



Optimizing Product Trials by Eliciting Flow States: The Enabling Roles of Curiosity, Openness, and Information Valence

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Purpose

Product trials are an effective way to influence consumer attitudes. While research has established several factors that influence whether consumers will try a product or not, it is less understood how marketers can optimize the trial experience itself. This research explores flow as an optimal state and the factors that give rise to it during a product trial.

Design/Methodology

This research consists of three experimental studies in which people trial new music. We explore the ability of curiosity to optimize consumers' flow experience during the trial and their attitudes towards the trialed product. We manipulate curiosity before the trial using information about the music (Study 1) and music previews (Study 3) and we also demonstrate that curiosity is naturally elevated amongst those high in openness to experience (Study 2).

Findings

Our results demonstrate that curiosity before a product trial fosters the optimal experience of flow during the trial, defined as an enjoyable state of full engagement, which in turn mediates more positive attitudes towards the trialed product. We demonstrate that curiosity can be evoked using product information or a preview of the content and can vary based on individual differences in openness to experience. The relationship between curiosity and flow is moderated by the valence of the information that is used to elicit curiosity, such that negatively valenced information thwarts the relationship.

Research Limitations

While our studies focus on the positive influence of curiosity in the trial of music, the effects may be different for other products. Our studies are also limited to two different manipulations of curiosity.

Practical Implications

This research has implications for marketers, as it demonstrates the relevance of flow and how to enable it in product trials to optimize effectiveness. Our manipulations also demonstrate how to manage the amount of information that is given to consumers before they trial a product.

Originality

This research reveals that flow states optimize the product trial experience. Our research also advances our understanding of the relationship between curiosity and flow by moderating their relationship with the valence of information that elicits curiosity. The findings also broaden the relevance of curiosity and flow in marketing by demonstrating their benefits within product trials.

OPTIMIZING PRODUCT TRIALS

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3 Marketers have a wide variety of promotional tactics to increase engagement with their
4 brand. Of the various tactics, product trials have been well-established as one of the most
5 effective ways to shape consumer attitudes and behavior (Smith and Swinyard 1983). The
6 support for the effectiveness of product trials is reflected in marketing practice, as product trials
7 are becoming increasingly common in the marketplace, especially with digital services and
8 software including applications “apps” (Cheng and Liu 2012). Many common services such as
9 the Spotify® music streaming app and Amazon Prime® offer a trial of their service or some of
10 its features, often at a discounted rate (Green 2019; Spotify 2021).
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22 Given the persuasive potential of product trials, marketing researchers have focused on
23 factors that influence the likelihood of consumers deciding to trial a product, including individual
24 differences (Steenkamp and Gielens 2003), social/psychological processes (Iyengar and Van den
25 Bulte 2015) and marketing mix elements (Donnelly Jr. and Etzel 1973; Sinapuelas, Wang and
26 Bohlmann 2015). However, not all product trials are effective, and they can in fact have a
27 negative influence on consumers (Lee 2015). This highlights the importance of understanding
28 factors that increase the quality of the trial experience.
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38 Despite the importance of managing the quality of a trial experience, research on the
39 topic is relatively scant. Extant research has focused on the influence of prior advertising on the
40 product trial experience and on consumers’ cognitive processing within the trial in particular
41 (e.g. Kamins, Alpert and Elliott 2000; Chang 2004; Micu and Coulter 2012; Kempf, Laczniak
42 and Smith 2006; Kempf and Smith 2008; Wang 2014a). However, there is evidence that
43 affective responses formed in product trials override cognitive structures (Kim and Morris 2007).
44 Together, these findings suggest the need to explore factors that positively influence the affective
45 aspect of a trial experience in addition to the cognitive aspect. Moreover, from a practical
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standpoint, expecting that consumers see an advertisement in order to encourage a product trial is rather unreliable. Consumers are exposed to brand and product information in several forms other than traditional advertising and marketers have the potential to provide pre-trial information in a more reliable way, such as giving product details or reviews.

We address these gaps in the literature by exploring how to optimize product trials from an affective and cognitive perspective while influencing consumers using tactics beyond traditional advertising. Specifically, we explore how to induce a flow state during product trials, since flow is an optimal experience from both a cognitive and affective perspective (Csikszentmihalyi and LeFevre 1989). Cognitively, flow is a state of seemingly effortless concentration in which full attention is devoted to the present moment (Csikszentmihalyi 1990; Keller and Bless 2008). Affectively, flow is renowned for its inherently enjoyable nature and for leading to extreme feelings of happiness (Csikszentmihalyi 2000; Seifert and Hedderson 2010; Tsaur, Yen and Hsiao 2013). Given these qualities, we expect that experiencing flow during a product trial will mediate increased attitudes towards that product. In order to leverage the power of flow, we also explore some factors that give rise to it.

