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# SERENDIPITY AS AN EXAMPLE FOR A NEW FOUR-TIERED MODEL OF THE STUDY OF INTENTIONAL SELF-REGULATION

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This article describes how actions transform chance events into sustained positive development. I argue that serendipity is intentional, and involves the coaction of self-regulatory actions and chance life events. To provide a foundation for research on both serendipity and self-regulation more generally, I introduce a model of self-regulation research organized across the nomothetic-ideographic spectrum. In this model, every self-regulatory action should be simultaneously studied at various levels of generality and specificity. Using the example case of serendipity, I argue that self-regulation research should adopt this model to capture the full richness of goal striving.

“Days pass and years vanish and we walk sightless among miracles” – Rosh Hashana prayer

How did you get here? Were there choices that you made or goals you pursued that led you here? Did some opportunity glint and glimmer unannounced at precisely the right moment, changing your life? Can your path be explained through some elegant symphony of biological and neurological processes? Is your story uniquely your own? How did you get here?

Developmental scientists have investigated the “fundamental pragmatics of life” (Baltes, 1997) by researching intentional self-regulation (ISR), or the agentic and purposeful regulation of actions to meet goals and adapt to environmental demands (see Geldhof, Little, & Colombo, 2010 for a review). The task of exploring “how people got to where they are” remains immense, and much of the existing developmental work can be organized along three tiers of research. A first tier often investigates the neurobiological bases of ISR. Another tier collapses ISR actions into universal categories (e.g., either “assimilative” or “accommodative”; Brandstädter, 2006) and assesses the use and usefulness of these categories across ages or goals. A third tier explores specific instances of goal striving through case studies and biographies (e.g., McAdams, 2011).

Over the last several decades, work in these tiers has led developmental science forward in critical ways. However, I argue that current developmental science research

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fails to sufficiently capture the full human richness of ISR for two reasons. First, the developmental literature is limited when it comes to assessing specific self-regulatory concepts (e.g., how goal mind-sets affect processing of incidental information; Fujita, Gollwitzer, & Oettingen, 2007). Such work can be considered an additional “tier” of developmental ISR research, located between the categorizing and idiographic. The second limitation builds from the first: that research across these four tiers—nomothetic, categorizing, specific, idiographic—is rarely integrated across a single research topic. It is only when research is integrated across these four tiers, I will argue, that we can motivate interdisciplinary research that more fully captures how people are the “producers of their own development” (Lerner, 1982).

My goal for this article is to present the study of serendipity as an example case for the benefits of an integrated program of ISR research across all four tiers. I have presented a theoretical grounding for the study of serendipity in a prior publication (Napolitano, 2013), and to maintain some consistency, the first section of this article updates this content, describing the etymological origins of serendipity, its links to the self-regulatory literature, and my conceptualization of serendipitous relations. The second section the article provides an initial description of the four-tiered model of ISR and briefly describes the benefits of this model for ISR research in general, and serendipity research specifically.

## SERENDIPITY AS A SELF-REGULATORY CONCEPT

Contemporary developmental science is based on a metatheoretical position termed “relationalism” (Overton, 2013). From a relational view, developmental influences measured at the individual level and those measured at the contextual level cannot be understood in isolation, but rather only understood through their mutually-informative coaction (for a brief discussion the use of the relational term *coaction*, rather than the Cartesian dualistic *interaction*, see Overton & Lerner, 2014). From this perspective, a person’s developmental trajectories are essentially plastic (Lerner, 1984). A person is not programmed by genetic material or early experiences but rather dynamically changes across the lifespan as personal factors and contextual factors influence each other, reciprocally.

Therefore, a fundamental position in the field is that people can create their own development (Lerner, 1982). People’s’ actions shape their world, which in turn shapes people and further informs their future self-developing actions. This reciprocal relation between people’s action and their development is the core of the action-theoretical (Geldhof et al., 2010) approach to ISR, which can be defined as a person’s “chosen, organized actions-in-context that further valued goals” (Napolitano, Bowers, Gestsdóttir, & Chase, 2011).

