

Appraisal components and emotion traits: Examining the appraisal basis of trait curiosity

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Abstract:

Individual differences related to emotions are typically represented as emotion traits. Although important, these descriptive models often do not address the psychological dynamics that underlie the trait. Appraisal theories of emotion assume that individual differences in emotions can be traced to differences in patterns of appraisal, but this hypothesis has largely gone untested. The present research explored whether individual differences in the emotion of interest, known as trait curiosity, consist of patterns of appraisal. After completing several measures of trait curiosity, participants read complex poems (Experiment 1) or viewed simple and complex pictures (Experiment 2) and then gave ratings of interest and interest's appraisal components. The effect of trait curiosity on interest was fully mediated by appraisals. Multilevel analyses suggested that curious people differ in the amount of appraisal rather than in the kinds of appraisals relevant to interest. Appraisal theories can offer a process-oriented explanation of emotion traits that bridges state and trait emotional experience.

Article:

One of the oldest issues in the study of emotion is the relationship between emotion and personality. Emotions and personality intersect in many ways (Arnold, 1960; Haviland-Jones & Kahlbaugh, 2000; Lewis, 2001; Magai & Haviland-Jones, 2002; Silvia & Warburton, 2006; Tomkins, 1979; van Reekum & Scherer, 1997; Vansteelandt & Van Mechelen, 2006). A popular intersection is the study of emotion traits. In this approach, research identifies individual differences in the intensity or frequency of experiencing an emotion, such as anger, anxiety, shame, happiness, or positive and negative moods (see Watson, 2000; Watson & Clark, 1997). Identifying and assessing emotion traits is central to understanding stable patterns of emotionality, but it is only the first step. The study of individual differences is most powerful when it adopts a process-oriented approach (Cronbach, 1957; Underwood, 1975). If the dynamics that create and sustain the individual differences are known, then state and trait approaches can be integrated, thus enriching the study of both states and traits.

Appraisal theories have been successful in explaining some of the central problems of emotion psychology (Ellsworth & Scherer, 2003; Roseman & Smith, 2001), and they have much to offer the study of emotion traits. The present research thus uses appraisal theories of emotions to examine the psychological processes that underlie individual differences in trait curiosity, the emotion trait associated with feelings of interest (Kashdan, Rose, & Fincham, 2004; Silvia, 2006b, chap. 4). Trait curiosity has been widely studied, and many reliable scales assess it (see Litman & Silvia, 2006). Like many emotion traits, however, little is known about why curious people experience interest in response to specific situations. The present research examines the appraisal basis of trait curiosity, and, in doing so, addresses the broader theoretical problem of how appraisal theories inform the process-oriented study of emotion traits.

Appraisal theories and emotion traits

One of the central questions appraisal theories were developed to handle, according to Roseman and Smith (2001), is the problem of individual differences in emotional experience. People respond differently to similar situations, and they vary in their chronic patterns of emotional experience. Appraisal theories explain this variability by referring to covarying patterns of appraisal (Lazarus, 1991; Roseman, 2001; Scherer, 2001a; Smith & Ellsworth, 1985). The role of appraisals in individual differences has been recognised in past work. Scherer (2001b, p. 383), for example, suggests that individual differences probably “massively contribute to the

variance in phenomena studied by appraisal theorists”. Nevertheless, individual differences have not received much attention in appraisal research. Lewis (2001, p. 211) notes that it is “somewhat of a mystery why appraisal theorists have spent so little time examining individual differences explicitly”.

One intersection between personality and appraisal that has received some attention is how individual differences affect appraisals (e.g., Smith & Pope, 1992). In an extensive treatment, van Reekum and Scherer (1997) outline ways in which individual differences affect emotions by influencing appraisal processes, such as individual differences related to levels and complexity of information processing. A second intersection of personality and appraisal—and the concern of the present research—is the appraisal basis of individual differences themselves (Lewis, 2001). Some emotion traits might be constituted by appraisals. In this case, people are typically angry, sad, or afraid because they typically appraise situations in a manner that creates the emotion of anger, sadness, or fear. To use trait curiosity as an example, the disposition of curiosity may be composed of the stable pattern of appraisals that create the emotion of interest: curious people are more often interested because they tend to make the appraisals that cause interest.

Trait curiosity and interest

The study of trait curiosity dates to the 1960s, inspired by the Berlyne (1960) tradition of curiosity research (see Day, 1971; Litman, 2005; Silvia, 2006b, chap. 4; Spielberger & Starr, 1994, for reviews). This early generation of research has been criticised in several reviews for poor psychometric practices (Boyle, 1983; Langevin, 1976; Loewenstein, 1994). Recently, a new generation of models has emerged (Kashdan et al., 2004; Litman & Jimerson, 2004). Given the youth of these models, not much is known about the processes that underlie individual differences in curiosity. To date, research has primarily correlated self-report curiosity scales with other self-report instruments; the psychological processes that constitute trait curiosity are not well understood.

The emotion of interest is the emotion associated with curiosity, exploration, intrinsic motivation, and information seeking (Fredrickson, 1998; Izard & Ackerman, 2000; Sansone & Smith, 2000; Silvia, 2005c, 2006b; Tomkins, 1962). Interest is thus the emotion most closely tied to trait curiosity. Appraisals of interest seem like a promising way of explaining trait curiosity. The appraisal structure of interest, according to recent research (Silvia, 2005c), involves two dimensions: an appraisal of novelty-complexity, and an appraisal of coping potential. As understood within the multilevel sequential-check model of appraisal (Scherer, 1997, 1999, 2001a), people first appraise an event's novelty, viewed broadly as appraisals of incongruity, complexity, unexpectedness, obscurity, and uncertainty (cf. Berlyne, 1960, chap. 2). Following this appraisal, an appraisal of coping potential assesses the person's ability to comprehend the new, complex event. Events appraised as new and complex yet potentially comprehensible are experienced as interesting.

