Being here and now: The benefits of belonging in space and time

Matthew Baldwin
University of Florida
Department of Psychology
Gainesville, Florida

Lucas A. Keefer
University of Southern Mississippi
Department of Psychology
Hattiesburg, Mississippi

Accepted for publication at the Journal of Happiness Studies. This is an uncorrected proof and may differ slightly from the final published version.

Address correspondence to: Matthew Baldwin, Department of Psychology, University of Florida,
Room 524 McCarty Hall C, Gainesville, Florida, 32603, 984-215-8674, mbaldwin1@ufl.edu

Abstract

Research suggests that a sense of belonging is a critical prerequisite of happiness and well-being. While some have focused on belonging provided by relationships, other work demonstrates the value of belonging in certain places. In the current research we join these efforts to understand belonging by offering a novel framework for exploring an understudied but no less fundamental aspect of human experience—*time*. We situate this framework within an existential analysis of human action and test general predictions about the psychological value of experiencing a sense of belonging in time, what we call temporal rootedness. Two samples (Studies 1 and 2) collected across cultures provide converging evidence that temporal rootedness is a unique psychological phenomenon that is predictive of personal psychological well-being. Two additional experiments (Studies 3 and 4) offer promising evidence that temporal rootedness can be situationally induced and threatened with consequences for well-being. These findings demonstrate the potential value of further exploration into this sense of belonging.

Being here and now: The benefits of belonging in space and time

“I often wonder if I should have been born at another time.... If I had just been born when it was a little quieter out there, would I have even become an addict in the first place? Might I have been more focused? A more fully realized person?”

—Sherlock Holmes, *Elementary*, Season 2 Episode 7

Although psychologists often agree that “context” is important, there are considerable differences in how people define the environment. For some “context” refers to broad cultural environments shaped by shared norms (Shweder, 1991), for others it is immediate physical surroundings (Gibson, 1978), or the total collection of people and objects influencing the individual (Latour, 2005).

What these and other senses of “context” commonly share is an emphasis on the *social* and the *spatial*, a focus we believe has had the undesirable consequence of neglecting the *temporal*. Just as human agents inhabit physical, social, and cultural spaces with unique psychological affordances, they also inhabit immediate and extended times, including days, seasons, and even generations (Lewin, 1936). While this is unlikely an eye-opening claim on its own, it points to a lacuna in research on how humans relate to temporal positions and whether these ways of relating differ meaningfully from orientations toward other contexts.

In the current paper, we focus specifically on the experience of *rootedness*, a sense of belonging and attachment associated with being in a certain place. This notion has a patchwork history in the psychology of place (reviewed below) and we see in this idea the potential to meaningfully bridge the gap between the spatial and temporal through the potential homology of this experience. Just as an individual can feel that they belong (or not) in a given neighborhood

or nation, so too can they feel that they fit (or not) into a current decade or century, for example.

We offer the first test of this possibility, including an initial comparison of the psychological consequences of both spatial and temporal rootedness. We 1) developed a rootedness measure capable of comparing and discriminating between spatial and temporal dimensions of rootedness, 2) offer analyses demonstrating the extent to which rootedness dimensions predict specific facets of well-being across samples and 3) present evidence that interventions boosting temporal rootedness enhance perceived well-being.

Belonging in Place

The idea of feeling a sense of belonging within a place (i.e., rootedness) has been explored through diverse methods and approaches. Below we review some of this work, noting that this research demonstrates that spatial rootedness takes many forms differing in geographical scale. Separate projects have explored how individuals feel this sense of belonging toward the home, local neighborhoods, cities, and even entire nations.

The Home. The sense of belonging in a place is so intuitively grounded in the home that it colors our ways of even speaking about spatial rootedness. For example, we might say that a person feels “at home” in a place that affords rootedness and the act establishing an emotional bond to a new residence is colloquially expressed as “making a house a home.” It should be no surprise, therefore, that a feeling of rootedness to the home has received attention in both theory and research.

One early effort to explore this issue is Seamon’s (1979) phenomenological analysis. Seamon explores the dynamics of place, noting the central role of home as a center for rest and a hub around which all activity is organized. Wherever the individual's daily life takes them, home remains a constant source of security and renewal during periods of rest, operationalized by

Seamon as maintaining a fixed spatial position for an extended duration.

Central to Seamon's phenomenological account of the power of the home is its ability to provide *rootedness*. He writes: "Rootedness is the power of the home to organize the habitual, bodily stratum of the person's lived-space. Literally, the home roots the person spatially, providing a physical centre for departure and return" (1979, p. 79). The home serves as a foundation, an unswerving constant in the flux of spatial movement. In this way, it offers the individual position from which to act in their daily life. Crucially, the home meaningfully belongs to its residents and conversely, they feel a sense of belonging in that space (Seamon, 1979). This mutual sense of belonging is the affective link that allows the home to effectively root spatial movement and provide its unique benefits for individual well-being.

The Neighborhood and Locale. The feeling of belonging in a place, which defines a sense of rootedness in the home, extends outward. Individuals commonly extrapolate this to a feeling of belonging in a neighborhood, a city, and even an entire nation. In an insightful account of this kind of rootedness, Oldenburg (1989) discusses so-called "third places" that serve as informal meeting places between the home and the workplace. These third places, such as pubs, coffee shops and barber shops, become homes away from home: "Though a radically different kind of setting from the home, the third place is remarkably similar to a good home in the psychological comfort and support that it extends" (Oldenburg, 1980; p. 42). By becoming a "regular" at such places, one also learns to identify with them; and doing so encourages a sense of belonging with others.

Other research on this phenomenon has studied it under the heading of *place attachment*, a felt affective connection to a place (Hidalgo & Hernández, 2001; Low & Altman, 1992; Scannell & Gifford, 2010). The significance of a place in attachment is characterized by more

than mere feeling: Lewicka (2014) notes that place attachment entails a desire to return, a willingness to stay close, and, critically, a sense of personal belonging or rootedness (sometimes referred to as *place identity*; Williams, 2014).

Neighborhood attachment directly contributes to individual well-being. For example, attachment to neighborhood and city each uniquely predicted greater social well-being across a wide range of outcomes (e.g., social integration; Rollero & De Piccoli, 2010), although city well-being was generally a stronger predictor. Other research finds that neighborhood belonging correlates with greater physical and mental health, as well as greater perceived social support (Farrell, Aubry, & Coulombe, 2003; Young, Russell, & Powers, 2004).

The Nation. Rootedness can even extend to very broad scales, including an entire nation. Relevant research explores the role of emotional bonds involved in patriotism, nationalism, and other forms of national attachment (Kosterman & Feshbach, 1989). While this analysis takes many forms (for detailed review and one such effort, see Schatz, Staub, & Lavine, 2003), the guiding theme of this research is that individuals meaningfully differ in their identification with and emotional investment in the nation.

While roots at the household and individual level seem to be important sources of well-being, relatively less is known about the role of national attachment. One suggestive study (Morrison, Tay, & Diener, 2011) found that individuals who were more satisfied with their nation were generally more satisfied with their lives and that these effects were particularly common for poorer and less mobile individuals.

Belonging in Time

Although much has been written about the importance of belonging in place, there has been essentially no psychological study of the experience of feeling rooted in time. We briefly

review how psychologists have commonly approached the relation between the self and time before motivating the importance of temporal rootedness as a unique and neglected phenomenon.

One approach to studying time in psychology is work on *time perspective* (Zimbardo & Boyd, 1999). Time perspective is comprised of five dimensions assessing how individuals appraise and orient themselves toward past, present, and future. These include perceptions that the past was positive or negative, that the present is to be enjoyed (present hedonism), that the present is problematic (present fatalism), and future orientation.

These five factors have been identified as coherent, relatively stable, and useful in a wide range of important domains. For example, research shows that temporal perspective shifts in response to threatening information with individuals becoming more present (and less future) oriented in response to social exclusion (Twenge, Catanese, & Baumeister, 2003). Other research shows that future orientation has a range of positive outcomes, particularly in the context of health behavior (Boyd & Zimbardo, 2005). Adolescents with a positive orientation toward the future, for instance, are less likely to engage in drug or alcohol use (Robbins & Bryan, 2004).

The growth of research on time perspective attests to its value yet fails to address the experience of temporal rootedness *per se*. Time perspective is an appraisal of time itself: An evaluation of an orientation (past, present, future) that fundamentally does not involve the self. In contrast, the research on spatial rootedness reiterates that this rootedness is fundamentally self-evaluative; it is determining how well the individual belongs in a given place.

Other research in psychology hints at a relation between time and identity, although this research is not framed in terms of rootedness. In their work on *temporal landmarks*, Peetz and Wilson (2013; 2014) propose that important temporal locations (e.g., birthdays, holidays) serve to structure the temporally extended self. For instance, individuals were more likely to think

about events separating their current and future selves if the future self was perceived as negative (Peetz & Wilson, 2013). The authors demonstrate that temporal landmarks serve to separate the self into pre and post-landmark selves (Peetz & Wilson, 2014).

