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The Pandora Effect: The Power and Peril of Curiosity

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Abstract

Curiosity—the desire for information—underlies many human activities, from reading celebrity gossip to developing nuclear science. Curiosity is well recognized as a human blessing. Is it also a human curse? Tales about such things as Pandora's box suggest that it is, but scientific evidence is lacking. In four controlled experiments, we demonstrated that curiosity could lead humans to expose themselves to aversive stimuli (even electric shocks) for no apparent benefits. The research suggests that humans possess an inherent desire, independent of consequentialist considerations, to resolve uncertainty; when facing something uncertain and feeling curious, they will act to resolve the uncertainty even if they expect negative consequences. This research reveals the potential perverse side of curiosity, and is particularly relevant to the current epoch, the epoch of information, and to the scientific community, a community with high curiosity.

Keywords

curiosity, information gap, affective forecasting

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Curiosity—the desire for information—is well recognized as a human blessing; it facilitates learning (Gruber, Gelman, & Ranganath, 2014; Kang et al., 2009), propels discoveries (Simon, 2001), and enriches life (Ruan, Hsee, & Lu, 2015; Kashdan & Silvia, 2009). Is curiosity also a human curse? Tales such as those about Pandora's box, Adam and Eve, and Lot's wife suggest it is. But rigorous scientific evidence is scant (Kruger & Evans, 2009; Litman, 2005).

In the current research, we explored whether curiosity is a curse and, in particular, whether the desire to resolve curiosity can lead humans to seek information despite predictably undesirable consequences. This question is especially relevant to the current epoch, the epoch of information, and to the scientific community, a community with high curiosity. An answer to this question could shed light on why humans, including scientists, seek information (e.g., how to manipulate the human genome and how to develop new weapons of mass destruction) and whether it is possible that they do so to satisfy their curiosity without paying sufficient attention to potential negative consequences.

Prior research has shown that curiosity may lead people to seek potentially unpleasant information, such as about their spouses' sexual history (Kruger & Evans, 2009) and about the results of their medical tests; however, such information may bring long-term benefits, such as helping the recipient improve his or her marital or medical decisions. Prior research has also shown that curiosity may lead people to seek information with little or no long-term benefits, such as information on celebrities' sexual histories (McNamara, 2011) and the results of sports games (Knobloch-Westerwick, Pradu, Eastin, Tamborini, & Greenwood, 2009); however, such information may be entertaining and hence bring immediate pleasure. In the current research, we showed that curiosity may lead people to seek information that provides neither immediate pleasure nor long-term benefits; that is, people had a pure desire to resolve curiosity.

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Hypotheses

Consider a person whose attention is drawn to a sealed box. She is uncertain about its contents but expects them to be aversive (e.g., flies or mosquitoes). Further, suppose that the information gained from opening the box brings little or no long-term benefit (e.g., it would not help her avoid flies or mosquitoes in the future). Will she open the box? According to consequentialist considerations, she will not.

We predict otherwise. We propose that humans possess an inherent desire to resolve uncertainty. When their attention is drawn to a sealed box, they will feel curious and, when curious, they will be tempted to open it to resolve the uncertainty. This proposition was inspired by Loewenstein's interpretation of curiosity as a desire to close an information gap (Golman & Loewenstein, 2015; Loewenstein, 1994). We argue that the desire to resolve uncertainty exists independently of consequentialist considerations, such as the valence of the outcome or the benefit of the information. The desire, we surmise, is an overgeneralized tendency—learned and internalized in situations in which resolving uncertainty brings desirable outcomes and carried over to situations in which it does not (Arkes & Ayton, 1999).

Thus, our central tenet is that the desire to resolve uncertainty will lead people to "open the box," even if the contents are expectedly negative. (For ease of exposition, we use the metaphor of *opening the box* throughout to refer to taking an action that leads to an expected negative outcome.) This tenet yielded several testable hypotheses. The primary hypothesis concerned uncertainty. Because we attributed the tendency to open the box to the desire to resolve uncertainty, we considered the presence of uncertainty to be pivotal. If no uncertainty existed, people would be less likely to open the box. This led to our first (primary) hypothesis:

> Hypothesis 1. People are more likely to open the box if the outcome is uncertain and expectedly negative than if the outcome is certain and neutral or certain and negative.