This appraisal structure is congruent with past research (see Silvia, 2005b, 2005c, 2006b, chap. 2). One literature shows that the family of novelty-complexity variables affects interest (see Berlyne, 1960, 1971, 1974; Walker, 1981); a different literature shows that appraisals of coping potential affect interest (Millis, 2001; Russell, 2003; Russell & Milne, 1997). More critically, several direct tests demonstrate that novelty and coping potential predict the experience of interest (Silvia, 2005a, 2005c, 2006a; Turner & Silvia, 2006). These effects replicated for measured and manipulated appraisals, for self-report and behavioural measures of interest, and for interest in random polygons, abstract visual art, classical paintings, and poetry. Moreover, this appraisal structure is specific to interest (Turner & Silvia, 2006): it discriminates interest from enjoyment, a related positive emotion (Ellsworth & Smith, 1988; see Silvia, 2006b, chap. 1, for a review).

The appraisal basis of trait curiosity

If these two appraisal components comprise the appraisal structure of interest, then the appraisal basis of trait curiosity can be examined. According to an appraisal analysis, trait curiosity should predict interest because it predicts appraisals. This hypothesis breaks down into two variants. First, trait curiosity might be mediated by both appraisals—it predicts interest by predicting both appraised novelty-complexity and appraised coping potential. Second, trait curiosity might be mediated by only one of these appraisals. It is difficult to predict

whether one or both appraisals will mediate the effects of trait curiosity. In either case, this possibility would manifest as indirect, mediated effects of trait curiosity on interest.

A second possibility is that trait curiosity will predict interest, but not by predicting appraisals. No modern theory of trait curiosity is rooted in appraisal theories or in emotion psychology more generally (Kashdan, 2004; Litman, 2005; Spielberg & Starr, 1994). To the extent that they have offered mechanisms that connect curiosity to emotional experience, these models have not proposed appraisals as an explanation. Furthermore, research on related constructs (e.g., sensation seeking, openness to experience) has traditionally preferred psychobiological mechanisms (Bergeman et al., 1993; Zuckerman, 1994). Thus, it isn't necessarily obvious that curiosity would predict interest because of appraisals. This second possibility would manifest as direct, unmediated effects of curiosity on interest.

The Present Research

Two experiments examined whether appraisal processes explain why trait curiosity predicts the experience of interest. In each experiment, interest and appraisals were measured in response to real events. Much appraisal research has used responses to hypothetical scenarios or retrospective reports of memorable emotions (see Roseman & Evdokas, 2004). Stronger inferences about the appraisal basis of emotion traits can be made by placing people in potentially emotional situations and then assessing momentary appraisals and momentary emotional experience. In Experiment 1, people read a series of complex poems and rated their experience of interest and their appraisals of coping potential. In Experiment 2, people viewed pictures and gave ratings of interest and of appraisals; novelty-complexity appraisals were manipulated by presenting simple versus complex pictures. By replicating the effects across type of interesting object (poetry vs. visual art) and across five measures of trait curiosity, the two experiments can provide strong evidence for convergent validity.

Study 2 explored an additional intersection between trait curiosity, appraisals, and interest: do curious people differ in the kinds of appraisals relevant to interest? Kuppens and his colleagues have recently suggested that people can vary in an emotion's appraisal structure (Kuppens, Van Mechelen, Smits, & De Boeck, 2003). In the case of anger, for example, people vary in whether an appraisal of high intentionality is necessary to become angry (Kuppens, Van Mechelen, Smits, De Boeck, & Ceulemans, in press). Perhaps curious and incurious people differ in kind, not just in amount, of appraisal. To explore this, Study 2 assessed whether trait curiosity affected the within-person relationships between appraisals and interest.

Experiment 1

Experiment 1 was an initial test of whether appraisals accounted for the effects of trait curiosity on interest. This experiment focused on appraisals of coping potential. Because several experiments have found that appraisals of coping potential predict interest only when novelty-complexity is high (Silvia, 2005c), Experiment 1 held the dimension of novelty-complexity constant at a high level to simplify the analyses. People read complex poems and rated each poem for interest and for appraised coping potential. An appraisal model predicts that coping potential will at least partially mediate between trait curiosity and the experience of interest.

Method

Participants

A total of 83 students—60 women, 23 men—enrolled in general psychology at the University of North Carolina at Greensboro (UNCG) participated and received credit toward a research option.

Procedure

People participated in groups of two to eight. The experimenter explained that the study was about personality and impressions of poetry. The participants expected to complete some measures of personality, read some poems, and provide their “impressions and reactions to the poems”.