One could consider that certain temporal landmarks have more influence than others. For instance, nostalgic memories—both personal and collective—tend to have a strong influence on individual and group psychology. Recalling personally nostalgic memories (e.g., a family vacation) increases feelings of social connectedness, personal authenticity, meaning in life, and self-esteem (see Sedikides, Wildschut, Juhl, & Cheung, 2017). Similarly recalling nostalgic memories about your social group or nation can increase feelings of group cohesion and self-esteem (Baldwin, White, & Sullivan, 2018; Cheung et al., 2017; Wildschut et al., 2014) and can protect against collective esteem threat (Baldwin et al., 2018). However, these benefits may be moderated by the degree to which people *belong* to the recalled events or time periods. For instance, nostalgia apparently has little effect on psychological well-being when people feel distant, or different, from who they were in the past (Iyer & Jetten, 2011).

Another psychological framework for making sense of the individual's relation to time is work on *narrative identity* (McAdams & McLean, 2013; Ricoeur, 1991; Singer, 2004). This perspective observes that the self is constructed as an internalized and evolving life story which organizes disparate events into a coherent and purposeful narrative about who one is and what life is about. In other words, we understand ourselves as living an unfolding story over time (Brockmeir, 2000; Habermas & Bluck, 2000; McAdams & McLean, 2013). Personal narratives reveal much about a person, including their personality (McAdams & Pals, 2006) and their motivations (Bluck, Alea, Habermas, & Rubin, 2005). Emergent themes and broad narrative structure of life stories also appear to be practically important; features of narratives are reliably

linked to well-being (McLean, Syed, Pasupathi, et al., 2019).

However, what this literature rarely considers explicitly is that the well-being effects of certain life narratives may stem in part from rooting the self in time. Life stories help the individual to understand why the present self is who it is by providing critical background; additionally, stories impose plans and goals onto an otherwise unknowable future (McAdams, 2006). Narrative identities achieve this temporal organization via narrative structure: turning points and momentous events that serve as temporal landmarks (e.g., before recovery, after marriage), events are narrated in ways that illustrate their contingencies (e.g., choosing a career because of childhood experience), and so on. Research demonstrates that life stories with greater temporal coherence, that is, clear causal relationships between events better promote individual well-being (Baerger & McAdams, 1999).

Although our focus in the current research is not on narrative identity *per se*, it highlights the importance of understanding how people feel about their position in time. Given that time is so fundamental to construction and maintenance of a self, it is crucial to study how individuals identify with the present narrative self and its trajectory toward the future. Because the temporal structure of personal narratives varies, individuals also differ in the extent to which they feel close or far from important temporal landmarks, whether their present self is seen as fitting with the past, or whether they identify with the self that they currently are or would rather prefer to be themselves in an earlier or later chapter in their life. This means that people could feel more or less rooted in time as a function of their identification with the present moment.

But why is this self-relevant appraisal of temporal rootedness significant, and should we expect temporal rootedness to differ psychologically from spatial rootedness? Despite the lack of psychological attention, early existentialists agree on the central importance of the individual's

identification with a given temporal position (Heidegger, 1927/1962; Sartre, 1943). An individual must make choices and act from their position in both space *and* time. Because the past has happened, human agency is directed toward a future that is largely indeterminate and predicated on an acceptance of current circumstances.

However, not all individuals equally embrace their temporal position. For example, the openness of the future means that individuals can reject the past or present in sometimes dramatic ways; for example, those individuals that experience “mid-life crises” or other stark rejections of current careers, relationships, and so on. Others are at home in their present and enact freedom in ways to improve or preserve the self that they currently are. One goal of this paper is to begin, in earnest, an empirical test of these differences in whether and how individuals feel they belong in the present moment.

The Current Research: Rootedness as a unifying experience

The present research has several closely related goals. Our priority is to develop and validate a measure of rootedness capable of systematically comparing the effects of rootedness across both space and time. While various research projects address the existence and significance of rootedness at the spatial level, our goal of creating a more flexible measure allowed us to offer the first measurement of rootedness in time.

In Study 1, we considered three levels within each broad domain. Among spatial forms of rootedness, we followed past research by assessing rootedness in the home, the neighborhood, and the nation although we would note that there are certainly other target domains that could have been considered (e.g., current city; Hidalgo & Hernandez, 2001). Temporal rootedness, however, is relatively novel so we decided upon certain analogues in scale. Specifically, we measured rootedness at the level of the current year, decade, and century. The current year is the

scale along which present concerns must be addressed. In contrast, the decade reflects a broader scope in terms of both long-term personal goals and generational trends in cultural norms and values.

Our rationale for the century can be traced back to our focus on the existential significance of belonging within a given time. Barring revolutions in medical technology, the century reflects the horizon in which our adult participants will live and die. Although the future is existentially indeterminate, death is the inevitable backdrop of all human action (Heidegger, 1927/1962). Rootedness at the century level therefore reflects acceptance of the entire time that one will live and an important bridge between subjective experience and biological reality.

We would note that just as spatial rootedness exists at varying scales, it is assumed that temporal rootedness may as well. These target times were chosen in part because of their breadth in scope and because there are simple and accepted terms for each temporal distance (unlike, e.g., a span of 3 years).

Research generally suggests that a feeling of belonging in space supports well-being, but one goal of the current study was to test whether this extends to temporal rootedness. On the basis of our theorizing above, we anticipate that temporal rootedness promotes well-being, broadly defined. To explore this predicted relationship, we measured diverse well-being indices to provide as much information as possible in two initial validation studies. To the extent that temporal rootedness reflects an acceptance, embrace, and unification of the past and projected continuity of one's life, the affective signature of rootedness should be positive—that is, people who feel rooted should report more positive (and less negative) experiences. Beyond these subjective feelings, we also expect temporal rootedness to be associated with more eudaimonic concepts, those that are related to purpose, growth, and psychological fulfillment (Deci & Ryan,

2008; Keyes & Haidt, 2003; Waterman, 1993). Thus, we also measure meaning in life, satisfaction of basic psychological needs, and a pre-requisites for psychological growth, namely, curiosity and exploration (Kernis & Goldman, 2006; Sheldon, Ryan, Rawsthorne, & Ilardi, 1997). Finally, given its uniqueness in the context of personal narrative identity, we expected temporal rootedness to be associated with well-being after controlling for the effects of spatial rootedness. Studies 1 and 2 sought to provide initial evidence for (Study 1) and extension of these effects in a different linguistic/cultural context (Study 2).

Finally, Studies 3 and 4 present initial data demonstrating that this feeling of belonging in time can be induced (Studies 3 and 4) and threatened (Study 4), and that situational consideration of one's place in time can influence well-being. These findings sought to replicate observed correlations from the initial studies while testing whether temporal rootedness can be a target of intervention to promote well-being.

Study 1: Developing the Measure

Method

Participants and procedure. Participants were 418 U.S. adults recruited on Amazon's Mechanical Turk, a website that allows researchers to recruit paid participants (Buhrmester, Kwang, & Gosling, 2011). Ages ranged from 18 to 69 years ($M = 34.33$, $SD = 10.67$) and participants identified as 55% male, predominately White (76.5%), mostly college educated (51.8% with two or four-year degree), and left-of-center on political orientation (81.8% identified as Liberal to Moderate).¹ Participants were paid \$0.50 for completing the survey described as research on life experiences. Data and model syntax can be found at

https://osf.io/mqzsn/?view_only=6c33e8de1be64f54b8243a694a42cce7

Measures

Spheres of rootedness. Constructing the Spheres of Rootedness scale (SRS) occurred in stages. An initial item pool was generated by compiling items from several existing scales measuring constructs similar to our conceptualization of rootedness (223 items total). The two authors rated each item independently using a 10-point scale (1 = *Definitely do not retain*; 10 = *Definitely retain*) and compared ratings to establish a subset of potential items. From the initial ratings and further discussion, eight items were retained and adapted to assess feelings of rootedness in six spheres of life, which were pre-determined by the authors on theoretical grounds (48-items total). The spheres included three spatial dimensions (house, neighborhood, and nation) and three temporal dimensions (year, decade, and century), and were intended to assess increasingly distal or broadening spheres of experience. Participants used a 7-point scale (1 = Not at all; 7 = Very much) to respond to each item (e.g., “I feel rooted in my house/neighborhood/nation/year/decade/century;” see Supplemental Information (SI) Appendix for full scale). Subscales were presented in a fixed order (house, neighborhood, nation, year, decade, and century) but items within each subscale were randomized.

Affective, evaluative, and motivational components of well-being. After completing the SRS, participants completed a battery of questionnaires aimed to provide a broad assessment of the extent to which rootedness covaries with various components (e.g., antecedents, processes) of personal well-being

Positive and negative experience. The Scale of Positive and Negative Experience (Diener et al., 2009) was used to measure participants’ positive and negative feelings in the past four weeks. Participants used a 5-item scale (1 = Very rarely or never; 5 = Very often or always)

to respond to six positive (e.g., happy; $\alpha = .94$) and six negative (e.g., Sad; $\alpha = .94$) items.

Depression. The Center for Epidemiologic Studies Depression scale (Eaton, Smith, Ybarra, Muntaner, & Tien, 2004) was used to assess the extent to which participants experienced symptoms associated with depression in the past week. Using a 4-point scale [1 = Rarely or none of the time (less than 1 day); 4 = Most or all of the time (5-7 days)] participants indicated the frequency of experiencing a variety of feelings and events (e.g., I was bothered by things that usually don't bother me;" $\alpha = .94$).