We refer to this effect as the *Pandora effect*. In our studies, we aimed to show that people would exhibit this effect even if the uncertain outcome was objectively worse than the certain outcome. Our theory also yielded secondary hypotheses. Because we predicted that people would be more likely to open the box if the outcome was uncertain rather than certain, we also predicted that they would end up experiencing more negative outcomes, and would therefore feel worse, when the outcome was uncertain rather than certain. In other words, the Pandora effect entailed a hedonic cost. Although people might feel temporarily relieved on opening the box and resolving the uncertainty (Golman & Loewenstein, 2015; Ruan et al., 2015; Litman, 2005; Loewenstein, 1994), this positive feeling might not withstand the negative feeling incurred by experiencing the negative outcome. Therefore, we predicted that people with uncertain outcomes would still feel worse. This was our second hypothesis:

> Hypothesis 2. On average, people feel worse if the outcome of opening the box is uncertain and expected to be negative than if it is certain and neutral or certain and negative.

According to our theory, people would open the box not because they had carefully considered hedonic consequences and concluded that they would be happier by opening the box; rather, they would open the box because they failed to carefully consider the hedonic consequences and were eager to resolve the uncertainty. Thus, we proposed that prompting people to predict hedonic consequences would attenuate their tendency to open the box. Moreover, because the tendency to open the box depended on uncertainty, we hypothesized that prompting people to predict hedonic consequences would attenuate the Pandora effect. This led to our third hypothesis:

> Hypothesis 3. People are less likely to exhibit the Pandora effect postulated in Hypothesis 1 if they are prompted to predict hedonic consequences than if they are not.

Extant literature shows that curiosity can drive people to seek miserable experiences, such as watching horrendous scenes (Zuckerman & Litle, 1986), exploring dangerous terrains (Kashdan, Rose, & Fincham, 2004; Loewenstein, 1999), and trying ruinous drugs (Green, 1990). However, such evidence comes largely from noncontrolled research. Therefore, it is unclear whether these activities are unique to specific individuals or are characteristic of the average person. It is also unclear whether people engage in these activities to resolve uncertainty or for other purposes, such as to enjoy schadenfreude or display heroism. In the current research, we recruited ordinary people as participants and conducted controlled experiments to minimize such confounding factors.

We report four studies in which we tested our hypotheses. We admire classic studies, such as Asch (1956), that use simple lab procedures (e.g., estimating a line) to elucidate complex real-world issues (e.g., the tendency to conform). We endeavored to emulate such studies when designing ours; we used simple procedures, such as touching a device and listening to a sound, to reveal people's desire to open the box. In an attempt to demonstrate not just the existence of this desire but also its power and peril, we adopted some of the most negative stimuli we could ethically apply on human participants—electric-shock devices, pictures of insects, and the sound of fingernails scratching a chalkboard.

Study 1

Method

In Study 1, we tested the Pandora effect (Hypothesis 1) using prank pens that might deliver electric shocks if clicked. In this case, clicking the pen represented opening the box.

We recruited participants from a large private university in the United States and paid them a fixed fee. On the basis of pilot tests, we expected the true effect size to be large (d = 0.8). A power analysis indicated that a sample size of 50 participants was required for the study to have 80% power to detect such an effect. We collected data until the close of the day on which the actual sample size reached or exceeded 50. The final sample size was 54 (24 women; mean age = 27.67 years).

To prevent participants from guessing our hypothesis, we embedded the study in another study. Each participant completed the study individually in a private room. A research assistant told the participant that the task was to evaluate some stimuli for a future study and that the stimuli would not be available until a few minutes later. The research assistant then showed the participant a set of prank electric-shock pens on a table and said that these pens were leftovers from a past study and that the participant did not need to evaluate them but could click them if he or she wanted to kill time. The research assistant asked the participant to put all the pens that had been clicked in an adjacent container. This procedure served two purposes—it made it easy for us to count how many pens each participant had clicked, and it dispelled the participant's desire (if any) to help us (i.e., the experimenters) identify which pens shocked and which did not (because all the pens were put in the same container and were indistinguishable).