Measures of trait curiosity

Before reading the poems, people completed three measures of trait curiosity. Multiple measures were used to avoid idiosyncrasies associated with any particular scale. All items were answered on 5-point Likert scales (endpoints: strongly disagree, strongly agree). The scales and their psychometric properties are described in detail elsewhere (Litman & Silvia, 2006). The Curiosity/Interest in the World subscale of the Values in Action Inventory is a 10-item measure of trait curiosity (Peterson & Seligman, 2004). The items, which are fairly general, have few references to positive emotional experience or to specific activities (e.g., “I find the world a very interesting place”; “I have many interests”). The Perceptual Curiosity Scale (Collins, Litman, & Spielberger, 2003) is a 10-item measure of curiosity associated with perceptual and sensory experience (e.g., “I like exploring my surroundings”). The third scale was the 20-item measure of Openness to Experience from the International Personality Item Pool (Goldberg et al., 2006). Openness to experience involves curiosity as a central component (see McCrae, 1996, 2007; Silvia, 2006b, chap. 4).

Complex poems

Eleven poems were taken from books and journals of experimental language art. Participants read the poems in the same random order. These poems were selected by pretesting a large set of poems; the 11 poems that received the highest ratings on a cluster of novelty-complexity variables were selected for the experiment. For example, one poem (Ingersoll, 1999) begins with:

Library free book night in the outside of
the woman whose house photograph apology,
little black camera; my layered noodle
hanging below sun's whereof a sliding stair,
uniforms like a fast, a liked spot in the angry confrontation.
Ratings of appraisals and of interest

After reading a poem, people rated their impressions on 7-point semantic-differential scales. Appraised ability to understand the poem was measured with three scales: comprehensible-incomprehensible, coherent-incoherent, and easy to understand-hard to understand. Interest was measured with two scales: interesting-uninteresting and boring-exciting. These items have been widely used in past research (Berlyne & Peckham, 1966; Evans & Day, 1971; Silvia, 2005a, 2005c, 2006a).

Results

Data reduction

A principal-axis factor analysis found that the measures of trait curiosity, openness, and perceptual curiosity loaded highly on a single factor. Factor scores for this factor were thus computed and used as a composite trait-curiosity score. This enables an analysis of the scales' shared variance. The items measuring interest and the items measuring appraised ability were averaged to form interest and ability scores. Higher values indicate higher ratings of curiosity, interest, and appraised ability.

The path analyses were conducted with AMOS 5 (Arbuckle & Wothke, 1999; Byrne, 2001) using full-information maximum-likelihood estimation. Several variables had skew that was resistant to transformation. Bootstrapped estimates (resampling $n=1000$) were thus conducted for all parameters. The two analyses were essentially identical, so the bootstrapped estimates are not reported. Table 1 displays the descriptive statistics.

TABLE 1. Descriptive statistics and correlations between trait curiosity, interest, and appraisals: Experiment 1

	M	SD	95% CI	Curiosity	Interest	Ability
<i>Trait curiosity</i>	0.00	0.82	-1.88 to 1.88	-		
<i>Interest</i>	3.95	0.73	1.27 to 5.32	.318	-	

Note: $N=83$. Coefficients are Pearson r correlations. All coefficients are significant, $p<.003$.

TABLE 1. Descriptive statistics and correlations between trait curiosity, interest, and appraisals: Experiment 1

	M	SD	95% CI	Curiosity	Interest	Ability
Appraised ability	4.04	0.67	2.36 to 5.33	.332	.573	-

Trait curiosity, appraisals, and interest

Path analyses were conducted to examine whether trait curiosity's effect on interest was mediated by appraisals of coping potential. The path model is shown in Figure 1; the path estimates are standardised. In this model, the effect of trait curiosity on interest was mediated by appraisals of coping potential. Trait curiosity significantly predicted appraised ability to understand ($\beta=.33, p<.001$), which in turn significantly predicted interest ($\beta=.53, p<.001$). Finally, the direct effect of trait curiosity was not significant ($\beta=.14, p<.13$). Because trait curiosity's zero-order effect on interest was significant ($r=.32, p<.003$), the non-significant direct effect in the mediational model suggests that trait curiosity affects interest by affecting appraisals of coping potential.

