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What Is Real about “Real Time” Anyway? A Proposal for A Pluralistic Approach to Studying Identity Processes across Different Timescales

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ABSTRACT

Recently, there has been a growing emphasis on the fact that an understanding of identity development requires the study of real-time identity. But what exactly constitutes ‘real-time identity’? In this manuscript, we highlight that definitions of real time are often fuzzy, which poses a threat to this research field. We discuss two conceptual issues of research on ‘real-time identity’ that we believe require further clarification. The first is that ‘real-time identity’ is often conflated with ‘micro-level identity’. The second is that ‘micro-level identity’ is pitted against ‘macro-level identity’. We attempt to bring clarification to the above issues by drawing attention to three conceptual points: Firstly, we stress that ‘real-time’ simply refers to “the actual time during which something takes place”. Secondly, researchers can study static characteristics of identity phenomena in real time or they can study dynamics of change and development in real time. Thirdly, we draw attention to the fact that the terms ‘micro-level’ and ‘macro-level’ represent two ends of a time-scale continuum. We describe these points in depth and summarize our clarifications as a taxonomy for authors interested in studying ‘real-time identity’, which promises to support theoretical and empirical integration between different approaches to identity.

KEYWORDS

Identity development; timescales; processes; ontology; epistemology

Recently, there has been growing emphasis (as evidenced by this special issue) on the fact that an understanding of identity requires the study of identity processes and mechanisms. Notably, some identity researchers (stemming from both qualitative and quantitative approaches) argue that studying concrete actions and experiences is key for elucidating such processes and mechanisms. This is because they are thought to relate to a more fine-grained and ecologically valid understanding of identity (Bosma & Kunnen, 2008; Korobov, 2015). This approach – sometimes conceptualized as tapping into “real-time identity processes” – concerns the study of identity-in-context, mechanisms of development, and within-person processes of identity (Bosma & Kunnen, 2001; Lichtwarck-Aschoff et al., 2008). With its focus on experiences and actions, this is a pioneering and innovative shift in identity research (Bosma & Kunnen, 2008), one which contrasts the more traditional research line of large-scale, group-based, and variable-oriented identity research focusing on identity in terms of self-reflection and cognition.

While the empirical research on “real-time identity processes” is blooming, we believe that a deeper conceptual analysis can strengthen this field yet further. Conceptual analysis entails the examination of concepts, terms, and constructs for clarity, and incoherencies, and for unjustified claims or implausible assumptions (Hibberd, 2021; Du Preez & De Klerk, 2019). Du Preez and De Klerk (2019) argued that while psychologists often assume that conceptual analysis is an

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inherent and obvious part of scientific activity, failure to explicitly preclude empirical research and choice of methods with explicit conceptual analysis can lead to distortions and misconceptions. It is thus vital to ensure that the concepts, terms, and assumptions that we use in identity research are free of conceptual problems, lest we pursue a line of empirical research that rests on shaky grounds.

With this manuscript, we provide a conceptual analysis that aims to scrutinize the conceptualization of and research practices concerning *how* questions for identity. More specifically, we argue that there is conceptual conflation between epistemology and ontology. We use the term *epistemology* to refer to the type of knowledge that is being pursued (i.e., questions of *how*: processes and mechanisms, and the situatedness in time), and we use the term *ontology* to refer to the object of study (i.e., the ways that researchers conceptualize identity). We argue that this conceptual conflation has resulted in a fuzzy and restrictive study of identity processes and the role of time. Furthermore, we note that this restrictive study further solidifies an unnecessary chasm between researchers studying situated processes of identity and those that are considered more mainstream (see e.g., Korobov, 2015 for a similar discussion).

We will show that our conceptual clarification contributes to the development of the identity field in the following way. We call for more deliberate contemplation about what the unique processes and mechanisms for each identity feature might be across various timescales. This broadens the scope for empirical research concerning identity processes and mechanisms while also enhancing the conceptual rigor of the field.

Ontologies and the study of identity: situated actions and experiences versus cognitive self-representations

Broadly speaking, identity has been studied in terms of two different features that have emerged as a result of two different theoretical foundations. These features are viewed as having qualitatively different ontologies. As we will describe here, these features correspond with quite distinct methodological approaches (and as we will argue in the next section, distinct epistemological aims). First, largely based on the work of Erikson (1968), identity has been conceptualized in terms of cognition and reflection. From this foundation, identity is broadly defined as an individual's "integrated, contextualized, holistic sense of self, which comprises numerous aspects of self" (e.g., domains and social roles; Galliher et al., 2017, p. 2013). "Sense of self," here, refers to the cognitive self-representations that individuals "have" (Bamberg, 2011). These cognitive self-representations are the "mental constructions about us as persons in terms of what we are identifying with and how we are identified . . . they are properties of an internal make-up as "who-we-are" as persons" (Bamberg, 2011, p. 6).

The most established methodological approaches to this feature of identity are the identity-status approach (Kunnen & Metz, 2015) and the narrative approach (Bamberg, 2011; McLean & Syed, 2015). While these traditional approaches to identity acknowledge that identities are developed within social contexts and everyday interactions (Adams & Marshall, 1996; Erikson, 1968; Postmes et al., 2006), identity development is understood as a largely internalized, cognitive process (Breakwell, 1986; Korobov, 2010) through which an individual integrates experiences across situations and contexts into a coherent sense of self. Importantly, these developmental processes are conceptualized as involving the "emergence and change of identity in the human lifespan" (Bosma & Kunnen, 2001, p. 41).

In contrast, a second broad conceptualization of identity has been formulated by researchers interested in concrete identity-related experiences and actions that are situated in the context of everyday life (e.g., Lichtwarck-Aschoff et al., 2008; Raeff, 2014). While stemming from different theoretical disciplines, researchers within this diverse approach assume that identity does not primarily generate daily identity-related experiences in a top-down manner. Instead, identity itself is considered "a product of social interaction" (Breakwell, 1986, p. 43). For example, many of the

qualitative approaches to identity consider the way that individuals construct and establish identities through the telling of everyday stories (Bamberg, 2006), position themselves (Korobov, 2010) or make identity claims (Schachter, 2015) within everyday conversations. In line with this, researchers have considered how interaction partners influence identity development through concrete behaviors such as scaffolding (McLean & Jennings, 2012; McLean & Mansfield, 2012), positioning (Anderson, 2009), or probing (Kerrick & Thorne, 2014).

Notably, while some qualitative researchers within this second ontological perspective take an explicitly non-cognitive approach (e.g., Korobov, 2010), researchers adopting a quantitative approach to identity tend to study individuals' self-reflective *experiences* in the context of everyday life (e.g., Becht et al., 2021; Klimstra et al., 2010; Van Der Gaag et al., 2016). Within these perspectives “actions and experiences in everyday life” are an important mechanism for the development of identity (Van Der Gaag et al., 2017, p. 2206). Importantly, these everyday processes are conceptualized as being relatively variable (Becht, Nelemans et al., 2016; Becht et al., 2021; Klimstra et al., 2010; Van Der Gaag et al., 2016). For example, some of these quantitative researchers have considered the dynamics of daily experiences of the self (Becht et al., 2021; Klimstra et al., 2010), or studied the influence of everyday emotional experiences and mood on daily identity processes (Klimstra et al., 2016; Van Der Gaag et al., 2017). What these qualitative and quantitative approaches share is an explicit consideration of identities as situated in immediate social contexts in which identity is negotiated (Korobov, 2010; McLean et al., 2007; Thorne & Shapiro, 2011) and shaped through concrete actions and behavior (see also Raeff, 2014; Van Der Gaag et al., 2016). As such, we will refer to these approaches, together, as the *situated approach* to identity.

In summation, there are two features of identity that have emerged as central for identity researchers: cognitive self-representations and situated actions or experiences. While the former is predominantly studied with identity-status and narrative methodological approaches, the latter is studied with a situated approach that relies on either qualitative or quantitative methodologies.

A brief history of diverging epistemological aims in identity research

Broadly, the traditional field of identity research has been interested in the establishment of between-individual outcomes of identity development (Berzonsky, 1990; Lavoie, 1994), external (i.e., contextual or environmental) predictors of these outcomes (Korobov, 2015), or types of between-individual structures of identity (Bosma, 1995). These aims have been criticized by researchers interested in identity as situated phenomena, arguing that they are based on static (Bosma, 1992; Bosma & Kunnen, 2008; Van Hoof, 1999) and decontextualized (Bosma & Kunnen, 2008; Korobov, 2015) research practices that are “not useful for the study of the developmental process” of identity (Bosma & Kunnen, 2008, p. 287).

As such, researchers interested in situated-identity phenomena have attempted to distance themselves from the more traditional aim described above. As a result, the field of identity research has seen a branching off, where some researchers have explicitly called for more research aimed at elucidating the processes and mechanisms of identity functioning and identity development (Berzonsky, 1990; Bosma, 1995; Bosma & Kunnen, 2008; Grotevant, 1987; Kroger, 1992). For groups of researchers within this emerging branch of identity research, there is a shared epistemological aim to understand the *how* questions of identity development (Bosma & Kunnen, 2008; Korobov, 2015; Kunnen & Van Geert, 2012; Smith & Sparkes, 2006) – *how* persons accomplish, construct, or establish a sense of self, and *how* identities develop.

For many of the quantitatively oriented researchers interested in *how* aspects of identity, inspiration was drawn (directly or indirectly) from the introduction of complex dynamic systems theory to the field of developmental psychology (Thelen & Smith, 1994; Van Geert, 1994). Here, a focus on processes in “real time” became established. In Thelen and Smith's (1994) seminal work on the development of cognition and action from a dynamic systems approach, they argued that meaningful developmental change is ultimately an “accrual of real-time events” (p. 244). Similarly, in Granic's

(2005) work on developmental psychopathology, she argued that “real-time behaviors . . . are the raw material of development” and that it is the repetition of these behaviors over many occasions that “grow” developmental outcomes (p. 391).