There are numerous action-theoretical models of ISR. One particularly prominent model is termed the selection, optimization, and compensation model (SOC, e.g., Baltes, Lindenberger, & Staudinger, 2006). The SOC model holds that when people channel their resources towards a small number of goals (selection), develop and improve their means for achieving that goal (optimization), and adjust those means when they fail (compensation), their likelihood of achieving goals and promoting their adaptive

development improves (Freund & Baltes, 2002). Research has shown that using SOC actions is associated with thriving across the life span (e.g., Napolitano et al., 2011).

### Towards an ISR-Based Conceptualization of Serendipity: Gaps in the Existing Literature

The utility of specific ISR actions varies depending on individual and contextual characteristics. In some cases, people can direct their development through striving for goals, but in others, the path toward goal achievement is circuitous. Existing models of ISR can be used to describe a person's actions during goal pursuits that are "linear"—that is, relatively straightforward, with few unexpected deviations—and "nonlinear," or characterized by twists or setbacks. For example, consider two adolescents with the goal to perform well on a standardized test. From the SOC perspective, both adolescents select to take this test, and attempt to optimize their chances of performing well through different study techniques. For one teen, the goal pursuit is linear: her study strategy "worked," and she performed well. The other adolescent may have a "nonlinear" goal pursuit. After performing poorly on the first test, he may compensate by studying in a different way for the next test, or may engage in loss-based selection by choosing to take a different standardized test better suited to his skills.

How does ISR research account for the linearity or nonlinearity of goal pursuits? One systematic way to investigate these influences is to adopt the life-span developmental approach (e.g., Baltes et al., 2006), and its "macro-model of developmental influences" (Baltes, Reese, & Lipsitt, 1980). This heuristic model contends that developmental influences can be categorized as either (1) age graded, or pertaining to one's developmental status; (2) history graded, or associated with specific historical conditions; or (3) non-normative, those events lacking "inter-individual homogeneity in occurrence and patterning," (Baltes et al., 1980, p. 76) such as career changes and relocations.

Two gaps exist in the ISR literature that provide a foundation for the study of serendipity. First, compared to age graded (e.g., Freund, Napolitano, & Knecht, 2016) and history-graded effects (Tomasik & Silbereisen, 2012), there has historically been less research on non-normative influences on development. This limitation is problematic. As individuals develop and become increasingly unique (the "orthogenetic principle"; Werner, 1957), the influence of non-normative experiences, events, and goals may become increasingly prominent (Baltes et al., 2006). In other words, compared to adolescents, who may face age-related goals such as performance on standardized tests, young and middle-age adults, who progress through their own unique "thread of life," (Wollheim, 1984), face challenges that are increasingly-idiosyncratic products of their past choices and current developmental trajectories.

A second limitation derives from the ISR literature's foundations in the gerontology literature. Because research from this perspective sought to identify developmental patterns of self-regulatory behavior in older adults, it focused on adaptive responses to losses in resources, rather than gains (Napolitano, 2013). Taken together, a gap in the literature emerges: there is little work exploring the self-regulatory actions associated with *maximizing gains* from unexpected, non-normative events. In other words, there is little research on how people use ISR actions to transform chance events into serendipity.

## Serendipity's History and Its Location within Relational Systems Theories

For a comprehensive account of the conceptual history of serendipity, I recommend Merton and Barber's *The Travels and Adventures of Serendipity* (2004). Space precludes a deep dive into this history, but some key details will be useful to frame this discussion. Horace Walpole (Walpole, Mann, & Lewis, 1954) coined the word *serendipity* in 1754, using it to describe the adventures of the "Three Princes of Serendip," who solved riddles using a combination of "chance" clues and their "sagacity" to interpret them. To Walpole, serendipity involved the coaction of the environment (chance), and people (their sagacity, or wisdom). Therefore, Walpole's definition aligns with the relational perspective underlying contemporary developmental science (Overton, 2013).

The interpretation of serendipity changed over time. To some, (Solly, 1875) serendipity was a characteristic of a person: "a particular kind of natural cleverness" (p. 68). From this perspective, a *person* could be more or less serendipitous. For others (Lang, 1881), serendipity became a characteristic of the environment: "the luck of falling on just the literary document which one wants at the moment" (p. 2). From this perspective, an event could be more or less serendipitous. This latter, context-based usage entered the lexicon (Merton & Barber, 2004).