The electric-shock pens used in this study resemble normal ballpoint pens. If a person clicks one, the person will receive an electric shock of approximately 60 V. In a pretest (N = 20), the shock was rated to be negative; specifically, it was rated significantly below the neutral midpoint of a 9-point negative-to-positive rating scale (M = 3.05, SD = 1.32), $t(19) = -6.62$, $p < .001$.

Each participant was randomly assigned to one of two conditions: the certain-outcome condition and the uncertain-outcome condition. In each condition, there were 10 pens on the table. In the certain-outcome condition, 5 of the 10 pens bore a red sticker, and the other 5 had a green sticker. The research assistant informed the participant that the pens with red stickers contained batteries and would deliver a painful though harmless electric shock if clicked, whereas the pens with green stickers had no batteries and would not deliver electric shocks if clicked. In the uncertain-outcome condition, all 10 pens carried yellow stickers; the research assistant informed the participant that some of the pens contained batteries and would deliver a painful though harmless electric shock if clicked, whereas the others had no batteries and would not deliver electric shocks. After giving the instructions, the research assistant sat back in a chair some distance from the participant, as if waiting for the stimuli that the participant was supposed to evaluate; after about 4 min, the research assistant went out to fetch the stimuli (a set of stink bombs), returned, and asked the participant to rate them.

Results

Intuition suggests that participants should have clicked fewer pens in the uncertain-outcome condition than in the certain-outcome condition, given that in the uncertain-outcome condition, they ran the risk of receiving electric shocks by clicking the pens, whereas in the certain-outcome condition, they could choose to click only the pens that were certain not to shock them (if they wanted to kill time), only the pens certain to shock them (if they wanted to find out what the electric shocks felt like), or some combination of the two. But the pattern of results was the opposite. Participants clicked more of the pens with an uncertain outcome (M = 5.11, SD = 3.88) than of the pens certain not to shock them (M = 1.30, SD = 1.46), the pens certain to shock them (M = 1.74, SD = 1.70), and the total number of the two types of pens with certain outcomes (M = 3.04, SD = 2.81), $t(52) = 2.25$, $p = .029$, $d = 0.61$, 95% confidence interval (CI) for the mean difference = [0.22, 3.92] (Table 1). This finding provided initial evidence for Hypothesis 1, suggesting that curiosity could even lead people to expose themselves to electric shocks. In the General Discussion section, we address potential alternative explanations, such as demand, variety seeking, and boredom.

Study 2

Method

We wanted to test the robustness of the Pandora effect. Therefore, Study 2 extended Study 1 in two ways. First, we manipulated the outcome within participants, to determine whether the same individual would click more pens when the outcome was uncertain rather than certain. Second, we kept the number of uncertain-outcome

Table 1. Key Results for Studies 1 Through 3

Study and dependent variable	Certain-outcome condition	Uncertain-outcome condition
Study 1 (between participants)		
Pens clicked	3.04	5.11
Study 2 (within participants)		
Pens clicked	2.72	4.16
Study 3 (between participants)		
Buttons pressed	28.16	39.29
Feelings rating	4.57	3.75

Note: In Study 1, there were 10 pens in each condition. In Study 2, there were 30 pens, 20 in the certain-outcome condition and 10 in the uncertain-outcome condition. In Study 3, there were 48 buttons in each condition. The feelings scale ranged from 1 to 7; higher numbers indicate better feelings.

pens at 10 but increased the number of certain-outcome pens from 10 (5 pens certain not to shock and 5 pens certain to shock) to 20 (10 pens certain not to shock them and 10 pens certain to shock them), to see whether participants would still click more uncertain-outcome pens even though the base rate made it harder for us to confirm our hypothesis.