Drawing on this dynamic systems framework, some identity researchers concerned with elucidating the processes and mechanisms involved in identity development adopted the concept of “real-time identity” (Henry, 2016; Lichtwarck-Aschoff et al., 2008; Van Der Gaag et al., 2016) – evidenced by this special issue. Notably, it is this aspect of identity development that is generally established as “relatively neglected” in identity research (Klimstra et al., 2010).

Real time was defined as occurring on *short-term* timescales (e.g., Bell et al., 2005), also called *micro-level* timescales (Lichtwarck-Aschoff et al., 2008). These short-term or micro-level timescales were further defined as lasting for seconds, minutes, hours, days (Lichtwarck-Aschoff et al., 2008) and weeks (Dietrich et al., 2011). While the term *real time* is explicitly used by some (Henry, 2016; Lichtwarck-Aschoff et al., 2008; Van Der Gaag et al., 2016), others use the terms *micro level* (e.g., Becht et al., 2021; Hathcock et al., 2020; Schwartz et al., 2011; Van Der Gaag et al., 2017), or *short term* (Klimstra et al., 2016, 2010) as generally synonymous alternatives.

Aside from distancing themselves from the traditional aims in identity research, those studying *real-time*, *micro-level*, and *short-term* identity processes also tend to distance themselves from studies of *developmental-time*, *macro-level*, or *long-term* processes (Bosma & Kunnen, 2001; Kerpelman et al., 1997; Lichtwarck-Aschoff et al., 2008). This contrast also echoes Thelen and Smith (1994), who established the distinction between *real time* and *developmental time*. In identity research, the developmental or macro-level timescale is further defined as lasting months, years, and decades (Lichtwarck-Aschoff et al., 2008), thus occurring across the lifespan (Bosma & Kunnen, 2001).

Thus, identity processes and mechanisms of identity have been thought to take place across the span of seconds to weeks, specifically. Pioneering identity theorists that focus on situated-identity phenomena suggest that identity phenomena that require more time to unfold (i.e., months to a lifespan) are explicitly *not* considered to be “identity processes” (Bosma & Kunnen, 2001, 2008). A developmental trajectory of Marcia’s (1966) identity statuses, for example, is considered to be a *developmental process*, distinct from an *identity process* (Bosma & Kunnen, 2001). It is the *identity processes* (characterized as short-term, or micro-level processes), specifically, that are assumed to be the “mechanisms and determinants” of identity development (Bosma & Kunnen, 2001, p. 59).

In this way, many of the pioneering identity researchers – from both qualitative and quantitative perspectives – have suggested that, if we want to understand *how* identity develops, we should focus on “real time events” (Bosma & Kunnen, 2008, p. 288), where “real time” refers to the day-to-day events (Klimstra et al., 2016) in “microinteractional contexts” (Korobov, 2015). These shorter-term processes are thought to “more directly adhere to dynamics of identity formation” (Becht, Branje et al., 2016, p. 661) and to uniquely provide insight into the “actual” (Dietrich et al., 2011, p. 135) or “precise” (Schwartz, 2011, p. 374) processes of identity. As stated in the description of this special issue, without knowledge of “real-time identity,” it is assumed that we cannot know “what is really happening in forming and developing identity” (Identity: An International Journal of Theory and Research, n.d.).

What we wish to highlight here is the apparent assumption – held in the situated-identity approach – that the epistemological aim of studying *how* identity develops requires researchers to study situated *short-term* processes, and therefore, that this aim cannot be tackled with studies of decontextualized long-term processes.

Largely related to this methodological constraint (i.e., only short-time scales), the study of *how* identity develops seems to correspond with an additional constraint, an ontological one. Specifically, short-term processes (often referred to as *micro-level* processes) are thought to correspond with specific features of identity. Lichtwarck-Aschoff et al. (2008), stated this quite explicitly: “micro and macro are further defined by the distinction between a focus on the expression of identity (micro level) and a focus on the reflection on identity (macro level)” (p. 377). We can see here that the distinction in

timescale (micro versus macro) directly corresponds with an ontological distinction in identity features. While it is not necessarily seen as impossible for cognitive and representational features of identity to occur on the short-term timescales, it is seen as “the exception rather than the rule” (Lichtwarck-Aschoff et al., 2008, p. 375). As such, studying “reflections on identity” that have no connection to the proximal interactions within one’s social context is therefore seen as less relevant for understanding processes and mechanisms of development (e.g., Thorne & Shapiro, 2011).

A similar conflation between this epistemological aim and the privileged status of situated actions and experiences of identity is also evident in the qualitative approach to situated identity (albeit not explicitly defined as *micro-level*). For example, Korobov (2015) suggested that to “see how identities develop” we should concern ourselves with “how they are built, shaped, contested, and revised within actual interactional contexts” (p. 211), which scholars in this area of research equate with a study of what people are “doing” (e.g., Bamberg, 2006). For scholars adopting qualitative approaches, an understanding of *how* identity functions and develops involves the situated acts of telling “small” stories (e.g., McLean & Jennings, 2012; McLean et al., 2007), claims about the self (Gmelin & Kunnen, 2021; Schachter, 2015), or identity positions (Kerrick & Thorne, 2014; Korobov, 2010, 2015).

The fuzzy and restrictive state of situated approaches to identity

The general epistemological goal to understand *how* identity functions and develops via the study of processes or mechanisms is one with which we sympathize, and which we pursue in our own work. We believe that the research that has come out of these fields of identity research has been extremely fruitful for the identity field more broadly. As such, we do not wish to critique this epistemological aim per se, and instead, we wish to argue that the conceptual conflations described above (between epistemological aims on the one hand, and methodological norms and identity ontologies on the other hand) are both nebulous and overly restrictive for the field of identity research (and any fields of research studying processes and mechanisms of human development for that matter).

As we described above (in *A brief history of diverging epistemological aims in identity research*), we observe a general sentiment that small units of time are perceived as somehow better equipped for studying *how* identity develops (e.g., Bosma & Kunnen, 2001, 2008; Klimstra, 2016; Schwartz, 2011) – where small units of time include moment-to-moment (e.g., Henry, 2016; Shaby & Vedder-Weiss, 2020), day-to-day, or week-to-week processes (Becht, Nelemans et al., 2016; Becht et al., 2021; Klimstra et al., 2016, 2010; Schwartz et al., 2011; Van Der Gaag et al., 2017; Van Der Gaag et al., 2016). In many ways, this view of privileging small units of time might be best illustrated by the term *real-time identity itself* (this issue) – indicating that there is something more *real* about time passing across seconds, hours, days, or weeks as compared to processes of in-depth reflection, which are framed as being removed from both context and time.

To be sure, this elevated status of smaller units of time for studying mechanisms of development can be observed in other areas of developmental psychology as well (for example, those where the term *real time* is used, e.g., Steenbeek & Van Geert, 2013; Thelen & Smith, 1994; Van Dijk, 2020; Witherington & Margett, 2011). But, however pervasive it might be, why should the study of mechanisms and “precise” studies of processes be a thing of exclusively *small* units of time? Why should *real time* refer specifically to short-term timescales? After all, the definition of *real time* is “the actual time during which something takes place” (Merriam-Webster, n.d.). It does not refer to any *specific* timescales or units of time. Indeed, all time is real time, including processes that take place across longer units of time.

We think that prioritizing small units of time for the aim of studying *how* identity develops can stand in the way of progress for identity research for two main reasons. The first reason refers to the chasm between this growing field of identity research and the more established one traditionally concerning cognitive self-representations of identity, and the second reason refers to hindering the conceptual progress of identity processes and mechanisms.

A divided field of research?

Prioritizing small units of time directly constrains the ontological scope considered. In studying how identity progresses *from moment-to-moment*, researchers are bound to the study of action- and experience features (Lichtwarck-Aschoff et al., 2008) – as described in the section *A brief history of diverging epistemological aims in identity research*.

But what of processes and mechanisms concerning cognitive and self-reflective features of identity? These features of identity should not be left behind in the wake of the emerging focus on actions and experiences (Freeman, 2006). Like identity actions and experiences, self-representations also develop as iterative evolution processes (Luyckx et al., 2006; Stephen et al., 1992). The evolution of self-representations across the lifespan is the “plot” of identity, or the “movement of our lives” (Freeman, 2006, p. 159). To study the processes of cognitive and self-representational features of identity in *real time*, we then merely need to determine the units of time that are relevant for these features of identity (*Future Directions for Studying Identity Processes and Mechanisms in Time*).

Furthermore, like identity actions and experiences, the dynamic, moving, evolution processes of self-representations will also be situated in a changing context – where more macroscopic contexts such as biographical milestones (i.e. the birth of a child or loss of a parent; McLean & Syed, 2015) or changes in collective cultures (e.g., the legalization of gay marriage) will be of relevance (Hviid, 2020). Processes of *macroscopically situated* self-representations are then also something that researchers can study in order to contribute to the understanding of *how* identity develops. Setting these features of identity outside the realm of *identity processes* (Bosma & Kunnen, 2001, 2008) sketches a false picture of two separate types of identity knowledge (i.e., the *how* versus the *what*) corresponding to two separate groups of identity researchers (i.e., those who study identity actions/experiences and those who study cognitive self-representations), respectively.