A series of three studies in the context of sampling new music demonstrate that curiosity, which is experienced as a desire for information (Loewenstein 1994), gives rise to flow during the product trial, which in turn mediates product attitudes. We demonstrate that curiosity can be increased by revealing written information about the product or by previews of the actual product, as well as by individual differences in openness to experience. We also demonstrate that the relationship between curiosity and flow is moderated by the valence of information that elicits curiosity, such that negatively-valenced information thwarts the relationship by limiting the fluent experiences that are characteristic of flow.

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3 In addition to advancing the product trial literature by demonstrating factors that optimize
4 the trial experience, including the affective component, our findings also make other
5 contributions to marketing theory and practice. From a theoretical perspective, our moderation
6 findings contribute to the understanding of the relationship between curiosity and flow, such that
7 the relationship depends on the valence of information that elicits curiosity, while the literature
8 currently depicts a uniformly strong and positive relationship between the two. Our results also
9 provide practical insights for marketers with regards to enhancing the quality of a product trial.
10 Most notably, we highlight the role of curiosity and the importance of how much information is
11 given before the trial. We demonstrate that too much or too little information thwarts curiosity
12 and in doing so, limits flow during the trial and attitudes towards the product.
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28 **CONCEPTUAL DEVELOPMENT**

29 *Product Trials*

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33 Product trials are regarded as one of the most effective ways to communicate information
34 about a product and to subsequently increase consumer engagement (Smith and Swinyard 1983).
35 Product trials have been demonstrated to have a variety of benefits for both consumers and
36 companies including increased learning, purchase intent, purchase and brand loyalty (Scott 1976;
37 Wang et al. 2013). The effectiveness of product trials has been supported for a wide range of
38 products, from tangible ones like beverages to less tangible ones like music and software (Cheng
39 and Liu 2012; Kempf and Laczniak 2001; Singh, Balasubramanian and Chakraborty 2000).
40 Product trials are also particularly beneficial in facilitating consumer adoption of new
41 technologies (Soscia, Arbore and Hofacker 2011; Wang et al. 2013).
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3 Product trials are a powerful marketing tool because the attitudes that result from them
4 are stronger than attitudes resulting from other sources of product information, including
5 advertising (Kamins, Alpert and Elliott 2000; Smith 1993). This is in part due to their increased
6 influence on information acceptance and belief confidence (Smith and Swinyard 1988). Product
7 trials also have superior effects on recall and purchase intent (Singh et al. 2000). Once an attitude
8 is formed from a product trial, it is difficult to change it with advertising, while attitudes formed
9 by other forms of promotion are more malleable and subject to change (Smith 1993). Given the
10 persuasive power of product trials, research efforts have focused on how to encourage consumers
11 to trial a product.
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24 Several individual differences have been demonstrated to increase the likelihood of trial,
25 including dispositional innovativeness, market mavenism, information seeking, and product
26 involvement, and others decrease the likelihood of trial, such as perceived risk and the
27 susceptibility to normative influence (Arts, Frambach and Bijmolt 2011; Schiffman 1972;
28 Steenkamp and Gielens 2003). In their model of factors that influence the likelihood to trial a
29 product, Steenkamp and Gielens (2003) offer several marketing factors that have a positive
30 influence, including the amount of advertising for the product, the strength of the brand and the
31 novelty of the product. Emotional arousal has also emerged as an effective way to encourage trial
32 as elicited by the animation speed of product messaging (Duff and Sar 2015) and product
33 newness (Donnelly and Etzel 1973).
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47 While research has focused on how to get people to trial a product, research on how to
48 optimize the product trial experience itself is relatively scant. This is problematic because
49 oftentimes trials lead to feelings of discomfort and consumers subsequently disengage with the
50 brand (Lee 2015). This opens the door to a fruitful stream of research dedicated to understanding
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3 the keys to fostering a favorable product trial. Kempf and Smith (1998) developed a model that
4 is helpful in this regard, as it highlights the psychological processes that underlie effective
5 product trials, which includes cognitive and affective aspects of the evaluation as well as the role
6 of prior advertising. In addition to thoughts evaluating how diagnostic and credible the trial is,
7 the importance of emotion is highlighted in their model, and in particular, the degree of both
8 pleasure and arousal that is generated by the trial.
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17 Research has since focused on how exposure to prior advertising influences the product
18 trial experience, with an emphasis on how it influences cognitive processing (e.g. Chang 2004;
19 Kempf and Laczniak 2001). For example, advertising prior to a trial can act as a schema to guide
20 attention within product trials and can increase the perceived diagnosticity of the trial and the
21 consumer's attitude confidence (Micu and Coulter 2012; Moore and Lutz 2000; Kempf and
22 Laczniak 2001). Similarly, prior advertising can have a positive effect on attitudes by giving rise
23 to positive confirmations, such that consumers look for and experience cues that confirm the
24 performance or quality claims from the advertisement and thus influence their perceptions when
25 looking back on the experience (Deighton and Shindler 1988).
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38 While much of the literature demonstrates that pre-trial advertising has a positive
39 influence on trial experience or resulting attitudes, research also demonstrates that sometimes it
40 has no influence (e.g. Hoch and Ha 1986). Related to this inconsistency, there is research which
41 explores moderators of the relationship between pre-trial advertising and product trial
42 experiences, including gender (Kempf, Laczniak and Smith 2006; Wang 2014a), consumer
43 expertise and the nature of the trial experience (Kempf and Smith 1998). For example, Yi (1993)
44 reveals that for ambiguous product trials, in which it is difficult to evaluate the quality of the
45 product, pre-trial advertisements have increased capability to influence the trial experience. Mica
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3 and Coulter (2012) also reveal the importance of the nature of the product and the content of the
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5 advertisement, such that pre-trial advertisements that use objective claims are most effective for
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7 utilitarian goods, while objective and subjective claims both positively influence post-trial
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9 attitudes for hedonic goods.
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12 While the focus of the literature has been on factors that influence the cognitive aspect of
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14 product trials, research suggests that the affective responses formed in product trials override
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16 cognitive structures (Kim and Morris 2007). With limited research exploring the factors that
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18 bolster the affective aspect of product trials and that efforts to influence the trial sometimes have
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20 limited to no influence (Hoch and Ha 1986), our research advances the literature by exploring
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22 factors that optimize product trials, including the quality of both the affective and cognitive
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24 aspects of the experience. Specifically, we explore the state of flow as a way to optimize the trial
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26 experience and the factors that will enable it.
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30 *Flow: An Optimal Experience*