These split conceptualizations of serendipity—as being either an individual or contextual characteristic—fit a reductionist worldview that divides concepts into unrelated antinomies (e.g., "nature" or "nurture," Overton, 2006). Thus, these conceptualizations are not compatible with the relational worldview. I have sought to reclaim Walpole's original, relational view of serendipity through the lens of ISR theory by introducing the concept of serendipitous relations, defined as "mutually beneficial, adaptive developmental regulations (Brandstädter, 2006) brought about by the time-extended coaction of intentional self-regulatory actions and unexpected non-normative life events" (Napolitano, 2013, p. 292). Serendipitous relations provides a lens to explore how our actions play a role in creating and maximizing the benefits from chance events in our lives. I describe the model below.

### The Serendipitous Relations Perspective

Picture a graduate student attending an academic conference with concurrent sessions. One morning, there is no session that aligns with her dissertation. Rather than take a coffee break, she chooses a session to attend by recognizing the names of the presenters. She finds a seat, and for the next two hours, she listens with rapt attention, excitedly filling her notebook. The talks open up new directions for her dissertation. She introduces herself to the panel after the session concludes, and years later, one presenter serves on her dissertation committee, and another supervises her postdoctoral research. Attending the session, seemingly on a whim, serendipitously changed her career.<sup>1</sup>

How do we assess this story as developmental scientists? This decision rests on how we conceptualize serendipity. As relayed earlier, the typical lay use of *serendipity* refers to a characteristic of an event. We can also find elements of this thinking in the literature. If we consider serendipity to be simply fate or luck, then studying serendipity would involve an "enormous fishing expedition" (Becker, 1994, p. 192).

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<sup>1</sup> Although we typically associate serendipity with significant life events, note that the below model applies for relatively-mundane daily instances of "minor serendipity." For example, people could serendipitously choose to read an article lying next to a printer, and that paper could end up a citation in their next manuscript.

Some researchers have argued that the study of chance events is “fundamentally unresolvable at the data level” (Krantz, 1998, p. 93).

In contrast, analyzing the story from the serendipitous relations perspective provides a viable research path. Building on suggestions from Bandura (1998), who argued that the “fact that an initiating event is fortuitous does not mean that the entire trajectory is a random one” (p. 97), serendipitous relations requires initially focusing on the story’s two coacting elements independently: (1) the unexpected non-normative life event, (e.g., the unexpectedly-useful conference session) and (2) the actions that brought about the opportunity and helped capitalize on it (e.g., the student’s choice to attend the session, and choice to engage the presenters after the session). Initially assessing each component independently is not incompatible with the relational perspective. In fact, Overton argues (2013) through his concepts of the *opposites of identity* and the *identity of opposites* that this approach is essential. One way to understand these principles is through M. C. Escher’s *Drawing Hands* ink sketch (Overton, 2006) where two hands relationally draw and are being drawn.

In this sense, from the perspective of “one hand” in the drawing, the conference session would have occurred (in a historical sense) with or without the student attending it, but only with her attendance, attention, and action does the session become a serendipitous one. From the “other hand,” the student may engage in similar ISR actions during other conference sessions (e.g., conscientiously attending, diligently taking notes), but only the specifically-fortuitous elements of this presentation (e.g., the unforeseen alignment with her research) render her actions serendipitous. In this way, serendipitous relations considers serendipity to be a dynamic, coactive process of action and opportunity (Napolitano, 2013).

### *The “3U” Model of Serendipitous Relations*

Figure 1 illustrates the “3U” model, a heuristic integration of how a person’s ISR actions and unexpected non-normative life events coact over time to promote serendipitous relations. Each element of serendipitous relations is represented in the figure: three phases of time termed “unexposed,” “uncovering,” and “unlocking”; the unexpected non-normative life event itself, and finally, the individual’s ISR contributions to serendipitous relations, which I have termed “serendipitous actions.”

*Serendipitous Actions During the Unexposed Phase.* The first phase of a serendipitous relation is termed “unexposed.” I have hypothesized that specific ISR actions bring about potentially-serendipitous non-normative life events. At a basic level, people’s continued strivings toward their earlier-defined goals help bring about potentially-serendipitous opportunities. For the graduate student, her active pursuit of dissertation material during the conference, and her choice to attend the presentation were necessary elements of her exposure to the fortuitous session. Bandura (1998) makes a similar point, arguing that people “can make chance happen by pursuing an active lifestyle that increases the number of fortuitous encounters that they are likely to experience” (p. 98).