Directly related to this ontological constraint, in focusing exclusively on identity actions and experiences, somewhat rigid methodological assumptions are perpetuated. Because *acts* of identity can be observed to change across very small units of time, the argument is that only methods that “directly” (Becht, Branje et al., 2016, p. 661) capture how the “actual processes” (Dietrich et al., 2011, p. 135) of identity development operate “exactly” (Klimstra et al., 2010, p. 192) in “concrete situations” (Henry, 2016, p. 202) are suitable for studying identity processes. These include observational methods, experience sampling methods (e.g., Becht et al., 2021; Klimstra et al., 2016; Schwartz et al., 2011; Van Der Gaag et al., 2016), and diaries (refer here to *daily* written diaries in which the individual reflects on a short span of time, e.g., Lichtwarck-Aschoff et al., 2010).

Observational, experience-sampling, and daily-diary methods are thought to be suitable for studying identity actions and experiences because they do not require the individual to “step back” and take an “aggregated” perspective on their identity in the way that traditional self-reflective methodology does (Freeman, 2006; Lichtwarck-Aschoff et al., 2008). This “stepping back” and “aggregation” should, however, not be seen as an indication that these reflective methods are any less capable of tapping into “real life” (Freeman, 2006). Indeed, we see no inherent reason why the study of processes and mechanisms of identity development should be left to only the observational, experience-sampling, and daily-diary methods. Here too, a picture of a divided epistemological aim seems to have been created for these different methodological approaches, one which stands to obstruct collaboration and integration of disparate approaches in identity research.

A mere quantitative distinction between timescales?

Our second argument against the prioritization of *small* units of time to study *how* identity develops refers to the conceptual progress of the field. This prioritization (in the context of trying to understand *how* identity develops) stems from the reductive assumption that global structures that have developed across the macro-level timescale can be explained by understanding how concrete components (i.e., actions) interact from moment-to-moment (Thelen & Smith, 1994). For example, Bosma and Kunnen

(2008) stated that “long-term developmental processes can be described as a long sequence of short-term interactions” (p. 41). In this way, studying the development of long-term processes is simply a matter of extending the amount of iteration observed at the level of actions. Accordingly, the macro-level timescale is conceptualized as the repetition of micro-level processes (Bosma & Kunnen, 2001). This communicates and promotes a reductive approach to development, where macro-level development is conceived as reducible to a series of micro-level activities (Witherington, 2019). Here, we would like to reiterate Witherington’s (2011) questions: “But why should . . . theorists privilege one level of analysis over another? What makes one level more ontologically ‘real’ than another?” Witherington (2011) was referring to the privileged status of here-and-now actions in the context of some dynamic system approaches to developmental psychology more broadly (such as Thelen & Smith, 1994). We would like to pose these questions to the identity researchers that adopt a situated-identity approach.

The assumption that concrete here-and-now processes are *the* closest to identity dynamics, processes, and mechanisms implies that there is nothing ontologically unique about longer-scale processes, that there are no qualitatively distinct mechanisms at play here (Witherington, 2019). If studying mechanisms at the macro level ultimately brings us back to processes at the micro level, then the only reason for studying identity processes at the macro level would be to establish between-individual outcomes, predictors, and typologies – i.e., the traditional epistemological aim of identity research.

We think it is necessary to re-orientate identity researchers back to the *qualitatively* distinct characteristics, properties, and indeed – mechanisms, at play on the macro-level timescale. We say “back” because much of the classic identity literature refers to mechanisms at play in macro-level developmental processes, including Marcia’s (1980) shifts from one identity stage to another and Berzonsky (1992)’s identity styles that constrain the way individuals construct or maintain their sense of identity. In short, “taking development seriously thus entails taking the level of developmental time organization seriously, as an explanation in its own right.” (Witherington, 2011, p. 87). We will expand more on how these unique macro-level processes of identity might fit into the study of *how* identity develops in the following section.

Future directions for studying identity processes and mechanisms in time

We would like to advocate for one, a *broader scope* of what it means to study processes and mechanisms of identity in time, and two, a more *conceptually thorough* treatment of what it means to study processes of identity in time. Specifically, we argue for a shift in focus away from specific units of time (i.e., seconds to weeks) and specific ontologies of identity (i.e., exclusively action- and experience-based features), and instead, a shift toward a more theoretically comprehensive epistemological approach.

From quantitative to qualitative distinctions between timescales

First, we would like to encourage researchers to contemplate the *qualitatively* different kinds of processes and mechanisms that can be studied at the micro-level versus macro-level timescales. This is in line with the conceptualizations of levels of processes offered by Lewis (2002) and Witherington and Margett (2011), who highlighted that macro-level timescales involve “change and consolidation” of a system’s “tendencies” (Lewis, 2002) and of “developmental patterning,” while micro-level timescales involve variability and “flux” (Witherington & Margett, 2011). Therefore, micro-level and macro-level is more than a quantitative distinction of units of time; it is also a distinction between processes of emergence. Flux and variability emerge at the micro-level timescale, and developmental change and patterning emerges at the macro-level timescale. Indeed, the “emergence and change of identity in the human lifespan” that Bosma and Kunnen (2001, p. 41) referred to need not be *reducible* to smaller-scale processes. We argue that the “emergence and change” at the macro level is qualitatively unique from emergence and change at the micro level.

At macro-level timescales, we can observe both stability as well as change in *patterns* of identity. At macro-level timescales, structures or patterns are introduced to the repertoire of the person or they are entrenched further. Change, here, therefore refers to the change in the repertoire *itself* (Witherington, 2019). For example, an individual may develop a new commitment, such as “leader,” as they take on new tasks in their professional life – a commitment that is *new* to this individual (see Van Der Gaag et al., 2020), for further description of this macro-level process of commitment development). A similar macro-level process is of course also a transition that an individual experiences between an old and new identity status (Marcia, 1980), such as developing an *achieved* status, or developing a new *life narrative* (Bamberg, 2011).

Importantly, macro-level patterns need not refer exclusively to self-representational identity structures; they can also refer to patterns of *being* or *doing* (i.e., identity actions and experiences). For example, Anderson (2009) studied how acts of positioning in classroom interactions constructed categorizations of students as *kinds* (e.g., *not competent*) that transcended particular contexts. Note that this *characterization* was not verbalized, but expressed via participants’ actions. This particular macro-level pattern – a *kind* of person – emerged and became patterned across the span of 14 weeks; thus creating a macro-level pattern.

When identity researchers establish what a *macro-level structure/pattern* might look like for a particular identity phenomenon, they can then conceptualize and investigate what the unique functions of this structure/pattern is, and thus the mechanisms of development. In this way, mechanisms of identity development can be found when looking at both micro-level and macro-level timescales. A promising macro-level mechanism was stressed by Witherington (2011), who emphasized that *patterns* (on the macro-level timescale) are not merely “an end product of more fundamental” processes. Instead, he reminds us that this patterning has its own mechanism of development, namely *constraint*. The macro-level pattern “contributes, by means of constraint, to the very process that gave rise to it” (p. 67). The mechanisms of constraint should not be seen as a deterministic or generative processes, but as part of a bi-directional dynamic interaction between lower- and higher-order levels (Haken, 1996).

This particular mechanism can indeed be observed for both situated identity features and self-representational features. In Anderson’s (2009) study, mentioned above, evidence was found for the constraining role that positioned *kinds* have on interactions: “different kinds of students or different ways of participating in activities shape opportunities to identify with practices (or not), to be seen as competent (or not), and thus to gain access to ways of knowing and being associated with learning (or not)” (p. 309). This “shaping of opportunities” is a process of constraint on micro-level interactions.

The constraint mechanism can also be found in classic notions of identity structures as constraining how we conduct and construct ourselves in the here-and-now (for example, Berzonsky, 1992). Similarly, deeply entrenched identity commitments can be conceptualized as making some self-reflective thoughts more probable than other self-reflective thoughts (Van Der Gaag et al., 2020).

We encourage identity researchers to pursue more conceptual and empirical work concerning, one, the unique forms of macro-level structures/patterns for different identity phenomena, and two, what the unique function of each of these has for the development of identity (e.g., De Ruiten et al., 2017). What we hope to have demonstrated here is that *how* questions of identity are also relevant for studies of identity at macro-level timescales.

By including macro-level timescales into this epistemological aim, new *how* questions might be: how do situated identity actions/experiences become *patterns* of actions/experience that transcend context dependency (i.e., investigating relatively long-term emergence of patterns)? How are generalized patterns of actions/experiences differentially enacted in different social interactions (i.e., investigating constraints)? How do new self-representations become *introduced* into an individual’s cognitive sense of self (i.e., investigating long-term emergence of patterns)? How are “old” self-representations left behind and omitted from an individual’s sense of self (i.e., investigating long-term change of patterns)? How do new narrative stories become prominent narratives (i.e., investigating long-term entrenchment of patterns)? These examples are of course not exhaustive. We encourage researchers to

think about the possibility, function, and process of patterning, change, entrenchment, and constraint that occurs across relatively larger timescales for many more features of identity, not necessarily mentioned above.

In contrast to the macro-level timescale, the *micro-level* timescales allow us to observe situated flux and variability in how macro-level structures or patterns are enacted in a new way situated in the current context (Varela et al., 1991; Witherington, 2019). The latter was demonstrated by Anderson's (2009) study of positioning in classroom interactions, where students enacted different ways of positioning themselves as a certain *kind* of person (i.e., *not competent*) according to the specific interaction they found themselves in. For example, Anderson (2009) found that one student (characterized by the macro-level kind *not competent*) was positioned as *being confused* at one moment, and at another moment, as *not being able to articulate oneself well*. This micro-level variability was interpreted as different enactments of a pattern that had already emerged, that of being one *kind* of person.

Aside from situated features of identity, self-representational features of identity can also show micro-level variability. For example, let us take an individual for whom *dedicated parent* is a central narrative or commitment (i.e., a macro-level identity structure). These structures might demonstrate micro-level change from month to month. During one month, *dedicated parent* might be enacted as *good parent*, while the next month it might be enacted as *parent who is determined to improve after an especially heated conflict with their child*. This micro-level change in how the commitment is enacted might be observed across a month-to-month basis in separate interviews, for example.