Meaning in life. Meaning in life was measured with the 10-item Meaning in Life Questionnaire (Steger, Frazier, Oishi, & Kaler, 2006). Participants used a 7-point scale (1 = Absolutely untrue; 7 = Absolutely true) to respond to five items each assessing the presence of meaning (e.g., "I have a good sense of what makes my life meaningful;" $\alpha = .94$) and the search for meaning (e.g., "I am looking for something that makes my life feel meaningful;" $\alpha = .96$).

Basic psychological needs. The 21-item Basic Need Satisfaction in General scale (Gagné, 2003) was used to assess participants' perceived autonomy (e.g., "I feel like I am free to decide for myself how to live my life;" $\alpha = .80$), relatedness (e.g., "I really like the people I interact with;" $\alpha = .84$), and competence (e.g., "Often, I do not feel very competent;" reversed; $\alpha = .87$). Participants responded to items using a 7-point scale (1 = Not true at all; 7 = Very true).

Authenticity. Authenticity was measured with the 12-item dispositional Authenticity Scale (Wood, Linley, Maltby, Baliousis, & Joseph, 2008), which assesses a tripartite conception of authenticity including self-alienation (e.g., "I don't know how I really feel inside;" *reversed*), accepting external influence (e.g., "Other people influence me greatly;" *reversed*), and authentic living ("I always stand by what I believe in"). Participants used a 7-point scale to indicate how much each statement described them (1 = Does not describe me at all; 7 = Describes me very

well). A composite authenticity score was computed by averaging across factors ($\alpha = .91$).

Curiosity/Exploration. The 10-item Curiosity and Exploration Inventory (Kashdan et al., 2009) measures individual differences in the recognition, pursuit, and integration of novel and challenging experiences and information was used to measure a pre-requisite for psychological growth. Five items assessed the extent to which people seek knowledge (“I actively seek as much information as I can in new situations”) and five items assessed the extent to which people are willing to embrace novelty (e.g., “I am the type of person who really enjoys the uncertainty of everyday life”). A composite was computed by averaging all items ($\alpha = .91$).

Demographics. After completing all of the measures, participants completed demographic items assessing their current state of residence, duration of current residence (in months), age, ethnicity, gender, education level, income, and political orientation.

Results

A Confirmatory Factor Analysis (CFA) was conducted which tested our theoretical structural model. Each of the eight rootedness items loaded uniquely on a latent factor representing the corresponding dimension of rootedness. No cross-loadings were permitted and latent factor variances were fixed to 1 for model identification (fixed factor method; Brown, 2014). Full information maximum likelihood estimation (FIML) was employed to account for missing data (Enders, 2001; Enders & Bandalos, 2001).

Initial Model The initial model was a poor fit to the data (following Hu & Bentler, 1999), $\chi^2 (1065) = 4994.82$, RMSEA = .094 (90% CI: .092, .097), CFI = .78, TLI = .77, SRMR = .063.² Inspection of factor loadings indicated that all items loaded highly and significantly on the appropriate factors, suggesting that misfit cannot be attributed to poorly loading items (SI Table 1). To further investigate potential sources of misfit, modification indices (the approximate

increase in χ^2 if a parameter were included) were obtained. Large changes in χ^2 (resulting in better model fit) would be expected if some item residuals within each factor were to be allowed to correlate. However, because the problem of correlated residuals can be adequately dealt with by parceling (Little et al., 2002) we proceeded to test a parceled baseline model. Following Little et al. (2002), we averaged scores for the highest and lowest loading items first, then the second highest and second lowest, and so on. Doing so considerably simplifies the number of parameters necessary for the model, reduces the possibility of correlated item residuals, and preserves statistical power.

After parceling items, the model fit the data significantly better than the unparceled model, $\Delta \chi^2 (828) = 3887.70, p < .001$, and showed acceptable fit, $\chi^2 (237) = 1107.09$, RMSEA = .094 (90% CI: .088, .10), CFI = .91, TLI = .90, SRMR = .04. All factors were significantly correlated ($ps < .001$) between $\Psi = .243$ and $\Psi = .779$ (Table 1) reflecting strong convergence for the spheres of rootedness dimensions. We next tested a series of reduced models against this baseline model.

Model Testing

Single factor. First, we tested a model in which every indicator loaded onto a single rootedness factor. This model tests whether a single factor can account for covariance among all the rootedness items. This reduced model fit more poorly than the baseline model, $\Delta \chi^2 (15) = 4910.60, p < .001$, providing strong support for our theoretical model and appropriateness of considering separate SRS subscales to account for covariance among groups of items.

One higher-order factor. Next, we modeled a higher-order factor such that each SRS factor loaded onto a general rootedness factor. This model tests whether a single construct can account for covariance among the rootedness *factors* (vs. items). A model comparison test

indicated that this reduced model resulted in poorer fit compared to the baseline model, $\Delta \chi^2(9) = 238.37, p < .001$. Thus, each SRS dimension reflects a unique aspect of rootedness and cannot be attributed to a single rootedness construct (in the same way that each of the Big Five personality traits cannot be attributed to a single personality construct; Ashton et al., 2009; Muncer, 2011).

Two higher-order factors. Finally, we modeled two higher-order factors reflecting spatial (home, neighborhood, nation) and temporal (year, decade, century) rootedness. This model tests whether the two groups of related factors can be accounted for by these more general constructs. The three space (or time) scales were loaded onto a higher-order space (or time) factor and the higher-order space/time factors were allowed to covary. This reduced model also showed poorer fit compared to the baseline model, $\Delta \chi^2(8) = 81.64, p < .001$, suggesting again that each SRS dimension is unique, and does not arise from more general space and time rootedness constructs.

Assessing the Psychological Relevance of Rootedness

We were primarily interested in the extent to which the SRS dimensions predicted various aspects of well-being. To this end, we estimated a structural model in which the SRS factors (included as latent variables) predicted components of affective and psychological well-being (included as manifest variables). Covariation among the predictor and outcome variables was also estimated.

Well-being. Correlations among all the well-being variables can be found in SI Table 2 and regression path coefficients can be found in Table 2.

Affective components. Four SRS dimensions showed significant relationships with participants' ratings of positive experiences in the last four weeks. Feeling rooted in the house, nation, year, and decade each uniquely predicted positive experiences. A slightly different

pattern of results was found with regard to negative experiences. Feeling rooted in one's neighborhood predicted significantly *lower* negative experiences. Feeling rooted in the house and year also predicted lower negative experiences, but the effects were not statistically significant by conventional standards. Patterns of association were found with regard to depression as well. Feeling rooted in the neighborhood and year predicted lower depressive symptomology.

Psychological components. The SRS dimensions also showed unique associations with presence of meaning in life. Feeling rooted in the house and nation predicted significantly higher meaning in life whereas the effect of year was marginally significant. Only feeling rooted in the century predicted lower search for meaning, but the effect was marginally significant.

Unique associations among the SRS dimensions and basic needs also emerged. Feeling rooted in the house, nation, and century predicted significantly higher autonomy and the effect of year was marginally significant and positive. Feeling rooted in the house and decade predicted more competence. Feeling rooted in the neighborhood, nation, and century predicted higher relatedness and the effects of house and decade were marginally significant and positive.

Only feelings of rootedness in the century predicted (higher) authenticity. Finally, feeling rooted in the neighborhood and decade was associated with higher curiosity/exploration whereas feeling rooted in the house and nation predicted *lower* curiosity/exploration, although the effect house was marginally significant.

Discussion

Study 1 offers a valid and reliable measure of spatial and temporal rootedness. Importantly, we found that each dimension of rootedness is empirically distinct, as neither a single factor, nor a two-factor model was adequate to explain the data better than treating each sphere as unique. These findings draw attention to temporal rootedness, an idea that has largely

been neglected in psychology, and allow researchers to evaluate its importance.

We also found that rootedness across domains has implications for human flourishing. This offers new insight into how well-being is situated: People thrive in part when they feel at home both *here* (home, neighborhood, nation) and *now* (year, decade, century). In Study 2 we aim to confirm the psychometric properties of the SRS in a German sample of participants. We also examine whether the SRS dimensions predict similar well-being outcomes as in the American sample.

Study 2: Validating a German Version

Method

Participants and procedure. Participants were 142 German adults who participated on campus at the University of Cologne. Participants were rewarded with a chocolate bar in return for participation, and recruitment occurred until the end of the semester (sample size was determined on this basis). Ages ranged from 16 to 66 years ($M = 24.37$, $SD = 7.04$). Participants identified as 45% male, were predominately of German nationality (87%), and leaned left-of-center with regard to political orientation ($M = 3.30$, $SD = 1.26$ on 7-point scale; 87% identified as Left to Center). Almost all participants were students (94%).

Measures

Spheres of rootedness. All items from Study 1 were provided to a native German research assistant proficient in the English language and were translated into German. The translated items were then provided to a different native speaking research assistant proficient in English and were back translated into English. The authors confirmed that the translations were accurate. As in Study 1, the spheres included three spatial dimensions and three temporal dimensions and were intended to assess increasingly distal or broadening spheres of experience

(see SI Appendix for full scale). The procedure was exactly the same as in Study 1.

