



# Seeking Common Ground: Surveying the Theoretical and Empirical Landscapes for Curiosity and Interest

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## Abstract

My purpose in this commentary was to seek out any common ground that might be found for theory and research on curiosity and interest as detailed by the contributors to this special issue. Despite the numerous differences that these authors demarcated, several areas of concurrence were readily identified. Those seven areas are, thus, specified and summarized. This commentary then concludes with the forwarding of three questions intended to provoke curiosity or fuel the interest of those engaged in research on these two complex and challenging constructs and their various manifestations.

In framing my commentary to this thought-provoking special issue, *Curiosity and Interest: Conceptual Distinctions, Relations, and Implications for Educational Practice*, I set out to map the common ground that those investigating curiosity or interest occupied. This is what Wilson (1998) described as a search for *consilience* or unity of knowledge. Thus, with the mapping of common ground as my goal, I looked for points of agreement in the conceptions, components, procedures, antecedents, and consequences of curiosity and interest as described by the contributing authors. This exploration, indeed, proved fruitful. In what follows, I summarize the emergent principles that form this common ground for curiosity and interest. Then, in keeping with my role as commentator, I conclude with several provocations for contributing authors and others invested in the study of curiosity or interest to weigh. In so doing, I hope to engender their curiosity and fuel their interest.

**Keywords** Curiosity · Interest · Knowledge

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## Consilience Within Curiosity and Interest Theory and Research

Before I map out what I regard as curiosity and interest's common ground, there are several caveats to forward. First, I am under no illusion that all who identify as curiosity or interest theorists or researchers will find the ensuing points of consilience to their liking. Second, it is reasonable to assume that these contributing authors ascribe differential importance to the individual claims I have staked out in this commentary. My intention was to merely mark these shared conceptions, components, procedures, antecedents, and consequences and not to chart the relative space they occupy within their respective domains. Finally, I am uncertain if or how this mapping of the common ground shared by curiosity and interest theory and research will ultimately prove useful to future forays into these realms. With those caveats in mind, I regard the following as the “unity of knowledge” unearthed within this special issue.

### The Terms Curiosity and Interest Are Often Ill-Defined and Poorly Demarcated, Especially Within Common Vernacular

A point of unity for all contributors to this special issue is that the terms *curiosity* and *interest* are often poorly defined within the professional literature and certainly in everyday discourse. Sometimes these terms are used interchangeably, while at other times they are cast as overlapping or entirely distinct notions. For instance, there are researchers like Silvia (2017) who use the terms curiosity and interest interchangeably, because they contend that the psychobiological data do not support any clear distinction. For their part, Murayama et al. (this issue) regard curiosity and interest as naïve or “folk” conceptions that lack scientific specificity. Thus, they see efforts to establish more defined boundaries for curiosity and interest as unnecessary and futile. In contrast, Hidi and Renninger (this issue) maintain that curiosity and interest have different affective markers, operate on distinct time scales, and have varied “triggers.” For these reasons, they and others (e.g., Ainley this issue; Peterson and Cohen this issue) proclaim the need for definitions of curiosity and interest that reflect their key conceptual and procedural distinctions.

### Curiosity and Interest Are Both Complex and Multifaceted Constructs

Although some of the terrain comprising the common ground for curiosity and interest theory and research remains somewhat unsettled, one area is firmly set. Specifically, whether the authors in this special issue, and the broader literature, regard curiosity and interest as similar, overlapping, or distinct, they almost invariably portray these constructs as complex, intricate, and multifaceted. It is quite likely that these attributes add to the conceptual ambiguity surrounding curiosity and interest. This portrayal of complexity for curiosity and interest is not limited to their definitions, but is spoken about in relation to the experiencing of curiosity and interest (Shin and Kim this issue), their “triggers” or catalysts (Hidi and Renninger this issue), and the profiles of those who manifest either (Ainley this issue). The dimensions of human psychology and neurophysiology implicated in displays of curiosity and interest are cognitive, social, affective, and physiological (Peterson and Cohen this issue), cultural, behavioral, and emotional (Shin and Kim this issue), as well as sensory, perceptual, and epistemic (Ainley this issue). Just contemplating the potential interactions among this myriad of dimensions is strong evidence that curiosity and interest are, indeed, highly complex notions.

Further, the multidimensional nature of these constructs is quite apparent in the many iterations populating this special issue, especially pertaining to curiosity. For example, there is mention of *intellectual curiosity* or what Dewey characterizes as children’s natural desire to make sense of the world they inhabit (Ainley [this issue](#)). Contributing authors (Peterson and Cohen [this issue](#); Shin and Kim [this issue](#)) also reference Litman’s (2005) notions of *I-type* and *D-type* curiosity, where the “I” or interest form is aligned with positive emotions (e.g., joy, excitement, or pleasure), whereas the “D” or deprivation form connotes more negative feelings (e.g., tension, anxiety, or frustration). Additionally, Hidi and Renninger ([this issue](#)) differentiate between perceptual curiosity and epistemic curiosity. With *perceptual curiosity*, the pursuit is for sensory information—how something feels, smells, or tastes. *Epistemic curiosity*, on the other hand, represents the search for relevant information to address a lack of knowledge or understanding.

