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Brief Reports

Insight-seeking is consistent across domains and distinct from other forms of curiosity

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ABSTRACT

Feelings of insight can be triggered by making a scientific discovery, but also by discovering the culprit in a whodunit, or solving a riddle. While the intensity of these feelings varies between individuals, it is unclear whether some people consistently seek out insight across a wide range of stimuli. We conducted two studies to investigate this question. Study 1 ($N = 189$) revealed that individuals who enjoy one type of insight-generating content tend to enjoy other types as well. Study 2 ($N = 470$) showed that this interest differs from other types of curiosity, such as exploration and morbid curiosity. Together, these findings suggest that insight-seeking might be a distinct personality trait.

1. Introduction

Feelings of insight can be triggered by various experiences across different domains (e.g physics, psychology, mathematics) and modalities (e.g reading, thinking, perceiving), and are common in everyday life (Ovington et al., 2015). Despite this diversity, a consistent phenomenological signature has been reported: a sudden burst of confidence, happiness, and surprise (Danek et al., 2014). However, the strength of these feelings varies: not everyone is passionate about science or whodunits (two common sources of insight). We ask whether the variation in interest in insight is (a) *consistent* within the same individual across different insight-generating stimuli and (b) *distinct* from other forms of curiosity. To address this, we test whether (a) individuals who are interested in one type of insight-generating stimulus also tend to be interested in other types and (b) whether these relationships between insight-generating stimuli are stronger than those with stimuli triggering other forms of curiosity.

Insight seeking–seeking information likely to generate the feeling of insight–is a form of curiosity. The consistency and distinctiveness of several other forms of curiosity have already been suggested (e.g., epistemic curiosity, Berlyne, 1954; joyous exploration, Kashdan et al., 2018; or morbid curiosity Scrivner, 2021). While these forms of curiosity are related to insight seeking (Chesebrough et al., 2024), they do not perfectly overlap. First, people can experience pleasure exploring or acquiring new knowledge without any associated insight. Second, insight can be generated from any of the different domains of curiosity (e.g., morbid curiosity in whodunits).

Recent research has highlighted the possibility of trait-like individual differences in the enjoyment of insight (Chesebrough et al., 2024). For instance, Webb et al. (2021) found associations between how much insight people report and various dimensions of schizotypal traits. Oh et al. (2020) found that individuals with high-reward sensitivity showed a distinct insight-related neural reward signal shortly after the insight occurred. This reward signal was absent in individuals with low reward sensitivity (although they report solving the problem with insight), suggesting that some individuals might experience stronger and more rewarding feelings of insight due to individual differences in reward sensitivity. However, this body of work does not explore associations with other forms of curiosity, or with behaviors.

The goal of the present studies is to test whether people vary in their tendency to seek insight, and whether this tendency is distinct from other forms of curiosity. Our first hypothesis is that there is interpersonal variability in insight seeking (**H1**), with some people being more interested in seeking insight in various forms. We test this hypothesis in Study 1 by asking participants how much they consume various types of media that generate insight.

Our second hypothesis is that insight seeking is a distinct trait that differs from seemingly close preferences such as interest for exploration or morbid stimuli (**H2**). In Study 2, we compare this interest in insight stimuli with exploratory curiosity and morbid curiosity and show that considering insight as a distinct trait better accounts for the data.

All studies were pre-registered and were approved by the IRB of the

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2. Study 1

There is a wide variety of insight-generating stimuli, from whodunits to popular science. In Study 1, we ask whether the same people tend to be more likely to consume insight-generating materials, irrespective of their form.

2.1. Methods

2.1.1. Participants

200 U.S participants were recruited via the online platform Prolific. Lacking prior data for effect size estimation, we determined the sample size based on financial constraints. Participants were asked to read an explanation of insight and asked if it was clear (see ESM, section 1.1). 11 participants were excluded because they did not understand the feeling of insight, for a final sample of 189 participants (97 women; M_{age} = 42.67; SD_{age} = 12.32; Self-reported ethnicity: 7 % Asian, Black, and Mixed each; 2 % Other; 77 % White). All participants were United States citizens.