Affective components of well-being. After completing the SRS, participants completed two measures assessing subjective (affective) components of well-being.

Positive and negative experience. A German version of the Scale of Positive and Negative Experience (Rahm, Heise, & Schuldt, 2017) was used to measure participants' positive and negative feelings in the past four weeks. Participants used a 5-item scale (1 = Very rarely or never; 5 = Very often or always) to respond to six positive ($\alpha = .94$) and six negative ($\alpha = .88$) items.

Depression. A German version of the Center for Epidemiologic Studies Depression scale (Hautzinger & Bailer, 1993) was used to assess the extent to which participants recently experienced symptoms associated with depression. Using a 5-point scale [0 = In the last week, rarely or none of the time (less than 1 day); 4 = In the last two weeks, almost every day] participants indicated the frequency of experiencing a variety of feelings and events (e.g., I was bothered by things that usually don't bother me").

Psychological components of well-being. Participants also completed two measures assessing psychological (evaluative) components of well-being.

Meaning in life. Meaning in life was measured with a German version of the 10-item Meaning in Life Questionnaire (Steger et al., 2006). The presence of meaning ($\alpha = .88$) and the search for meaning ($\alpha = .89$) subscales were reliable.

Basic psychological needs. A German version of the 18-item Balanced Measure of Psychological Needs scale (BMPN; Neubauer & Voss, 2016) was used to assess participants' perceived autonomy (e.g., "I was free to do things my own way;" $\alpha = .69$), relatedness (e.g., "I felt close and connected with other people who are important to me" $\alpha = .74$), and competence

(e.g., “I took on and mastered hard challenges;” $\alpha = .72$) in the last four weeks. Participants responded to items using a 7-point scale (1 = Not true at all; 7 = Very true).

Demographics. After completing all of the measures, participants completed demographic items assessing their age, nationality, gender, political orientation, duration of current residence (in months), and whether or not they are students.

Results

A Confirmatory Factor Analysis was conducted which tested our theoretical structural model against several alternatives. We reproduced our analytic strategy in Study 1: Rootedness items loaded uniquely on a latent factor representing the corresponding dimension of rootedness (no cross-loadings; fixed factor variances, and FIML to account for missingness).

Initial Model The initial model was a poor fit to the data, $\chi^2 (1065) = 2136.97$, RMSEA = .084 (90% CI: .079, .089), CFI = .75, TLI = .73, SRMR = .082. Inspection of factor loadings indicated that the majority of items loaded highly and significantly on the appropriate factors. However, a total of six items showed lower loadings than recommended given our sample size ($< .45$; Hair, Tatham, Anderson, & Black, 1998), suggesting that some misfit can be attributed to these poorly loading items. After removing the items, the model fit slightly better, $\chi^2 (804) = 1566.62$, RMSEA = .082 (90% CI: .076, .088), CFI = .80, TLI = .79, SRMR = .076 but not enough to suggest that misfit was due only to poorly loading items.

As in Study 1, we proceeded to test a parceled baseline model. Following Little et al. (2002), we averaged scores for the highest and lowest loading items first (from the revised model above), then the second highest and second lowest, and so on. Doing so considerably simplifies the number of parameters necessary for the model, reduces the possibility of correlated item residuals, and preserves statistical power. After parceling items, the model fit the data better than

the unparcelled model and showed acceptable fit, $\chi^2 (194) = 366.35$, RMSEA = .079 (90% CI: .067, .091), CFI = .92, TLI = .90, SRMR = .05. All factors were significantly correlated (p s < .007) between $\Psi = .236$ and $\Psi = .601$ (Table 1), with the exception of neighborhood and nation ($\Psi = .162$, $p = .079$), reflecting strong convergent validity for the spheres of rootedness dimensions. We next tested a series of reduced models against the parceled baseline model.

Model Testing

Single factor. First, we tested the model in which every indicator loaded onto a single rootedness factor. This reduced model fit more poorly than the baseline model, $\Delta \chi^2 (15) = 1192.10$, $p < .001$, providing strong support for our theoretical model and appropriateness of retaining separate SRS subscales.

One higher-order factor. Next, we modeled a higher-order factor such that each SRS factor loaded onto a general rootedness factor. A model comparison test indicated that this reduced model resulted in poorer fit compared to the baseline model, $\Delta \chi^2 (9) 31.15$, $p < .001$. Thus, each SRS dimension reflects a unique aspect of rootedness and cannot be attributed to a single rootedness construct.

Two higher-order factors. Finally, we modeled two higher-order factors reflecting space (home, neighborhood, nation) and time (year, decade, century) rootedness. The three space factors were loaded onto a higher-order space factor and the three time factors were loaded onto a higher-order time factor. The higher-order factors were allowed to covary. This reduced model also showed poorer fit compared to the baseline model, $\Delta \chi^2 (8) = 22.86$, $p = .003$. Each of the above model comparisons is consistent with those carried out in Study 1, providing a strong

replication of the underlying theoretical constructs.

Assessing the Psychological Relevance of Rootedness

We were primarily interested in the extent to which the SRS dimensions predicted various aspects of well-being in the German sample. As in Study 1, the SRS factors (included as latent variables) predicted components of affective and psychological well-being (included as manifest variables). Covariation among the predictor and outcome variables was also estimated.

Well-being. Correlations among all the well-being variables can be found in SI Table 2 and regression path coefficients can be found in Table 2.

Affective components. Four SRS dimensions showed significant relationships with participants' ratings of positive and negative experiences in the last four weeks. Feeling rooted in the nation and the year uniquely predicted more positive experiences and fewer negative experiences. Nation and year also had consistent associations with regard to depression: Feeling rooted in the nation and year predicted lower depressive symptomology.

Psychological components. The SRS dimensions also showed unique associations with presence of meaning in life. Feeling rooted in the decade predicted significantly higher meaning in life whereas feeling rooted in the century predicted higher search for meaning. Unique associations among the SRS dimensions and basic needs also emerged. Feeling rooted in the house, nation, and year predicted significantly higher autonomy. Feeling rooted in the nation and year predicted more competence. Feeling rooted in the house and nation predicted higher relatedness, and the effects of century was marginally significant and negative.

Discussion

The results of Study 2 largely confirm those from Study 1; the SRS showed a good fit to the data and the best fitting model was one that treated each sphere of rootedness as a separate

construct. It should be noted, however, that some items in the German sample showed poor loadings which were removed from the German scale but not from the English scale. This could be due to issues with translations, or that some specific aspects of temporal rootedness do not generalize to the German context. Regardless, the overall scale was reliable and conformed to our theoretical model, even after these items were removed.

Moreover, the SRS showed some consistent associations with well-being, compared to Study 1. Overall, feeling rooted in the nation and the year had positive influences on well-being in both samples, including positive experiences, depression, meaning in life, autonomy, and relatedness. However, some interesting differences were also found. For instance, being rooted in the home more strongly predicted positive experiences for Americans but fewer negative experiences for Germans. Such a difference could indicate that Americans use the home as a place to promote or achieve positive experiences—as a source of positivity—whereas Germans may use the home as a place to prevent or avoid negative experiences—as a refuge from negativity. This possibility is supported by the fact that Americans gain autonomy from being rooted in the home (Study 1) whereas Germans do not.

Another interesting difference is that rootedness in the neighborhood predicts lower depression for Americans, whereas rootedness in the nation predicts lower depression for Germans. This difference might reflect the extent to which citizens in Germany turn to the state and national government to assist with basic needs and social security, whereas the tendency in the United States may be to turn to more local support systems. Indeed, the association between competence and rootedness in the nation and year was stronger in the German sample, lending support for the idea that modern social progress occurring at the level of the state or nation may better predict well-being for Germans who identify with that progress. Americans may instead

derive well-being from more local sources of support, such as the home and neighborhood.

Finally, it is interesting to note that feeling rooted in the century was related to greater relatedness and less search for meaning in the American sample, but less relatedness and more search for meaning in the German sample. Given the vast historical differences between the two nations in the last century, this is not surprising. The last century in America could be categorized by massive social growth (e.g., production of cars, civil rights) whereas the last century in German is marred by conflict, the rise of the Nazi Party, and separation of the East and West. Feeling still rooted in these times may indeed lead a German person to question the meaning of life and feel disconnected from her fellow citizens, both locally and globally. Altogether, these converging and diverging patterns of results suggest that our concept of spatial and temporal rootedness is a novel framework rich with potential for the study of the human experience.

Study 3: Inducing Rootedness

Although the prior studies indicate that temporal rootedness predicts improved well-being, the reliance on cross-sectional survey methods leaves open questions about the malleability of rootedness and its potential for interventions designed to improve well-being. Our primary goal in Study 3 was to pilot test a brief rootedness induction designed to boost feelings of belonging in the current time period (temporal) or the current physical environment (spatial). Additionally, we included measures of well-being to assess whether increased rootedness would increase well-being as our theoretical framing would suggest.

Method

A sample of 184 American adults were recruited through Amazon Mechanical Turk for a small financial incentive (\$0.50). After excluding participants who failed an attention check ($n =$

11) we were left with a final sample for analysis of 173 ($M_{\text{age}} = 39.55$, $SD_{\text{age}} = 12.81$; 75 women/98 men; 140 White, 17 Black, 8 Asian/Pacific Islander, 3 Hispanic/Latino, 3 Mixed Race, 2 South Asian). No other cases were excluded from analysis.