We recruited participants from a large private university in the United States and paid them a fixed fee. Because this study used a within-participants design, we chose a small sample size of 30, and we collected data until the end of the day on which the actual sample size reached or exceeded that number. The final sample size was 32 (20 women, mean age = 20.09 years).

The study followed the same procedure as Study 1 except that all participants were shown 30 pens, of which 10 carried red stickers (pens certain to shock them), 10 green stickers (pens certain not to shock them), and 10 yellow stickers (uncertain-outcome pens).

Results

As described earlier, there were twice as many certain-outcome pens (20) as uncertain-outcome pens (10). Had participants randomly chosen pens to click, they should have clicked twice as many certain-outcome pens. But the result revealed the opposite pattern: They clicked more of the pens with an uncertain outcome (M = 4.16, SD = 3.67) than of the pens certain not to shock them (M = 1.69, SD = 2.29), the pens certain to shock them (M = 1.03, SD = 1.79), and also the total number of the two types of pens with certain outcomes (M = 2.72, SD = 2.94), $t(31) = 2.08$, $p = .046$, $d = 0.37$, 95% CI for the mean difference = [0.03, 2.85] (Table 1). This result replicated the Pandora effect and attested to its power.

Study 3

Method

In Study 3, we attempted to achieve two objectives: first, to replicate the Pandora effect (Hypothesis 1) in another domain (sounds); second, to show that the Pandora effect entails a hedonic cost (i.e., it affects the participants' feelings; Hypothesis 2).

Fifty-three students (21 women, mean age = 20.15 years) from a large private university in the United States partook in the study for a fixed payment. We expected the true effect size for feelings (i.e., hedonic cost) to be similar to that for choices, and so we determined the sample size for this study as we did for Study 1.

Participants completed the study individually on a computer and wore earphones. The instructions informed participants that the study was about reactions to sounds and that once the study began, they would see 48 buttons displayed simultaneously on a computer screen. Each button was labeled "nails," "water," or "?": If they clicked a "nails" button, they would hear a the sound of fingernails scratching a chalkboard for 4 s; if they clicked a "water" button, they would hear the sound of water pouring into a jar for 4 s; and if they clicked a "?" button, they had an equal chance of hearing either sound. They were informed that the study would last several minutes, during which they should feel free to click as few or as many buttons as they pleased. While participants were not clicking buttons, they could sit back and relax. To prevent them from feeling bored, the computer continuously played a piano piece ("Twinkle, Twinkle, Little Star") at low volume in the background. After the instructions were given, the study commenced.

In a pretest (N = 28), the fingernails-on-a-chalkboard sound was rated as negative (i.e., significantly below the neutral midpoint of a 7-point negative-to-positive rating scale; M = 1.86, SD = 1.04), $t(27) = -10.86$, $p < .001$; the water sound was rated as neutral (i.e., not significantly different from the neutral point of the scale; M = 3.96, SD = 1.35), $t(27) = -0.14$, $p = .889$; and the background music was rated as positive (i.e., significantly above the neutral point of the scale; M = 5.96, SD = 1.14), $t(27) = 9.13$, $p < .001$.

Like Study 1, this study consisted of two between-participants conditions: the uncertain-outcome and certain-outcome conditions. In the uncertain-outcome condition, most buttons (44 of 48) were unidentified and labeled "?"; only 4 were identified, 2 of which were labeled "nails" and 2 were labeled "water." In the certain-outcome condition, most buttons (44 of 48) were identified, 22 of which were labeled "nails" and 22 were labeled "water"; only four were unidentified and labeled "?"

The study lasted 300 s. Every 30 s throughout the period, a question appeared on the screen that read, "How do you feel now?" and prompted participants to respond on a 7-point scale. Higher numbers indicated better feelings.