Conceptualizing different levels of processes, not by the units of time but by timescale-specific mechanisms and types of emergency will ultimately result in a more inclusive and pluralistic approach (Witherington, 2011) to the understanding of *how* identity develops and functions in time. Such an approach will be “marked by causal pluralism and an emphasis on the relativity of perspective and vantage point, not a privileging of one level of organization or analysis over another” (Witherington, 2011, p. 87). We will explore what this ontological and methodological pluralism might look like below.

From a monolithic to a pluralistic ontology and methodology for identity research

Ontological pluralism

In broadening the scope of units of time, we can ask *how* questions for many more identity features than we have customarily done. This is represented visually in [Figure 1](#) below. Each feature of identity is situated in micro-level *and* macro-level timescales – both of which are *real time*. Observations of micro-level versus macro-level processes afford the study of different qualities of processes and developmental mechanisms. The units of time that are considered for the micro- versus macro-level timescale are then specific to the identity feature in question. Micro-level and macro-level timescales are then relative, not absolute, with regard to units of time. For some features, the micro-level timescale might be minute-to-minute (e.g., identity actions), while for others, the micro-level timescale might be month-to-month (e.g., life narratives). Likewise, the units of time needed to study macro-level processes will be unique for each feature of identity. For some, the macro-level timescale might be week-to-week (e.g., identity experiences), while for others, the macro-level timescale might be year-to-year (e.g., self-representation) or decade-to-decade (e.g., identity statuses).

We argue, therefore, that both situated identity-experiences and actions *and* cognitive self-representations can be examined as features of identity occur in real time, and that both features of identity can be studied in terms of micro- *and* macro-level timescales. This is summarized in [Figure 1](#), where we hope to show that various ontological approaches to identity (which focus on different features of identity) can be studied as processes across multiple timescales. For processes of change or stability of a pattern itself, researchers should look to macro-level timescales. For processes of change or stability of how the feature of identity is situated in a context or in how a pattern is enacted in

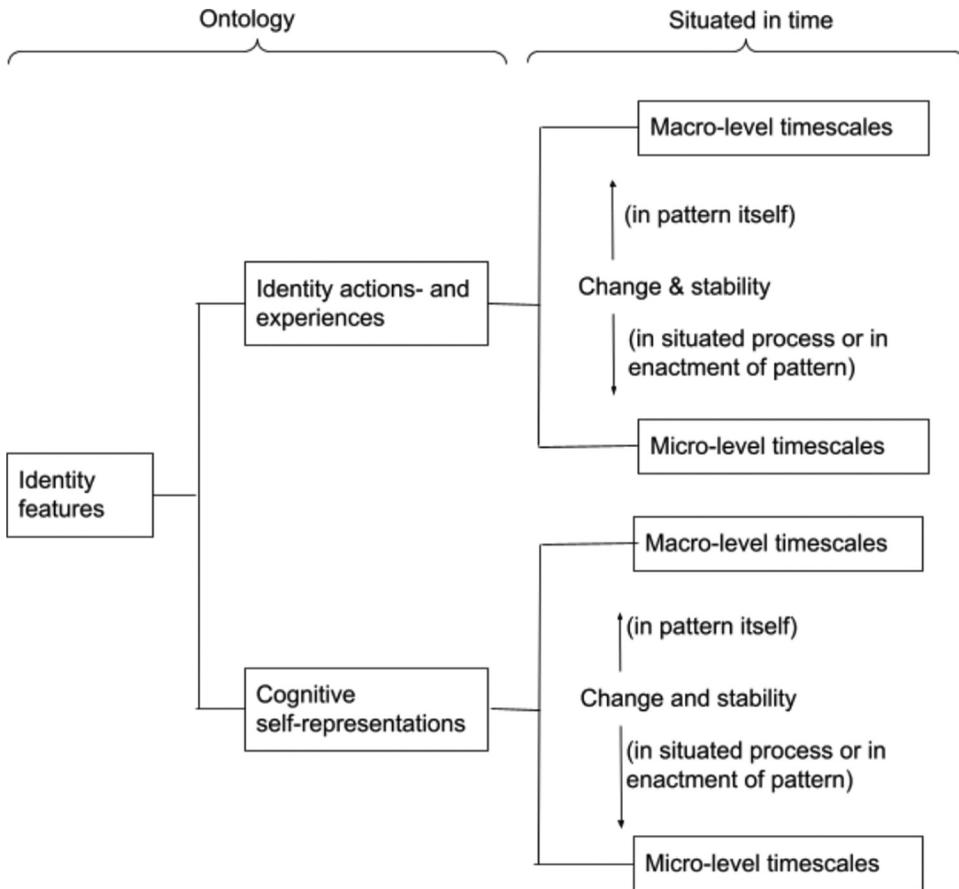


Figure 1. A taxonomy for a pluralistic approach to identity situated in multiple timescales.

a context, researchers should look to micro-level timescales. For both, any ontological approach can be adopted (i.e., identity actions and experiences *and* cognitive self-representations). The figure is therefore a taxonomy for features of identity crucial to the field, and the role of time.

Note that this figure should not be construed as a developmental model for the developmental links *between* identity actions and experiences and cognitive self-representations. The developmental mechanisms and processes that link these identity features are indeed an important theoretical question for the field of identity, one which remains largely unsolved, and beyond the scope of the current article. Our hope is that the summative taxonomy in Figure 1 will provide the conceptual clarity necessary for future research to explore these developmental links. We believe that a full understanding of this will necessitate an explicit consideration of how micro- and macro-level processes influence each other. For this, we suggest that researchers make explicit what the qualitatively unique processes and mechanisms of development are that occur across micro- and macro-level timescales for the specific feature of identity in question (see the section above, *From quantitative to qualitative distinctions between timescales*, for more discussion).

Let us illustrate Figure 1, and specifically the notion that any specific identity feature can be observed in terms of its micro-level *and* macro-level development by looking at specific ontological approaches in the identity field. In the narrative tradition, for example, researchers distinguish between “small” and “big” stories. This distinction is a useful one for our current purpose, as there are large tensions regarding how these two features of narratives can be studied (e.g., Smith & Sparkes, 2006). Big stories refer to the content of narratives (Freeman, 2006), where stories are analyzed as

representations of the self or the world (Bamberg, 2011). These stories are thought to be backward oriented (Bamberg, 2006). To study big stories at the micro-level timescale, a researcher would need to determine the units of time across which we might expect to see variability in the self-representations found in the narrative content. For big stories, the micro-level timescale might then refer to months or possibly years. For example, McAdams et al. (2006) repeatedly assessed and compared key scenes in the life stories of emerging adults both three months, as well as three years apart. In contrast, a researcher interested in studying processes of self-sustained development or stability (i.e., the macro-level timescale) of big stories might need to study the process of narratives across years or decades. For example, Köber and Habermas (2017) studied the stability of life narratives over a span of eight years. Similarly, Schiff (2005) compared life stories of a Holocaust survivor told 12 years apart.

In contrast with big stories, small stories refer to narrating as an activity that takes place between people (Bamberg, 2006). This approach to narratives focuses on the “way stories surface in everyday conversation . . . , as the locus where identities are continuously practiced and tested out” (Bamberg, 2011, p. 15). As such, a researcher interested in studying the intra-individual variability (i.e., micro-level timescale) of how small stories are told might consider studying time intervals of seconds to minutes. It is across these units of time that stories “get managed, turn-by-turn, in interaction” (Stokoe & Edwards, 2006, p. 70). For example, McLean and Mansfield (2012) studied the co-construction of memory narratives by analyzing how mothers’ turn-by-turn scaffolding behavior influenced adolescents’ narrative meaning-making. In contrast, if the researcher is interested in macro-level timescales of development for small stories, they might study how narrative activity becomes self-sustaining across interactions, spaced across months or years. For example, Josselson (2009) analyzed one woman’s telling of the same autobiographical episode at repeated intervals of approximately ten years over a period of 35 years, highlighting how the retelling afforded self-constructions in the present moment as well as the preservation of disused past self-representations.

Another example of how features of identity require a consideration of their unique relationship with time might be the study of exploration and commitment, as pivotal aspects of identity that characterize someone’s identity status (see e.g., Kunnen & Metz, 2015). Identity commitments are “stable set[s] of goals, values, and beliefs that provide a direction, purpose, and meaning to life,” which can be the result of a period of exploration in which the individual engages with “meaningful alternatives” (Marcia, 1966, p. 551). Drawing on in-depth interviews, researchers link processes of exploration and commitment to identity statuses: foreclosure, moratorium, diffusion, and achievement. At the micro level, identity commitment and exploration have been found to exhibit daily (Klimstra et al., 2010) and weekly (Van Der Gaag et al., 2016) fluctuations, and have been shown to influence each other at a day-to-day level (Becht et al., 2021). At even smaller units of time, researchers have studied the concrete second-by-second actions through which peers construct a safe environment for exploration (i.e. exploration; Sugimura et al., 2021).

Studying commitment and exploration processes at the macro-level timescale involves the study of how these two elements interact and emerge into patterned “statuses” – where a status refers to exploration and commitment becoming self-sustained. A researcher might study the macro-level timescale of this phenomenon by examining an individual’s progression through statuses as they change from month to month, or year to year. Notably, Becht et al. (2021) studied daily commitment and exploration processes within an interpersonal and educational domain over a period of five years using a three-item questionnaire, creating profiles of day-to-day *patterns*. In contrast, Eriksson et al. (2020) recently studied changes in identity statuses across three intervals, spanning a seven-year period (ages 25 to 33), using identity status interviews.