Rootedness Manipulation

To manipulate a feeling of rootedness, we randomly assigned participants to receive one of three essay prompts. In the Temporal Rootedness condition ($n = 52$), individuals were asked to reflect on why they might choose to live in this time period over any other and to describe what makes them feel rooted in the present time. In the Spatial Rootedness condition ($n = 61$), individuals reflected on the ways people use objects to achieve their goals and describe the things around them in their current environment. Finally, the Control condition ($n = 60$) was asked to think about what things define the current time period without any specific reference to the self. Full instructions are available at the OSF link above.

State Temporal Rootedness

We created a brief measure of rootedness designed to assess the effectiveness of this manipulation. Rather than measuring various levels of rootedness, we focused on keeping this assessment brief for the experimental format. It included eight items modified to refer to the present time period (e.g., “I feel secure in the present time period”, “I wish I lived in a different time period (reverse-scored)”). Participants rated their agreement with a 7-point scale (1 = *Not at all*, 7 = *Very much*). Items formed a reliable composite and were averaged ($\alpha = .94$, $M = 4.78$, $SD = 1.53$). The experiment also contained several measures of well-being; No main effects of prime were observed on these measures but full analysis is provided in a supplement on OSF.

Results and Discussion

Scores on our rootedness measure were submitted to a one-way ANOVA by prime

condition. This analysis returned a main effect of priming condition, $F(2, 170) = 13.58, p < .001$, $\eta^2 = .16$. The pattern indicated that both the Temporal ($M = 5.18, SD = 1.54$) and Spatial ($M = 5.21, SD = 1.16$) Rootedness conditions reported greater belonging in the present than the Control condition ($M = 4.00, SD = 1.59; ps < .001$). The rootedness conditions did not differ ($p = .91$), which is notable given the temporal (but not spatial) content of the measure. This finding fits the strong correlations we observed between spatial and temporal rootedness in the prior samples. Furthermore, this study provides initial evidence that rootedness can be affirmed and may potentially contribute to increased momentary well-being (see Supplemental Analysis).

Study 4: Experimentally Testing the Rootedness—Well-Being Link

Study 3 provided initial evidence that temporal rootedness can be situationally induced, and doing so leads to similar feelings of belonging as priming spatial rootedness. However, Study 3 did not provide evidence that heightened rootedness had a direct effect on well-being.

To address this limitation, Study 4 was a preregistered experiment that aimed to 1) confirm that temporal rootedness can be experimentally manipulated and 2) show that experimentally heightened temporal rootedness increases well-being. The pre-registration along with other materials, data, and code can be found on the OSF link from above.

Method

A sample of 299 American adults were recruited through Amazon Mechanical Turk for a small financial incentive (\$0.70). After excluding participants who failed an attention check ($n = 12$) we were left with a final sample for analysis of 285 ($M_{\text{age}} = 35.44, SD_{\text{age}} = 10.41$; 98 women/186 men/1 other; 198 White, 49 Black, 14 Asian/Pacific Islander, 10 Hispanic/Central or South American, 7 Mixed Race, 3 South Asian, 2 Native American, 1 Caribbean/West Indies, 1

Arab/Middle-Eastern). No other cases were excluded from analysis.

Rootedness Manipulation

To manipulate temporal rootedness, we randomly assigned participants to receive one of three essay prompts. In the High Rootedness condition ($n = 91$), individuals reflected on a recent experience that made them feel like they are living in the “right time” or that they belong in the present time. In the Low Rootedness condition ($n = 93$), individuals reflected on a recent experience that made them feel like they are living in the “wrong time” or that they do not belong in the present time. Finally, the Control condition ($n = 101$) was asked to describe a recent experience and to estimate how much time it took. Crucially, all participants considered the temporal quality of their experiences, but only those in the rootedness conditions considered the extent to which they do or do not belong in the present.

Rootedness and Well-Being Measures

The same measure of state temporal rootedness from Study 3 was used to assess the effectiveness of the manipulation. Items formed a reliable composite and were averaged ($\alpha = .90$, $M = 4.76$, $SD = 1.28$). Well-being was assessed with three measures.

Satisfaction with life. The five-item Satisfaction with Life Scale (SWLS; Diener et al., 1985) asks individuals to rate (1 = *Strongly disagree*/7 = *Strongly agree*) their agreement with statements assessing global life satisfaction (e.g., “I am satisfied with my life”, “The conditions of my life are excellent”). Items formed a highly reliable composite and were averaged ($\alpha = .94$, $M = 4.56$, $SD = 1.59$).

Flourishing. The eight-item flourishing questionnaire (Diener et al., 2010) was used to assess global evaluations of life (e.g., “I lead a purposeful and meaningful life”; “I am optimistic about my future”) and used the same rating scale as the SWLS. This measure was also highly

reliable and scores were averaged ($\alpha = .91$, $M = 5.29$, $SD = 1.06$).

Affect balance. We assessed state-specific well-being by asking individuals to rate (1 = *Not at all*/7 = *Very much*) their current levels of five positive emotions (e.g., Interested, Excited) and five negative emotions (e.g., Upset, Scared). Composites for each were highly reliable (Positive: $\alpha = .90$, $M = 4.28$, $SD = 1.60$; Negative: $\alpha = .94$, $M = 2.16$, $SD = 1.59$). Following past work using affect as an index of well-being (e.g., Diener et al., 2009), we computed an affect balance index as a difference between the two (Positive-Negative: $M = 2.12$, $SD = 2.13$).

The well-being scales were all strongly and significantly correlated ($r_s = .47 - .70$, $p_s < .001$) so we combined them into a single well-being index by first standardizing each score and then averaging across scales for each participant.

Results

Scores on the state rootedness measure were submitted to a one-way ANOVA by rootedness condition. This analysis returned a main effect of condition, $F(2, 282) = 28.41$, $p < .001$, $\eta^2 = .17$. The pattern indicated that rootedness was highest in the High Rooted condition ($M = 5.30$, $SD = 1.05$) followed by the Control condition ($M = 4.94$, $SD = 1.17$), and finally the Low Rootedness condition ($M = 4.04$, $SD = 1.27$). Tukey tests revealed that rootedness was significantly lower in the Low Rootedness condition compared to the Control ($p < .001$) and High Rootedness conditions ($p < .001$). The difference between the High Rootedness and Control conditions was trending in the predicted direction ($p = .08$).

Well-being also differed significantly across conditions, $F(2, 282) = 3.88$, $p < .001$, $\eta^2 = .03$, but the means were not completely in support of our pre-registered predictions. As expected, well-being was higher in the High Rootedness condition ($M = .19$, $SD = .79$) compared to the Control condition ($M = -.15$, $SD = .91$; $p = .02$). And although well-being was higher in the

High vs Low Rootedness condition ($M = -.03$, $SD = .09$), the difference was not statistically significant ($p = .18$).

Mediation by state rootedness. As a final test of the effect of rootedness on well-being, we examined whether state rootedness following the manipulation explained reported well-being. A quasi-Bayesian Monte Carlo simulation method was used (10,000 resamples) to test the mediated effect of the high and low rootedness inductions (vs. control) on reported well-being through state rootedness (Figure 1). Mediation effects were estimated with the *mediation* package in R (Tingley, Yamamoto, Hirose, Keele, Imai, 2014). The effect of the high rootedness condition (vs. control) on state rootedness produced a significant indirect effect on well-being, *average indirect effect* = .11 [.01, .22], $p = .03$. Inducing temporal rootedness increased state feelings of rootedness which in turn contributed to higher well-being. Compared to the total effect of high rootedness on well-being, $b = .34$, $SE = .12$, $p = .006$, the average direct effect after accounting for the mediator was smaller, but still significant, *average direct effect* = .22 [.02, .43], $p = .03$ (Figure 1).

The effect of the low rootedness condition (vs. control) on state rootedness also produced a significant indirect effect on well-being, *average indirect effect* = -.28 [-.42, -.16], $p < .001$. However, the pattern of effects reflects suppression (vs. mediation) as inducing low rootedness led to lower state feelings of rootedness, which in turn suppressed the otherwise positive effect of state rootedness on well-being. This suppression effect can be seen especially when comparing the small and non-significant total effect, $b = .12$, $SE = .12$, $p = .35$, and the larger and significant average direct effect, $b = .36$ [.16, .63] of low rootedness on well-being.

Discussion

Study 4 provides further evidence that temporal rootedness can be situationally induced,

and extends Study 3 by showing that these momentary changes have direct and indirect effects on reported well-being assessed as life satisfaction, psychological flourishing, and affect balance. One unexpected finding, however, was that the effect of inducing low rootedness appeared to suppress well-being indirectly rather than decrease well-being directly. In fact, the main effect of the low rootedness induction was significantly *positive* after accounting for the mediator. It is possible that considering one's place in time has a general positive benefit but that this benefit is weakened if the resulting evaluation is that one is not in the 'right' time period. Alternatively, some participants may have benefited from considering ways they do not belong in the present, if doing so led to a vivid nostalgic reflection on some prior period (Baldwin, Biernat, & Landau, 2015; Baldwin et al., 2018; Routledge et al., 2012).