2.1.2. Procedure

After the explanation of insight, participants were given a questionnaire regarding their interest in insight-generating stimuli in different media (novels, podcasts, etc.). For each medium, their interest was measured only if participants did not answer that they "Never" consumed this type of media. The scales were the same for each medium (see below).

2.1.3. Materials

Two questions were asked for each of the following six categories: Novels, Movies, Popular Science, Puzzles, Video Games, Documentaries (see ESM, section 1.2). Participants were informed that the examples provided were illustrative only and by no means exhaustive. Note that the examples were different for each medium, as they often allow different types of insights due to medium-specific constraints (e.g. video games are interactive). For example, in the category Novels, participants had to answer the two following questions (scales in brackets):

How often do you read novels? [Never – Rarely – Sometimes – Often – Very often].

How interested are you in novels that elicit a feeling of insight? For instance novels in which a plot twist or a new revelation about a character helps make sense of the story. [Not at all interested – Not very interested – Neutral – Slightly interested – Moderately interested – Very interested – Extremely interested].

2.2. Results and discussion

All statistical analyses were conducted in R (v.4.2.2), using R Studio (2023.09.1+494). See Supplementary Table S1 for descriptive statistics.

2.2.1. Confirmatory analyses

To test **H1**, we used a permutation test comparing participants' mean pairwise correlations to those of 1000 permuted datasets. In the permutation process, we disrupted the original coherence of participant ratings by randomly reassigning ratings from other participants. As a result, the distribution of mean correlations in the permuted datasets represents what we would expect if there is no consistent preference across media. The mean for each pairwise correlation, on the question of the interest in insight-generating media, are available in the ESM (Fig. S1). Computing the mean of these mean pairwise correlation we found a mean correlation of 0.32 (SD = 0.14). This mean correlation was significantly different from the mean correlation from the permuted datasets (p-value < .001, see Fig. 1).

2.2.2. Exploratory analyses

As an exploratory research question, we were interested in estimating which pairwise correlations between media categories were significantly different from chance. Using the pairwise correlations from the permuted datasets, we found the only non-significant pairwise correlation was between the Puzzle and the Popular Science media (ESM, Fig. S2).