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33 Flow is often described as an optimal experience from both a cognitive and affective
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35 perspective (Csikszentmihalyi 2000). Cognitively, flow is a state of full yet seemingly effortless
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37 attention in which one is fully absorbed in the present moment and from an affective perspective,
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39 it is renowned for its intrinsically enjoyable (autotelic) nature and for eliciting high levels of
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41 happiness (Csikszentmihalyi 2000; Fredrickson 2001). While subjectively experienced as having
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43 total control and a sense of calm, flow is a state of activation with moderate levels of arousal
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45 (Peifer et al. 2014). These characteristics map perfectly onto the cognitive and affective
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47 processes that are suggested to drive effective product trials (Kempf and Smith 1998).
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50 Specifically, it elicits emotional pleasure and arousal while also providing the necessary
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3 attentional resources to process and discern the diagnosticity of the trial from a cognitive
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5 perspective.
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8 Although flow is characterized by several different experiences, it is driven by two
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10 underlying dimensions (Lavoie, Main and Stuart-Edwards 2021). The first dimension, known as
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12 absorption, involves sustained concentration over a long period of time (Dietrich 2004). Some
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14 examples of experiences that exemplify this dimension include the merging of action and
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16 awareness, time distortion, and loss of self-consciousness (Csikszentmihalyi 2000). The second
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18 dimension, known as fluency, refers to the more inherently enjoyable nature of flow and the
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20 experience of everything going smoothly, often through mastery of a task (Lavoie and Main
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22 2019a; Lavoie et al., 2021). This dimension is characterized by feelings of automaticity, or an
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24 ease in one's actions and thoughts, and a high degree of control (Engeser and Rheinberg 2008;
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26 Moneta 2012).
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31 All flow states are comprised of both dimensions, but their duration and intensity differs
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33 based on the nature of the activity that elicits them. At one end of the continuum are deepflow
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35 states, which are what individuals typically associate with flow. Deepflow states are elicited by
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37 relatively complex activities, are longer in duration, and are more intense. Examples of activities
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39 that may give rise to deepflow states include surfing on whitewater rivers (Mackenzie, Hodge
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41 and Boyes 2011), engaging in sexual activities (Privette 1983), and cruising a boat across the
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43 ocean (MacBeth 1988). On the opposite end of the continuum are microflow states, which are
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45 experienced far more frequently. Microflow states are elicited by relatively simple and short
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47 tasks, such as listening to music (Privette 1983), reading (Magyaródi and Oláh 2015), and
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49 playing video games (Lavoie and Main 2019a).
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3 Flow states can arise throughout the consumption process and everyday life in general
4 (Csikszentmihalyi and Lefevre 1989). For example, findings have demonstrated that flow can
5 occur during information searches (Novak, Hoffman and Yung 2000), while engaging with
6 advertising materials (Bittner and Schipper 2014), during online shopping (Novak, Hoffman and
7 Duhachek 2003), and during product usage (Keller and Bless 2008). Flow is often facilitated by
8 technology (Ghani and Deshpande 1994), which is evidenced by its increased prevalence in
9 activities such as playing video games (Keller et al. 2011), internet usage (Koufaris 2002) and
10 online gambling (Lavoie and Main 2019b).

