers (U.S. citizenry, 90% and above HIT approval rate, nonparticipation in our prior studies). We excluded seven participants for not completing the study, 17 for failing the attention check, and 11 for not following the instructions carefully (e.g., one participant in the low self-concept clarity condition wrote "yes that was," and another in the high self-concept clarity condition wrote "NA"). The final sample consisted of 155 participants (104 women, 51 men; $M_{age} = 38.52$ years, $SD_{age} = 12.81$ years). Of them, 82.4% were White, 9.8% Asian, 2.6% African American, 2.0% American Indian or Alaskan Native, and 3.3% from multiple ethnicities. In addition, 5.8% of participants possessed a high school degree or equivalent, 20% some college education but no degree, 9.7% a 2-year college degree, 42.6% a

Figure 7. Self-continuity as function of self-concept clarity and memory in Study 6. Error bars represent ±1 *SE*.

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[8] In the online supplemental materials, we report results controlling for participant age and word count.

4-year college degree, and 21.3% a graduate level degree; 0.6% declared *none of the above*. We randomly assigned participants to the conditions of a 2 (self-concept clarity: low, high) × 2 (memory: autobiographical, control) between-subjects design. Cell sizes ranged from 38 to 40.

Procedure and materials. We used a manipulation and manipulation check of self-concept clarity ($M = 4.27$, $SD = 1.50$; $\alpha = .70$) identical to those of Studies 2, 3, and 6. The memory manipulation followed. In the autobiographical memory condition, participants narrated their life stories (i.e., thinking about what they had gone over during the years and how major life experiences had made them who they were), whereas, in the control condition, they wrote in favor of environmental protection (i.e., why environmental protection is important and what benefits it may bring). These tasks lasted 3 min each. As in Studies 2, 3, and 5, we proceeded with a word count. On average participants in the low and high self-concept conditions wrote 60.92 essay words ($SD = 40.48$). Also, on average, participants in the autobiographical memory and control conditions wrote 62.20 essay words ($SD = 37.11$). Finally, as in prior studies, we assessed self-continuity using the self-continuity index (Sedikides et al., 2015; $1 = strongly\ disagree$, $7 = strongly\ agree$, $M = 5.01$, $SD = 1.18$; $\alpha = .95$). The two types of self-continuity were positively associated, $r(155) = .84$, $p < .001$, with separate analyses leading to similar results as the reported ones (online supplemental materials).

Results and Discussion

Word count. The word count of participants in low self-concept clarity condition ($M = 68.68$, $SD = 44.79$) was higher compared with that of participants in the high self-concept clarity condition ($M = 52.86$, $SD = 33.91$), $F(1, 153) = 6.12$, $p = .014$, $\eta_p^2 = .038$, 90% CI [.0041, .0992]. Also, the word count of autobiographical memory condition participants ($M = 71.88$, $SD = 42.09$) was higher than that of control condition participants ($M = 52.39$, $SD = 28.31$), $F(1, 153) = 11.42$, $p < .001$, $\eta_p^2 = .069$, 90% CI [.0183, .1412].

Manipulation check. Controlled for the word count of self-concept clarity (low vs. high) tasks, participants in the low self-concept clarity condition ($M = 3.48$, $SD = 1.26$) reported lower self-concept clarity than those in the high self-concept clarity condition ($M = 5.10$, $SD = 1.28$), $F(1, 152) = 55.63$, $p < .001$, $\eta_p^2 = .268$, 90% CI [.1721, .3565], testifying to the effectiveness of the manipulation. The self-concept clarity manipulation check index was significantly linked to self-continuity, $r(155) = .23$, $p = .004$.

Low self-concept clarity, autobiographical memory, and self-continuity. Controlling for the word count of both self-concept clarity (low vs. high) and memory (memory vs. control) tasks, neither the self-concept clarity, $F(1, 149) = 2.11$, $p = .15$, $\eta_p^2 = .014$, 90% CI [.0000, .0599], nor the memory, $F(1, 149) = 1.84$, $p = .18$, $\eta_p^2 = .012$, 90% CI [.0000, .0564], main effect was significant.