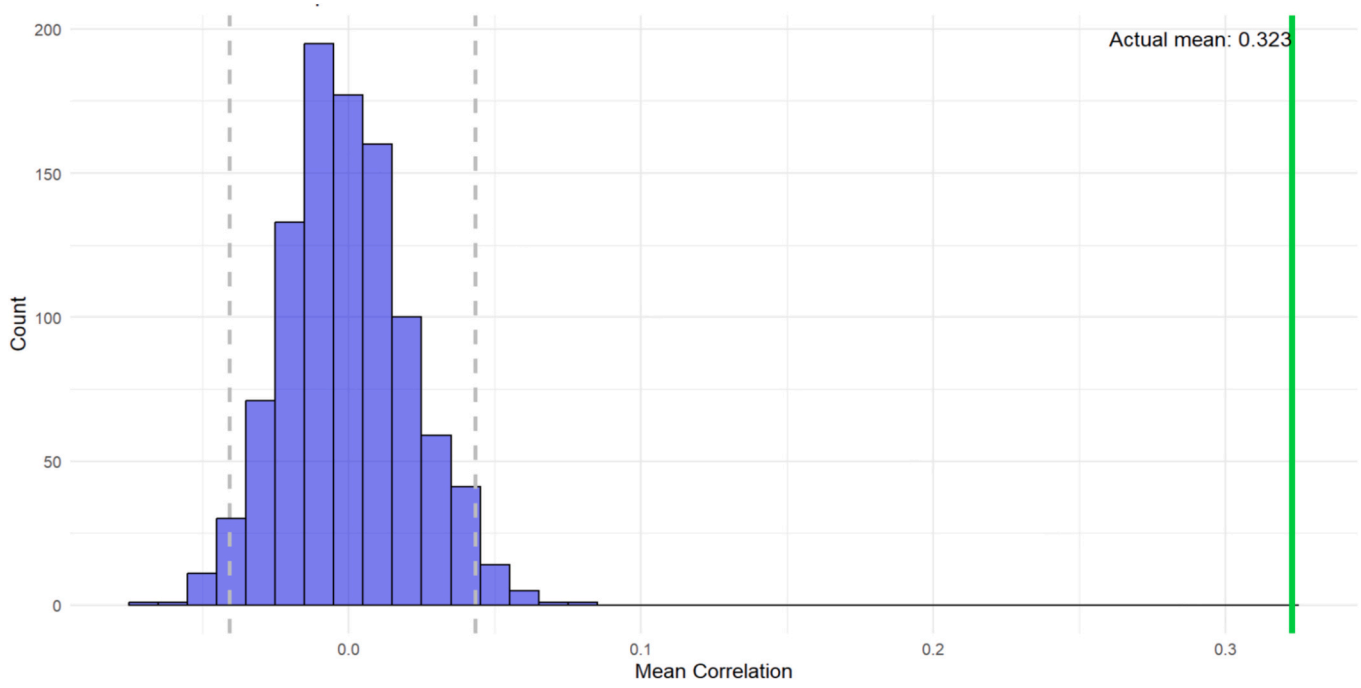

Fig. 1. Distribution of mean correlations computed from 1000 permuted dataset. Dashed lines represent the 95 % confidence interval. The green line represents the actual mean of the participants.

2.2.3. Discussion

This study shows that people who tend to consume one type of insight-generating media (e.g. insight-generating novels) also tend to consume other insight-generating media, such as video games or documentaries.

3. Study 2

Is the consistent preference for insight-generating materials evidence in Study 1 distinct from related preferences? People who consume insight-generating materials could for instance be interested in exploration more generally. In whodunits, insight is often generated through the resolution of a crime, so that people might be curious about the insightful solution, or, instead, about the morbid details of the crime. Morbid curiosity, defined as a motivation to seek information about threats and dangers, has been shown to predict interest in genres where threats are central (e.g., horror, crime and thriller; Scrivner, 2021). Our goal here is to test whether insight-seeking can be differentiated from these related constructs.

3.1. Methods

3.1.1. Participants

501 U.S participants were recruited via the online platform Prolific. We computed an a priori sample size of 489 for our most complex model (Soper, 2024). Thirty-one participants were excluded as they did not understand insight, for a final sample of 470 participants (233 women; M_{age} = 42.7; SD_{age} = 13.15; Self-reported ethnicity: 9 % Asian, 12 % Black, 5 % Mixed, 3 % Other, 71 % White). All participants had United States nationality.

3.1.2. Design and procedure

The design and procedure are the same as Study 1.

3.1.3. Materials

We re-used the same materials as Study 1 for questions related to interest in insight and constructed two other questions for each category (Novel, Movies, Non-fiction, Video Games, Documentary, see: ESM, section 2.3). We removed the puzzle category as it was not adaptable to exploratory and morbid curiosity. As an illustration, here are the new questions for Novels:

How interested are you in novels that transport you far away or to imaginary worlds? For instance, novels that immerse you in fantasy worlds, futuristic societies or far away places.

How interested are you in scary novels? For instance, novels that evoke fear, suspense, or a sense of dread.

3.2. Results and discussion

Descriptive statistics are available in Table S2.

In order to test if participants' answers are better explained by differentiating each stimuli group (Insight, Exploration Curiosity, and Morbid Curiosity), we constructed a hierarchical CFA model graphically represented in Fig. 2.