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12 We suggest that as an optimal state that engenders the cognitive and affective experiences
13 that are fundamental to effective product trials (Kempf and Smith 1998), experiencing flow
14 during a product trial will positively mediate product attitudes. This is consistent with prior
15 research which demonstrates flow's mediating effect of product attitudes in a variety of other
16 related contexts, including product usage and information search (Hoffman and Novak 2009;
17 Korzaan 2003; Hsu and Lu 2003). Stated formally:

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Hypothesis 1: Flow experienced during a product trial will mediate consumer attitudes towards the trialed product.

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In order to leverage the benefits of flow we need it to emerge in the trial. We suggest that curiosity is a relevant antecedent to flow in the context of product trials given its practical relevance to the product trial context. Specifically, product trials provide the opportunity to learn new information about a product, which is the motivational crux of curiosity. Moreover, curiosity makes for a great antecedent because it has the potential to bolster both dimensions of flow, as we explain below.

Consumer Curiosity

Curiosity is a state of cognitive deprivation that arises from an information gap between what one presently knows and what one desires to know (Loewenstein 1994). Experienced as a desire to know, curiosity elicits a degree of arousal that motivates one to act and explore in the search of information (Hill, Fombelle and Sirianni 2016; Smith and Swinyard 1988). As an aroused state that gives rise to increased engagement, curiosity should bolster the absorption dimension of flow. Thanks to the inherent pleasure that curiosity can add to acquiring new information (Litman 2005), curiosity, and satisfying curiosity more specifically, should also enhance the fluency dimension of flow.

Given its foundation in the amount of information that one has, one way to increase curiosity is by providing information about something, with curiosity following an inverted-U function based on the amount of information one is given (Loewenstein 1994). That is, curiosity (the desire to know) increases as one acquires information about something, but there is a threshold point after which one is satisfied with how much one knows and additional information serves to decrease curiosity.

Although research on curiosity in marketing is relatively scant relative to its prevalence in the marketplace (Thomas and Vinuales 2017; Wang 2019), research has shown that curiosity can have several different consequences for both consumers and marketers (see Table 1 for a summary of the literature). Seminal research in this area focused on the outcomes of curiosity as the result of individual differences (e.g. Kashdan, Rose and Fincham 2004; Park, Peterson and Seligman 2004), but more recent research has explored how states of curiosity can be manipulated to influence consumer behavior (e.g. Daume and Huttel- Maack 2019; Wang 2019).

INSERT TABLE 1 HERE

The majority of research on the consequences of curiosity has focused on how it influences exploratory behavior. For example, findings have shown that curiosity increases variety seeking (Baumgartner and Steenkamp 1996; Martenson 2018), information seeking (Hsee and Ruan 2016), and novelty seeking (Kashdan et al. 2009). Furthermore, researchers have established that curiosity is linked to several positive marketing-related outcomes, including increased content sharing (Ho and Dempsey 2010), increased satisfaction with information (Ozkara, Ozman and Kim 2016), enhanced attitudes towards advertisements and products (Menon and Soman 2002; Yang, Carlson and Chen 2020), and increased purchase likelihood (Laran and Tsiros 2013; Hill, Fombelle, and Sirianni 2016).

Curiosity can also have positive consequences for consumers. For example, heightened curiosity can lead to increased learning (Marvin and Shohamy 2016) and memory (Kang et al. 2009) as it increases both the breadth and quality of information search (Menon and Soman 2002). In addition, curiosity has been found to have a positive influence on psychological well-being (Gallagher and Lopez 2007; Park, Peterson and Seligman 2004), positive affect (Koo and Ju 2010), and personal growth (Kashdan et al. 2009). However, curiosity can also produce negative consequences. For example, it can lead consumers to expose themselves to aversive stimuli (Kruger and Evans 2009) or make indulgent choices (Wang and Huang 2017). For marketers, curiosity's positive correlation with increased variety seeking may pose dangers regarding consumer loyalty (e.g. Martenson 2008).