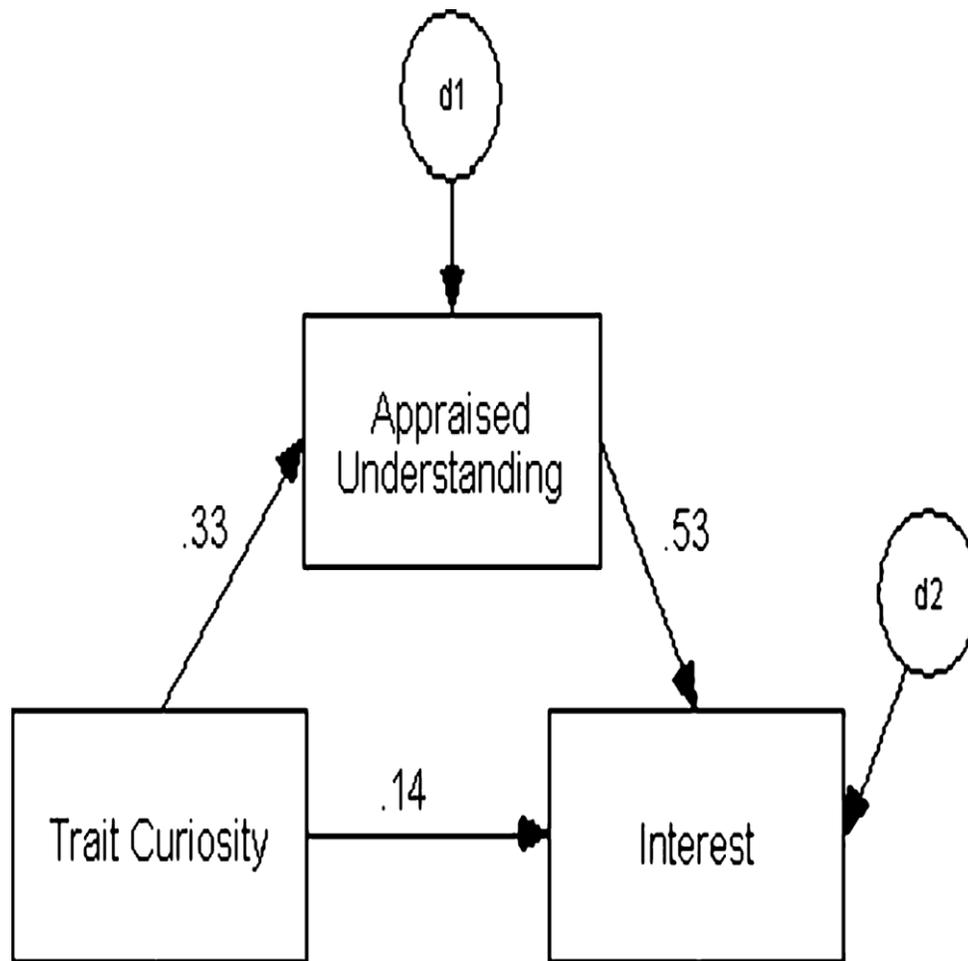


Figure 1. Path model of how trait curiosity and appraised understanding predict interest in complex poetry: Experiment 1.

Mediational predictions can be evaluated by comparing the path model to a model in which the direct effect is fixed at zero (see Loehlin, 2004). If the models differ in fit, then the conclusion of full mediation can be rejected. If the models do not differ in fit, however, then the conclusion of full mediation is not rejected. Fixing the direct effect of trait curiosity on interest to zero did not lead to a significant worsening of fit, $\chi^2(1)=2.27, p<.131$. This further suggests that appraisals fully mediated the effect of trait curiosity on interest.

Discussion

Experiment 1 suggests that trait curiosity affected the experience of interest in response to poetry by affecting appraisals. People high in curiosity appraised the complex poems as easier to understand, relative to people low in curiosity. As a result, people high in curiosity experienced greater interest, as expected from past research on the appraisal structure of interest (Silvia, 2005c). It is noteworthy that appraisals of coping potential fully mediated the effects of trait curiosity. Experiment 1 did not vary or measure novelty-complexity, however, so it is unclear if appraisals of novelty-complexity also explain the effects of trait curiosity on interest. Experiment 2 was designed to examine this issue.

Experiment 2

Experiment 2 extended Experiment 1 in several respects. First, Experiment 2 manipulated the complexity of the potentially interesting stimuli. Whereas Experiment 1 held novelty-complexity constant at a high level, Experiment 2 presented pictures pretested to be low or high in novelty-complexity. This enables a look at whether appraisals of novelty-complexity also carry the effects of trait curiosity on interest. Second, Experiment 2 used visual art instead of poetry. This enhances the generality of the inferences about the appraisal basis of trait curiosity. Finally, two new measures of trait curiosity were included, thus assessing whether the appraisal basis of trait curiosity is general across measures of the curiosity. As before, interest and appraisals were assessed in response to real situations, not in response to retrospective or imagined events. After completing measures of trait curiosity, participants viewed simple and complex pictures. They rated each picture for interest and for appraisals of complexity and ability to understand. Past research with this procedure found that appraisals of complexity and ability to understand interactively predicted interest (Silvia, 2005c, Experiment 3). When complexity was low, ability appraisals were unrelated to interest. When complexity was high, however, ability appraisals strongly predicted interest. Thus, one would expect that appraisals would carry the effects of curiosity on interest at high levels of complexity.

Finally, Experiment 2 explored whether curious and incurious people differ qualitatively in the appraisals that predict interest. At the within-person level, both appraisals ought to predict feelings of interest. People will vary, however, in how strongly an appraisal predicts interest: people will have different weights for each appraisal. Using multilevel modelling (Hox, 2002; Luke, 2004; Silvia, 2007), we can assess whether between-person differences in trait curiosity predict the strength of within-person relationships between appraisals and interest.

Method

Participants

A total of 122 students—93 women, 29 men—enrolled in general psychology at UNCG participated and received credit toward a research option.

Procedure

The procedure was modelled on a previous study of the appraisal structure of interest (Silvia, 2005c, Experiment 3). Participants were told that the study was about how different aspects of personality relate to perceptions of art. As in Experiment 1, three measures of trait curiosity were used. All items were answered on 5-point Likert scales (endpoints: strongly disagree, strongly agree). The Curiosity/Interest in the World subscale of the Values in Action Inventory (Peterson & Seligman, 2004) was included along with two new scales. The Curiosity and Exploration Inventory is a 7-item scale that emphasises positive emotional experience and feelings of absorption (Kashdan et al., 2004). This scale's item-content is heavily motivational (e.g., "When I am actively interested in something, it takes a great deal to interrupt me"; "Everywhere I go, I am out looking for new things or experiences"), following the scale's roots in a theory of curiosity (Kashdan, 2004; Kashdan & Roberts, 2004). The 15-item Curiosity as a Feeling of Deprivation scale (Litman & Jimerson, 2004) assesses curiosity motivated by gaps in one's knowledge (e.g., "If I read something that puzzles me at first, I keep reading until I understand it").

