

Running Head: INTEREST AND CURIOSITY

Interesting Things and Curious People:

Exploration and Engagement as Transient States and Enduring Strengths

Paul J. Silvia

University of North Carolina at Greensboro

Todd B. Kashdan

George Mason University

[Paul J. Silvia](#) & Todd B. Kashdan (2009). Interesting things and curious people: Exploration and engagement as transient states and enduring strengths. *Social and Personality Psychology Compass*, 3, 785–797. <http://onlinelibrary.wiley.com/doi/10.1111/j.1751-9004.2009.00210.x/abstract>

Made available courtesy of Wiley-Blackwell. The definitive version is available at

www.onlinelibrary.wiley.com.

*****Reprinted with permission. No further reproduction is authorized without written permission from Wiley-Blackwell. This version of the document is not the version of record. Figures and/or pictures may be missing from this format of the document. *****

Author Note

Paul J. Silvia, Department of Psychology, University of North Carolina at Greensboro; Todd B. Kashdan, Department of Psychology, George Mason University.

Correspondence should be addressed to Paul J. Silvia, Department of Psychology, P. O. Box 26170, University of North Carolina at Greensboro, Greensboro, NC, 27402-6170, USA; e-mail: p_silvia@uncg.edu; phone (336) 256-0007; fax (336) 334-5066.

Abstract

Curiosity, interest, and intrinsic motivation are critical to the development of competence, knowledge, and expertise. Without a mechanism of intrinsic motivation, people would rarely explore new things, learn for its own sake, or engage with uncertain tasks despite feelings of confusion and anxiety. This article explores two sides of interest: momentary feelings (the emotion of interest) and enduring traits (the character strength of curiosity). Recent theories in emotion psychology can explain why and when people experience feelings of interest; recent research has illuminated the role of curiosity in cultivating knowledge, meaning in life, close relationships, and physical and mental resilience. The problem for future research—and for social and personality psychology more generally—is how to bridge the dynamics of everyday experience with stable, lifespan aspects of personality.

Keywords: interest, curiosity, emotion, exploration, intrinsic motivation

Interesting Things and Curious People:

Exploration and Engagement as Transient States and Enduring Strengths

All humans and many non-human animal species are hard-wired to be anxious and curious (Panksepp, 1998). When faced with new, unfamiliar, and challenging events, people have a classic approach-avoidance conflict. In hopes of preventing danger, death, and the exhaustion of limited energy, people often experience anxiety. Avoiding the new and unfamiliar allows us to survive. But those same events might offer knowledge, wisdom, and opportunities that can improve the quality and longevity of our lives. In hopes of learning more about ourselves, other people, and the world around us, people often experience more than anxiety—they experience curiosity. Curiosity motivates us to approach and explore new and uncertain things in greater depth. Anxiety might be essential to surviving our current situation, but situations change. Curiosity and exploration are essential to learning how to adapt to changing situational demands and capitalize on growth opportunities. Without curiosity, stagnation is inevitable.

Psychology knows a lot about anxiety—the avoid part of the approach-avoid conflict is well understood. But what about curiosity, the urge to explore new things, to learn for its own sake, to become immersed and fascinated? The approach side of the conflict remains mysterious. Not so long ago, we could complain about the lack of attention given to positive states like interest, curiosity, and engagement, but the kudzu growth of positive psychology has strangled that claim. Psychology now knows a lot about character strengths and the ingredients of a satisfying, meaningful life. But curiosity is a back-bench player in modern positive psychology research—it is hard to compete with happiness, after all. Nevertheless, curiosity is interesting: it plays a powerful role in learning and development, and a motivational force like curiosity reveals much about human motivation and human nature.

This article examines two sides of interest: interest as a transient experience and interest as an enduring character strength. The division between states and traits is an old one in social-personality

psychology, and it is just as old in the psychology of interest. Work on emotional feelings and on stable traits developed independently and followed different paths. We hope to bring together what is known about both areas. For the experience of interest, we consider the detailed, micro-level: what makes things interesting? What cognitive processes bring about feelings of interest? For the trait of curiosity, we consider the abstract, macro-level: viewed broadly, what does curiosity do across the lifespan? Why is curiosity viewed as a character strength instead of just another trait?

Momentary Feelings of Interest

Our first level of analysis is momentary experience—the state of interest and curiosity. At this level, research explores the functions, causes, and consequences of feeling interested. These problems have been tackled many ways over the years (see Silvia, 2006). In this paper, we'll discuss the most influential theories and consider recent evidence.

Berlyne's Model

The modern study of feelings of interest begins with Daniel Berlyne (1960, 1967, 1971), who developed several important theories of curiosity and sparked a new tradition of experimental research on the causes of exploratory behavior. Berlyne (1971) proposed that *collative variables*—a family of variables associated with information gaps and conflicts—influence interest. The collative variables, such as novelty, complexity, uncertainty, and conflict, increase the activation of a primary reward system: as novelty increases, the reward system activates, causing feelings of interest and motivating exploratory behavior. But at high levels of novelty, a primary aversion system activates, causing feelings of anxiety and negative affect. When this aversion system dominates, most people are motivated to withdraw and avoid (Berlyne, 1973).