Continuing to work toward current goals while remaining open to potentially-serendipitous opportunities are the hallmarks of adopting a serendipitous orientation (Napolitano, 2013). Although likely associated with a person’s agency (Little, Snyder, & Wehmeyer, 2006),

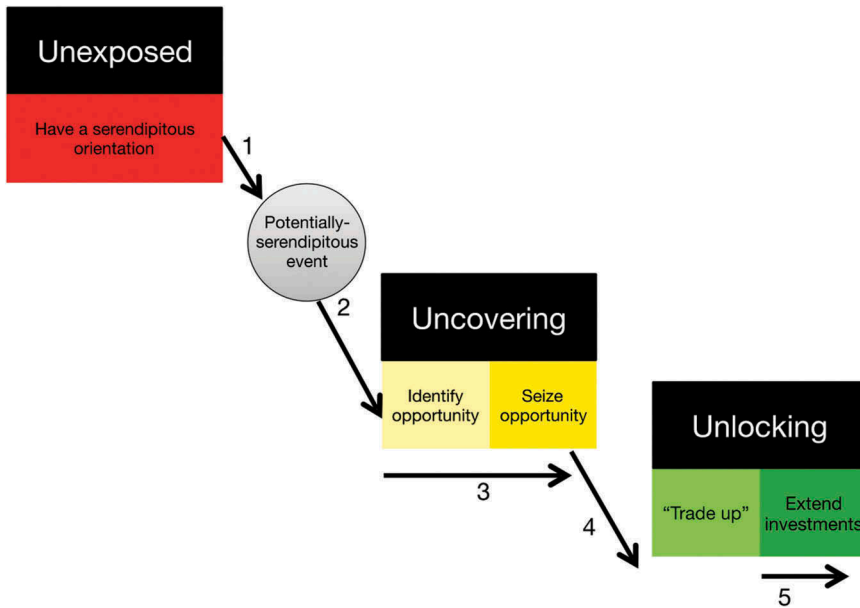


FIGURE 1 The “3U Model,” a heuristic representation of serendipitous actions. In the example of the student, she begins in the “unlocked” phase by choosing to have a serendipitous orientation, being open to potential opportunities (Location 1 on the figure). After choosing to attend the session, she identifies it is being potentially serendipitous (Location 2) and begins to seize the opportunity by speaking to the presenters after their talks (Location 3). This is the “uncovering” phase. After learning more about their research, she “trades up,” by disengaging from her prior dissertation topic (Location 4), and directing her research toward the serendipitous topic. Over months and years, she maximizes the benefit of the serendipitous session by extending her investments (Location 5), and continuing to develop her relationship with the presenters. This is the “unlocking” phase.

dispositional openness to experience (McCrae & Sutin, 2009), or curiosity (Kashdan, Sherman, Yarbrow, & Funder, 2013), here, a serendipitous orientation centers on a person’s intentional choice to be open to serendipity. Why is it necessary to emphasize intentionality in serendipitous orientations? In addition to grounding serendipitous relations in the ISR literature, this stance reflects the essential plasticity (Lerner, 1984) of human development. Consistent with self-monitoring (Gangestad & Snyder, 2000), which demonstrates that people can outwardly express adaptive behaviors that do not mirror their typical internal dispositions, I contend that even the temperamentally rigid may, in a particular context, adopt a serendipitous orientation to further their goals.

It is of course likely that some individuals tend to adopt a serendipitous orientation across domains and goals. Future work should explore variations in the consistency with which one adopts a serendipitous orientation and strive to conceptually and empirically disentangle this intentional accounting of one’s serendipitous orientation from dispositional openness to



experience. Does serendipity occur more commonly for those consistently oriented toward and searching for its possibility, or is it more common for those dutifully and conscientiously (Roberts, Lejuez, Krueger, Richards, & Hill, 2014) pursuing goals while intentionally keeping “one eye open” for serendipity? Future work should explore age-related differences: a serendipitous orientation may be associated with younger adults’ growth orientation (Freund, Hennecke, & Riediger, 2010).