Results

Choice. In this study, opening the box was operationalized as clicking a button. Intuition suggests that participants should have clicked fewer buttons in the uncertain-outcome condition than in the certain-outcome condition to avoid hearing the aversive nails sound; in the certain-outcome condition, they could choose to hear only the neutral water sounds. But again, the results revealed the opposite pattern and supported Hypothesis 1: Participants in the uncertain-outcome condition clicked more buttons (M = 39.29, SD = 12.76) than participants in the certain-outcome condition (M = 28.16, SD = 16.18), $t(51) = 2.79$, $p = .007$, $d = 0.77$, 95% CI for the mean difference = [3.14, 19.12]. (Recall that 4 of the 48 buttons in the certain-outcome conditions were unidentified and 4 of the 48 buttons in the uncertain-outcome conditions were identified. Even if these buttons were excluded, the results remained the same.)

Feelings. We observed a significant correlation between choice and feelings: The more buttons a participant clicked (i.e., the more sounds the participant chose to hear), the worse he or she felt, $r = -.40$, $t(51) = -3.11$, $p = .003$. We also found that participants in the uncertain-outcome condition felt significantly less happy (M = 3.75, SD = .81) than participants in the certain-outcome condition (M = 4.57, SD = .65), $t(51) = -4.02$, $p < .001$, $d = 1.11$, 95% CI for the mean difference = [−1.23, −0.41]. Consistent with Hypothesis 2, the findings suggest that curiosity led people to open the box and then suffer.

Study 4

Method

In Study 4, we tested the moderating effect of hedonic prediction (Hypothesis 3). To test the generalizability of the effect, we used a different set of stimuli (pictures) and a different means of manipulating uncertainty in this study. In Studies 1 to 3, the stimuli were either neutral or negative (e.g., the water sound or the fingernails-on-a-chalkboard sound), and the uncertainty lay in whether the final outcome was neutral or negative. In Study 4, the stimuli were all negative (pictures of disgusting insects), and the uncertainty lay in which negative stimulus (i.e., which insect) was the final outcome.

We conducted this study on Amazon's Mechanical Turk and paid participants a fixed fee. Because we aimed to detect an interaction effect in a 2 × 2 design and because the study was conducted online, we set a large target sample size of 280 (see Simonsohn, 2015). We received completed responses from 274 participants (154 women; mean age = 38.29 years).

The stimuli for the study were five pictures, each displaying a different insect—a bedbug, a centipede, a cockroach, a mosquito, or a silverfish. In a pretest (N = 30), all the pictures were rated as negative (i.e., significantly below the neutral midpoint of a 5-point negative-to-positive rating scale), $t(29)$s ranged from −10.14 to −7.58, ps < .001. During the study, the insect pictures were initially covered, and participants could choose to view or skip them. In this study, viewing a covered insect picture represented opening the box.

The study had a 2 (outcome condition: certain, uncertain) × 2 (response condition: choice only, prediction plus choice) design. In all conditions, participants were told that the study was about insect pictures and that during the study, they would encounter 30 covered insect pictures. They were informed that they must view three of them and could choose to view or skip the rest. Participants then underwent 30 consecutive rounds. In each round, a rectangle representing a covered picture would appear on the screen. In the certain-outcome condition, the covered picture specified which insect was behind it by displaying the name of the insect (e.g., "Mosquito"). In the uncertain-outcome condition, the covered picture did not specify which insect was behind it and simply displayed a question mark. In a pretest (N = 50), the covered pictures in the uncertain-outcome condition indeed aroused more curiosity (M = 2.36, SD = 1.08) than the covered pictures in the certain-outcome condition (M = 1.49, SD = .65, ranked on a 5-point scale, with higher numbers indicating greater curiosity), $t(48) = 3.53$, $p < .001$.

In the choice-only condition, once a covered picture appeared on the screen, participants were directly asked to decide whether to view or skip it. In the prediction-plus-choice condition, once a covered picture appeared on the screen, participants were first asked to predict whether viewing it or skipping it would make them feel better and were then asked to decide whether to view or skip it.

In all the conditions, if participants chose to view a covered picture, the covered picture would turn into the corresponding insect picture and stay on the screen for 3 s. If they chose to skip it, the picture would not appear. At the end of each round, participants were prompted to rate their feelings on a 5-point scale, with higher numbers indicating better feelings. After that, the next round began. This process repeated for all the 30 rounds.