General Discussion

Taken together, these studies provide support for the distinctive nature of temporal rootedness as an individual difference, demonstrate that temporal rootedness is sensitive to situational influence, and provide initial evidence of its psychological importance. Across an American and German sample, our first two studies show that the newly developed spheres of rootedness scale consistently represented statistically distinct temporal rootedness factors capable of predicting better well-being even after controlling for differences in spatial rootedness. Although we noted some minor discrepancies from one sample to another, the overall patterns were similar. In two experimental studies we demonstrate that temporal rootedness can be induced momentarily, and that these momentary changes have clear effects on reported well-being. However, diverging patterns of direct and indirect effects in Study 4 warrant further research.

It is also noteworthy that a strong connection between space and time was found in

Studies 1-3, which gives credence to the idea that temporal landmarks and spatial landmarks may serve similar functions. For example, a memory of a birthday party may serve to root oneself in time, but the location of that party represented in the memory may also serve to root oneself in space. If one were to visit the location of the party in space, such a return might serve to root oneself in time all over again. Future research should further explore the link between spatial and temporal rootedness, and how landmarks might be the mechanism behind their overlap.

Limitations and Future Directions

Because this work represents a novel direction in the study of an individual's experience of time, we believe that there are numerous avenues for further development. First, this investigation is limited by its methods which are wholly quantitative. We see considerable value in supplemental qualitative studies of temporal rootedness that may help to further enrich our understanding of the experience, its antecedents, and its potential consequences. Our analysis sacrifices this depth to study comparative differences between individuals, but more integrative work can help to offset this cost.

In developing this collaboration, we see the potential for developing and enhancing any resulting measure of this construct. We created items based primarily on analogy to spatial rootedness items and our own theoretical intuitions, but a rich qualitative study of this experience would provide a wealth of additional, and potentially corrective, knowledge on the views that define temporal rootedness. The current samples demonstrated at least some effects of temporal rootedness, at least as we have measured it, but considerably more could be learned from a more theoretically enriched understanding.

It is also worth noting that our analysis is in part limited by its selection of variables. As in all studies on well-being, there are some constraints imposed by the choice of outcome

measures. In this context, we focused primarily on cognitive appraisals indicative of positive well-being and affective indices (e.g., depression). These variables focus solely on the individual's feelings and appraisals of their own lives, and future research would do well to expand the scope of both the measures of well-being and the units of analysis. For instance, one fruitful direction could be to examine how dyads or groups experience collective temporal rootedness (e.g., how "we" belong in this time period).

Additionally, we have relied solely on cross-sectional methods. Because temporal rootedness reflects an individuals' comportment toward their place in time and that place in time is constantly changing, we would anticipate that temporal rootedness is not a stable dimension of personality at all. Rather, we believe it reflects an important existential insight into the individual's awareness of themselves in the world that can shift with the contingencies of life (something more commonly termed a characteristic adaptation in personality research; Henriques, 2017; McAdams & Pals, 2006).

As a result, we anticipated that shifts in temporal rootedness are not only possible (e.g., Studies 3 and 4), but may help explain the benefits (or costs) afforded to certain positive (or negative) experiences. An individual who benefits from therapy or a positive interpersonal relationship may in part be happier because of their greater sense of being where and when they feel they *should* be. That sense of fit to world is largely ignored in mainstream psychology, but offers some insight into the conscious and self-reflective processes that may give rise to psychological well-being (at least, as measured in survey instruments).

The broader point to note is that future research on temporal rootedness should avail itself of a diversity of methods befitting this dynamic construct. Longitudinal methods may be

particularly valuable for tracking changes in this sense of belonging.

It is worth noting at this point that although we expected, and found support for, a causal impact of rootedness on well-being, future longitudinal or experimental research may benefit from considering the converse relationship. In other words, individuals who feel greater well-being may come to more strongly identify with their self in the present moment, reversing the relationship we observed. Ultimately, our theorizing does not and need not imply unidirectional relationships between temporal rootedness and other facets of well-being: Belonging in the moment promotes well-being and well-being may boost one's sense of belonging in this moment.

Because temporal rootedness is expected to be so malleable, there is also a need for further work investigating the role of culture and the environment. Although our two samples came from different sides of the Atlantic, both cultures are Western, largely post-industrial, and individualistic (Henrich, Heine, & Norenzayan, 2010). There is, however, a growing literature speaking to the fact the experience of time in highly modernized contexts is not representative. For example, under technologically advanced forms of capitalism, individuals must place considerable emphasis on the market or exchange value of their time, they face greater pressure to record and plan time use, and there is a separation of times from places in a more abstract coordination of behavior across places and times (Keefer, Stewart, Palitsky, & Sullivan, 2019; Sugarman & Thrift, 2017; Sullivan, Keefer Lucas, Stewart Sheridan, & Palitsky, 2016). In sum, we have every reason to expect that the nature of temporal rootedness would be different under different cultural contexts.

Conclusion

In this paper we offered a brief theoretical proposal for the study of temporal rootedness

and provided two initial sets of statistical analysis speaking to the value of this study. We found that 1) individual differences in temporal rootedness track variation in well-being in the ways that we predicted on the basis of earlier existential analysis and 2) momentary feelings of belonging (or not) in time have clear associations with perceived well-being. Although we have noted that there remains much work to do to develop our understanding of this topic, we hope that this first attempt inspires others to attend to this narrow but important dimension of the individual's awareness of themselves.

Footnotes

¹ Nineteen participants did not indicate their age and 18 participants did not complete the remaining demographics items. Thus, the reported sample characteristics do not reflect the entire sample included in primary analyses.

² The Root Mean Square Error of Approximation (RMSEA) assesses the extent to which a model misrepresents the observed data, with 0 being the theoretical ideal (i.e., a perfect model), .05 reflecting a good fit, and any value below .08 reflecting acceptable fit. The Standardized Root Mean Square Residual (SRMR) reflects the extent to which the covariances in the model differ from those in the full data, and here any value below .10 is considered acceptable. The Comparative Fit Index (CFI) assesses the extent to which the specified model improves upon a baseline model in which observed variables are assumed to be independent: values above .90 are considered to have reasonably good fit. The Tucker-Lewis Index (TLI), also known as the Non-Normed Fit Index (NNFI), is similar to the CFI except that it adjusts for model complexity; again, a value greater than .90 is considered a good degree of fit.

References

- Ashton, M. C., Lee, K., Goldberg, L. R., & de Vries, R. E. (2009). Higher order factors of personality: Do they exist? *Personality and Social Psychology Review*, 13(2), 79-91.
- Baerger, D. R., & McAdams, D. P. (1999). Life story coherence and its relation to psychological well-being. *Narrative Inquiry*, 9, 69-96.
- Baldwin, M., Biernat, M., & Landau, M. J. (2015). Remembering the real me: Nostalgia offers a window to the intrinsic self. *Journal of Personality and Social Psychology*, 108(1), 128-147. doi: <http://dx.doi.org/10.1037/a0038033>
- Baldwin, M., White, M. H., & Sullivan, D. (2018). Nostalgia for America's past can buffer collective guilt. *European Journal of Social Psychology*, 48(4), 433-446.
- Boyd, J. N., & Zimbardo, P. G. (2005). Time Perspective, Health, and Risk Taking. In *Understanding behavior in the context of time: Theory, research, and application*. (pp. 85-107). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.
- Brown, B., Perkins, D. D., & Brown, G. (2003). Place attachment in a revitalizing neighborhood: Individual and block levels of analysis. *Journal of Environmental Psychology*, 23(3), 259-271. doi:[https://doi.org/10.1016/S0272-4944\(02\)00117-2](https://doi.org/10.1016/S0272-4944(02)00117-2)
- Brown, T. A. (2014). *Confirmatory factor analysis for applied research*: Guilford Publications.
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6(1), 3-5.
- Cheung, W.-Y., Sedikides, C., Wildschut, T., Tausch, N., & Ayanian, A. H. (2017). Collective nostalgia is associated with stronger outgroup-directed anger and participation in ingroup-favoring collective action. *Journal of Social and Political Psychology*, 5(2), 301-

319.

Diener, E., Wirtz, D., Biswas-Diener, R., Tov, W., Kim-Prieto, C., Choi, D.-w., & Oishi, S.

(2009). New measures of well-being. In *Assessing well-being* (pp. 247-266): Springer.

Eaton, W. W., Smith, C., Ybarra, M., Muntaner, C., & Tien, A. (2004). Center for Epidemiologic

Studies Depression Scale: Review and Revision (CESD and CESD-R) [Press release]

Enders, C. K. (2001). The Performance of the Full Information Maximum Likelihood Estimator

in Multiple Regression Models with Missing Data. *Educational and Psychological*

Measurement, 61(5), 713-740. doi:10.1177/0013164401615001

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum

likelihood estimation for missing data in structural equation models. *Structural equation*

modeling, 8(3), 430-457.

Farrell, S., J., Aubry, T., & Coulombe, D. (2003). Neighborhoods and neighbors: Do they

contribute to personal well-being? *Journal of Community Psychology*, 32(1), 9-25.

doi:10.1002/jcop.10082

Gagné, M. (2003). Autonomy support and need satisfaction in the motivation and well-being of

gymnasts. *Journal of Applied Sport Psychology*, 15(4), 372-390.