### **There Are More Transient and More Stable Forms of Curiosity and Interest Presumed To Contribute Differentially to Academic Achievement and Human Development**

There are forms of curiosity and interest that operate on distinctly different time scales. For instance, both *state curiosity* and *situational interest* are distinguished by their typically short-lived, fleeting response to real or perceived conditions within the immediate context, what Ainley ([this issue](#)) called in-the-moment experiences. On the other hand, *individual interest* is marked by a more enduring interplay between learner characteristics and external conditions that engender more intentional processing and more selective attention.

In contrast to Murayama et al.’s ([this issue](#)) argument that theory and research in curiosity and interest operate without a priori conceptions, I witnessed a remarkable level of consistency in contributing authors’ characterizations of transient or fleeting displays of curiosity and interest. For instance, there was the shared perception that the “triggers” or “attractors” for these more state-like manifestations arise from the immediate external context (Shin and Kim [this issue](#)). It is with regard to the nature of those triggers or attractors and their emotional valences where divergences between curiosity and interest are largely presumed to occur (Hidi and Renninger [this issue](#)). There was similar consistency in the conception of the more enduring, deep-seated form of interest, *individual interest*, which is grounded in the writings of Dewey (1913) and reiterated by contemporary interest researchers (Renninger and Hidi 2011; Schiefele 1991; Wade 2001).

In contrast to the more short-lived displays, individual interest is internally powered and, thus, more cross-contextual and cross-situational, by nature. Varied perspectives were noted in contributing authors’ characterizations of the more stable form of curiosity. For some of these authors, the predictable display of curiosity (i.e., *trait curiosity*) is attributable to individuals’ inquisitive or probing nature (Hidi and Renninger [this issue](#)). The target or context for those occurrences is treated as non-specified or generic. Alternatively, Peterson and Cohen ([this issue](#)) proffer a domain-specific view of curiosity. This more predictable and reoccurring form of curiosity is predicated on learners’ knowledge and involvement in a particular domain or associated topics, which can drive the formulation of thought-provoking or “curiosity questions” (i.e., Renninger 2010). These curiosity questions can serve as the basis for an active and pleasurable pursuit of information (Alexander and Grossnickle 2016). Thus, this form of *domain-specific curiosity*, as with trait curiosity, is sourced within the individual, but it is attached to learners’ academic competences and identity and not to a general personality trait.

## Curiosity and Interest Share Certain Underlying Components and Processes

Even while acknowledging construct distinctions, the contributing authors to this special issue were in agreement that particular components and processes are common to curiosity and interest. Among those shared components are learners' knowledge base, their goals, beliefs about self and about knowledge and knowing, and their cognitive and regulatory strategies (Ainley [this issue](#)). Even Murayama et al. ([this issue](#)), who questioned the need for any differentiation between curiosity and interest, incorporated common components in their reward-learning framework. Further, both Hidi and Renninger's ([this issue](#)) four-phase model of interest development and Peterson and Cohen's ([this issue](#)) depiction of domain-specific curiosity identify learners' knowledge as key to experiences of curiosity or interest. Epistemic competence, cognition, and beliefs are also portrayed as components of both curiosity and interest that entail the identification of relevant and valid information (Hidi and Renninger [this issue](#); Peterson and Cohen [this issue](#)). Moreover, learners who have a richer strategic repertoire can employ efficient and effective procedures to seek relevant information when their curiosity is aroused or their interest piqued. In addition, emotions appear in contributors' examinations of curiosity and interest (Ainley [this issue](#); Shin and Kim [this issue](#)), although the valence of those emotions (i.e., positive or negative) remains less settled.

As to the processes common to the exhibition of curiosity and interest, the contributing authors discuss goal-directed and self-regulatory behaviors that drive a search for information and the oversight of that process (Shin and Kim [this issue](#)). Further, there is mention made of attention and perception as learners connect with the immediate context and recognize certain gaps in their understanding or point of intrigue (Ainley [this issue](#)).

## Curiosity and Interest Can Manifest Instinctually or Intentionally and Can Be Internally or Externally Instigated

In her attempt to capture the areas of convergence and divergence for curiosity and interest, Ainley ([this issue](#)) describes young children's natural curiosity about their surroundings exhibited as exploratory behavior (Alexander et al. 2008). While acknowledging this more organic side of curiosity, Peterson and Cohen's ([this issue](#)) attention to domain-specific curiosity captures a more active and intentional experience. Similarly, Murayama et al. ([this issue](#)) contrast more unspecified exploration of the environment to a more dedicated and conscious investigation of a question or topic. Hidi and Renninger ([this issue](#)) offer an alternative perspective on intentionality. Specifically, they lay out the evidence to show that while both curiosity and interest can happen organically or be pursued intentionally, it is their foci that set them apart.