The theoretically relevant interaction was marginally significant, $F(1, 149) = 3.11$, $p = .080$, $\eta_p^2 = .020$, 90% CI [.0000, .0717] (see Figure 8). In the memory condition, there was no significant difference in reported self-continuity between high ($M = 5.10$, $SD = 1.30$) and low ($M = 5.16$, $SD = 1.24$) self-
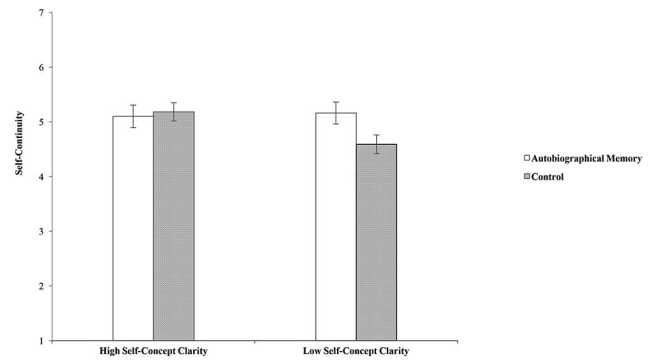

Figure 8. Self-continuity as function of self-concept clarity and memory in Study 7. Error bars represent ±1 *SE*.

concept clarity participants, $F(1, 149) = .05$, $p = .83$, $\eta_p^2 < .001$, 90% CI [.0000, .0167]. However, in the control condition, high self-concept clarity participants ($M = 5.18$, $SD = 1.04$) reported greater self-continuity than low self-concept clarity participants ($M = 4.59$, $SD = 1.05$), $F(1, 149) = 5.28$, $p = .023$, $\eta_p^2 = .034$, 90% CI [.0025, .0938].

Summary. Taken together, Study 7 replicated the Study 6 findings using a different manipulation of autobiographical narratives, namely, life narratives. Study 7 also conceptually replicated our prior findings. The results converge in showing that an opportunity to turn to autobiographical memory can buffer the disruptive influence of low self-concept clarity on self-continuity.[9]

General Discussion

Although studies have focused on different facets of the self, such as structural (e.g., self-concept clarity; Campbell et al., 2003) and temporal (e.g., self-continuity; Bluck & Alea, 2008), no research has linked self-concept clarity to self-continuity or examined the role of autobiographical memory in this relation. Self-concept clarity (Marcia, 1980) and self-continuity (Parfit, 1971) are thought to represent bases of identity (Gregg et al., 2011), and so delving into their dynamic exchange, and probing the role of autobiographical memory, can advance understanding of broader self-processes.

We formulated two hypotheses. First, low or threatened self-concept clarity is associated with or leads to decreased self-continuity. Second, confronted with threatened self-concept clarity, people resort to autobiographical memory, thus counteracting threat and reestablishing self-continuity. We obtained support for these hypotheses in seven studies. In Study 1, low self-concept clarity covaried naturalistically with low self-continuity. In Study 2, low (vs. high) self-concept clarity decreased self-continuity. In Study 3, low (vs. high) self-concept clarity caused participants to turn to autobiographical memory (vs. control). In Study 4, low self-concept clarity undercut self-continuity, but also fortified the inclination to resort to autobiographical memory, an act that restored self-continuity. In Study 5, participants who were chronically low (vs. high) on self-concept clarity reported higher self-

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[9] In the online supplemental materials, we report results controlling for participant age and word count.

continuity after turning to autobiographical memory (vs. control). Finally, in Studies 6 and 7, participants induced with low (vs. high) self-concept clarity, and prompted experimentally to turn to autobiographical memory (vs. control), displayed higher levels of self-continuity.[10]

Implications

Self-concept clarity predicted and led to self-continuity. Congruent with our first hypothesis and theories of personal identity (Crocetti et al., 2008; Crocetti, Schwartz, Fermani, Klimstra, & Meeus, 2012), our findings suggest that individuals have trouble developing a sense of enduring self in the absence of structural integrity of the self. Also congruent with our second hypothesis and theoretical views on autobiographical memory (Addis & Tippett, 2008; Wang, 2013), our findings indicate that low (vs. high) self-concept clarity individuals are more likely to turn to autobiographical memory, thus achieving greater self-concept clarity and maintaining the structural integrity of the self. Lastly, congruent with our hypothesis and prior literature (Bluck & Alea, 2008), our findings stipulate that resorting to autobiographical memory restores self-continuity.