*Serendipitous Actions During the Uncovering Phase.* The uncovering phase begins after the unexpected non-normative life event occurs and is characterized by two serendipitous actions: (1) identifying the event as being a potentially-serendipitous opportunity, and (2) seizing the opportunity by making provisional investments. The graduate student listened to the session with rapt attention, making connections to her research and identifying the talks as potentially-serendipitous for her career. Extending the story, we can imagine her seizing the opportunity by scheduling follow-up conversations with the presenters. Note that neither the student’s identification of the opportunity, nor her provisional investments would be likely without her adopting a serendipitous orientation.

Identifying potentially-serendipitous opportunities likely occurs through a combination of attention, creativity, *and* wisdom. A serendipitous relation cannot occur if a person does not notice the potentially-serendipitous opportunity. Some attention is required. However, serendipity’s fortuitous nature complicates contemporary research on attention (e.g., Lavie, 2010), which often seeks to identify how distracting information deviates attention away from focal tasks. It may be that one person’s “distractor” is another person’s potentially-serendipitous opportunity. Once exposed to the unexpected, non-normative life event, creativity (e.g., Sternberg, 2006) is likely required to make novel connections to related goals. Finally, and especially in contexts suffused with opportunities, wisdom (e.g., Baltes & Staudinger, 2000) likely enables people to discern those serendipitous opportunities from everyday chance. The interplay between attention, creativity, and wisdom in identifying serendipitous opportunities recalls “sagacity” in (Walpole, Mann, & Lewis, 1954) original definition.

Seizing the opportunity is a “mirror image” the SOC model’s loss-based selection (e.g., Freund & Riediger, 2003). Instead of directing resources toward a new goal because of losses, seizing the opportunity involves making provisional investments in a new goal based upon projected gains. Consistent with the concept of redundant backup plans (Napolitano & Freund, 2016), or alternative means that people develop for use in case they later perceive insufficiency (rather than failure) in their “Plan A,” people likely concurrently compare the possible gains from their current goal and their serendipitous goal. In this case, imagine the student comparing whether her new serendipitous tack will provide greater benefits compare to her prior path.

*Serendipitous Actions During the Unlocking Phase.* Serendipitous relations’ unlocking phase begins as people transition their primary investments away from the prior focal goal and toward the serendipitous goal. Therefore, unlocking the potential of a serendipitous opportunity requires flexibly disengaging from the prior goal, and then using ISR actions (e.g., the SOC model’s optimization) to maximize chances for success in the serendipitous goal. Colloquially, the unlocking phase’s central serendipitous action involves “trading up.” The student disengaged from her plans and changed her research course, judging it would led to more impactful science.

Most models of ISR include disengagement components; however, to my knowledge, each existing model predicates disengagement on losses. “Accommodation” (Brandstädter, 2006),

“secondary control,” (Heckhausen, Wrosch, & Schulz, 2010), and “loss-based selection” (Baltes et al., 2006) all describe a person’s decisions to disengage from initial means or ends because of setbacks. In contrast, “trading up” during serendipitous relations is based on perceiving the serendipitous goal’s greater potential gains relative to the initial goal.

Following the decision to trade up to the serendipitous goal, people engage in ISR actions (such as those described in the SOC model) to optimize their chances for success. Imagine the story’s student maintaining communications with the speakers. A key point for serendipitous relations is that it requires ISR at all stages—before, during, and after the unexpected event—for a person to maximize potential gains. We can all recall a time where we felt like the student, stumbling upon a potentially-serendipitous opportunity. We can also all think back to a moment where, after the initial excitement of the event wore off, we failed to fully invest in the opportunity, and let a chance at serendipity pass us by.

### *Summary*

Serendipity is not simply chance. It is an adaptive process and outcome of intentional self-regulatory action. Adopting a relational perspective, serendipitous relations involves the coaction of serendipitous actions and unexpected non-normative life events. The serendipitous actions that are currently proposed—adopting a serendipitous orientation, identifying opportunities, seizing opportunities, and trading up—are not components of any existing model of ISR, despite aligning with the basic foundations that these models share in action theory. With this suggested theoretical foundation for the study of serendipity in place, I now turn to locating the study of serendipity within the ISR field.