Following the measures of trait curiosity, participants viewed 12 images taken from books and journals of experimental visual art. These were the same pictures used in past research (Silvia, 2005c, Experiment 3). All

images were black-and-white and non-representational. Each picture's complexity had been determined through pretesting, in which a sample of participants rated several dozen pictures. Complexity was operationalised by ratings on a cluster of novelty-complexity variables, denoted by high complexity, uncertainty, and novelty. The six most complex and the six least complex pictures were used.

Participants viewed the pictures in the same random order. After viewing a picture, they rated their impressions on a set of 7-point semantic-differential scales. Appraised complexity was measured with complex-simple. Appraised ability to understand the picture was measured with three scales: comprehensible-incomprehensible, coherent-incoherent, and easy to understand-hard to understand. Interest was measured with two scales: interesting-uninteresting and boring-exciting.

Results and discussion

Data reduction

A principal-axis factor analysis found that the three trait-curiosity scales loaded highly on a single factor. Factor scores for this factor were thus computed and used as a composite trait-curiosity score. After reverse-scoring as appropriate, the two items measuring interest and the three items measuring appraised ability were averaged to form interest and ability scores. Higher values indicate higher ratings of curiosity, interest, ability, and complexity. The path analyses were conducted with AMOS 5 using full-information maximum-likelihood estimation. As before, bootstrapped estimates (resampling $n=1000$) did not diverge from the initial analyses. One participant was dropped as a multivariate outlier, leaving a final sample of $n=121$. The multilevel models were estimated with HLM 6 using restricted maximum-likelihood estimation. The Level 1 predictors (appraisals and interest) and the Level 2 predictor (trait curiosity) were grand-mean centred.

Descriptive statistics

Before conducting the path analyses, descriptive statistics were examined to assess the coherence of the pattern of results. Table 2 provides the descriptive statistics and confidence intervals for trait curiosity, interest, and appraisals. First, the manipulation of complexity was successful; people rated the complex pictures as significantly more complex relative to the simple pictures. Second, people rated the complex pictures as significantly more interesting and as harder to understand, relative to the simple pictures. Given that the expected effects were found, the data were suitable for examining the appraisal basis of trait curiosity.

TABLE 2. Descriptive statistics: Experiment 2

	M	SD	95% CI
<i>Note: N=121. Response scales for interest and appraisals ranged from 1 to 7.</i>			
Trait curiosity	0.00	0.86	-0.15 to 0.15
Interest (simple)	3.73	0.74	3.60 to 3.87
Interest (complex)	4.97	0.91	4.83 to 5.15
Appraised complexity (simple)	2.53	0.89	2.37 to 2.69
Appraised complexity (complex)	5.51	0.77	5.37 to 5.65
Appraised ability (simple)	4.89	0.91	4.73 to 5.05
Appraised ability (complex)	3.82	0.86	3.66 to 3.97

Between-person analyses of trait curiosity, appraisals, and interest

Path analyses were conducted to examine whether trait curiosity's effect on interest was mediated by appraisals. Separate path analyses were conducted for simple and complex pictures. The path model for complex pictures is shown in Figure 2; the path estimates are standardised. In this model, the effect of trait curiosity on interest was primarily mediated by appraisals of coping potential. Trait curiosity significantly predicted appraised understanding ($\beta=.34, p<.001$), which in turn significantly predicted interest ($\beta=.36, p<.001$). Trait curiosity had essentially no effect on appraised complexity; complexity had a significant effect on interest that was

independent of trait curiosity ($\beta=.34, p<.001$). Finally, the direct effect of trait curiosity was not significant ($\beta=.12, p<.15$). Because trait curiosity's zero-order effect on interest was significant ($r=.242, p<.007$; see Table 3), the non-significant direct effect in the mediational model suggests that trait curiosity affects interest by affecting appraisals, particularly appraisals of coping potential.