The psychobiological details of Berlyne's theory have not been supported, but Berlyne's ideas about collative variables continue to influence modern research (see Silvia, 2006). The family of novelty–complexity variables clearly affects feelings of interest, according to dozens of experiments. Moreover,

Berlyne's group was the first to show large individual differences in people's responses to novel things; such differences hint at a role for personality in the experience of interest. And Berlyne was the first to pose the central problem for theories of interest: sometimes people find new things interesting, but sometimes they find them confusing, threatening, or aversive.

Situational Interest

The Berlyne tradition waned in the 1980s and 1990s. In its place, models of *situational interest*, a momentary state of interest triggered by events in the environment (Hidi, Renninger, & Krapp, 1992), emerged in the study of learning and text-processing. In this model, features of the environment evoke feelings of interest. These features resemble the collative variables proposed by Berlyne (e.g., novelty, complexity); a few of them are new, such as themes of sexuality and mortality (Hidi & Berndorff, 1998). Although they differ in some small ways, theories of situational interest generally propose a long list of factors that predict interest; in the context of reading, the list includes variables like concreteness, coherence, ease of comprehension, vividness, and novelty (Hidi, 2001; Krapp, 1999; Wade, 2001). Theoretically, these factors evoke interest in nearly everyone.

The central flaw of this model is that there's no evidence that some things are interesting to nearly everyone—variability is clearly the norm. In our research on interest and curiosity, we see huge variability in the extent to which people find pictures, poems, text, random images, classical paintings, and social encounters to be interesting. Studies of situational interest, in fact, demonstrate this variability. Much of the literature consists of between-person correlational studies (see Schraw & Lehman, 2001) that assess interest in response to text. If people didn't vary in interest, then the outcome would be invariant and hence unable to covary with predictor variables. A secondary flaw is the model's inability to explain why novelty is sometimes aversive. As Berlyne and others have found, new things are sometimes confusing and unpleasant. The situational interest model, however, has little to say about why this happens: it posits only linear effects.

Appraisals and Interest

Recently, appraisal theories of emotion have emerged as a perspective on momentary feelings of interest. Appraisal theories can sidestep the objectivity problem that besets models of situational interest. According to appraisal models, emotions stem from people's evaluations of events in the world, not from objective features of the events themselves (Lazarus, 1991). Because people bring different knowledge, goals, and values to an event, they will usually appraise the event differently and thus experience different feelings. As a result, individual differences in appraisals cascade into individual differences in emotional experience (Smith & Kirby, in press).

In the appraisal approach, novelty and complexity are subjectively appraised, not objectively discerned. Nothing is necessarily novel or complex to everyone, so it is unrealistic to assume that some things are interesting to everyone. An appraisal approach thus easily explains individual differences in feelings of interest. A trickier problem, however, is the non-linear relation between novelty and interest—why are novel things sometimes confusing or aversive?

An appraisal approach can explain this by assuming that more than one appraisal is required for interest. In past work, we have suggested that interest involves two appraisals: an appraisal of *novelty–complexity* and an appraisal of *coping potential*. The novelty–complexity appraisal is obviously related to Berlyne's collative variables—it reflects people's appraisal of an event as new, unexpected, complex, or unfamiliar. The coping potential appraisal reflects people's appraisal of whether they can understand the unusual, complex, and unexpected thing. Just as people appraise their ability to handle physical challenges, they appraise their ability to handle cognitive challenges. Interest, then, should occur when events are appraised as new but comprehensible. When events are new but incomprehensible, feelings of confusion, anxiety, and discomfort should occur.

Evidence for an Appraisal Model

Experimental Evidence

Several lines of work support the two-factor appraisal model for interest. One body of evidence manipulated one or both of the appraisals and then measured interest. For the novelty–complexity appraisal, a large body of work has found that varying novelty affects interest. Berlyne (1960, 1971, 1974) and his research group conducted dozens of studies on the effects of novelty and complexity. They manipulated the complexity of music, random patterns, polygons, and abstract films, and they measured emotional responses in samples of college students, children, experts in the arts, and members of non-Western cultures. Among other things, Berlyne found that novelty–complexity had different effects on interestingness and pleasingness: in general, new, complex, and uncertain things were interesting, but familiar, simple, and complete things were pleasing. Contemporary research in this tradition has manipulated the complexity of random polygons (Silvia, 2005), abstract visual art (Silvia, 2006), and drawings (Nittono, Shibuya, & Hori, 2007). Walker (1980) provides a book-length review of the effects of novelty–complexity on reward, preference, and interest.

A different body of work has manipulated people’s appraisals of their ability to understand an event. The largest literature is in the study of reading, which has extensively examined the causes and correlates of a text’s interestingness (Hidi, 2001; Sadoski, 2001). Several experiments have manipulated variables that foster or impede comprehension, such as the presence of informative titles (Millis, 2001), clues about the text’s broader meaning (Silvia, 2005), or textual features such as concreteness and coherence (Sadoski, Goetz, & Rodriguez, 2000). Making a text easier to understand makes it more interesting.

Within-Person Evidence

An intriguing way to test the appraisal approach to interest is to examine the within-person covariation of appraisals and interest. Appraisal theories of emotion make within-person predictions—as a person’s appraisals change, his or her feelings should correspondingly change—but testing these predictions had to wait for the development of multilevel models. Among their many virtues, within-

person models prevent the confounding effects of individual differences (Nezlek, 2008; Silvia, 2007). Traits like openness to experience, intelligence, sensation-seeking, and expertise in the arts, for example, are related to feelings of interest. In a typical between-person correlational design, these variables are possible confounds that must be measured and controlled. But in a within-person design, these individual differences are held constant: each person has many within-person scores (e.g., responses to 20 images) but only one between-person score (e.g., a single score on an openness scale). The invariant between-person score cannot explain the covariance of the within-person scores.