The above examples (stemming from the narrative approach and the status approach) show that every feature of identity (whether action/experiences or self-representations) can be studied as real-time phenomena at multiple timescales. In line with Gallagher’s (2013) pattern theory of self, none of these features need be conceptualized as central or essential, as they – *together* – form a constellation of features that we might call *identity in real time*.

Methodological pluralism

If studying identity in real time does not exclude any timescales, units of time, or indeed identity features, we propose that all methods can be used to study processes and mechanisms of identity. Whereas Lichtwarck-Aschoff et al. (2008) categorized only observational and diary methods as being *real-time* methods – excluding questionnaire and interview methods, we argue that many methods can be used to study processes at *both* micro-level and macro-level timescales. The difference, as we will describe below, ultimately comes down to how the researcher is using the method.

Observational methods. Observational methods are traditionally seen as methods for studying variability of identity actions across seconds or minutes (Lichtwarck-Aschoff et al., 2008). And indeed, observational methods are ideal for studying the variability of how identity is constructed across the course of an interaction, such as parent–child interactions, classroom interactions, or romantic interactions. For example, Morek (2015) has studied how preadolescents sequentially negotiated interactional identities within both family and peer talk.

However, with the aim of studying *patterns* of actions, such as the entrenched stability or self-sustained change, observational methods can also be used to study processes at the macro-level timescale. A researcher can investigate how constructive and expressive acts of identity become situated *patterns* in contexts or how these patterns develop alongside the changing social context. If the researcher selects the appropriate intervals of time, then the development of these situated patterns of identity actions can be followed in real time. These kinds of macro-level developmental studies of interactional patterns are relatively scarce (Anderson, 2009). In one example, Shaby and Vedder-Weiss (2020) studied the development of science-identities among three students by observing their engagement, actions, and talk during yearly class-visits to science museums over the course of three years.

Diaries. Diaries are the other method that has commonly been reserved for studying short-term processes as they occur across days or weeks (Lichtwarck-Aschoff et al., 2008). For this purpose, researchers use *daily* diaries. Indeed, daily diaries can be used to study the variability of identity experiences as situated in day-to-day or week-to-week social experiences. For example, Lichtwarck-Aschoff et al. (2010) assessed changes and patterns in adolescents' experiences of conflicts with their mothers based on daily diary entries over the course of one year. Diary studies, however, can also be used to study experience-based identity processes at even smaller units of time. Researchers could examine how individuals construct their identity narrative as a sentence-by-sentence process within the context of writing a diary entry. While we are not aware of any studies that have employed such an approach, future studies might draw on methods for analyzing the construction and formulation of small stories in terms (e.g., Bamberg, 1997; Stokoe & Edwards, 2006).

Diaries can also be used to study identity actions and experiences on the macro-level timescale, where the focus becomes the self-sustained stability or development of an individual's daily identity experiences. For example, Dalenberg et al. (2016) found patterns in young people's discussion of sexual experiences with their parents reported in daily diaries over the course of one year.

Finally, diary methods can be used to study identity representations, in which case the entries would be used to assess individuals' representations as expressed globally in the text. With representations in mind, a researcher could examine how these identity representations are variable from entry to entry as situated in the participant's recollection of daily experiences, thus, the micro-level timescale.

A researcher could also study how these representations stabilize or develop across entries (thus the macro-level timescale), a process that might be situated in larger-scale contextual shifts. While we are not aware of any research that has specifically assessed stability in self-representations over time, research might draw on the methodologies developed by researchers interested in the retelling of life narratives. For example, McAdams et al. (2006) have studied the consistency in narratives of key events in narrators' lives over both a span of three months and three years.

Interviews. While Lichtwarck-Aschoff et al. (2008) characterized interviews as a method suitable for studying identity representation across months or years, this method can also be used for studying different forms of identity, and at different timescales. Traditionally, interviews are used to assess individuals' cognitive self-representations. These can be studied in terms of their fluctuations and variability from one interview to the next (i.e., the micro-level) or in terms of developmental trajectories of change and stability across a relatively longer span of time (i.e., the macro-level). While the former is theoretically possible, the latter is more common, with researchers studying changes in identity statuses based on identity interviews over the course of several years. For example, Eriksson et al. (2020) studied changes in individuals' identity statuses based on an identity status interview over a period of seven years.

In addition, interviews can be used to examine how individuals construct their identity narrative together with the interviewer, thus studying identity actions and their situated variability (i.e., the micro-level timescale). In this sense, interviews can be used in a similar way as observations, where turn-by-turn identity actions are examined as situated in a dyadic context. For example, Talmy (2011) has investigated how identities and meanings within interviews are collaboratively achieved by both interviewers and interviewees. Interviews can also be used to study the patterning (i.e., self-sustained change or development) of identity actions as situated in the context of the interaction with the interviewer across interview sessions, thus studying identity actions on the macro-level timescale. For example, Pasupathi and Wainryb (2019) have highlighted the ways in which interviewees construct and tailor their identity narratives to their conversation partner in two narrative interviews spaced five years apart.

Questionnaires. Lichtwarck-Aschoff et al. (2008) classified questionnaires as the second method for studying identity representations, which the authors described can be done at the macro-level timescale. However, short questionnaires can also be used to study identity experiences and their situated variability (i.e., on the micro-level timescale). For example, experience-sampling methods can assess how identity experiences fluctuate from context to context throughout the day and across weeks (e.g., Dietrich et al., 2011; Klimstra et al., 2016; Schwartz et al., 2011; Van Der Gaag et al., 2016). Investigating these processes across relatively longer spans of time in order to reveal trajectories, would then be a way of using this method to study identity experiences on the macro-level timescale. Recently, Becht et al. (2021) used daily questionnaires to investigate how processes of commitment and exploration influenced each other over time, and identified identity statuses based on daily assessment of identity processes repeated over a five-year measurement period.

Finally, questionnaires can be used to study self-representations, as suggested by Lichtwarck-Aschoff et al. (2008). This might be done by assessing how self-representations are variable from experience to experience (i.e., micro-level timescale), although we are unaware of any such examples. When studying how identity representations develop and stabilize as longer-term trajectories, the researcher is then considering identity representations on the macro-level timescale, as is traditionally done in identity research. For example, Becht et al. (2021) used the Utrecht-Management of Identity Commitments Scale to assess processes of identity exploration and commitment across four (bi-) annual surveys.

In summation, each methodological approach can be used to study different types of identity (i.e., identity actions/experiences and identity representations), and they can be used to study these features of identity as different types of processes (i.e. intra-individual variability on the micro-level timescale and intra-individual (change in) patterning on the macro-level timescale).

As such, we suggest that there is no *best* way of studying identity processes and mechanisms, as each method is best suited to the specific angle of identity chosen by the researcher. This was underlined by Sorell and Montgomery (2001), when they stated that “arguing for one ‘superior’ method of studying identity (and suggesting that others are without value) implies certainty about a superior standpoint and epistemology” (p. 106). Identity researchers stand to learn the most about what identity is in real time and *how* it develops if we adopt a pluralistic approach, acknowledging that there is no superior paradigm for understanding identity in real time.

Conclusion and discussion

In this article, we highlighted a conflation between ontology and epistemology that is currently present in some areas of identity research. Specifically, this conflation was analyzed in the specific subfields of identity with the epistemological aim of pursuing knowledge about *how* identity develops and functions (Kunnen & Van Geert, 2012; Smith & Sparkes, 2006) – *how* persons accomplish a self, and *how* this development works. This epistemological aim is shared by the various qualitative approaches to identity within the context of everyday talk (e.g., Bamberg, 2006; Korobov, 2010; Stokoe & Edwards, 2006; Ten Have, 1999) and by quantitative approaches (e.g., Kerpelman et al., 1997; Klimstra, 2016; Van Der Gaag et al., 2016).

Researchers typically tackle the *how* questions of identity functioning or development by studying one specific ontological feature of identity: actions and experiences as situated in real-life contexts. Some identity researchers conceptualize these features of identity as “real-time identity” (e.g., Henry, 2016; Lichtwarck-Aschoff et al., 2008; Van Der Gaag et al., 2016).

These situated features of identity are often contrasted with the more traditional features of identity: cognitive self-representations that people “have.” These self-representations are thought to correspond with a completely different epistemological aim, namely, the aim of establishing between-individual outcomes, predictors, and typologies of identity (e.g., Becht et al., 2021; Bosma & Kunnen, 2001; Lichtwarck-Aschoff et al., 2008; Van Der Gaag et al., 2016), the *what* questions of identity.

In this article, we argued that the epistemological and ontological marriage between the aim to understand *how*, and the exclusive focus on action- and experience-features of identity (respectively), limits the fulfillment of this epistemological aim. Specifically, processes of emergence, stabilization, and development of self-representational features of identity (i.e., the “who-we-are” as persons features; Bamberg, 2011) are just as vital to understand as the concrete actions and experiences of identity. The cognitive self-representational features can also be studied as situated in time, and thus also can be studied in *real time*. For these features of identity, processes of emergence, stabilization, and development simply occur across larger intervals of time. As such, we suggested that a study of processes and mechanisms (i.e., the *how* questions) need not be limited to the examination of limited ontologies of identity, and instead, requires a *process approach* in which a phenomenon is considered with regard to how it is uniquely situated in time.