As explained above, we suggest that curiosity before a trial will facilitate flow during the trial based on the engaging and enjoyable aspects of curiosity. This hypothesis is supported by

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3 findings in other marketing contexts that demonstrate a strong positive relationship between the
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5 two (e.g. Hoffman and Novak 2009; Mathwick and Rigdon 2004). For example, Schutte and
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7 Malouf (2020) demonstrate that individual differences in curiosity enhance flow in creative
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9 tasks, which in turn mediates enhanced creativity (Schutte and Malouf 2020). While Schutte and
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11 Malouf (2020) operationalize curiosity as an individual difference, we advance their findings by
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13 showing that curiosity can also be situationally induced to subsequently elicit flow, which is
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15 important for its value in marketing, as it makes the experience possible for a wider audience.
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17 We also advance their findings by demonstrating the relationship between flow and curiosity
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19 within a different psychological process – attitude formation. Stated formally:
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24 *Hypothesis 2: curiosity experienced before a product trial will enhance the flow*
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26 *experience during the product trial.*
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31 We also expect that certain people will be naturally more curious, and as a result, more
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33 likely to experience flow in a product trial. We expect that openness to experience is an
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35 individual difference that should enhance curiosity given the willingness to engage with stimuli
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37 that it engenders (Kashdan, Rose and Fincham 2004). Broadly defined, openness to experience is
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39 “seen in the breadth, depth and permeability of consciousness, and in the recurrent need to
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41 enlarge and examine experience” (McCrae and Costa 1997, p. 2). Furthermore, individuals who
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43 have high levels of openness to experience are driven to examine, which is related to a need to
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45 understand (Murray 1938), and seek out new and novel experiences (Zuckerman 1979). People
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47 who are highly open to experience are also more ‘open’ to intellectual interests such as fantasy
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49 and emotions (McCrae and John 1992).
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3 We included openness to experience as an antecedent to curiosity based on the
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We included openness to experience as an antecedent to curiosity based on the aforementioned properties and the fit with both curiosity and the product trial context. That is, openness to experience constitutes an increased desire to explore and expand ones breadth of experience, which translate perfectly into having increased curiosity before a product trial. Moreover, openness to experience is highly relevant to the context of product trials, as it relates to and supports trying new things.

The nature of openness to experience has been debated for many years, with recent research suggesting that much of the disagreement has largely arisen due to its multifaceted nature (DeYoung et al. 2005). Specifically, the personality dimension, openness to experience, is now referred to as openness/intellect, as this more accurately reflects its two facets: openness, which is related to engagement with perceptual and aesthetic domains; and intellect, which is related to intellectual engagement with ideas (DeYoung et al. 2007).

Individuals who are high in openness would be considered artistic and perceptive in that they have “the ability and tendency to explore sensory and aesthetic information through perception, fantasy and artistic endeavor”, while those high in intellect would be considered philosophical and clever, having “the ability and tendency to explore abstract information through reasoning” (DeYoung et al. 2014, p. 46/47). Importantly, both aspects of openness encompass increased ability and tendency to explore information, suggesting their inherent link with curiosity.

We suggest that the motivation to explore that is shared by both dimensions of openness to experience will manifest in curiosity before a product trial, especially towards a music product trial which is the context of the study. We expect this to be the case because a product trial for music presents abstract information to be determined as good or bad, which captures the intellect

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3 dimension, while it also provides sensory and aesthetic information to be explored, which
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5 captures the essence of the openness dimension. Thus, the higher one scores in the openness/
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7 intellect dimensions, the more curious they should also be before a music trial. Combined with
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9 Hypotheses 1 and 2, we offer the following serial mediation hypothesis.