We hypothesize that the hierarchical structure of Model 1, in which there is a layer of specific forms of curiosity (insight seeking, exploration curiosity, morbid curiosity) between general curiosity and the consumption of specific media (e.g. novels), fits better than a Model 2 in which a general factor (curiosity) is the single latent factor explaining the variance in answer to all questions. In both models, we control for the consumption of specific media, by adding a factor for each media category. The “lavaan” package was used to fit the models (Rosseel, 2012, exact models specification in the pre-registration). As our design imply the Missing values at Random (MAR), but not Missing Completely at Random (MCAR), we choose to use all available data by using Full-Information Maximum Likelihood estimation methods (FIML) which is advised in our case (Kline, 2023).

3.2.1. Model fit

When fitting the model, we used the Broyden–-Fletcher–Goldfarb–Shanno (BFGS) optimization method as convergence failed using the default method. Model 1 ($\chi^2(57) = 168.45$, $p < .001$, CFI

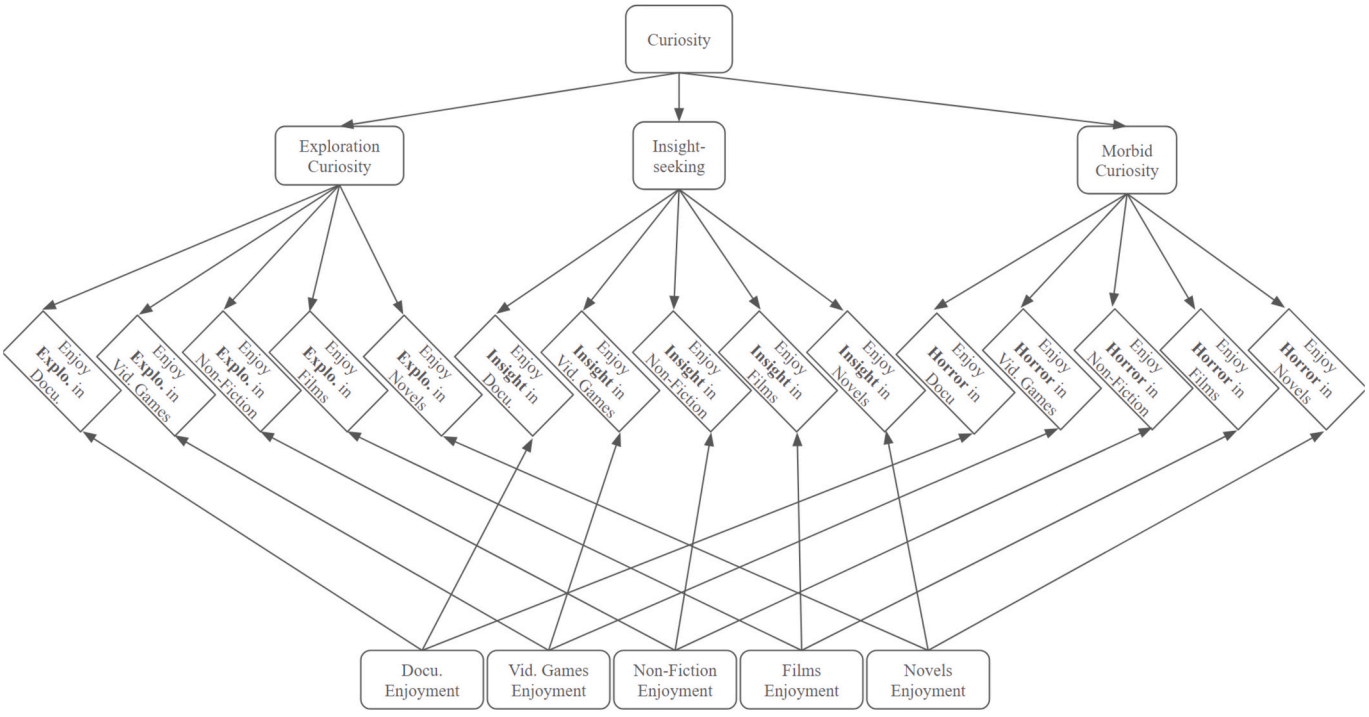

Fig. 2. Model 1 - A hierarchical structure of interests, controlling for enjoyment of specific media categories. In Model 2, the second layer (Exploration Curiosity, Insight Seeking, and Morbid Curiosity) is removed (see ESM, Fig. S3).