There are also references made to the more instinctual and more intentional manifestations of interest within this issue. For example, situational interest is characterized as externally triggered, implying a more spontaneous rather than intentional nature (Schiefele 1991). Dewey (1913) wrote disdainfully about individuals' attempts to dress up content as a way to enhance its appeal. Regrettably, there are ample cases of writers or speakers using salacious but unimportant information to pique readers' or listeners' interest; what Garner et al. (1989) called seductive details. Rather than sustain or hold the readers' or listeners' interest, such seductions can lead them cognitively astray.

## Both Curiosity and Interest Develop Over Time as a Consequence of Maturation and Experiences

Whether only implied or explicitly stated, the contributing authors to this special issue acknowledge that curiosity and interest undergo change over the lifespan. Inevitably, an expression of curiosity or interest represents individuals' responses or reactions to certain conditions within given contexts. Thus, as individuals mature neurologically, biologically, culturally, socially, emotionally, and affectively, and as they experience increasingly more varied and complex situations during their lifetime, their demonstrations of curiosity and interest should correspondingly change. Contributing authors to this special issue explore the development of curiosity and interest in diverse ways. For example, Ainley ([this issue](#)) casts change in terms of increased diversification in the expressions of curiosity and interest over time, which appear inextricably intertwined within the responses and reactions of young children.

For their part, Shin and Kim ([this issue](#)) address the developmental interplay between curiosity and interest. As they contend, "iterative cycles of curiosity resolution can lead to the development of individual interest" (p. xx). This observation seems in harmony with Hidi and Renninger's model (2016), and the perceived role that curiosity is thought to play in that developmental trajectory. Further, while the development of interest has dominated the literature, with curiosity assuming a supporting role, Peterson and Cohen ([this issue](#)) position curiosity development front and center. These authors sidestep the generic conceptualization of curiosity that prevails in this issue and the literature in favor of a domain-specific orientation.

## The Measurement of Curiosity and Interest in a Direct and Psychometrically Sound Manner Remains Elusive

Sadly, as is true for many constructs of importance within educational psychology, the challenges of measuring curiosity and interest and their antecedents and consequences are formidable. Various creative techniques to unearthing curiosity and interest are described in this special issue, such as trivia questions, parent questionnaires, creative activity boxes, and reports of feelings while reading and writing. Further data sources authors identified as relevant to the study of curiosity and interest included self-reports, personality measures, eye-tracking, transdermal optical imaging, and event or behavioral sampling procedures. Also, as with several contributors to this special issue (Hidi and Renninger [this issue](#); Murayama et al. [this issue](#); Shin and Kim [this issue](#)), I find that the neuroscientific techniques such as functional near-infrared spectroscopy (fNIRS), electroencephalograms (EEG), and fMRI bring a new and promising dimension to the measurement of curiosity and interest.

There are other approaches to the measurement of curiosity and interest not expressly discussed in this special issue. For example, Renninger and Hidi (2016) have described four behavioral markers that can be used in the measurement of interest: frequency of engagement, depth of engagement, voluntary re-engagement, and the capacity for independent re-engagement. Correspondingly, my colleagues and I have used domain-specific measures of demonstrated versus self-reported interest to capture the frequency of individuals' voluntary engagement in relevant domain activities (Alexander et al. 2004).

Despite this diversity of sources and techniques, none directly measures curiosity or interest in that they either rely on the subjective judgments of respondents (e.g., self-report measures) or the interpretations and inferences of researchers (e.g., fMRI scans). Also, even with this

array of measurement techniques, most researchers investigating curiosity and interest continue to rely exclusively on self-report data. Moreover, it is important to remember that the novel tasks or instruments that researchers have developed to examine curiosity and interest have been shaped by their conceptualizations of these constructs, thus impacting what can ultimately be concluded from them. In light of such concerns, it would seem prudent for researchers examining individuals' curiosity and interest to seek corroborating evidence across several modes of measurement (e.g., self-report questionnaire and fNIRS scan).

## Drilling Down into the Common Ground

As the prior discussion established, there is a “unity of knowledge” among curiosity and interest theorists and researchers that forms their common ground (Wilson 1998). Yet, there is still more to be learned about the terrain shared by curiosity and interest researchers, if one is willing to probe beneath the surface. This is precisely my aim in bringing this commentary to a close. To accomplish this end, I have put forth several provocations in the form of lingering questions. My hope is that these questions will engender readers' curiosity or fuel their interest in subsequent explorations.