Several recent studies have tested whether appraisals of novelty–complexity and coping potential predict feelings of interest. These studies have used samples of experts in the arts and unselected samples of college students; the stimuli have included classical paintings (Turner & Silvia, 2006), modern poetry (Silvia, 2009), and experimental visual art (Silvia, 2005, 2008a). In these designs, people view a wide range of things and rate each one for their experience of interest and for appraisals of novelty and comprehension. Within-person regression models then estimate the effects of the two appraisals on feelings of interest. To date, this line of work has found strong evidence for the roles of novelty–complexity and comprehension in the experience of interest: each appraisal significantly and independently predicts interest (Silvia, 2005, 2008a, 2009; Turner & Silvia, 2006). The models find unique effects despite the occasionally substantial correlation between the two appraisals, which are negatively related.

Does Interest Have Kinds of Appraisal Structures?

For people in general, the two appraisals predict interest. But digging deeper into the within-person data reveals that people vary in how strongly the appraisals predict interest. For some people, the within-person coefficients are quite high; for other people, the coefficients are much lower. Moreover, people seem to differ in whether complexity or comprehensibility has a stronger effect on interest. The between-person variability in within-person effects is interesting in its own right—it

suggests that there might be individual differences in how appraisals relate to emotions (Kuppens, Van Mechelen, & Rijmen, 2008; Kuppens, Van Mechelen, Smits, & Ceulemans, 2007).

Eyeballing the data suggests that people might differ meaningfully in how their appraisals predict interest. How can this possibility be tested empirically? One approach is to search for types, clumps, and clusters in the data. Instead of assuming that a single appraisal model applies to every member of the sample, we could explore the sample for distinct, nominal groups, each with a different appraisal model. The field of statistical classification is vast, but a convenient method for our data is to apply a latent class extension of a conventional multilevel model, known as semiparametric group-based models, latent class growth models, and growth mixture models (Jung & Wickrama, 2008; Nagin, 1999). With this family of latent class models, researchers can identify subgroups within the data that are defined by different within-person effects.

In a recent study, we used multilevel mixture analyses to see if there are kinds of within-person appraisal structures (Silvia, Henson, & Templin, in press). A large sample of students viewed a wide range of images, which had been published in books and journals of small-press experimental writing. For each image, people rated their feelings of interest and their appraisals of novelty–complexity and comprehension. A simple multilevel model found that both appraisals predicted interest. A latent class extension, however, found two classes. For both classes, both appraisals significantly and positively predicted interest. But in the larger class (68% of the sample), the complexity appraisal had a stronger effect on interest; in the smaller class (32% of the sample), the comprehension appraisal had a stronger effect. Intriguingly, people for whom complexity had a larger effect were higher in traits such as trait curiosity, openness to experience, and sensation seeking. In short, both of interest’s appraisals are important overall, but complexity plays a bigger role for some people, and comprehensibility plays a bigger role for others.

What About Other Appraisals?

So far, appraisal research on interest has focused on only two appraisals: novelty–complexity and comprehension. If nothing else, this simple appraisal structure offers a focal point for future work. It is easy to build upon a simple, empirically-supported structure, so the two-appraisal structure can be a benchmark for future research. What other appraisal dimensions might be important?

We can eliminate a couple of intuitive candidates. One likely appraisal is *importance*. Some events are relevant to significant goals, values, and concerns, and appraisals of importance figure in many emotions (Lazarus, 1991; Smith & Ellsworth, 1988). It seems reasonable that interest requires appraising an event as important or significant, but research has failed to support this notion. Many studies find that importance and interest diverge. For example, readers distinguish between important parts and interesting parts of texts, process the elements using different strategies, and recall them differently (Sadoski & Quast, 1990; Shirey, 1992). In a study of positive emotions, Ellsworth and Smith (1988) found that appraised importance predicted many emotions, but it didn't uniquely predict interest. Some of the strongest evidence comes from research in interest and self-regulation. Several studies have manipulated the importance of a task and found that importance per se does not enhance interest. Instead, it can motivate people to construe or modify the task in ways that make it more interesting. These interest-enhancing strategies, in turn, increase interest and intrinsic motivation for the task (Sansone & Smith, 2000).

With the hindsight of research, it can seem obvious that interesting things needn't be important. After all, many of the things that people find interesting, such as aesthetic objects and fictional narratives, are hard to understand in terms of importance. Furthermore, a functional analysis of interest would suggest that interest and importance must be independent. The purpose of interest is to motivate engagement, exploration, and learning. Many of the things that people explore will turn out to be important, rewarding, or dangerous; many more things will turn out to be trivial and pointless. Discerning how an event connects to one's goals and concerns is often an outcome of exploration, not

an antecedent.

Another likely appraisal is *pleasantness*. Interest is considered a positive emotion, and research finds that the experience of interest is typically associated with positive feelings (Ellsworth & Smith, 1988; Izard, 1977). Nevertheless, interest and pleasantness can typically coincide without pleasantness being an appraisal necessary for the experience of interest. Many studies by Berlyne (1971) found that interestingness and pleasingness had different predictors and consequences; other researchers have replicated these effects in diverse areas (Iran-Nejad, 1987; Walker, 1980). In a recent study, people viewed a diverse set of classical paintings, rated their experience of interest and pleasantness, and reported their appraisals (Turner & Silvia, 2006). Multilevel models found that interest and pleasantness were unrelated, and that the appraisal of novelty–complexity had opposite relationships with interest and pleasantness.