## AN INITIAL DESCRIPTION OF A NEW FOUR-TIERED MODEL FOR THE STUDY OF INTENTIONAL SELF-REGULATION

Recall the opening question in this article, “How did you get here?” The task of developmental scientists studying ISR is to assess how people create their futures by producing their own development (Lerner, 1982). In this first section of this article, and in prior work (Baay, Napolitano, & Schipper, *in press*; Napolitano, 2013), I argued that serendipity can be understood as an adaptive ISR process and outcome. However, locating serendipity within the ISR field is complicated. Even a cursory review of the ISR literature indicates the field is noisily fractured into competing theories (e.g., see Haase, Heckhausen, & Wrosch, 2013) and varying methodological approaches.<sup>2</sup> Therefore, one purpose of this section is to taxonomize ISR research across four tiers, not to redefine existing research or resolve all conflicts, but instead provide

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<sup>2</sup> I deliberately focus on goal-related research in the developmental sciences, which is often termed “intentional self-regulation.” Self-regulation, more broadly, is prevalent across many disciplines, and within each discipline, favored definitions and concepts vary. For an overview of self-regulation at this broad level, I direct readers to Karoly’s review (1993) or a chapter by Geldhof and colleagues (Geldhof et al., 2010). Despite the differences in self-regulation research across disciplines, I contend that the four-tiered model presented below could be extended to other instances of self-regulation research.

researchers with a “birds-eye view” that may facilitate interdisciplinary research on ISR in general and serendipity specifically.

This section has two additional aims pertinent to serendipitous relations. First, I will argue that the systematic study of specific ISR actions (Tier 3 in the present model) is under-represented in developmental science, despite being widespread in other areas of the psychological sciences. Research on serendipitous actions, in particular, is well suited for this tier. Second, although some work integrates several tiers (e.g., Chein, Albert, O’Brien, Uckert, & Steinberg, 2011), I will argue for further conceptual and methodological “cross-pollination” in ISR research. Serendipity is one ISR topic that is particularly amenable to being integrated across all tiers, and such an integration would further illustrate that serendipity is not simply idiosyncratic “luck,” but rather a symphony of intentional self-regulatory processes.

### Describing the Four-Tiered Model

To paraphrase a classic concept in the personality literature (Murray & Kluckhohn, 1953), every use of an ISR action is like all other uses, like some other uses, and like no other use. In other words, every instance of an ISR action can be simultaneously understood in terms of general phenomena and the specifics of people’s action, the context, and their coaction. Although informed by other models that organize ISR research by competing theory (e.g., Haase et al., 2013) and by discipline (e.g., Karoly, 1993), as well as more general theoretical frameworks calling for the integration of developmental influences across biology and ecology (e.g., Bronfenbrenner & Morris, 2006), the four-tiered model adds value to the

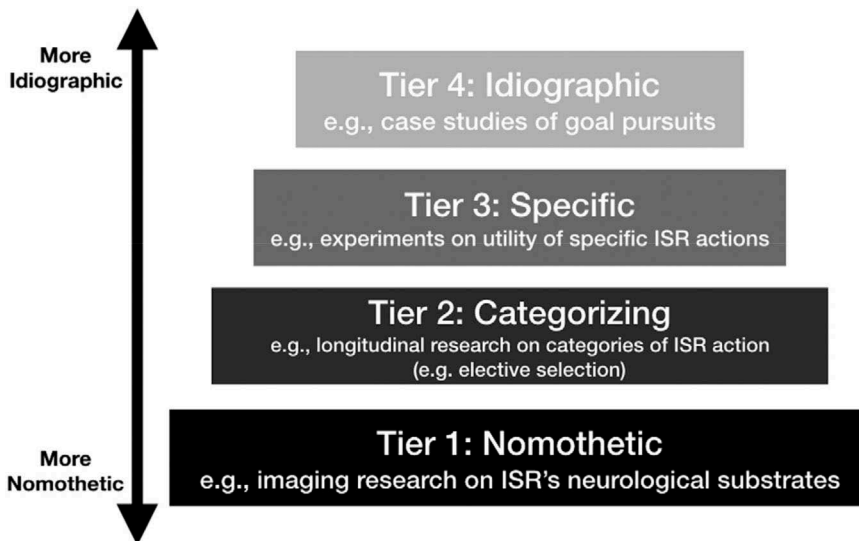


FIGURE 2 The four-tiered model of intentional self-regulation (ISR). All instances of ISR action simultaneously exist at four levels, ranging from the most nomothetic Tier 1 to the most idiographic Tier 4.