Gibson, J. J. (1978). The ecological approach to the visual perception of pictures. *Leonardo*,

11(3), 227-235.

Harrington, J. R., & Gelfand, M. J. (2014). Tightness–looseness across the 50 united states.

Proceedings of the National Academy of Sciences, 111(22), 7990-7995.

Hautzinger, M., & Bailer, M. (1993). Allgemeine Depressionsskala.[The German version of

Center for Epidemiologic Studies Depression Scale.]. *Göttingen: Hogrefe*.

Heidegger, M. (1927/1962). Being and time. *Trans. John Macquarrie and Edward Robinson*.

- 1
2
3
4 *San Francisco: Harper and Row.*
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). Most people are not WEIRD. *Nature*, 466, 29. doi:10.1038/466029a
- Henriques, G. (2017). Character adaptation systems theory: A new big five for personality and psychotherapy. *Review of General Psychology*, 21, 9-22. doi: 10.1037/gpr0000097
- Hidalgo, M. C., & Hernández, B. (2001). Place attachment: Conceptual and empirical questions. *Journal of Environmental Psychology*, 21(3), 273-281.
- Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1-55. doi:10.1080/10705519909540118
- Iyer, A., & Jetten, J. (2011). What's left behind: Identity continuity moderates the effect of nostalgia on well-being and life choices. *Journal of Personality and Social Psychology*, 101(1), 94-108. doi:10.1037/a0022496
- Kashdan, T. B., Gallagher, M. W., Silvia, P. J., Winterstein, B. P., Breen, W. E., Terhar, D., & Steger, M. F. (2009). The curiosity and exploration inventory-II: Development, factor structure, and psychometrics. *Journal of research in personality*, 43(6), 987-998.
- Keefer, L. A., Stewart, S. A., Palitsky, R., & Sullivan, D. (2017). Time–space distancing: An empirically supported integrative framework for the cultural psychology of time and space. *Time & Society*, 0961463X17716736. doi:10.1177/0961463X17716736
- Kernis, M. H., & Goldman, B. M. (2006). A multicomponent conceptualization of authenticity: Theory and research. *Advances in experimental social psychology*, 38, 283-357.
- Kosterman, R., & Feshbach, S. (1989). Toward a Measure of Patriotic and Nationalistic

- Attitudes. *Political Psychology*, 10(2), 257-274. doi:10.2307/3791647
- Latour, B. (2005). *Reassembling the social: An introduction to actor-network theory*. Oxford, UK: Oxford University Press.
- Lewicka, M. (2005). Ways to make people active: The role of place attachment, cultural capital, and neighborhood ties. *Journal of Environmental Psychology*, 25(4), 381-395.
doi:<https://doi.org/10.1016/j.jenvp.2005.10.004>
- Lewicka, M. (2010). What makes neighborhood different from home and city? Effects of place scale on place attachment. *Journal of Environmental Psychology*, 30(1), 35-51.
doi:<https://doi.org/10.1016/j.jenvp.2009.05.004>
- Lewicka, M. (2011). Place attachment: How far have we come in the last 40 years? *Journal of Environmental Psychology*, 31(3), 207-230.
doi:<https://doi.org/10.1016/j.jenvp.2010.10.001>
- Lewicka, M. (2014). In search of roots: Memory as an enabler of place attachment. In L. C. Manzo and P. Devine-Wright (Eds.), *Place attachment: Advances in theory, methods, and applications* (pp. 49-60). New York, NY: Routledge.
- Lewin, K. (1936). *Principles of topological psychology*. F. Heider and G. M Heider (Trans.). NewYork, NY: McGraw Hill.
- Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To Parcel or Not to Parcel: Exploring the Question, Weighing the Merits. *Structural Equation Modeling: A Multidisciplinary Journal*, 9(2), 151-173. doi:10.1207/S15328007SEM0902_1
- Low, S. M., & Altman, I. (1992). Place Attachment. In I. Altman & S. M. Low (Eds.), *Place Attachment* (pp. 1-12). Boston, MA: Springer US.
- McAdams, D. P. (2006). The problem of narrative coherence. *Journal of Constructivist*

- 1
2
3
4 *Psychology, 19*, 109-125.
5
6
7 McAdams, D. P., & Pals, J. L. (2006). A new Big Five: fundamental principles for an integrative
8
9 science of personality. *American psychologist, 61*(3), 204-217.
10
11
12 McAndrew, F. T. (1998). The measurement of 'rootedness' and the prediction of attachment to
13
14 home-towns in college students. *Journal of Environmental Psychology, 18*(4), 409-417.
15
16 doi:<https://doi.org/10.1006/jevp.1998.0078>
17
18
19 Mesch, G. S., & Manor, O. (1998). Social Ties, Environmental Perception, And Local
20
21 Attachment. *Environment and Behavior, 30*(4), 504-519.
22
23
24 doi:[10.1177/001391659803000405](https://doi.org/10.1177/001391659803000405)
25
26
27 Mihaylov, N., & Perkins, D. D. (2014). Community place attachment and its role in social capital
28
29 development. *Place attachment: Advances in theory, methods and applications, 61*.
30
31
32 Morrison, M., Tay, L., & Diener, E. (2011). Subjective Well-Being and National Satisfaction:
33
34 Findings From a Worldwide Survey. *Psychological Science, 22*(2), 166-171.
35
36 doi:[10.1177/0956797610396224](https://doi.org/10.1177/0956797610396224)
37
38
39 Muncer, S. J. (2011). The general factor of personality: Evaluating the evidence from meta-
40
41 analysis, confirmatory factor analysis and evolutionary theory. *Personality and*
42
43 *Individual Differences, 51*(6), 775-778.
44
45
46 Oldenburg, R. (1989). *The great good place: Café, coffee shops, community centers, beauty*
47
48 *parlors, general stores, bars, hangouts, and how they get you through the day*: Paragon
49
50 House Publishers.
51
52
53 Peetz, J., & Wilson, A. E. (2013). The post-birthday world: Consequences of temporal landmarks
54
55 for temporal self-appraisal and motivation. *Journal of Personality and Social Psychology,*
56
57
58
59
60
61
62
63
64
65

- 1
2
3
4 104(2), 249-266. doi:10.1037/a0030477
5
6
7 Peetz, J., & Wilson, A. E. (2014). Marking time: selective use of temporal landmarks as barriers
8
9 between current and future selves. *Pers Soc Psychol Bull*, 40(1), 44-56.
10
11 doi:10.1177/0146167213501559
12
13
14 Rahm, T., Heise, E., & Schuldt, M. (2017). Measuring the frequency of emotions—validation of
15
16 the Scale of Positive and Negative Experience (SPANE) in Germany. *PloS one*, 12(2),
17
18 e0171288.
19
20
21 Robbins, R. N., & Bryan, A. (2004). Relationships Between Future Orientation, Impulsive
22
23 Sensation Seeking, and Risk Behavior Among Adjudicated Adolescents. *Journal of*
24
25 *Adolescent Research*, 19(4), 428-445. doi:10.1177/0743558403258860
26
27
28 Rollero, C., & De Piccoli, N. (2010). Place attachment, identification and environment
29
30 perception: An empirical study. *Journal of Environmental Psychology*, 30(2), 198-205.
31
32 doi: 10.1016/j.jenvp.2009.12.003
33
34
35 Routledge, C., Arndt, J., Wildschut, T., Sedikides, C., Hart, C. M., Juhl, J., . . . Schlotz, W.
36
37 (2011). The past makes the present meaningful: Nostalgia as an existential resource.
38
39 *Journal of Personality and Social Psychology*, 101(3), 638-652. doi:10.1037/a0024292
40
41
42
43 Sartre, J.-P. (1943). 1956. *Being and nothingness*.
44
45
46 Scannell, L., & Gifford, R. (2010). Defining place attachment: A tripartite organizing
47
48 framework. *Journal of Environmental Psychology*, 30(1), 1-10.
49
50 doi:https://doi.org/10.1016/j.jenvp.2009.09.006
51
52
53 Schatz, R., T., Staub, E., & Lavine, H. (2003). On the Varieties of National Attachment: Blind
54
55 Versus Constructive Patriotism. *Political Psychology*, 20(1), 151-174. doi:10.1111/0162-
56
57
58
59
60
61
62
63
64
65

895X.00140

Seamon, D. (1979). *A Geography of the Lifeworld*.

Sedikides, C., Wildschut, T., Juhl, J., & Cheung, W. Y. (2017). The psychological functions of nostalgia. In *Oxford Handbook of Psychology of Time Travel and Temporality*: Oxford University Press.

Sheldon, K. M., Ryan, R. M., Rawsthorne, L. J., & Ilardi, B. (1997). Trait self and true self: Cross-role variation in the Big-Five personality traits and its relations with psychological authenticity and subjective well-being. *Journal of Personality and Social Psychology*, 73(6), 1380-1393. doi:10.1037/0022-3514.73.6.1380

Shweder, R. A. (1991). *Thinking through cultures: Expeditions in cultural psychology*: Harvard University Press.

Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The meaning in life questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology*, 53(1), 80-93. doi:10.1037/0022-0167.53.1.80

Sugarman, J., & Thrift, E. (2017). Neoliberalism and the Psychology of Time. *Journal of Humanistic Psychology*, 0022167817716686. doi:10.1177/0022167817716686

Sullivan, D., Keefer L., A., Stewart Sheridan, A., & Palitsky, R. (2016). Time-Space Distanciation: An Interdisciplinary Account of How Culture Shapes the Implicit and Explicit Psychology of Time and Space. *Journal for the Theory of Social Behaviour*, 46(4), 450-474. doi:10.1111/jtsb.12103

Tingley, D., Yamamoto, T., Hirose, K., Keele, L., Imai K. (2014). mediation: R Package for Causal Mediation Analysis. *Journal of Statistical Software*, 59(5), 1-38. URL

- 1
2
3
4 <http://www.jstatsoft.org/v59/i05/>.
5
6
7 Twenge, J. M., Catanese, K. R., & Baumeister, R. F. (2003). Social Exclusion and the
8
9 Deconstructed State: Time Perception, Meaninglessness, Lethargy, Lack of Emotion, and
10
11 Self-Awareness. *Journal of Personality and Social Psychology*, 85(3), 409-423.
12
13
14 doi:10.1037/0022-3514.85.3.409
15
16 Wildschut, T., Bruder, M., Robertson, S., van Tilburg, W. A. P., & Sedikides, C. (2014).
17
18 Collective nostalgia: A group-level emotion that confers unique benefits on the group.
19
20 *Journal of Personality and Social Psychology*, 107(5), 844-863. doi:10.1037/a0037760
21
22
23 Williams, D. R. (2014). "Beyond the commodity metaphor": Some methodological reflections
24
25 on place attachment research. In L. C. Manzo and P. Devine-Wright (Eds.), *Place*
26
27 *attachment: Advances in theory, methods, and applications* (pp. 91-99). New York, NY:
28
29 Routledge.
30
31
32
33 Wood, A. M., Linley, P. A., Maltby, J., Baliousis, M., & Joseph, S. (2008). The authentic
34
35 personality: A theoretical and empirical conceptualization and the development of the
36
37 Authenticity Scale. *Journal of Counseling Psychology*, 55(3), 385-399.
38
39
40
41 doi:10.1037/0022-0167.55.3.385
42
43 Young, A. F., Russell, A., & Powers, J. R. (2004). The sense of belonging to a neighbourhood:
44
45 can it be measured and is it related to health and well being in older women? *Social*
46
47 *Science & Medicine*, 59(12), 2627-2637.
48
49
50
51 doi:<https://doi.org/10.1016/j.socscimed.2004.05.001>
52
53 Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual-
54
55 differences metric. *Journal of Personality and Social Psychology*, 77, 1271-1288.
56
57
58
59
60
61
62
63
64
65

Table 1. *Latent Correlations among the Six Spheres of Rootedness Dimensions in the Parceled Models in Studies 1 and 2*

	1	2	3	4	5	6
1. House	-	0.76	0.31	0.47	0.37	0.24
2. Neighborhood	0.52	-	0.41	0.46	0.38	0.28
3. Nation	0.32	0.16*	-	0.42	0.47	0.39
4. Year	0.31	0.36	0.31	-	0.78	0.40
5. Decade	0.26	0.31	0.44	0.60	-	0.51
6. Century	0.26	0.24	0.24	0.33	0.45	-

Note. All correlations are significant at $p < .007$, unless otherwise noted. Values above the diagonal are from the American sample and those below the diagonal are from the German sample; * $p = .08$

Table 2. *Estimated Parameters of the Structural Model Regressing Well-Being Measures on Spheres of Rootedness Dimensions in Studies 1 and 2*

Predictor	American Sample			German Sample		
	Unstandardized (SE)	Standardized	<i>p</i>	Unstandardized (SE)	Standardized	<i>p</i>
Positive Experiences						
House ^A	.23 (.07)	.24	.001	.07 (.07)	.10	.31
Neighborhood	.08 (.07)	.09	.24	-.01 (.07)	-.01	.93
Nation ^B	.10 (.05)	.11	.03	.22 (.07)	.29	.002
Year ^B	.17 (.08)	.18	.03	.31 (.08)	.40	< .001
Decade ^A	.15 (.08)	.16	.05	.00 (.09)	.00	.97
Century	.04 (.05)	.05	.38	-.06 (.07)	-.07	.41
Negative Experiences						
House ^A	-.12 (.07)	-.14	.08	-.44 (.09)	-.05	.63
Neighborhood ^A	-.19 (.07)	-.21	.01	.03 (.09)	.03	.77
Nation ^G	-.04 (.05)	-.05	.36	-.20 (.09)	-.23	.03
Year ^B	-.15 (.08)	-.16	.07	-.25 (.10)	-.28	.01
Decade	-.06 (.08)	-.06	.49	-.01 (.11)	-.01	.92
Century	.00 (.05)	.00	.97	.11 (.09)	.13	.21
Depression						
House	-.04 (.05)	-.06	.40	-.05 (.06)	-.08	.44
Neighborhood ^A	-.11 (.05)	-.17	.03	.04 (.06)	.06	.55
Nation ^G	-.03 (.03)	-.05	.32	-.18 (.06)	-.27	.005
Year ^B	-.23 (.05)	-.37	< .001	-.32 (.07)	-.48	< .001
Decade	.00 (.06)	.00	.99	.05 (.08)	.07	.53
Century	-.03 (.03)	-.04	.46	.03 (.06)	.05	.61
Presence of Meaning						
House ^B	.34 (.13)	.21	.01	.43 (.14)	.30	.002
Neighborhood	.06 (.13)	.04	.64	-.01 (.13)	-.01	.91

Nation ^A	.32 (.09)	.20	.001	.12 (.13)	.08	.36
Year ^A	.26 (.14)	.16	.08	.11 (.14)	.08	.44
Decade ^G	.16 (.15)	.10	.30	.52 (.16)	.36	.001
Century	-.11 (.09)	-.07	.22	-.10 (.13)	-.07	.41
Search for Meaning						
House	-.25 (.16)	-.14	.11	-.17 (.16)	-.11	.29
Neighborhood	.08 (.16)	.04	.63	-.18 (.16)	-.12	.27
Nation	.00 (.12)	.00	.95	-.20 (.15)	-.13	.20
Year	-.19 (.18)	-.11	.30	-.16 (.17)	-.11	.35
Decade	.14 (.19)	.08	.46	-.20 (.19)	-.13	.29
Century ^B	-.20 (.12)	-.11	.08	.30 (.15)	.20	.05
Autonomy						
House ^B	.27 (.08)	.25	.001	.23 (.11)	.21	.04
Neighborhood	.00 (.08)	.01	.93	-.12 (.11)	-.11	.28
Nation ^B	.11 (.06)	.11	.05	.24 (.11)	.22	.03
Year ^B	.17 (.09)	.15	.07	.35 (.12)	.31	.003
Decade	.15 (.09)	.14	.10	.04 (.13)	.04	.76
Century ^A	.15 (.06)	.14	.01	-.06 (.10)	-.06	.54
Competence						
House ^A	.21 (.09)	.18	.02	.05 (.12)	.04	.70
Neighborhood	.12 (.09)	.11	.17	.11 (.12)	.10	.33
Nation ^G	.07 (.06)	.06	.25	.32 (.12)	.27	.006
Year ^G	.12 (.10)	.11	.21	.51 (.13)	.43	< .001
Decade ^A	.27 (.10)	.23	.01	-.16 (.14)	-.13	.26
Century	.05 (.06)	.04	.47	-.11 (.11)	-.09	.31
Relatedness						
House ^B	.15 (.08)	.14	.06	.24 (.12)	.21	.04
Neighborhood ^A	.24 (.08)	.22	.002	.17 (.12)	.14	.14
Nation ^B	.11 (.06)	.11	.04	.43 (.12)	.37	< .001
Year	.06 (.08)	.05	.51	.13 (.12)	.11	.30
Decade ^A	.17 (.09)	.16	.06	-.06 (.14)	-.05	.67
Century ^B	.23 (.06)	.21	< .001	-.20 (.11)	-.17	.07

Authenticity				
House	.12 (.08)	.12	.16	
Neighborhood	.03 (.09)	.03	.70	
Nation	.06 (.06)	.06	.35	
Year	.09 (.09)	.09	.36	
Decade	-.07 (.10)	-.07	.44	
Century ^A	.31 (.06)	.30	< .001	
Curiosity/Exploration				
House ^A	-.13 (.07)	-.17	.06	
Neighborhood ^A	.15 (.07)	.19	.04	
Nation ^A	-.14 (.05)	-.18	.01	
Year	.00 (.08)	.00	.96	
Decade ^A	.16 (.08)	.20	.05	
Century	-.01 (.05)	-.02	.80	

Note. Authenticity and exploration were not measured in the German sample. ^A: Significant in the American sample; ^G: Significant in the German sample; ^B: Significant across groups

Figure 1: Mediation model showing total, direct, and mediated effects for rootedness conditions predicting state rootedness and well-being. Path coefficients represent regression betas (standard errors). Average direct and mediated effects are displayed as the approximated effect and 95% confidence intervals.