Although pleasantness isn't necessary for interest, it does usually covary with it. One reason, we suspect, is that each feeling can bring about the other, creating cycles of interest and pleasantness. For example, interest motivates people to try to understand some new, complex thing. If people meet their goal of comprehension, feelings of joy or contentment should follow, given that these particular positive emotions are primarily caused by appraisals of goal congruence (Ellsworth & Smith, 1988). Similarly, positive feelings make people more willing to try new things and more confident about their ability to understand them (Fredrickson, 1998). People in positive moods are thus probably more likely to appraise events in ways that create interest. These cyclical notions are speculative, but they suggest intriguing new directions for research on the relationships between distinct positive feelings.

Curiosity as an Enduring Strength

Everyone experiences moments of interest, but not everyone is characteristically curious. Curious people have a tendency to recognize and pursue new knowledge and experiences, an open and receptive attitude toward whatever is the target of their attention, and a greater willingness to manage

and cope with uncertainty and ambiguity (Kashdan, 2004). To the extent that people engage in these behaviors regularly, they can be expected to explore, discover, and grow in more profound ways than their less curious peers (Kashdan, 2009). Everyone possesses moments when they are curious; where people differ is the frequency, intensity, length, and scope of these experiences.

Highly curious people feel more intense feelings of curiosity, interest, and wonder. They show a strong preference for novelty, variety, and complexity. Highly curious people feel curious many times in a given day, and the urge to explore and investigate is easily triggered. A curious person's sense of intrigue and desire to explore often endures for a longer duration. This includes intentionally prolonging uncertainty because repetitive thoughts about what remains to be discovered are pleasurable (Bryant & Veroff, 2007; Wilson, Centerbar, Gilbert, & Kermer, 2005). This goes beyond the current situation, as research confirms that the more that we discover, the more we are attuned to the gaps in our knowledge (Loewenstein, 1994), and attending to these gaps is tension-producing and enjoyable at the same time (Berns, McClure, Pagnoni, & Montague, 2001; Panksepp & Moskal, 2008). Highly curious people are more finely attuned to what remains to be discovered, enjoy the perpetual search process, and create more meaning from these events (Kashdan & Steger, 2007).

Other elements related to trait curiosity are best understood together as breadth and depth. Breadth refers to the number of events that make a person feel curious or interested. Curious people are interested in a large span of their world, such as their work, relationships, passions, and hobbies, and their own private thoughts, feelings, and values. People can be curious about the past, present, or future; people can be intrigued by the external world or enjoy introspection and figuring themselves out. Once people find something that captures their interest, depth refers to whether they hold onto that interest and integrate new experiences into their identity. That is, initial momentary interest can lead to long-lasting hobbies or passions, providing a renewable source of engagement and meaning (Hidi & Renninger, 2006; Hulleman, Durik, Schweigert, & Harackiewicz, 2008).

With the wide array of personality characteristics linked to positive outcomes, it is necessary to detail some of the particular benefits of being an open and curious person. Due to space limitations, we narrowed our focus to several elements of a fulfilling life: intelligence, physical health, happiness, and beneficial social interactions and relationships.

Links to Intelligence

General intelligence involves applying cognitive skills and knowledge to learn, solve problems, and make progress toward goals that are valued by a person or culture. Part of being intelligent is learning from experience and adapting to varying situational demands. It is difficult to envision high intelligence without at least some semblance of elevated curiosity, including the ability to manage novelty and uncertainty and to solve new problems by taking an interest in varied ideas and perspectives (Berg & Sternberg, 1985). Supporting this idea, in a sample of 1,795 children, curiosity and intelligence were measured at age 3 and age 11. Even after accounting for the children's intelligence at age 3, being more curious at age 3 predicted a growth in intelligence over time (Raine, Reynolds, Venables, & Mednick, 2002). To quantify the value of curiosity, children in the top 15% on measures of curiosity at age 3 scored 12 points higher on general intelligence tests at age 11 compared with the least curious children (bottom 15%). Thus, regardless of a child's initial intelligence, the existence of intense curiosity leads to impressive cognitive development during formative years. Related to this line of research, children diagnosed with mental retardation with elevated curiosity often exhibit problem-solving skills and psychological flexibility that betrays their crude characterization as poor learners in educational, work, and social settings (Reiss & Reiss, 2004).

Links to Physical Health

Few outcomes are more desirable than being alive. In one study, older adults aged 60 to 86 were carefully observed over a 5-year period. People who were more curious at the beginning of the study were more likely to be alive at the end of the study, even after accounting for age, smoker status,

presence of cancer or cardiovascular disease, and other relevant variables (Swan & Carmelli, 1996). Although these findings are promising, additional replications are needed. Similar results have been found with non-human animals. Female rats that frequently pursue new experiences live longer than their less curious peers. In a strain of laboratory rats that all eventually die from tumors, rats with greater curiosity lived 25% longer lives than those fearing the unknown (Cavigelli & McClintock, 2003; Cavigelli, Yee, & McClintock, 2006).