We showed that, for some identity researchers, widening the scope of *real-time identity* research will entail an additional adjustment of methodological norms, as well as the abovementioned ontological assumption. Specifically, for those that gain their inspiration (directly or indirectly) from dynamic system work in developmental psychology (e.g., Bosma & Kunnen, 2000; Kerpelman et al., 1997; Lichtwarck-Aschoff et al., 2008), the privileged role of small units of time and of observational, experience-sampling or daily-diary methods is quite explicit. Lichtwarck-Aschoff et al. (2008) framework for identity research, for example, places mechanisms of identity development in the *micro-dynamic* quadrant of their framework. This quadrant is defined, not only by identity actions and experiences but also by short-term time intervals (i.e., seconds to days) and observational, experience-sampling, and daily-diary methodology (sampled as individual time series). We argued that it is not only observational and diary methodologies that can tap into the within-person processual nature of identity, as interviews and questionnaires can also be used in a multitude of ways, to capture processes across small and larger units of time.

To illustrate this, we gave examples of empirical studies that have been used to study how action/experience features of identity are variable as situated processes (i.e., micro-level timescale) as well as how they become patterned across time (i.e., macro-level), and how more cognitive self-representational features of identity are variable as situated processes (i.e., micro-level timescale) as well as how these become patterned across time (i.e., macro-level timescale). We argued that identity researchers stand to learn the most about *how* identity occurs and develops if we adopt a pluralist approach to methodology.

Finally, we showed that the above entrenched assumptions and norms might stem from the common conceptualization of *micro-level* and *macro-level timescales*. We argued that processes and mechanisms are not necessarily the stuff of micro-level timescales, but also of macro-level timescales. Therefore, both the *micro-dynamic* and *macro-dynamic* quadrants from Lichtwarck-Aschoff's (2008) framework can be studied to pursue an understanding of how identity develops, as both relate to real-time processes. We outlined an important limitation in how micro- and macro-level timescales are commonly approached in identity research. Specifically, the distinction between these two timescales is conceptualized as a *quantitative* one. There, micro-level timescales refer to *small* units of time (specifically, seconds to weeks), and macro-level timescales refer to *large* units of time (specifically, months to decades, Lichtwarck-Aschoff et al., 2008). This quantitative definition of timescales is quite entrenched, reaching across many domains of developmental psychology (e.g., Steenbeek & Van Geert, 2013; Van Dijk, 2020).

It is this quantitative distinction that has resulted in the conceptualization of specific identity features as being “housed” by one timescale or the other (e.g., actions change from second to second, and thus “exist” on a micro-level timescale of second-to-second, but not on a macro-level timescale of years). We stressed that this quantitative distinction gives rise to the assumption that explanations of identity development ultimately can be reduced to the moment-to-moment interactions or iterations between concrete events (Witherington, 2019). As such, incentive is removed to understand *how* identity functions and develops across macro-level timescales.

We wish to bring the *qualitative* differences between these timescales back into the foreground. With this, the micro-level timescale allows us to study flux (in the sense of non-recurring introduction of novelty) and the way that an existing identity structure or pattern is differentially enacted in different situations or across time (Varela et al., 1991; Witherington, 2019). The macro-level timescale, in contrast, allows us to study the change or stability of a structure, pattern, or repertoire *itself* (Witherington, 2019) – thus characterizing self-sustained change or stability. Conceptualized this way, researchers are encouraged to reflect upon the units of time that are relevant for studying how these distinct types of processes play out for specific identity features (portrayed in Figure 1).

In this manuscript, we argued that the current conceptualizations of what it means to study identity processes and mechanisms (i.e., strictly defined features of identity, units of time, and methodologies) threaten to widen an existing chasm between disparate approaches in identity research. Specifically, the emerging aim to understand processes and mechanisms of identity development was already juxtaposed with the aim of establishing between-individual differences and group-level trajectories (Becht, 2021; Lichtwarck-Aschoff et al., 2008; Van Der Gaag et al., 2016). However, this chasm has become increasingly salient and impassable with the ontological and methodological distinctions that have been proposed (Lichtwarck-Aschoff et al., 2008) and normalized in research practices (e.g., Becht, 2020; Henry, 2016; Van Der Gaag et al., 2016).

We therefore suggested that, to study processes and mechanisms of identity (i.e., the *how* questions), it is useful to focus on the nature of (micro- and macro-level) processes, and how these might be characterized specifically for the entire range of identity features available to identity research. Our pluralistic approach to this epistemological aim puts the *nature of processes* back in the foreground. We suggest that timescales are not temporal places in which certain identity features *exist*, but rather, the researcher may usefully *describe* any identity process (either its variability or its development/stability) at a specific timescale. The *description of processes* is thus central (where “process” here refers to processes of patterning as well), making the process orientation key for this epistemological aim.

This broadening of what it constitutes to study identity in real time thus allows for the comprehensive study of identity as the multi-leveled and multifaceted phenomenon that it is (e.g., see Galliher et al., 2017). As such, the study of processes and mechanisms in identity research may become a more inclusive one. We encourage a plurality of methodologies (observations, diary, *and* questionnaire, interviews), designs (short-term *and* long-term units of time), and ontologies of identity (action/experience features *and* cognitive self-representations). In this way, no method need be more superior than others (Sorell & Montgomery, 2001), no unit of time need be more ontological close to the real

dynamics or processes of identity than others (Witherington, 2019), and concrete events need not be more real or true for the study of identity (Bamberg, 2006). A specific choice of method, unit of time, and identity feature, instead, adds to our understanding of how identity – as a multifaceted phenomenon – functions and develops in time. We hope that our re-conceptualizations and re-orientations can therefore decrease the chasm between the well-established identity research approaches and the relatively new move toward situated-identity research.

We believe that the above inclusive conceptualization of what it means to study processes of identity may be helpful in the empirical endeavor to study identity development in multiple timescales. This is a challenge that has been highlighted as vital, time and time again (Bamberg, 2006; Bosma & Kunnen, 2001; Lichtwarck-Aschoff et al., 2008; Witherington, 2019), and remains an important issue for this field. Previously, such an endeavor would entail different sets of methodologies within one design. This would be done in order to study how action- or experience features of identity are related to the development of cognitive self-representations (Lichtwarck-Aschoff et al., 2008). For example, Henry (2016) combined interviews, observational data and text-entries in an online forum to study the development of teacher identities.

If, however, we disentangle timescales from ontologies of identity, we are able to study nested timescales *within* any one feature of identity as well (demonstrated in Figure 1). One need only reflect upon when (in time) processes of situated variability might become globally patterned, and when these patterns might be changed. Anderson's (2009) investigation of positioning in classroom interactions demonstrates such an endeavor, where repeated interactional events are gathered in order to study the relationship between what happens *within* each event and what emerges *across* events. As such, longitudinal-burst designs are ideal for studying how micro-level variability becomes patterned across bursts, and once developed, how these patterns might be constraining the variability within each burst, or how the patterns further evolve between bursts. For this, the researcher thus needs to first have a clear conceptualization about how these processes are expected to play out across time, which units of time are necessary to study micro-level timescales of change versus macro-level timescales of change *for the specific identity feature under consideration*.

As such, we do not claim – or wish – to provide researchers with a description of specific units of time necessary to study identity processes or mechanisms on the micro- or macro-level timescale, nor do we want to provide an exhaustive list of specific properties or mechanisms that can be studied across these two timescales. We have provided some examples and some tentative suggestions for units of time that might be relevant for specific features of identity, and we have suggested some specific properties that might be unique to the macro-level timescale (i.e., patterning, emergence of new structures/patterns, entrenchment of structures/patterns) as well as mechanisms (i.e., loose constraint on lower-order variability and specific enactment of structures/patterns). However, it may be that some of these properties or mechanisms are more, or less, relevant for certain features of identity, or that other features of identity may necessitate or afford the investigation of yet other macro-level properties or mechanisms.

We hope that identity researchers interested in understanding *how* identity functions and develops will take on these tasks in their own studies of specific features of identity. We hope to have provided the field with an explicit conceptual analysis of the concepts, terms, implicit and explicit assumptions, and practices linked to the aim of understanding the *how* questions of identity. With this, we aimed to solve some critical conceptual problems that we believe were limiting the understanding of identity processes and mechanisms. We hope to have provided identity researchers with a solid conceptual ground from which to pursue a broader scope of *how* questions, and ultimately, to encourage researchers to premise any empirical work with their own conceptual analysis of how identity is situated in time (both micro and macro). With this, we as a field might come to a complete understanding of identity processes and mechanisms – an epistemological aim that stands at the forefront of a multidisciplinary approach to identity.