= 0.958, TLI = 0.92, RMSEA = 0.064, AIC = 22,458, BIC = 22,782) fitted the data better than Model 2 ($\chi^2(60) = 572.86$, $p < .001$, CFI = 0.808, TLI = 0.664, RMSEA = 0.135, AIC = 22,856, BIC = 23,167). Standard criteria in the literature consider a model to fit well the data when CFI > 0.95, TLI >0.95, RMSEA <0.06 (Kline, 2023), suggesting that Model 1 offers a decent fit to the data, while Model 2 doesn't.

3.2.2. Manipulation Check

Before comparing the two models, we examined if the two alternative models are nested as the appropriate comparison test is different for nested and non-nested models. Using the standard method by Bentler and Satorra (2010), we found that our second model (df = 60) was nested within our first model (df = 57).

3.2.3. Confirmatory analyses

As our two alternative models were nested, we used a Chi-Square difference test (χ^2_{DIFF}) in order to see if adding a hierarchical structure significantly improves the fit (Kline, 2023). To control for the tendency of unscaled χ^2_{DIFF} to favor the more complex CFA model in some context, we used a scaled χ^2_{DIFF}. In line with our hypothesis, Model 1 fitted the data significantly better than Model 2 ($\chi^2_{DIFF}(3) = 404.41$, $p < .001$).

3.2.4. Exploratory analyses

We then conducted exploratory analyses and found that the model that fit the best the data is one where we only model the specific forms of curiosity without the general factor of curiosity (see ESM, section 4, Fig. S4-S7).

3.2.5. Discussion

In this study we showed that preferences for insight-generating contents are different from potentially related preferences and that a latent factor of "insight seeking" accounts for the variation in preferences for these contents. A limitation is that for the documentary and non-fiction categories, the questions on morbid curiosity were more specific (bearing on true crime) than for the other categories. While uniform questions across categories might have been ideal, this should not impact our results, which focus on curiosity for insight-generating materials. Nonetheless, the results reveal an interesting gender pattern, with women being more curious than men about morbid content for the documentary and non-fiction categories, and less for the other three fiction-related categories (see Table S3).

4. Conclusion

Insight can be elicited by a wide range of stimuli, from pictures to novels. In Study 1, we provide empirical evidence for consistent interpersonal variability in insight seeking by showing that, on average, participants who report consuming insight-generating stimuli in one medium (e.g. documentaries) also like it in another, quite different, medium (e.g. video games). In Study 2, a Confirmatory Factor Analysis showed that modeling a latent factor of insight seeking, distinct from other types of preference (exploratory and morbid curiosity), best explains the data, suggesting that insight seeking is a specific form of curiosity. Our studies have some limitations; in particular, they have only been carried out in one country, and only measure reported behavior. Still, our results suggest that insight-seeking might be a distinct personality trait. Future studies could investigate whether this preference is stable over time, and distinct from other types of curiosity besides those explored here.

CRediT authorship contribution statement

Marius Mercier: Writing – review & editing, Writing – original draft, Visualization, Software, Methodology, Investigation, Formal analysis, Conceptualization. **Edgar Dubourg:** Writing – review & editing, Visualization, Software, Methodology, Conceptualization. **Hugo Mercier:** Writing – review & editing, Supervision, Methodology, Funding acquisition, Conceptualization.

Declaration of competing interest

No competing interests to disclose.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2025.113051.

Data availability

Data, pre-registrations, analysis scripts, materials and ESM: https://osf.io/zyufe/

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