### Are Curiosity and Interest Desired “Ends” or “Means” to Desired Ends?

One of the uncertainties to emerge from my reading of the articles comprising this special issue was whether these researchers regard curiosity or interest as “ends” that should be fostered in their own right. Or is the nurturance of curiosity and interest important because they lead to outcomes of academic or psychological significance? In my research (Alexander and Grossnickle 2016), and in the work by Hidi and Renninger ([this issue](#)), Ainley ([this issue](#)), and others, it is apparent that individual interest is a valued outcome as well as a means to desired ends, such as expertise or academic development. Peterson and Cohen ([this issue](#)) bring that same perspective to the more enduring form of curiosity. But is that perspective generally shared by others? Based on the contents of this special issue, the resolution is uncertain.

Take Murayama et al.'s ([this issue](#)) reward-learning framework, for instance. What they argue is that the unnamed processes of curiosity and interest promote the acquisition of knowledge. In contrast, Shin and Kim ([this issue](#)) contend that the actual outcomes of curiosity have yet to be determined. As they stated, “future work can examine the effects of curiosity on problem-solving, creativity, and well-being, and how the iterative resolution of curiosity for one specific topic can lead to individual interest” (p. xx)

### Is Ascribing Negative Emotions to Curiosity Necessary or Justified, or Is That Characterization Merely a Way To Disentangle It from Interest?

I found myself troubled by the negative emotional valences that were repeatedly attached to curiosity, in contrast to the positive reactions tied to interest. I appreciated the presence of neurophysiological evidence offered in support of this claim by several contributors (Hidi & Renninger [this issue](#); Shin and Kim [this issue](#)). It is also noteworthy that neuroscientists like Jepma, Verdonschot, van Steenbergen, Rombouts, and Nieuwenhuis (2012) have reported that the initial aversive state can rather quickly give way to more positive emotions once closure is

reached (Renninger and Hidi 2016). Nonetheless, I would argue that there are factors that complicate the conclusions reached regarding the emotions ascribed to state curiosity. For one, the tasks or activities developed to assess the neurochemical reactions of state curiosity were at times conceived to engender frustration or to be resolved through the identification of rather discrete information. For another, I could not help but wonder why trait curiosity would be viewed as a positive personality characteristic if its manifestations translate into repeated frustrations or feelings of deprivation even initially.

Moreover, the information searches that the contributors to this special issue describe were not uniform and that variability would seem potentially influential to whatever initial or culminating emotional valence manifested. There are undoubtedly times when individuals undertake information searches to resolve a very specific gap in their understanding that is not tied to any domain or topic of personal relevance. In such instances, it is reasonable that there are feelings of deprivation that accompany the search process. Yet, quite different reasons for embarking on an information search can also be envisioned with more positive emotional outcomes. For example, in their more domain-specific view of curiosity, Peterson and Cohen ([this issue](#)) argued that state curiosity can be associated with increased attention and with the activation of the brain's reward circuitry during the search for information and not only after the search is resolved.

I also concur with Renninger and Hidi (2011) that posing curiosity questions is likely a link to individual interest. Also, the attention to gaps in understanding or an information shortfall even among more acclimating or early competence learners could stand as a positive sign that they were metacognitively engaged. Similarly, learners' willingness to pursue information that can address those gaps or shortfalls should be encouraged from a regulatory standpoint. Achieving some level of closure, therefore, should engender positive reactions, especially when those efforts are self-induced. Thus, I think it is worth reconsidering the negative orientation routinely ascribed on curiosity.

### **Is Theory and Research into Curiosity Mature Enough To Forward Implications for Instructional Practice?**

I am always a bit leery about what are legitimate and useful implications for instructional practice based on existing theory and research. From my vantage point as a former school teacher, there needs to be a sufficient number of studies conducted with real learners in real learning environments engaged in real academic tasks before presenting guidelines to practitioners. While decades of research into interest have seemingly met those requirements, I do not find that the literature on curiosity yet reaches that threshold. Perhaps that is why contributors to this special issue—its title notwithstanding—have focused much on theoretical and empirical insights and implications than on what all this means for educational practice. This observation points to the next generation of curiosity and interest studies that seem essential to move this growing body of work forward. In essence, there is a pressing need for quasi-experimental and experimental studies conducted in ecologically valid ways that put theoretical assumptions and empirical conclusions about curiosity and interest to the test within the dynamic and uncertain context of the classroom.

### **Coda**

It has been my honor to read and respond to the well-crafted and informative articles that comprise this important and timely special issue. There is no question that the contributing



authors have triggered my curiosity and piqued my interest. The critical analysis of the articles and the associated search for pertinent information has been a most pleasurable experience for me. Further, I trust that the common ground I have mapped out and the provocative questions I have implanted are just as stimulating to contributing authors to this special issue and to others who are fortunate enough to peruse its contents.

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