The rewards of longevity only remain if physical and mental health remains relatively intact. As people live longer with modern advancements in health and technology, an unintended consequence is a greater incidence of brain degeneration conditions such as Alzheimer's disease. Interestingly, some of the early signs of neurological illness in older adults include a decreased ability to attend to novelty, manage novelty, and extract rewards from novel and challenging opportunities (Daffner et al., 2000). Perhaps more exciting than the benefits of curiosity on life longevity is research showing that being curious appears to be useful in enhancing cognitive abilities and vitality (for reviews, see Daffner et al., 2006; Stine-Morrow, 2007). Patients with Parkinson's and Alzheimer's disease suffer from a degeneration in dopamine circuits and, in turn, show a lack of curiosity and general unwillingness to explore their environment; dopaminergic activity is more closely aligned with curiosity than general positive emotions (e.g., Panksepp, 1998). There are promising signs that enhancing curiosity reduces the risk for disease and even the potential to reverse some of the natural degeneration that occurs (Fritsch et al., 2005; Wilson et al., 2002).

Links to Happiness

For most people, intelligence and physical health are secondary to their primary life objective: happiness. When people think about being happy, enhancing curiosity is an afterthought at best. Recent work suggests this neglect is misguided. Several recent studies have been undertaken to determine which of 24 character strengths are relevant to achieving happiness. Character strengths such as love,

kindness, spirituality, perseverance, self-control, and emotional intelligence are often discussed in the scientific and popular literature as being central to reaching greater well-being. Thus, it might be surprising to some that of the character strengths, curiosity was in the top five most strongly linked to global life satisfaction, work satisfaction, living a pleasurable life, living an engaging life, and living a meaningful life (Brdar & Kashdan, 2009; Park, Peterson, & Seligman, 2004; Shimai, Otake, Park, Peterson, & Seligman, 2006). The only strengths with similar links to these outcomes were hope, zest, and gratitude. In a survey of over 130,000 people from over 130 nations by the Gallup Organization, the two factors with the strongest influence on how much enjoyment a person experienced on a given day were being able to count on someone for help and learning something new yesterday (Diener, 2008). As for becoming intelligent and remaining physically healthy into old age, the conditions that support the development and maintenance of pleasurable and meaningful living are growth opportunities. A central element in our motivation to pursue personal growth and achieve fulfillment is curiosity (Deci & Ryan, 2000; Fredrickson, 1998; Kashdan, 2009; Panksepp, 1998). Curious people are in an excellent position to recognize and capitalize on these growth opportunities and the associated feelings of fulfillment.

Links to the Social World

Curiosity is rarely discussed in the context of producing positive relationship outcomes. The preference of scientists to devise different words for similar concepts explains the lack of discussion on curiosity. For instance, researchers discovered that being interested and responsive when partners share positive events and good fortunes from their own lives predicts greater relationship satisfaction, greater commitment, less conflict, and a devaluation of relationship alternatives. Instead of using the word “curious,” this line of research relies on the newly coined term “capitalization” (e.g., Gable, Gonzaga, & Strachman, 2006; Gable, Reis, Impett, & Asher, 2004). In general, curious people report more satisfying social interactions and relationships, and their partners describe them as interested and responsive (Burpee & Langer, 2005; Kashdan & Roberts, 2004, 2006). Acquaintances of a mere 5

minutes view highly curious people as highly enthusiastic and energetic, talkative, interesting in what they say and do, displaying a wide range of interests, confident, humorous, expressive, socially skilled, and less likely to act in a fearful or timid manner or share insecurities compared with less curious people. There is an impressive degree of convergence between these impressions and how curious people view themselves, suggesting that curious people are genuine and authentic (Kashdan, McKnight, Sandberg, Fincham, & Rose, 2009). Curious people ask questions, take an interest in learning about partners, and intentionally try to keep interactions interesting and playful, which contribute to the satisfying and meaningful interactions that often serve as relationship beginnings.

In the absence of curiosity and openness to experience, people show an intolerance of uncertainty and a strong need for closure in their lives. While these characteristics might protect a person from unwanted tension, their destructive influences on social relationships are far ranging (Kruglanski & Webster, 1996; McCrae & Sutin, in press). Less curious people rely on stereotypes to describe others and find new information inconsistent with these early beliefs to be threatening, resulting in stronger attachments to first impressions even when wrong. This closed-mindedness is the springboard of prejudice and the rapid rejection of others who disagree or fail to conform. To avoid uncertainty in social relationships, less curious people quickly shift from love to hate, trust to mistrust, showing a general discomfort of being unsure or conflicted (Sorrentino, Hanna, Holmes, & Sharp, 1995). Less curious people view ambivalence about other people as a marker of unworkable problems that rapidly degenerate into violent arguments, rejection, or relationship break-ups. Curious people show a willingness to work with doubts and mixed emotions in their relationships.

The behavior and attitudes of curious people promote a variety of beneficial processes in interactions, relationships, and society. An increased probability of positive social outcomes has to be balanced with the understanding that in certain situations, or in combination with personality traits such as impulsivity or hostility, curiosity can be a social liability. Annoying behaviors such as nosiness, gossip,

and obsessive interests capture nuances that can disrupt communications or the potential for intimacy. An overuse and over-reliance on curiosity without self-awareness can be problematic. It is important to recognize that even enduring strengths such as curiosity can become weaknesses depending on the situational demands. Part of being in an interaction or relationship is realizing that it is a collaborative, flexible process. Being a curious person plays a useful role in ensuring this process is intact, most of the time.