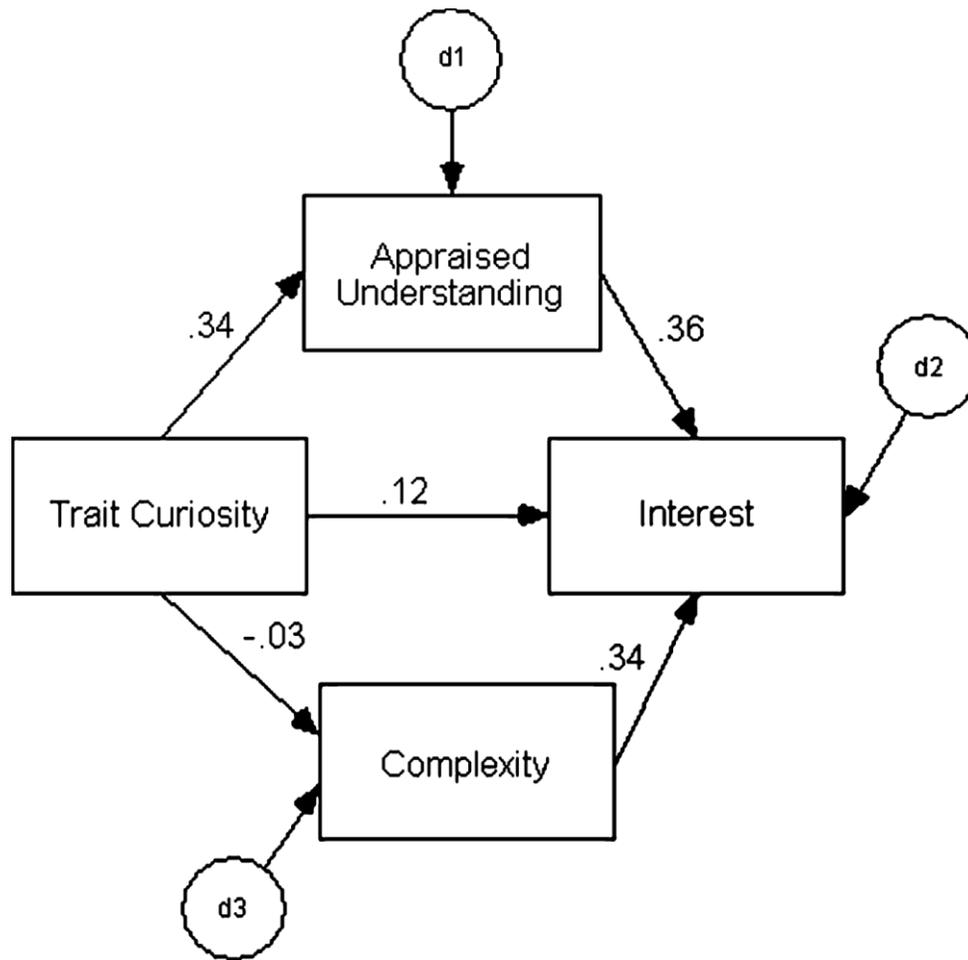


Figure 2. . Path model of how trait curiosity and appraisals predict interest in complex images: Experiment 2.

TABLE 3. Correlations between trait curiosity, interest, and appraisals: Experiment 2

	Curiosity	Interest	Complexity	Ability
1. Trait curiosity	-	.066	-.015	.270
2. Interest	.242	-	.255	.000
3. Appraised complexity	-.029	.232	-	-.314
4. Appraised ability	.344	.304	-.326	-

As before, the mediational model was evaluated by comparing the path model to a model in which the direct effect is fixed at zero (Loehlin, 2004). If the models differ in fit, then the conclusion of full mediation is rejected. For the model of interest in complex pictures, fixing the direct effect of trait curiosity on interest to zero did not lead to a significant worsening of fit, $\chi^2(1)=2.05, p<.16$. This further suggests that appraisals fully mediated the effect of trait curiosity on interest.

The path model for simple pictures is shown in Figure 3. Trait curiosity did not significantly predict interest in simple pictures at the zero-order level ($r=.066, p<.47$; see Table 3), so there was no significant effect to be mediated. Trait curiosity significantly predicted appraised coping potential ($\beta=.27, p<.002$), but, as in past research (Silvia, 2005c), coping potential did not predict interest in simple pictures ($\beta=.07, ns$). Trait curiosity did not significantly predict appraised complexity; complexity had a significant independent effect on interest ($\beta=.28, p<.001$). The direct effect of trait curiosity was not significant. This supports findings of past research, which found that appraisals of complexity and coping potential interactively affected interest (Silvia, 2005c).

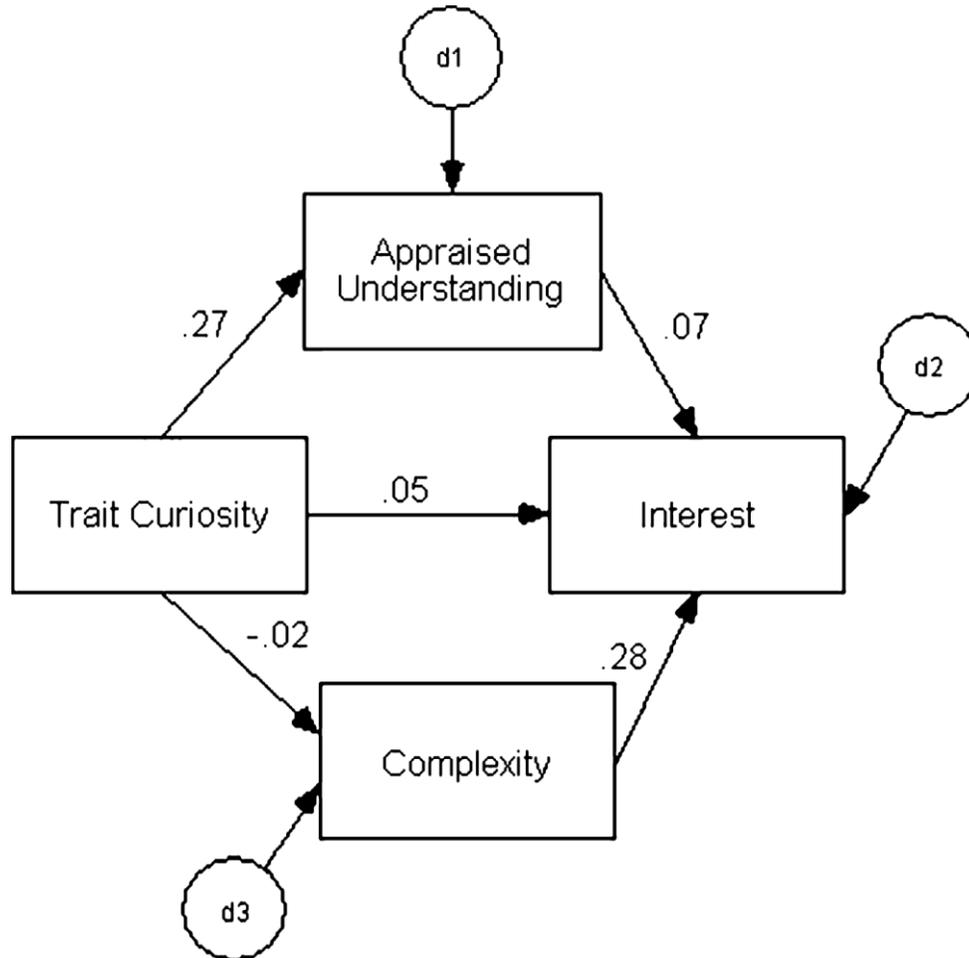


Figure 3. . Path model of how trait curiosity and appraisals predict interest in simple images: Experiment 2.