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12 *Hypothesis 3: Those high in openness to experience will be more curious before the*
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14 *product trial, which will increase the strength of flow during the trial and together*
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16 *sequentially mediate more positive attitudes towards the product.*
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21 We also suggest that the relationship between curiosity and flow is more nuanced than
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23 previously suggested, such that it depends on the valence of information that elicits curiosity and
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25 that curiosity can have differential effects on the two dimensions of flow. We consider the
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27 valence of information as a moderating variable because of its practical relevance to the context
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29 of product trials. Consumers are exposed to a plethora of information about products, whether it
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31 be through traditional word of mouth, online reviews or on social media (Azemi, Ozuem and
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33 Howell 2020; Sen and Lerman 2007). Importantly, the information that consumers receive is
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35 sometimes negative and sometimes positive (East, Hammond and Wright 2007; Zhang, Omran
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37 and Cobanoglu 2017). We also chose valence as a moderating variable because we expect both
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39 positive and negatively valence information to equally elicit levels of curiosity, but to
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41 differentially influence the flow experience.
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47 In the context of this research, we suggest that it is possible for positive and negative
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49 information related to products like music to elicit equal curiosity given the subjectivity involved
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51 in rating intangible goods (Singh et al. 2017) and thus, the possibility that one could still love a
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53 negatively reviewed song. Moreover, consumers have become skeptical of marketplace
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3 information such as reviews and they are often unsure whether or not to believe them (Sher and
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5 Lee 2009; Reimer and Benkenstein 2016). Lastly, while it may seem that negative reviews would
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7 not elicit as much curiosity, negative information, including that contained within online
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9 reviews, is often more engaging than positive (Bitter and Grabner-Krauter 2016), as evidenced
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11 by the negativity bias in the social transmission of information (Bebbington et al. 2017; Ito et al.
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13 1998). It is likely therefore, that after receiving negative information, consumers will want more
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15 information, which is the essence of curiosity. Considering these factors, both negative and
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17 positive reviews should evoke curiosity and leave people wanting to hear the song to decide for
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19 themselves.
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24 We expect positive and negative information to differentially influence flow though,
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26 since using negatively valenced information to elicit curiosity should thwart its relationship with
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28 flow. Since negative information is engaging (Bitter and Grabner-Krauter 2016), it should still
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30 elicit flow experiences related to absorption when engaging with the product. However, the
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32 negative valence information should lead to a disfluent experience. Consider the example of
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34 someone who seems to like the song once they start listening. The inconsistency between their
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36 experience and the prior beliefs set by the negative review will decrease processing fluency,
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38 which is an established outcome of inconsistency in information (Topolinski and Strack 2009;
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40 Winkielman et al. 2012). The difficulty in processing created by the confusion would create a
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42 sense of dissonance and discomfort which would be experienced as disfluent (Forster, Leder and
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44 Ansorge 2016). The other possibility is that someone does not like the song, so even though this
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46 would be consistent with the negative valence information from the review, the experience will
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48 be disfluent because they are not enjoying it. Stated formally as a hypothesis:
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3 *Hypothesis 4: the valence of information that elicits curiosity will moderate the*
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5 *relationship between curiosity and flow, such that curiosity elicited by negative valence*
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7 *information will thwart the relationship.*
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12 Combining Hypotheses 1, 2 and 4, we suggest that curiosity before a product trial will
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14 enhance flow while consumers engage with the product during the trial but only if it is elicited
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16 by positive valence information. Flow will in turn mediate their attitudes towards it. The
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18 proposed moderated mediation relationship is illustrated in Figure 1 below.
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26 *INSERT FIGURE 1 HERE*
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33 **OVERVIEW OF STUDIES**

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35 We test our hypotheses across a series of three studies. Study 1 seeks to support the
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37 simple mediation relationship (Hypotheses 1 and 2) while manipulating curiosity using written
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39 information about the product. Study 2 seeks to support the sequential mediation relationship
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41 (Hypothesis 3), such that those higher in openness to experience would be more curious before
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43 the product trial and in turn more likely to experience flow and have more positive attitudes
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45 towards the song. Study 3 seeks to moderate the relationship between curiosity and flow by
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47 manipulating the valence of information that elicits curiosity using product reviews (Hypothesis
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Study 1: Curiosity via Written Product Information

The goal of Study 1 is to provide initial support for the proposed mediation relationship. The literature suggests that providing information about a product will increase curiosity until a certain point in which more information will decrease curiosity (Loewenstein 1994). We seek to demonstrate this by providing people with low, moderate and high amounts of information about the product before a trial. We will use music as the product to be trialed in each of our studies as it is a common product to first listen to samples of music on podcasts and on music applications. We expect to find that those who received a moderate amount of information before the product trial would be most curious and as a result, have a stronger flow experience during the trial which in turn mediates increased attitudes towards the product after the trial.

Design and Measures

Participants ($N= 407$ undergraduate students, $M_{age}= 20.54$, 44.2% Female) were told that they would be in a product trial and that they would be listening to a clip of music and asked what they think about it. Participants were told that they were randomly selected to listen to progressive house music, to make it seem like the type of music was randomized, meanwhile everyone was listening to the same song (a 3-minute clip of the song Indigo by the artist Fehrplay). The clip of music had no lyrics in it to minimize the influence of differing perceptions of the words and language.

Before listening to the clip of music, participants received one of three sets of information with varying amounts of text about the music they were going to listen to, creating three conditions (information amount: low/moderate/high). One group was given a minimal amount of information- they were only told the type of music they would be listening to, so we