Bridging States and Traits

People can be curious in the moment and they can be typically curious: this is simply psychology's distinction between states and traits, a distinction both ancient and complicated. How are the micro-level and macro-level of curiosity bridged? The problem of how momentary experience and stable personality structures relate has been discussed since the earliest works in personality psychology (see Silvia, 2006), and we can't solve it here. To unpack this problem, though, we can consider how traits influence states and contrast it with how states influence traits.

The first problem—how traits influence states—is reasonably straightforward. People high in trait curiosity tend to view the world in ways that bring about feelings of interest. In a study of interest in visual art, for example, curious people found the art more interesting because they appraised it as more comprehensible (Silvia, 2008a). In this case, momentary appraisals of the world mediated the effect of the trait on the state of interest (Smith & Kirby, in press). Similarly, curious people tend to be more mindful. Being attuned to a present moment allows the moment to become novel, different, and unique. As a result, people can find novelty and hence interest in an otherwise mundane event (Kashdan, 2009; Kashdan & Steger, 2007).

The second problem—how states influence traits—is more vexing. Several theories have proposed that momentary experience somehow fosters changes in stable dispositions. In his *script theory*, Silvan Tomkins (1979, 1987) suggested that people abstract meaning and themes from individual

experiences. An emotion makes an event significant, and the mind then seeks themes and patterns in significant experiences. For example, people who try something new and find it interesting would abstract simple, basic ideas such as “That was interesting” and “I should do it again.” These beliefs should guide future behavior, such as another engagement with the activity. If the activity continues to afford novelty and complexity, people may continue to find it interesting, which should strengthen the abstract beliefs. Across time and contexts, some people will develop global worldviews such as “The world is an interesting place,” “I can figure out a lot of things that are confusing at first,” “Things are more interesting when I do them with a friend,” which are mental models about the world that encourage curiosity and exploration.

Script theory is probably the best-developed theory of how individual experiences can coalesce into global and enduring aspects of personality. Its notion that individual differences in emotional traits are rooted in different mental models of how the world works is an innovative idea that combines cognitive, social, and developmental approaches to emotion. It’s an intriguing theory, and we’re surprised that it hasn’t attracted much research interest.

Conclusion

This paper explored interest at two levels: the state level of interesting things, and the trait level of curious people. At the level of momentary experience, interest is rooted in appraising an event as new yet comprehensible. New, unfamiliar things that stretch one’s knowledge create feelings of interest and its corresponding motivation to learn, understand, and explore. At the level of personality, curious people display curiosity in many domains and gain many benefits of being curious, ranging from intelligence to mental and physical resilience. The frontier of this research area is the tricky problem of how states and traits affect each other, particularly how states of interest influence trait-like levels of curiosity.

Brief Author Bios

Paul J. Silvia is an Associate Professor of Psychology at the University of North Carolina at Greensboro. His recent books include *Exploring the Psychology of Interest* (2006) and *How to Write A Lot* (2007). His research has been funded by the National Institute of Mental Health, and he received the Berlyne Award from Division 10 of the American Psychological Association for his research on aesthetic emotions.

Todd B. Kashdan is an Associate Professor of Psychology at George Mason University. His most recent book is *Curious? Discover the Missing Ingredient to a Fulfilling Live* (2009). His research has been funded by grants from the National Institute of Health, Veterans Integrated Service Network, Anxiety Disorder Association of America, Society for a Science of Clinical Psychology, and the Positive Psychology Network.

References

- Berg, C.A., & Sternberg, R.J. (1985). Response to novelty: Continuity versus discontinuity in the developmental course of intelligence. *Advances in Child Development, 19*, 1-47.
- Berlyne, D. E. (1960). *Conflict, arousal, and curiosity*. New York: McGraw-Hill.
- Berlyne, D. E. (1967). Arousal and reinforcement. *Nebraska Symposium on Motivation, 15*, 1–110.
- Berlyne, D. E. (1971). *Aesthetics and psychobiology*. New York: Appleton-Century-Crofts.
- Berlyne, D. E. (1973). The vicissitudes of aplopathematic and thelematoscopic pneumatology (or the hydrography of hedonism). In D. E. Berlyne & K. B. Madsen (Eds.), *Pleasure, reward, preference* (pp. 1–33). New York: Academic Press.
- Berlyne, D. E. (Ed.) (1974). *Studies in the new experimental aesthetics: Steps toward an objective psychology of aesthetic appreciation*. Washington, DC: Hemisphere.
- Berns, G.S., McClure, S.M., Pagnoni, G., & Montague, P.R. (2001). Predictability modulates human brain response to reward. *Journal of Neuroscience, 21*, 2793-2798.
- Brdar, I., & Kashdan, T.B. (2009). [Strengths and well-being in Croatia]. Unpublished raw data.
- Bryant, F.B., & Veroff, J. (2006). *Savoring: A new model of positive experience*. Mahwah, NJ: Erlbaum.
- Burpee, L.C., & Langer, E.J. (2005). Mindfulness and marital satisfaction. *Journal of Adult Development, 12*, 43–51.
- Cavigelli S.A., & McClintock M.K. (2003). Fear of novelty in infant rats predicts adult corticosterone dynamics and an early death. *Proceedings of the National Academy of Sciences, 100*, 16131-16136.
- Cavigelli S.A., Yee J.R., & McClintock M.K. (2006). Infant temperament predicts life span in female rats that develop spontaneous tumors. *Hormones & Behavior, 50*, 454-462.
- Daffner, K.R., Ryan, K.K., Williams, D.M., Budson, A.E., Rentz, D.M., Wolk, D.A., & Holcomb, P.J. (2006). Increased responsiveness to novelty is associated with successful cognitive aging. *Journal of*