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References

- Adams, G. R., & Marshall, S. K. (1996). A developmental social psychology of identity: Understanding the person-in-context. *Journal of Adolescence*, 19(5), 429–442. <https://doi.org/10.1006/jado.1996.0041>
- Anderson, K. T. (2009). Applying positioning theory to the analysis of classroom interactions: Mediating micro-identities, macro-kinds, and ideologies of knowing. *Linguistics and Education*, 20(4), 291–310. <https://doi.org/10.1016/j.linged.2009.08.001>
- Bamberg, M. (2006). Stories: Big or small - Why do we care? *Narrative Inquiry*, 16(1), 139–147. <https://doi.org/10.1075/ni.16.1.18bam>
- Bamberg, M. G. W. (1997). Positioning between structure and performance. *Journal of Narrative & Life History*, 7(1–4), 335–342. <https://doi.org/10.1075/jnlh.7.42pos>
- Bamberg, M. G. W. (2011). Who am I? Narration and its contribution to self and identity. *Theory & Psychology*, 21(1), 3–24. <https://doi.org/10.1177/0959354309355852>
- Becht, A. I., Branje, S. J. T., Vollebergh, W. A. M., Maciejewski, D. F., van Lier, P. A. C., Koot, H. M., Denissen, J. J. A., & Meeus, W. H. J. (2016). Assessment of identity during adolescence using daily diary methods: Measurement invariance across time and sex. *Psychological Assessment*, 28(6), 660–672. <https://doi.org/10.1037/pas0000204>
- Becht, A. I., Nelemans, S. A., Branje, S. J. T., Vollebergh, W. A. M., Koot, H. M., Denissen, J. J. A., & Meeus, W. H. J. (2016). The quest for identity in adolescence: Heterogeneity in daily identity formation and psychosocial adjustment across 5 years. *Developmental Psychology*, 52(12), 2010–2021. <https://doi.org/10.1037/dev0000245>
- Becht, A. I., Nelemans, S. A., Branje, S. J. T., Vollebergh, W. A. M., & Meeus, W. H. J. (2021). Daily identity dynamics in adolescence shaping identity in emerging adulthood: An 11-year longitudinal study on continuity in development. *Journal of Youth and Adolescence*, 50, 1616–1633. <https://doi.org/10.1007/s10964-020-01370-3>
- Bell, N. J., Wieling, E., & Watson, W. (2005). Identity development during the first two university years: Exploring intersections between micro-, ontogenetic processes. *New Ideas in Psychology*, 23(2), 53–73. <https://doi.org/10.1016/j.newideapsych.2005.09.003>
- Berzonsky, M. D. (1990). Self-construction over the life span: A process perspective on identity formation. In G. J. Neimeyer & R. A. Neimeyer (Eds.), *Advances in personal construct psychology* (Vol. 1, pp. 155–186). JAI Press.
- Berzonsky, M. D. (1992). Identity style and coping style. *Journal of Personality*, 60, 771–788.
- Bosma, H. A. (1992). Identity in adolescence: Managing commitments. In G. R. Adams, T. P. Gullotta, & R. Montemayor (Eds.), *Adolescent identity formation: Advances in adolescent development* (pp. 91–121). Sage.
- Bosma, H. A. (1995). Identity and identity processes: What are we talking about? In A. Oosterwegel & R. A. Wicklund (Eds.), *The self in European and North American culture: Development and processes. NATO advanced science institutes series* (pp. 5–17). Kluwer Academic/Plenum Publishers.
- Bosma, H. A., & Kunnen, E. S. (2001). Determinants and mechanisms in ego identity development: A review and synthesis. *Developmental Review*, 21(1), 39–66. <https://doi.org/10.1006/drev.2000.0514>
- Bosma, H. A., & Kunnen, E. S. (2008). Identity-in-context is not yet identity development-in-context. *Journal of Adolescence*, 31(2), 281–289. <https://doi.org/10.1016/j.adolescence.2008.03.001>
- Breakwell, G. M. (1986). *Coping with threatened identities*. Methuen.
- Dalenberg, W. G., Timmerman, M. C., Kunnen, E. S., & Van Geert, P. L. C. (2016). Young people's everyday romance and sexual experiences in relation to sex-related conversations with parents: A diary study in the Netherlands. *Sex Education*, 16(6), 692–706. <https://doi.org/10.1080/14681811.2016.1192026>
- De Ruiter, N. M. P., Van Geert, P. L. C., & Kunnen, E. S. (2017). Explaining the “how” of self-esteem development: The self-organizing self-esteem model. *Review of General Psychology*, 21(1), 49–68. <https://doi.org/http://dx.doi.org/10.1037/gpr0000099>
- Dietrich, J., Kracke, B., & Nurmi, J.-E. (2011). Parents' role in adolescents' decision on a college major: A weekly diary study. *Journal of Vocational Behavior*, 79(1), 134–144. <https://doi.org/10.1016/j.jvb.2010.12.003>
- Du Preez, H., & De Klerk, W. (2019). A psycho-philosophical view on the ‘conceptualisation’ of psychological measure development. *SA Journal of Industrial Psychology*, 45(1), 1–10. <https://doi.org/10.4102/sajip.v45i0.1593>
- Erikson, E. H. (1968). *Identity: Youth and crisis*. Norton.

- Eriksson, P. L., Wängqvist, M., Carlsson, J., & Frisé, A. (2020). Identity development in early adulthood. *Developmental Psychology*, 56(10), 1968–1983. <https://doi.org/10.1037/dev0001093>
- Freeman, M. (2006). Life “on holiday”? In defense of big stories. *Narrative Inquiry*, 16(1), 131–138. <https://doi.org/10.1075/ni.16.1.17fre>
- Gallagher, S. (2013). A pattern theory of self. *Frontiers in Human Neuroscience*, 7(August), 1–7. <https://doi.org/10.3389/fnhum.2013.00443>
- Gallagher, R. V., McLean, K. C., & Syed, M. (2017). An integrated developmental model for studying identity content in context. *Developmental Psychology*, 53(11), 2011–2022. <https://doi.org/10.1037/dev0000299>
- Gmelin, J. H., & Kunnen, E. S. (2021). Iterative micro-identity content analysis: Studying identity development within and across real-time interactions. *Identity*, 21(4), 324–340. <https://doi.org/10.1080/15283488.2021.1973474>
- Granic, I. (2005). Timing is everything: Developmental psychopathology from a dynamic systems perspective. *Developmental Review*, 25(3), 386–407. <https://doi.org/10.1016/j.dr.2005.10.005>
- Grotevant, H. D. (1987). Toward a process model of identity formation. *Journal of Adolescent Research*, 2(3), 203–222. <https://doi.org/10.1177/074355488723003>
- Haken, H. (1996). *Principles of brain functioning: A synergetic approach to brain activity, behavior and cognition*. Springer.
- Hathcock, S. J., Garner, J. K., & Kaplan, A. (2020). Examining micro-change within and among science teachers’ identities: A multiple case study. *Science Education*, 104(5), 827–856. <https://doi.org/10.1002/sc.21577>
- Henry, A. (2016). Conceptualizing teacher identity as a complex dynamic system: The inner dynamics of transformations during a practicum. *Journal of Teacher Education*, 67(4), 291–305. <https://doi.org/10.1177/0022487116655382>
- Hibberd, F. J. (2021). Psychology’s inertia: Epistemological and ethical implications. In J. T. Lamiell & K. L. Slaney (Eds.), *Problematic research practices and inertia in scientific psychology* (pp. 23–38). Routledge. <https://doi.org/10.1016/j.newideapsych.2016.11.006>
- Hviid, P. (2020, February). Aged experience – A cultural developmental investigation. *Learning, Culture and Social Interaction*, 100386. <https://doi.org/10.1016/j.lcsi.2020.100386>
- Identity: An International Journal of Theory and Research. (n.d.). Real-time identity processes. *Identity: An International Journal of Theory and Research*. Retrieved April 10, 2021, from https://think.taylorandfrancis.com/special_issues/real-time-identity/
- Josselson, R. (2009). The present of the past: Dialogues with memory over time. *Journal of Personality*, 77(3), 647–668. <https://doi.org/10.1111/j.1467-6494.2009.00560.x>
- Kerpelman, J., Pittman, J., & Lamke, L. (1997). Toward a microprocess perspective on adolescent identity development: An identity control theory approach. *Journal of Adolescent Research*, 12(3), 325–346. <https://doi.org/10.1177/0743554897123002>
- Kerrick, M. R., & Thorne, A. (2014). “So it’s like, do you like Jeff a lot or, I mean . . .”: How women friends interactionally position personal identity while conversing about desire. *Emerging Adulthood*, 2(4), 294–303. <https://doi.org/10.1177/2167696814549803>
- Klimstra, T. A., Kuppens, P., Luyckx, K., Branje, S., Hale, W. W., Oosterwegel, A., Koot, H. M., & Meeus, W. H. J. (2016). Daily dynamics of adolescent mood and identity. *Journal of Research on Adolescence*, 26(3), 459–473. <https://doi.org/10.1111/jora.12205>
- Klimstra, T. A., Luyckx, K., Hale, W. A. I., Frijns, T., van Lier, P. A. C., & Meeus, W. H. J. (2010). Short-term fluctuations in identity: Introducing a micro-level approach to identity formation. *Journal of Personality and Social Psychology*, 99(1), 191–202. <https://doi.org/10.1037/a0019584>
- Köber, C., & Habermas, T. (2017). How stable is the personal past? Stability of most important autobiographical memories and life narratives across eight years in a life span sample. *Journal of Personality and Social Psychology*, 113(4), 608–626. <https://doi.org/10.1037/pspp0000145>
- Korobov, N. (2010). A discursive psychological approach to positioning. *Qualitative Research in Psychology*, 7(3), 263–277. <https://doi.org/10.1080/14780880902822321>
- Korobov, N. (2015). Identities as an interactional process. In K. C. McLean & M. Syed (Eds.), *The Oxford handbook of identity development* (pp. 210–227). Oxford University Press.
- Kroger, J. (1992). Intrapsychic dimensions of identity during late adolescence. In G. R. Adams, T. P. Gullotta, & R. Montemayor (Eds.), *Adolescent identity formation: Advances in adolescent development* (pp. 122–144). Sage.
- Kunnen, E. S., & Bosma, H. A. (2000). Development of meaning making: A dynamic systems approach. *New Ideas in Psychology*, 18(1), 57–82. [https://doi.org/10.1016/S0732-118X\(99\)00037-9](https://doi.org/10.1016/S0732-118X(99)00037-9)
- Kunnen, E. S., & Metz, M. (2015). Commitment and exploration: The need for a developmental approach. In K. C. McLean & M. Syed (Eds.), *The Oxford handbook of identity development* (pp. 115–131). Oxford University Press.
- Kunnen, E. S., & Van Geert, P. (2012). General characteristics of a dynamic systems approach. In S. Kunnen (Ed.), *A dynamic systems approach to adolescent development* (pp. 15–34). Psychology Press.
- Lavoie, J. C. (1994). Identity in adolescence: Issues of theory, structure and transition. *Journal of Adolescence*, 17(1), 17–28. <https://doi.org/10.1006/jado.1994.1003>