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3 expected curiosity to be relatively low amongst this group. The second group was given a
4 moderate amount of information, comprised of three sentences explaining how the sounds within
5 progressive house songs are put together and we expected curiosity to be highest amongst this
6 group. The third group was given a large amount of information, including the information given
7 in the moderate condition in addition to two paragraphs of information about how the sounds are
8 made and the history of that type of music. We expected that this was too much information and
9 that participant curiosity would have decreased as a result. See Appendix A for the full text used
10 in the manipulations.
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21 After the manipulation, and before listening to the music, we assessed curiosity. Next,
22 participants were asked to listen to the clip of music. Then, we assessed the dependent measures
23 as outlined below along with other measures for exploratory purposes that are not reported here,
24 as was the case in all studies, and finished with demographic questions related to age and gender.
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30 *Manipulation Check (Curiosity).* We assessed curiosity using a 2-item measure adapted
31 to the context of listening to music ($r = .88$), “how curious are you about the song you are about
32 to hear?” and “how eager are you to hear the song?” (1=not at all, 7= very much so) (Wang
33 2014b).
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40 *Mediator (Flow).* Flow was assessed using the 10-item ($\alpha = .88$) Flow Short Scale with
41 questions pertaining to participants’ experience of listening to the song (Rheinberg et al. 2003;
42 Engeser and Rheinberg 2008). Sample items include “I was totally absorbed in the experience”,
43 “My thoughts seemed to happen naturally and on their own” and “I lost track of time.” See
44 Appendix B for the full scale, along with the full items of all scales from each study.
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51 *Product Attitudes.* To assess consumer attitudes towards the song we asked them to
52 “please use the following items to describe your attitudes towards the song you just listened to”
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with three items ($\alpha = .97$) on 7-point semantic differential scales with the following anchors: Dislike/Like, Bad/Good, and Negative/Positive.

Results and Discussion

Manipulation Check. In order to demonstrate the effectiveness of the manipulation we compared curiosity ratings across the three conditions using a one-way ANOVA. The pattern of results supported the effectiveness of the manipulation ($F(2, 405) = 3.31, p = .04, \eta^2 = .016$), with curiosity following the inverted-u pattern (Loewenstein 1994). Pairwise comparisons of the marginal means revealed that those who received the moderate amount of information were more curious ($M = 5.01, SD = 1.52$) than those who received a large amount of information ($M = 4.52, SD = 1.79, p = .01, d = .30$) and marginally more those who received minimal information ($M = 4.64, SD = 1.70, p = .07, d = .23$).

Mediator (Flow). In order to demonstrate that curiosity influenced flow during the trial, we ran the same one-way ANOVA across conditions on reported experiences of flow. The results suggested that there were statistically significant differences in flow across the conditions ($F(2, 404) = 3.86, p = .02, \eta^2 = .019$). Pairwise comparisons of the means revealed the expected pattern, with those in the moderate amount of information condition having the strongest flow experiences ($M = 3.79, SD = 1.14$) compared to those that received a large amount of information ($M = 3.55, SD = 1.33, p = .09, d = .20$) and those that received minimal information ($M = 3.37, SD = 1.27, p = .01, d = .36$).

Product Attitudes. To demonstrate that curiosity would also increase attitudes towards the product that was trialed, we ran the same one-way ANOVA across conditions on attitudes towards the product, which also revealed significant differences across the conditions ($F(2, 404)$

= 4.32, $p = .01$, $\eta^2 = .021$). Pairwise comparisons of the means revealed the same pattern, with those in the moderate amount of information condition having the most positive attitudes towards the song ($M = 4.50$, $SD = 1.82$) compared to those that received a large amount of information ($M = 3.99$, $SD = 1.99$, $p = .03$, $d = .27$) and those that received minimal information ($M = 3.82$, $SD = 2.08$, $p = .01$, $d = .35$).

Mediation. The primary focus of Study 1 is to demonstrate that flow mediates the relationship between curiosity and product attitudes. To do this, we ran PROCESS model 4 in SPSS (Hayes 2017) with 5,000 bootstrap re-samples. Since we had three conditions in our predictor variable, we needed to compare the moderate information (curiosity) condition against both the low and high information conditions independently. To do so, in PROCESS we identified our predictor variable as multi-categorical. This option allows for a comparison of all three conditions together, providing output of focal comparisons of the indirect effects across the conditions, ultimately producing relative indirect effects.

Since we wanted to demonstrate the superiority of the moderate information (curiosity) condition compared to the other two conditions, we coded the low information condition as “0”, the moderate information (curiosity) condition as “1” and the high information condition as “2”. We chose the sequential coding option because it provides the relative indirect effects of a moderate amount of information compared to both low information and high information. We expected to see that the indirect effect was strongest in the moderate information condition. Given the marginal statistical difference in flow between the moderate and high information conditions as demonstrated in the ANOVA results, we used a 90% confidence interval to test the mediation relationship, consistent with prior research when the relationship is weak to moderate (e.g. Nath 2020).