Within-person analyses of trait curiosity, appraisals, and interest

The path analyses indicated that between-person variance in trait curiosity predicted between-person variance in appraisals and interest. Multilevel models were then estimated to explore whether trait curiosity predicted *within-person* variance in appraisals and interest. The following model was estimated:

$$\text{Level 1 : Interest}_{ij} = B_{0j} + B_{1j}(\text{Novelty-Complexity}) \\ + B_{2j}(\text{Coping Potential}) + r_{ij}$$

$$\text{Level 2 : } B_{0j} = \gamma_{00} + \gamma_{01} (\text{Trait Curiosity}) + u_{0j}$$

$$B_{1j} = \gamma_{10} + \gamma_{11} (\text{Trait Curiosity}) + u_{1j}$$

$$B_{2j} = \gamma_{20} + \gamma_{21} (\text{Trait Curiosity}) + u_{2j}$$

At Level 1, interest was estimated as a function of a within-person intercept, a slope for novelty-complexity, a slope for coping potential, and residual within-person variance. At Level 2, the intercept and slopes were estimated as a function of a between-person intercept, a slope for trait curiosity, and residual between-person variance. The model used people's subjective ratings of novelty-complexity rather than the pictures' binary simple/complex coding.

Both appraisals significantly predicted interest. Interest scores increased as novelty-complexity, $\gamma_{10}=.423$, $SE=0.022$, $t(119)=18.8$, $p<.001$, and coping potential, $\gamma_{20}=.179$, $SE=0.034$, $t(119)=5.25$, $p<.001$, scores increased. These effects replicate recent within-person analyses of interest and its appraisals (Silvia, 2005a, 2006a; Turner & Silvia, 2006). Figure 4 shows a boxplot of the distributions of the within-person slopes (estimated as empirical Bayes coefficients). Overall, there wasn't much variance in the slopes' direction: 100% of the novelty-complexity slopes and 94% of the coping potential slopes were positive, indicating that the slopes were in the expected direction for essentially everyone.

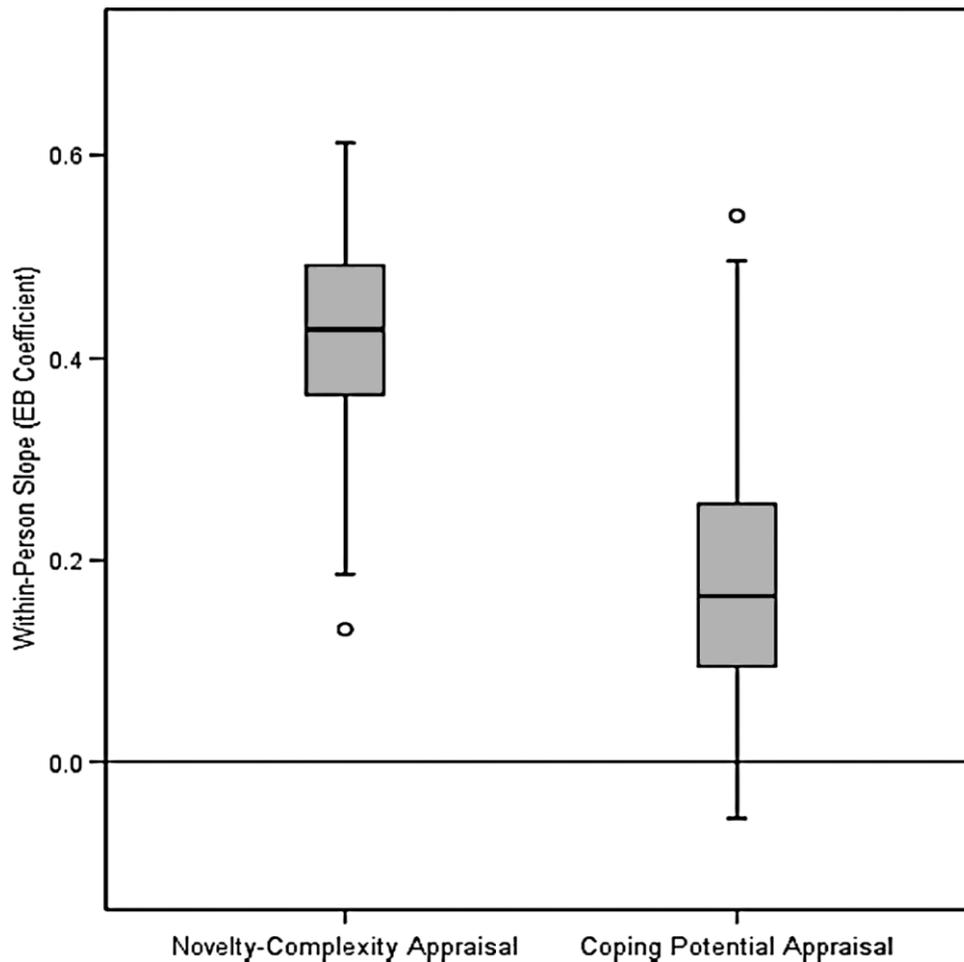


Figure 4. . Boxplots of the within-person slopes relating appraisals to interest: Experiment 2.