field by taxonomizing ISR research along the nomothetic-idiographic spectrum (Robinson, 2011), from ISR research focusing on what is somewhat universal across people, to ISR research focusing on what is somewhat idiographic.<sup>3</sup> Simultaneously exploring the same ISR phenomena (e.g., serendipity) across the entire spectrum, I will argue, provides the richest description of how people create their own development. I next briefly introduce the four tiers and describe one research exemplar that may inform future work on serendipity. A thorough review of research at each tier is outside the scope of this article. The four-tiered model is depicted in [Figure 2](#).

### *Tier 1: Nomothetic*

Research at Tier 1 assesses the use and usefulness of ISR actions most nomothetically. A typical aim of Tier 1 research is to identify and assess the biological and neurological processes that underlie goal-related actions. Such work is often conducted in behavioral neuroscience and related fields. An example of Tier 1 research potentially-relevant to serendipitous relations is the recently-proposed identity-value model (Berkman, Livingston, & Kahn, 2017). Integrating neuroscience research that suggests the role of the ventromedial prefrontal cortex in self or identity-related information processing (e.g., Pfeifer, Lieberman, & Dapretto, 2007) and subjective valuation (e.g., Levy & Glimcher, 2011), Berkman and colleagues', 2017 model frames self-control as a value-based choice, where options associated with a person's identity are most likely to be selected. From the perspective of the 3U model, it may be fruitful to explore whether serendipitous opportunities aligned with a one's identity are especially likely to be identified and seized upon.

### *Tier 2: Categorizing*

Research at Tier 2 categorizes the use and usefulness of ISR actions across groups or developmental characteristics. The aim of Tier 2 research is to organize the wide range of ISR action into discrete, theoretically predicated categories to test basic "rules" about how people across different groups (e.g., periods of the life span) tend to approach their goal pursuits. Such work is often conducted by developmental scientists, and key methodological tools include questionnaire items and longitudinal research designs. A clear example of Tier 2 research relevant to serendipitous relations research is the SOC model (e.g., Freund & Baltes, 2002). As noted earlier, it may be fruitful to explore whether some serendipitous actions (seizing the opportunity and trading up) can be considered something akin to "gains-based selection," where people disengage from current goals because they perceived the serendipitous opportunity to provide greater potential gains. This concept does not currently

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<sup>3</sup> It should be noted that Geldhof, Little, and Colombo's (2010) excellent heuristic model of action-theoretical self-regulation is similar to the four-tiered model presented here. These two models can be viewed as complimentary attempts to make sense of a complex field. Both are hierarchical, describing self-regulation at various levels of abstraction or specificity. Where they differ somewhat is in their aims. Geldhof and colleagues' work synthesizes research across existing theoretical perspectives of ISR (e.g., motivational, social-constructivist), harmonizing evidence toward a metamodel for the development of ISR across the life span. The four-tiered model, in contrast, focuses more on ISR actions themselves, rather than their development, arguing that each instance of ISR can be understood as a nested series of more general or more idiosyncratic actions or processes.

exist within the SOC model and may expand the model's utility for gains-oriented adolescents and young adults.

### *Tier 3: Specific*

Research at Tier 3 explores the use and usefulness of specific self-regulatory actions or aspects of that action. The aim of Tier 3 research is to explain the conditions under which a specific action (or aspect of that action) is effective for goal pursuit. Such work is often conducted in social or motivational psychology, and methodological tools can include observational tasks and (quasi-)experimental designs. To distinguish Tier 2 from Tier 3, consider the SOC model. While studying optimization, broadly, would be Tier 2 research, studying new skill acquisition or persistence, two specific optimizing actions (Freund et al. 2016), would be Tier 3 research. An example of Tier 3 work that may be fruitful for serendipitous relations involves implicit theories of willpower (e.g., Napolitano & Job, *in press*), which demonstrates that people who believe their willpower to be nonlimited, rather than depletable, persist in challenging tasks. Given their dogged persistence, it is plausible that those with a nonlimited theory of willpower are more likely to “unlock” the potential of serendipitous opportunities, but may be less likely to identify those opportunities in the first place.