Results

Choice. To test Hypothesis 3, we conducted a 2 (outcome condition: certain, uncertain) × 2 (response condition: choice only, choice plus prediction) analysis of variance (ANOVA) on choice (i.e., whether the participant did or did not choose to view the picture). The analysis yielded a main effect of outcome condition, $F(1, 270) = 26.74$, $p < .001$, $\eta_p^2 = .09$; no main effect of response condition, $F(1, 270) = 1.67$, $p = .197$, $\eta_p^2 = .01$; and an interaction effect, $F(1, 270) = 5.40$, $p = .021$, $\eta_p^2 = .02$. Overall, participants viewed more pictures if the outcomes were uncertain rather than certain, which replicated the Pandora effect found in the other studies, but this effect was significantly weaker in the prediction-plus-choice condition than in the choice-only condition. Supporting Hypothesis 3, the results suggest that predicting hedonic consequences moderates the Pandora effect.

Additional analyses provided further insight: When the pictures were uncertain, participants viewed significantly more pictures if they made choices without first predicting hedonic experiences (i.e., in the choice-only condition) than if they made choices after predicting hedonic experiences (i.e., in the prediction-plus-choice condition), $F(1, 270) = 6.44$, $p = .012$. When the pictures were certain, this effect vanished, $F(1, 270) = 0.54$, $p = .464$ (see Table 2). As the results suggest, predicting hedonic experiences reduced people's tendency to open the box when the outcome was a priori uncertain.

Feelings. Replicating the results of Study 3, Study 4 also found a significant correlation between choice and feelings: The more pictures participants viewed, the worse they felt, $r = -.45$, $t(272) = -8.35$, $p < .001$. A 2 (outcome condition: certain, uncertain) × 2 (response condition: choice only, prediction plus choice) ANOVA on feelings yielded a main effect of outcome condition, $F(1, 270) = 17.67$, $p < .001$, $\eta_p^2 = .06$, and a main effect of response condition, $F(1, 270) = 5.35$, $p = .022$, $\eta_p^2 = .02$, but no significant interaction effect, $F(1, 270) = 1.07$, $p = .301$, $\eta_p^2 = .004$. Overall, participants in the uncertain-outcome condition were less happy than participants in the certain-outcome condition, yet participants who made predictions before making choices were happier than participants who did not.

General Discussion

This set of simple and controlled experiments demonstrated that curiosity can induce people to open a box when aversive consequences are expected. Specifically, we observed what we term a Pandora effect: People were more likely to open a box if its outcome was a priori uncertain and negative than if its outcome was certainly neutral or certainly negative. Moreover, people opening the box did suffer, but urging them to predict hedonic consequences could attenuate their tendency to open the box. In the remainder of this article, we discuss alternative explanations for and implications of our findings.

Potential alternative explanations

Boredom, obligation, and variety seeking. According to these explanations, participants opened the box (e.g., clicked pens with potential electric shocks) because they were bored (Hsee, Yang, & Wang, 2010; Wilson et al., 2014), because they felt obligated to do something in the study, or because they wanted to seek variety (Simonson, 1990). Although these accounts could explain why participants opened the box at all, they cannot explain the Pandora effect (i.e, the difference between the certain-outcome and the uncertain-outcome conditions). For example, if participants wanted variety, they could have chosen different stimuli to experience even in the certain-outcome condition.

Curiosity about the outcome, about one's prediction, or about the stimulus? One might ask what exactly the participants in our studies were curious about. There were three possibilities—curiosity about the outcome (e.g., whether a pen would shock or not), curiosity about one's ability to predict the outcome (e.g., whether the participant was able to predict whether a pen would shock or not), and curiosity about the stimulus itself (e.g., what the electric shock would feel like). These three types of curiosities were not mutually exclusive. In our view, curiosity about the outcome was most likely and was common to all the

Table 2. Key Results for Study 4

	Choice-only condition		Prediction-plus-choice condition	
Dependent variables	Certain outcome	Uncertain outcome	Certain outcome	Uncertain outcome
Pictures for which a prediction was made (0–30)	—	—	9.87	12.48
Pictures viewed (0–30)	9.24	16.33	10.21	12.91
Feelings rating (1–5)	2.87	2.52	2.96	2.75