Did trait curiosity predict variability in the within-person slopes? The multilevel model found small and non-significant effects of trait curiosity on novelty-complexity slopes, $\gamma_{11}=.021$, $SE=0.025$, $t<1$, $p=.42$, and on coping potential slopes, $\gamma_{21}=-.034$, $SE=0.037$, $t<1$, $p=.38$. In short, people high and low in curiosity had the same relationship between appraisals and interest. They differed in the amounts of these variables—as shown in the between-person path models—but they didn't differ in the how these variables related to interest.

General Discussion

Appraisal basis of emotion traits

Many psychologists have emphasised the value of integrating dispositional and situational processes (Cronbach, 1957; Lewin, 1935; Underwood, 1975). Examining the psychological processes that underlie stable traits provides a dynamic understanding of individual differences and mutually enhances the study of both states and traits (e.g., Atkinson, 1964; Kane & Engle, 2003). In the study of emotion and personality, several appraisal researchers have pointed out that appraisal theories have had little contact with the study of individual differences in emotionality (Lewis, 2001; Scherer, 2001b; Smith & Pope, 1992; van Reekum & Scherer, 1997).

It is important to learn more about curiosity and interest, given that there is relatively little appraisal research related to interest (Ellsworth, 2003; Keltner & Shiota, 2003; Silvia, 2006b). The present research thus used trait curiosity and the appraisal components of interest as a context for examining the appraisal basis of an emotion trait. Two experiments found that the appraisal components central to interest fully accounted for the effects of trait curiosity on interest. Specifically, appraised coping potential fully mediated the effects of trait curiosity. This indicates an appraisal basis of the trait—curious people appear to be curious because they are more likely to appraise their ability to understand as high. Replicating this effect with two kinds of stimuli (poetry and visual art) and five measures of trait curiosity suggests generality to these effects.

It is noteworthy that only coping potential mediated the effect of trait curiosity on interest. Trait curiosity affected appraisals of coping potential, but it did not affect appraisals of complexity. This finding suggests that individual differences in emotionality need not be founded on all of the components in an emotion's appraisal structure. Instead, a single component or a subset of components may explain the trait's influence on emotional experience. An emotion's trait architecture may be simpler than its state architecture. For example, people high in trait-hostility might not be more likely to make all of the appraisals relevant to anger. Instead, they may be more likely to make only one or two of the appraisals, such as goal incongruence and intentionality (see Kuppens et al., 2003). This intriguing possibility deserves future research.

The study of appraisal and emotion traits illustrates the value of seeking a process-oriented approach to individual differences. Applying an appraisal model to individual differences in curiosity enhances theories of appraisal and theories of individual differences. Appraisal theories gain support for their contention that interindividual variability in emotions can be understood by covarying differences in patterns of appraisal (Roseman & Smith, 2001), a notion that has not received much research attention. This lends further support to appraisal theories of emotion and illustrates their wide range of application. Theories of emotion traits, in turn, benefit from the integration with theories of state emotion, which enable going beyond general main effects (curious people will find things interesting) to making incisive, interactive predictions.

Furthermore, the present experiments extend past research on interest and demonstrate its usefulness for studying problems in appraisal research. Appraisal research has sometimes been criticised for relying too much on retrospective reports and hypothetical scenarios (e.g., Parkinson, 1995). Clearly, stronger inferences can be made by manipulating the events people encounter (Roseman & Evdokas, 2004) or by measuring appraisals and emotions as they happen in everyday life (Tong et al., 2005). The present experiments assessed momentary feelings of interest in actual stimuli, not retrospective reports of interest or interest associated with fictional scenarios. Because interest has a relatively small set of appraisal components and is easily measured and manipulated, it is a useful emotion for testing appraisal predictions using in vivo designs.

Individual differences in appraisal structure

Experiment 2 explored whether interest-appraisal relationships differed qualitatively or quantitatively between curious and incurious people. Based on recent research (Kuppens et al., in press), one could propose that curious people are making different *types* of appraisals, not just different amounts of the same appraisals. Taken together, however, the path analyses and multilevel analyses suggested that curiosity affects the amount, not the kinds, of appraisals. Appraisals strongly predicted interest at the within-person level, but trait curiosity did not predict variability in these within-person effects. In short, the appraisals predicted interest regardless of one's level of trait curiosity.

At its core, this represents a null effect: trait curiosity did not predict variance in within-person relationships. Nevertheless, this absent relationship has appeared in past research. In an earlier study (Silvia, 2005a), interest's appraisals predicted interest for 100% of the participants, and variability in the within-person slopes was unexplained by trait PA or NA. In an analogous study (Silvia, 2006a), experts and novices in the arts differed quantitatively in appraisals—experts found complex art more comprehensible and thus more interesting—but not qualitatively. Multilevel analyses found strong within-person relations between appraisals and interest, and expertise didn't predict variability in these relations. People do not seem to differ in interest's appraisal structure, based on this small body of work, but this issue awaits a more comprehensive set of experiments.

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Notes

¹Notable exceptions, however, include Kashdan's research on how trait curiosity affects state curiosity (Kashdan & Roberts, 2004; Kashdan & Steger, 2007) and Litman's research on how varieties of trait curiosity affect appraisals of uncertainty (Litman, 2005; Litman, Hutchins, & Russon, 2005).