- Cognitive Neuroscience*, 18, 1759–1773.
- Diener, E. (2008, July). *Well-being of planet earth*. Keynote address at the European Positive Psychology Summit, Opatija, Croatia.
- Ellsworth, P. C., & Smith, C. A. (1988). Shades of joy: Patterns of appraisal differentiating positive emotions. *Cognition and Emotion*, 2, 301–331.
- Fleeson, W. (2001). Toward a structure- and process-integrated view of personality: Traits as density distributions of states. *Journal of Personality and Social Psychology*, 80, 1011–1027.
- Fritsch, T., Smyth, K.A., Debanne, S.M., Petot, G.J., & Friedland, R.P. (2005). Participation in novelty-seeking leisure activities and Alzheimer's disease. *Journal of Geriatric Psychiatry and Neurology*, 18, 134-141.
- Hidi, S. (2001). Interest, reading, and learning: Theoretical and practical considerations. *Educational Psychology Review*, 13, 191–209.
- Hidi, S., & Berndorff, D. (1998). Situational interest and learning. In L. Hoffman, A. Krapp, K. A. Renninger, & J. Baumert (Eds.), *Interest and learning* (pp. 74–90). Kiel, Germany: IPN.
- Hidi, S., & Renninger, K.A. (2006). The four-phase model of interest development. *Educational Psychologist*, 41, 111-127.
- Hidi, S., Renninger, K. A., & Krapp, A. (1992). The present state of interest research. In K. A. Renninger, S. Hidi, & A. Krapp (Eds.), *The role of interest in learning and development* (pp. 433–446). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Hulleman, C. S., Durik, A. M., Schweigert, S., & Harackiewicz, J. M. (2008). Task values, achievement goals, and interest: An integrative analysis. *Journal of Educational Psychology*, 100, 398-416.
- Iran-Nejad, A. (1987). Cognitive and affective causes of interest and liking. *Journal of Educational Psychology*, 79, 120–130.
- Jung, T., & Wickrama, K. A. S. (2008). An introduction to latent class growth analysis and growth mixture

- modeling. *Social and Personality Psychology Compass*, 2, 302–317.
- Kashdan, T. B. (2004). Curiosity. In C. Peterson & M. E. P. Seligman (Eds.), *Character strengths and virtues: A handbook and classification* (pp. 125–141). New York: Oxford University Press.
- Kashdan, T.B. (2009). *Curious? Discover the missing ingredient to a fulfilling life*. New York: William Morrow.
- Kashdan, T.B., McKnight, P.E., Sherman, R., Fincham, F.D., & Rose, P. (2009). When being curious breeds intimacy: Taking advantage of intimacy opportunities and transforming boring conversations. *Manuscript submitted for review*
- Kashdan, T. B., & Roberts, J. E. (2004). Trait and state curiosity in the genesis of intimacy: Differentiation from related constructs. *Journal of Social and Clinical Psychology*, 23, 792–816.
- Kashdan, T.B., & Roberts, J.E. (2006). Affective outcomes and cognitive processes in superficial and intimate interactions: Roles of social anxiety and curiosity. *Journal of Research in Personality*, 40, 140-167.
- Kashdan, T. B., Rose, P., & Fincham, F. D. (2004). Curiosity and exploration: Facilitating positive subjective experiences and personal growth opportunities. *Journal of Personality Assessment*, 82, 291–305.
- Kashdan, T. B., & Steger, M. F. (2007). Curiosity and pathways to well-being and meaning in life: Traits, states, and everyday behaviors. *Motivation and Emotion*, 31, 159–173.
- Kashdan, T. B., & Yuen, M. (2007). Whether highly curious students thrive academically depends on the learning environment of their school: A study of Hong Kong adolescents. *Motivation and Emotion*, 31, 260–270.
- Krapp, A. (1999). Interest, motivation and learning: An educational-psychological perspective. *European Journal of Psychology of Education*, 14, 23–40.
- Kruglanski, A. W., & Webster, D. M. (1996). Motivated closing of the mind: "Seizing" and "freezing."

- Psychological Review*, 103, 263-283.
- Kuppens, P., Van Mechelen, I., & Rijmen, F. (2008). Toward disentangling sources of individual differences in appraisal and anger. *Journal of Personality*, 76, 969–1000.
- Kuppens, P., Van Mechelen, I., Smits, D. J. M., & Ceulemans, E. (2007). Individual differences in patterns of appraisal and anger experience. *Cognition and Emotion*, 21, 689–713.
- McCrae, R.R., & Sutin, A.R. (in press). Openness to experience and its social consequences. In M.R. Leary & R.H. Hoyle (Eds.), *Handbook of individual differences in social behavior*. New York: Guilford.
- Millis, K. (2001). Making meaning brings pleasure: The influence of titles on aesthetic experience. *Emotion*, 1, 320–329.
- Nagin, D. S. (1999). Analyzing developmental trajectories: A semiparametric, group-based approach. *Psychological Methods*, 4, 139–157.
- Nezlek, J. B. (2008). An introduction to multilevel modeling for social and personality psychology. *Social and Personality Psychology Compass*, 2, 842–860.
- Nittono, H., Shibuya, Y., & Hori, T. (2007). Anterior N2 predicts subsequent viewing time and interest rating for novel drawings. *Psychophysiology*, 44, 687–696.
- Panksepp, J. (1998). *Affective neuroscience: The foundations of human and animal emotions*. New York: Oxford University Press.
- Panksepp, J., & Moskal, J. (2008). Dopamine and SEEKING: Subcortical "reward" systems and appetitive urges. In A. Elliot (Ed.), *Handbook of approach and avoidance motivation* (pp. 67–87). New York: Psychology Press.
- Park, N., Peterson, C., & Seligman, M. E. P. (2004). Strengths of character and well-being. *Journal of Social and Clinical Psychology*, 23, 603-619.
- Raine, A., Reynolds, C., Venables, P. H., and Mednick, S. A. (2002). Stimulation-seeking and intelligence: A prospective longitudinal study. *Journal of Personality and Social Psychology*, 82, 663-674.