Note: On the feelings scale, higher numbers indicate better feelings.

studies. Curiosity about prediction was less likely. In addition, this explanation requires the assumption that participants predicted the outcomes. Predicting outcomes was effortful and not always rewarding; for example, in Study 4, the uncertain-outcome condition involved five possible outcomes (five different insects), so it would have been hard to correctly predict the outcome. Finally, curiosity about the stimulus was least likely; if participants were simply curious about what the electric shocks would feel like, they could have clicked the pens certain to shock them rather than the uncertain-outcome pens.

Prospect theory. Our finding that people were more likely to open the box when the outcome was uncertain rather than certain appears similar to prospect theory's proposition that people are risk seeking in losses (Kahneman & Tversky, 1979). But a closer look suggests otherwise: Prospect theory predicts that people prefer uncertain negative options over certain negative options with the same expected value. We found that people preferred uncertain negative stimuli over even certain neutral stimuli, which prospect theory would not predict.

Sampling artifact. According to this account, the Pandora effect is a statistical artifact caused by participants' desire to sample different stimuli. Take Study 1, for example. Suppose participants wanted to sample one pen certain to shock them and one pen certain not to shock them. Statistically speaking, it would take participants more rounds to achieve this goal in the uncertain-outcome conditions than in the certain-outcome condition. Although this account could explain the result of Study 1, it could not explain the results of Study 2 or Study 3. Study 2 adopted a within-participants design; if participants had just wanted to sample one pen certain to shock them and one pen certain not to shock them, they could have clicked only the certain-outcome pens. Study 3 included only two stimulus sounds (water and fingernails on a chalkboard); the desire to sample stimuli does not explain why participants in the uncertain-outcome condition listened to the sounds so much more (11 more times) than participants in the certain-outcome condition.

Demand or hypothesis guessing. According to this account, participants guessed we wanted them to experience more uncertain stimuli than certain stimuli, and therefore they did so. Although we could not completely rule out this possibility, we did our best to minimize it, and we doubt it is a highly viable explanation. For example, in Studies 1 and 2, we embedded the real experiment in another experiment, and told participants the stimuli (the electric-shock pens) were leftovers from a previous study and did not need to be evaluated. Moreover, even if participants had tried to guess our intention, they were as likely to have guessed that we wanted them to click the pens that were certain to shock them as to have guessed that we wanted them to click the uncertain-outcome pens.

Implications and conclusion

When individuals encounter a sealed box, should they open it? More broadly, when curious, should individuals take actions to discover the missing information and resolve their curiosity? We do not suggest that individuals should never satisfy their curiosity, and we realize that curiosity resolution can yield valuable knowledge—knowledge that brings immediate pleasure, long-term benefits, or both.

Although we recognize the value of curiosity resolution, we also wish to make a contrarian point—curiosity resolution is not always beneficial. We try to use the small experiments in this research to make a big point—curious people do not always perform consequentialist cost-benefit analyses and may be tempted to seek the missing information even when the outcome is expectedly harmful.

As we asked earlier, why do humans, including scientists, seek information, including information about how to manipulate the human genome and how to develop new weapons of mass destruction? One possibility is that they want to benefit humanity. Another possibility is that they want to satisfy their curiosity. Just as curiosity drove Pandora to open the box despite being warned of its pernicious contents, curiosity may tempt humans to seek information with ominous consequences. With this possibility in mind, we hope the current research draws attention to the risk of information seeking in the age of information.

Action Editor

Hal Arkes served as action editor for this article.

Author Contributions

The authors contributed equally to the project. Both authors contributed to the concept and to the design of the studies. Data were collected by B. Ruan and by research assistants under the supervision of the authors. B. Ruan performed data analyses. C. K. Hsee drafted the manuscript, and B. Ruan provided critical revisions. Both authors approved the final version.

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Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

Supplemental Material

Additional supporting information can be found at http://pss.sagepub.com/content/by/supplemental-data

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