### *Tier 4: Idiographic*

Research at Tier 4 assesses the use and usefulness of ISR actions most idiographically, focusing on how the unique actions and goal pursuits of one person or small group of people may provide greater insight into ISR actions more generally. Such work is also conducted by developmental scientists, and methodological tools involve observations and interviews. An example of Tier 4 research that may be fruitful for serendipitous relations is work on narrative identity (e.g., McAdams, 2011), or a person's evolving story of her life. In examining people's stories of how serendipity shaped their development, researchers may gain new insights into serendipitous relations and how they vary across people, contexts, and time.

## Possible Benefits of the Four-Tiered Model for ISR and Serendipity Research

Beyond providing a heuristic taxonomy of a disparate field, I argue that this four-tiered model can be used to promote a new wave of interdisciplinary ISR research, with serendipity being an example topic. There are at least four general benefits to the model. First, the model may encourage ISR research at tiers that are under-represented in the developmental sciences, such as Tier 3. To understand how people create their development by pursuing their goals, we must research what it is people actually do during goal pursuit, and others have similarly called for such research in life-span developmental psychology (Freund & Isaacowitz, 2014). The four-tiered model sheds light on understudied concepts in the ISR field.

A second general benefit may be in encouraging interdisciplinary “team-science” research on the same self-regulatory concept across tiers and research groups. Rather than trying to solve calcified divisions across psychological disciplines or theoretical preferences, the four-tiered model could encourage researchers to competitively, but

collaboratively address “big questions” (like, for instance, the antecedents and consequences of adaptive goal setting) using the concepts and methods along the nomothetic-idiographic spectrum with which they are most familiar or competent. Taking a different perspective, a third general benefit involves “methodological cross-pollination.” Although ISR research is often characterized by tier-typical methods, there is nothing precluding the use of, for example, neurobiological methodologies to address more-idiographic Tiers 2 through 4 questions from a new vantage. In short, when assessed through the four-tiered model, any instance of ISR (including serendipitous relations) is a nested system of simultaneously more-nomothetic and more-idiographic processes. From this viewpoint, interdisciplinary collaborations (or competitions) in ISR research are natural.

### *Benefits of the Four-Tiered Model for Serendipity Research*

A fourth general benefit of the four-tiered model is that it may encourage ISR researchers to inclusively consider a wider range of concepts as potential instances of self-regulation. Serendipity, as I have argued, may be such a concept. Given that the common lay conception of serendipity is that it is driven by “lucky” chance events (Merton & Barber, 2004), some may consider serendipity to be not empirically analyzable, or, at best, a topic that can only be studied through idiosyncratic accounts or reports, as in Tier 4. In other words, it may be intuitive for most to consider instances of serendipity—like the student’s described above—as being purely idiographic in nature. Although Tier 4 research on serendipity may prove vital, it need not end there. Instead, as I have suggested, a thorough examination of serendipitous relations would also involve Tier 3 research on specific serendipitous actions, Tier 1 research on biological and neurological substrates (such as a role of identity-aligned serendipitous opportunities as in the identity-value model), and Tier 2 research on the relations between serendipitous actions and how they relate to, for example, well-studied and validated categories of ISR action like loss-based selection or other components of the SOC model. In short, the four-tiered model allows researchers to move beyond what Bandura (1998) termed the potential “investigatory paralysis” of studying chance events in the psychological sciences and toward a better accounting of how chance and action combine to shape development.

### **Conclusion**

The goal of this article was to describe how the study of serendipity can be considered a sample case for the utility of a new, four-tiered model of ISR research. To support this goal, I provided a background on the serendipity literature and introduced the concept of serendipitous actions, or the specific actions that people use to bring about and maximize the benefits from chance events. To illustrate that serendipity is not only unique to a specific individual and a specific context, I argued that serendipitous actions, like all ISR actions, can be considered across various “tiers” of the idiographic-nomothetic spectrum. People’s serendipitous actions can simultaneously be studied as unique to those people (Tier 4), as an amalgam of their specific ISR actions (Tier 3), as emblematic of broader categories of, or trends in the use of their ISR actions (Tier 2), and finally, as being informed by, for example, biological processes (Tier 1). Taking this viewpoint, I argue,

should support the future interdisciplinary work on both serendipity specifically and the ISR field as a whole.

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