- Reiss, S., & Reiss, M. (2004). Curiosity and mental retardation: Beyond IQ. *Mental Retardation, 42*, 77-81.
- Sadoski, M. (2001). Resolving the effects of concreteness on interest, comprehension, and learning important ideas from text. *Educational Psychology Review, 13*, 263–281.
- Sadoski, M., Goetz, E. T., & Rodriguez, M. (2000). Engaging texts: Effects of concreteness on comprehensibility, interest, and recall in four text types. *Journal of Educational Psychology, 92*, 85–95.
- Sadoski, M., & Quast, Z. (1990). Reader recall and long term recall for journalistic text: The roles of imagery, affect, and importance. *Reading Research Quarterly, 25*, 256–272.
- Shimai, S., Otake, K., Park, N., Peterson, C., & Seligman, M. E. P. (2006). Convergence of character strengths in American and Japanese young adults. *Journal of Happiness Studies, 7*, 311-322.
- Shirey, L. L. (1992). Importance, interest, and selective attention. In K. A. Renninger, S. Hidi, & A. Krapp (Eds.), *The role of interest in learning and development* (pp. 281–296). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Silvia, P. J. (2005a). Cognitive appraisals and interest in visual art: Exploring an appraisal theory of aesthetic emotions. *Empirical Studies of the Arts, 23*, 119–133.
- Silvia, P. J. (2005b). What is interesting? Exploring the appraisal structure of interest. *Emotion, 5*, 89–102.
- Silvia, P. J. (2006a). Artistic training and interest in visual art: Applying the appraisal model of aesthetic emotions. *Empirical Studies of the Arts, 24*, 139–161.
- Silvia, P. J. (2006b). *Exploring the psychology of interest*. New York: Oxford University Press.
- Silvia, P. J. (2007). An introduction to multilevel modeling for research on the psychology of art and creativity. *Empirical Studies of the Arts, 25*, 1–20.
- Silvia, P. J. (2008a). Appraisal components and emotion traits: Examining the appraisal basis of trait

- curiosity. *Cognition and Emotion*, 22, 94-113.
- Silvia, P. J. (2008b). Interest—The curious emotion. *Current Directions in Psychological Science*, 17, 57–60.
- Silvia, P. J. (2009). *Confusion and interest: The role of knowledge emotions in aesthetic experience*. Unpublished manuscript, University of North Carolina at Greensboro.
- Silvia, P. J., Henson, R. A., & Templin, J. L. (in press). Are the sources of interest the same for everyone? Using multilevel mixture models to explore individual differences in appraisal structures. *Cognition and Emotion*.
- Smith, C. A., & Kirby, L. D. (in press). Putting appraisal in context: Toward a relational model of appraisal and emotion. *Cognition and Emotion*.
- Sorrentino, R. M., Hanna, S.E., Holmes, J.G., & Sharp, A. (1995). Uncertainty orientation and trust in close relationships: Individual differences in cognitive styles. *Journal of Personality and Social Psychology*, 68, 314-327.
- Stine-Morrow, E.A.L. (2007). The Dumbledore hypothesis of cognitive aging. *Current Directions in Psychological Science*, 16, 295-299.
- Tomkins, S. S. (1979). Script theory: Differential magnification of affects. *Nebraska Symposium on Motivation*, 26, 201–236.
- Tomkins, S. S. (1987). Script theory. In J. Aronoff, A. I. Rabin, & R. A. Zucker (Eds.), *The emergence of personality* (pp. 147–216). New York: Springer.
- Turner, S. A., Jr., & Silvia, P. J. (2006). Must interesting things be pleasant? A test of competing appraisal structures. *Emotion*, 6, 670–674.
- Wade, S. E. (2001). Research on importance and interest: Implications for curriculum development and future research. *Educational Psychology Review*, 13, 243–261.

Walker, E. L. (1980). *Psychological complexity and preference: A hedgehog theory of behavior*. New York: Brooks–Cole.

Wilson, R.S., de Leon, C.F.M., Barnes, L.L., Schneider, J.A., Bienias, J.L., Evans, D.A., & Bennett, D.A. (2002). Participation in cognitively stimulating activities and risk of incident Alzheimer Disease. *Journal of the American Medical Association, 287*, 742-748.

Wilson, T. D., Centerbar, D. B., Kermer, D. A., & Gilbert, D. T. (2005). The pleasures of uncertainty: Prolonging positive moods in ways people do not anticipate. *Journal of Personality and Social Psychology, 88*, 5-21.