Our research offers an integrative framework for understanding the development of the self. The self does not develop separately in terms of structure and temporality. Addressing simultaneously self-concept clarity and self-continuity delineates a developmental course: Structure lays the foundation for temporality. This course aligns with theoretical proposals of developmental psychologists, who claim that clear self-awareness is indispensable for the development of an enduring sense of self (Howe & Courage, 1993; Nelson, 2008), and of identity theorists, who assert that a robust self-structure affords a sense of enduring selfhood over time (Erikson, 1994; Rogers, 1959).

Our research contributes to the psychology of personality by incorporating self-concept clarity in the landscape of personality. Theorists claimed that personality needs to be understood and studied at three levels (McAdams, 1995). The first is dispositional traits, that is, a range of decontextualized traits. The second level is personal concerns, which are contextualized and includes developmental (e.g., role-relevant) and motivational (e.g., personal strivings, defense mechanisms) constructs. The third level is narrative identity, a coherent and meaningful story about one's life that integrates one's past, leads to and explains the present, and provides guidance for the future. Narrative identity functions to develop and sustain a sense of enduring self across time. Our findings advance personality psychology by indicating that self-concept clarity is key for the development of narrative identity: To foster narrative identity, one would do well to strengthen self-concept clarity.

Moreover, building a connection between self-concept clarity and self-continuity can integrate seemingly disparate lines of research. Low self-concept clarity is associated with negative health outcomes and behavioral maladjustment (Campbell et al., 1996; Campbell et al., 2003; Richman et al., 2016; Wong, Dirghangi, & Hart, 2019). Our findings suggest that low or threatened self-concept clarity undermines self-continuity, which in turn may account for the negative health outcomes and behavioral maladjustment. Consistent with this possibility, self-discontinuity is linked to psychological malaise (Chandler & Proulx, 2008; Milli-

gan, 2003; Sadeh & Karniol, 2012; Sedikides, Wildschut, Gaertner, Routledge, & Arndt, 2008), and self-concept clarity and self-continuity are vulnerable to common external factors (Burris & Rempel, 2008; Jiang et al., 2019; Richman et al., 2016; Slotter et al., 2010).

The findings enrich several lines of inquiry. Some authors (Lodi-Smith, Spain, Cologgi, & Roberts, 2017) hypothesized that self-concept clarity would predict personality consistency over time, and reported that increases in self-concept clarity were positively related to increases in trait stability over time. This relation, though, was correlational, whereas we reported a causal one. In addition, temporal stability does not necessary imply self-continuity. As a case in point, abstract self-knowledge can be independent of specific behavioral examples stored in episodic memory (Klein, Babey, & Sherman, 1997), and so individuals who do not remember their past (episodic memory impairment) and are thus deprived of self-continuity may still manifest high levels of temporal stability in their self-ratings. Indeed, neuropsychological findings are consistent with this possibility: Persons with impaired episodic memory still have access to self-knowledge (Hehman, German, & Klein, 2005; Klein, Loftus, & Kihlstrom, 1996), which could help them retain temporal stability in self-ratings. In our work, we demonstrated that self-concept clarity leads to self-continuity.

Finally, our findings have developmental and clinical implications. In the developmental domain, the findings imply that self-concept clarity development precedes self-continuity, and that a clear self-concept earlier in life facilitates or even enables self-continuity later on. Thus, to foster the long-term development of self and identity (i.e., the sense of a continuous self) among children or young adolescents, more effort could be directed toward nurturing self-concept clarity at the present. In the clinical domain, our findings suggest that turning to autobiographical memory, such as revisiting one's life experience (Studies 5 and 6) or narrating life stories (Study 7), is an effective way for coping with self-concept clarity threat or chronically low self-concept clarity (e.g., identity crisis).

Limitations and Future Directions

We assessed self-concept clarity with an established scale (Campbell et al., 1996) or induced self-concept clarity by asking participants to record self-aspects that were in conflict with each other (engendering low self-concept clarity) versus in harmony with each other (engendering high self-concept clarity). Future investigations might use other induction methods for generalizabilty purposes. For example, following completion of a self-concept questionnaire, participants could be instructed to generate examples for three adjectives that they had previously regarded as descriptive of them (high self-concept clarity) or nondescriptive of them (low self-concept clarity; Setterlund & Niedenthal, 1993). Future investigations might also implicate different setting, such as

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[10] In the online supplemental materials, we report the results of a mini-meta-analysis of Studies 6 and 7 testing the interaction between self-concept clarity and autobiographical memory on personal self-continuity. The meta-analysis established that autobiographical memory moderated the relation between self-concept clarity and self-continuity.

the laboratory, instead of relying exclusively on online participants, as we did.