- Lewis, M. D. (2002). Interacting time scales in personality (and cognitive) development: Intentions, emotions and emergent forms. In N. Granott & J. Parziale (Eds.), *Microdevelopment: Transition processes in development and learning* (pp. 183–212). Cambridge University Press. <https://doi.org/10.1017/CBO9780511489709.008>
- Lichtwarck-Aschoff, A., Kunnen, S., & Van Geert, P. (2010). Adolescent girls' perceptions of daily conflicts with their mothers: Within-conflict sequences and their relationship to autonomy. *Journal of Adolescent Research, 25*(4), 527–556. <https://doi.org/10.1177/0743558410367953>
- Lichtwarck-Aschoff, A., van Geert, P., Bosma, H., & Kunnen, S. (2008). Time and identity: A framework for research and theory formation. *Developmental Review, 28*(3), 370–400. <https://doi.org/10.1016/j.dr.2008.04.001>
- Luyckx, K., Goossens, L., & Soenens, B. (2006). A developmental contextual perspective on identity construction in emerging adulthood: Change dynamics in commitment formation and commitment evaluation. *Developmental Psychology, 42*(2), 366–380. <https://doi.org/10.1037/0012-1649.42.2.366>
- Marcia, J. E. (1966). Development and validation of ego-identity status. *Journal of Personality and Social Psychology, 3*(5), 551–558. <https://doi.org/10.1037/h0023281>
- Marcia, J. E. (1980). Identity in adolescence. In J. Adelson (Ed.), *Handbook of adolescent psychology* (pp. 159–187). Wiley.
- McAdams, D. P., Bauer, J. J., Sakaeda, A. R., Anyidoho, N. A., Machado, M. A., Magrino-Faila, K., White, K. W., & Pals, J. L. (2006). Continuity and change in the life story: A longitudinal study of autobiographical memories in emerging adulthood. *Journal of Personality, 74*(5), 1371–1400. <https://doi.org/10.1111/j.1467-6494.2006.00412.x>
- McLean, K. C., & Jennings, L. E. (2012). Teens telling tales: How maternal and peer audiences support narrative identity development. *Journal of Adolescence, 35*(6), 1455–1469. [psyh. https://doi.org/10.1016/j.adolescence.2011.12.005](https://doi.org/10.1016/j.adolescence.2011.12.005)
- McLean, K. C., & Mansfield, C. D. (2012). The co-construction of adolescent narrative identity: Narrative processing as a function of adolescent age, gender, and maternal scaffolding. *Developmental Psychology, 48*(2), 436–447. <https://doi.org/10.1037/a0025563>
- McLean, K. C., Pasupathi, M., & Pals, J. L. (2007). Selves creating stories creating selves: A process model of self-development. *Personality and Social Psychology Review, 11*(3), 262–278. <https://doi.org/10.1177/1088868307301034>
- McLean, K. C., & Syed, M. (2015). Personal, master, and alternative narratives: An integrative framework for understanding identity development in context. *Human Development, 58*(6), 318–349. <https://doi.org/10.1159/000445817>
- Merriam-Webster. (n.d.). *Real time*. Retrieved April 10, 2021, from <https://www.merriam-webster.com/dictionary/real%20time>
- Morek, M. (2015). Show that you know—Explanations, interactional identities and epistemic stance-taking in family talk and peer talk. *Linguistics and Education, 31*, 238–259. <https://doi.org/10.1016/j.linged.2014.10.004>
- Pasupathi, M., & Wainryb, C. (2019). Ghosts in the story: The role of audiences in stability and change in twice-told life stories. *Qualitative Psychology, 6*(2), 178–193. <https://doi.org/10.1037/qup0000153>
- Postmes, T., Baray, G., Haslam, S. A., Morton, T. A., & Swaab, R. I. (2006). The dynamics of personal and social identity formation. In T. Postmes & J. Jetten (Eds.), *Individuality and the group: Advances in social identity* (pp. 215–236). Sage Publications, Inc. <https://doi.org/10.4135/9781446211946.n12>
- Raeff, C. (2014). Going where the action is to conceptualize the person. *New Ideas in Psychology, 44*, 7–13. <https://doi.org/10.1016/j.newideapsych.2016.11.006>
- Schachter, E. P. (2015). Integrating “internal,” “interactional,” and “external” perspectives: Identity process as the formulation of accountable claims regarding selves. In M. Syed & K. C. McLean (Eds.), *Handbook of identity development* (pp. 228–245). Oxford University Press.
- Schiff, B. (2005). Telling it in time: Interpreting consistency and change in the life stories of Holocaust survivors. *The International Journal of Aging and Human Development, 60*(3), 189–212. <https://doi.org/10.2190/PXX9-1G2J-R6X7-N976>
- Schwartz, S. J., Klimstra, T. A., Luyckx, K., Hale, W. W., Frijns, T., Oosterwegel, A., van Lier, P. A. C., Koot, H. M., & Meeus, W. H. J. (2011). Daily dynamics of personal identity and self-concept clarity. *European Journal of Personality, 25*(5), 373–385. <https://doi.org/10.1002/per.798>
- Shaby, N., & Vedder-Weiss, D. (2020). Science identity trajectories throughout school visits to a science museum. *Journal of Research in Science Teaching, 57*(5), 733–764. <https://doi.org/10.1002/tea.21608>
- Smith, B., & Sparkes, A. C. (2006). Narrative inquiry in psychology: Exploring the tensions within. *Qualitative Research in Psychology, 3*(3), 169–192. <https://doi.org/10.1191/1478088706qrp068oa>
- Sorell, G. T., & Montgomery, M. J. (2001). Feminist perspectives on Erikson's theory: Their relevance for contemporary identity development research. *Identity, 1*(2), 97–128. https://doi.org/10.1207/S1532706XID0102_01
- Steenbeek, H., & Van Geert, P. (2013). The emergence of learning-teaching trajectories in education: A complex dynamic systems approach. *Nonlinear Dynamics, Psychology, and Life Sciences, 17*(2), 233–267.
- Stephen, J., Fraser, E., & Marcia, J. E. (1992). Moratorium-achievement (Mama) cycles in lifespan identity development: Value orientations and reasoning system correlates. *Journal of Adolescence, 15*(3), 283–300. [https://doi.org/10.1016/0140-1971\(92\)90031-Y](https://doi.org/10.1016/0140-1971(92)90031-Y)
- Stokoe, E., & Edwards, D. (2006). Story formulations in talk-in-interaction. *Narrative Inquiry, 16*(1), 56–65. <https://doi.org/10.1075/ni.16.1.09sto>

- Sugimura, K., Gmelin, J. H., Van Der Gaag, M. A. E., & Kunnen, E. S. (2021). Exploring exploration: Identity exploration in real-time interactions among peers. *Identity*. <https://doi.org/10.1080/15283488.2021.1947819>
- Talmy, S. (2011). The interview as collaborative achievement: Interaction, identity, and ideology in a speech event. *Applied Linguistics*, 32(1), 25–42. <https://doi.org/10.1093/applin/amq027>
- Ten Have, P. (1999). *Doing conversation analysis*. Sage.
- Thelen, E., & Smith, L. B. (1994). *A dynamic systems approach to the development of cognition and action*. The MIT Press.
- Thorne, A., & Shapiro, L. A. (2011). Testing, testing: Everyday storytelling and the construction of adolescent identity. In E. Amsel & J. Smetana (Eds.), *Adolescent vulnerabilities and opportunities: Developmental and constructivist perspectives* (pp. 117–138). Cambridge University Press. <https://doi.org/10.1017/CBO9781139042819.008>
- Van Der Gaag, M. A. E., Albers, C., & Kunnen, S. (2017). Micro-level mechanisms of identity development: The role of emotional experiences in commitment development. *Developmental Psychology*, 53(11), 2205–2217. <https://doi.org/10.1037/dev0000336>
- Van Der Gaag, M. A. E., De Ruiter, N. M. P., & Kunnen, E. S. (2016). Micro-level processes of identity development: Intra-individual relations between commitment and exploration. *Journal of Adolescence*, 47, 38–47. <https://doi.org/10.1016/j.adolescence.2015.11.007>
- Van Der Gaag, M. A. E., De Ruiter, N. M. P., Kunnen, S. E., & Bosma, H. (2020). The landscape of identity model: An integration of qualitative and quantitative aspects of identity development. *Identity*, 20(4), 272–289. <https://doi.org/10.1080/15283488.2020.1821154>
- Van Dijk, M. (2020, May). A complex dynamical systems approach to the development of feeding problems in early childhood. *Appetite*, 157(2020), 104982. <https://doi.org/10.1016/j.appet.2020.104982>
- Van Geert, P. (1994). *Dynamic systems of development: Change between complexity and chaos*. Harvester Wheatsheaf.
- Van Hoof, A. (1999). The identity status field re-reviewed. *Developmental Review*, 19(4), 497–556. <https://doi.org/10.1006/drev.1999.0484>
- Varela, F. J., Thompson, E., Rosch, E., & Kabat-Zinn, J. (1991). *The embodied mind: Cognitive science and human experience*. MIT Press. <https://doi.org/10.29173/cmplct8718>
- Witherington, D. C. (2011). Taking emergence seriously: The centrality of circular causality for dynamic systems approaches to development. *Human Development*, 54(2), 66–92. <https://doi.org/10.1159/000326814>
- Witherington, D. C. (2019). Making sense of microdevelopment, macrodevelopment, and their interrelation. *Human Development*, 63(1), 33–37. <https://doi.org/10.1159/000501635>
- Witherington, D. C., & Margett, T. E. (2011). How conceptually unified is the dynamic systems approach to the study of psychological development? *Child Development Perspectives*, 5(4), 286–290. <https://doi.org/10.1111/j.1750-8606.2011.00211.x>