Across studies, we manipulated self-concept clarity and assessed self-continuity. It is possible that self-discontinuity, a sense of disconnect with one's past and one's present (Sedikides et al., 2015) that typically accompanies life events such as breakup, job loss, or relocation (Light & Visser, 2013; Oishi, Miao, Koo, Kisling, & Ratliff, 2012; Slotter et al., 2010), might undermine self-concept clarity. For example, when individuals are high on self-discontinuity, they may find it difficult to locate or articulate divergent self-aspects in a clear manner. In an indirect foray into this issue (Ritchie et al., 2011), self-concept clarity mediated the relation between self-discontinuity and subjective well-being. Self-discontinuity, as induced by largely negative disruptions in one's life, was linked to questioning how the self has changed over time, which in turn undermined self-concept clarity. These findings were correlational and await experimental confirmation. Relatedly, traumatic events may induce self-discontinuity, which subsequently may strip life of its meaning (Ulman & Brothers, 1988; Wilson, Friedman, & Lindy, 2012) and undercut self-concept clarity.

Some theoretical formulations have posited age differences in self-continuity. Younger adults face the task of forging a clear self-concept (Erikson, 1959), whereas older adults have consolidated it (Brandtstädter & Greve, 1994). As such, the relation between self-concept clarity and self-continuity will be weaker among younger than older adults, which is indeed the case (Bluck & Alea, 2008; Crocetti, Rubini, Branje, Koot, & Meeus, 2016). We did not examine systematically these relations, although we addressed the role of age in each of our studies. In none did age interact with self-continuity, and the results we reported did not change when we controlled for age. Experience sampling methodology and longitudinal designs are needed to inform better this issue. Such designs can allow the researcher to observe the dynamic interplay between self-concept clarity and self-continuity as they unfold across briefer or longer temporal periods.

How autobiographical memory copes with low self-concept clarity threat and restores self-continuity also needs to be addressed. Based on previous literature, we suggest that autobiographical memory counteracts low self-concept clarity either by discounting the disarranged or nonfitting elements of the self (i.e., protecting the working self; Sedikides, Wildschut, et al., 2016) or by reassembling these elements into past self-knowledge (i.e., distorting the past to align it with the working self; Conway et al., 2004), thus fostering self-continuity. We did not test these two processes in the current research, but they qualify as priorities for future work.

Easterners (i.e., East-Asians) report lower self-concept clarity than Westerners (Campbell et al., 1996). One possibility is that Easterners are more comfortable with contradiction, change, and holism (i.e., dialectical self—Spencer-Rodgers, Boucher, Mori, Lei Wang, & Kaiping Peng, 2009) because of the contextual and interdependent qualities of their culture. Another, more mundane, possibility is that the current widely used self-concept clarity scale (Campbell et al., 1996) does not capture the relational aspects of Easterners' self. Interestingly, Easterners are also likely to experience higher levels of self-continuity, as they are more past-oriented (Caruso, Gilbert, & Wilson, 2008; Guo, Ji, Spina, & Zhang, 2012; Ji, Guo, Zhang, & Messervey, 2009). The relation between self-concept clarity and self-continuity among Easterners,

as well as the role of autobiographical memory in this relation, remain unclear and a target for empirical scrutiny.

We assumed that low self-concept clarity individuals would turn to autobiographical memory for the goal of elucidating the self. Of course, resorting to autobiographical memory is only one path toward achieving that goal. Interpersonal interactions (Slotter & Gardner, 2014), conversations with close others, or social support would be other candidates. Nostalgic engagement (Cheung, Wildschut, & Sedikides, 2018; Sedikides, Wildschut, Routledge, Arndt, et al., 2015) may be another. Follow-up work would do well to explore alternative paths through which individuals counter the undesirable presence or influence of low self-concept clarity.

In Closing

Our research into self-concept clarity and self-continuity indicated that the former is a prerequisite for the latter. Low self-concept clarity fosters self-continuity with the aid of autobiographical memory. We hope that our findings spark additional research on the topic and inform the parameters and consequences of the effect we observed.

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