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3 The results supported our mediation hypothesis, such that the indirect effect was stronger
4 amongst those who received a moderate amount of information compared to those who received
5 a low amount of information, as evidenced by a positive and statistically significant relative
6 indirect effect [$\beta = .4452$, S.E. = .1582, 90% C.I. = .1867, .7066]. This demonstrates that a
7 moderate amount of information bolsters the indirect effect on product attitudes. The inverted-u
8 pattern was further supported by the fact that the indirect effect weakened when people were
9 given too much information, as evidenced by a significant negative relative indirect effect when
10 a high amount of information was given compared to a moderate amount [$\beta = -.2565$, S.E. =
11 .1521, 90% C.I. = -.5085, -.0063]. The negative relative indirect effect demonstrates that
12 providing too much information has a negative influence on flow and ultimately product
13 attitudes.
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28 Study 1 provides initial support that curiosity can be manipulated prior to a product trial
29 and in turn it influences the nature of the trial experience and eventual attitudes towards the
30 product. Specifically, a moderate amount of information prior to the trial facilitates curiosity,
31 which fosters flow during the product trial and in turn mediates positive attitudes towards the
32 product. Together, these results suggest that curiosity can optimize product trials by eliciting
33 flow, which benefits both the consumer and the company running the trial.
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42 While the manipulation of curiosity in Study 1, which entailed providing information
43 about how the product is made, produced statistically significant direct and indirect effects on
44 attitudes towards the song, it produced only a relatively weak increase in curiosity. We believe
45 that the significant indirect effect despite the relatively weak increase of curiosity highlights the
46 strength of the relationship between flow and attitudes. That is partly because the indirect effect
47 is the product of the linear relationship between X and the Mediator (the a path) and between the
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3 Mediator and Y (the *b* path) and that the relatively weak manipulation would have decreased the
4 strength of the *a* path (Hayes 2017). A significant indirect effect despite this, means that the *b*
5 path (flow to attitudes) was notably strong.
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10 While we did find support for the proposed mediation relationship in Study 1 despite the
11 relatively weak manipulation of curiosity, we want to find more powerful sources of curiosity, in
12 part to bolster the effect size and the practical implications of the findings. We do so in future
13 studies, including a stronger manipulation in Study 3 to increase power (Meyvis and van
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While we did find support for the proposed mediation relationship in Study 1 despite the relatively weak manipulation of curiosity, we want to find more powerful sources of curiosity, in part to bolster the effect size and the practical implications of the findings. We do so in future studies, including a stronger manipulation in Study 3 to increase power (Meyvis and van Osselaer 2018). In Study 2 we seek to provide additional support for this mediation model with curiosity as generated by individual differences in openness to experience, which we expect to be a relatively strong source of curiosity.

Study 2: Curiosity Based on Individual Differences in Openness to Experience

The goal of Study 2 is to provide support for our mediation model based on individual differences. That is, people who are inherently more curious should be more likely to experience flow during a product trial, which will in turn lead them to evaluate the product more favorably. We suggest that those who are high in openness to experience should be naturally more curious prior to a product trial.

Design and Measures

We asked participants ($N= 122$ Crowdfunder online panel workers, $M_{age}= 36.66$, 43.0% Female) to listen to the same clip of music used in Study 1. We simulated a product testing scenario by telling participants that they would be evaluating a new genre of music called ‘Synthwave.’ Before listening to the song, we measured curiosity to support our contention that

those who score high in openness to experience will also be more curious before listening to the song. After participants had listened to the song, we assessed openness to experience, flow, attitudes towards the song, and demographic variables related to age and gender. It was important to measure openness to experience and curiosity at separate times (after the experience vs. prior to the experience, respectively) to guard against common method bias. It is also possible that individuals high in openness to experience simply enjoyed electronic music more, which would naturally enhance their experience of flow during listening. As such, we assessed how much participants liked electronic music to ensure that it was not confounded with openness to experience. This study followed a quasi-experimental design, as it only measured the independent variable.

Openness to Experience. Openness to experience was measured using the BFAS scale (DeYoung et al. 2007), which consists of two subcomponents: intellect and openness. The openness subscale is comprised of 10 items ($\alpha = .848$), with four reverse-coded items. Sample items include “I enjoy the beauty of nature,” “I need a creative outlet,” and “I seldom notice the emotional aspects of paintings and pictures”(r). The intellect subscale is also comprised of 10 items ($\alpha = .861$) and four reverse-coded items. Sample items include “I like to solve complex problems,” “I avoid difficult reading material”(r), and “I avoid philosophical discussions” (r).

Curiosity. Curiosity was measured using the same two-item measure used in Study 1 ($r = .773$, Wang 2014b).

Flow. We assessed flow in the same way as Study1, using the flow short scale (10-items, $\alpha = .884$, Rheinberg et al. 2003).

Product Attitudes. We assessed attitudes towards the song by asking “Did you like the clip of music?” (1= not at all, 7= very much so).

Alternative Explanation. We assessed liking of electronic music by asking “How much do you like electronic music?” (1= not at all, 7= very much so).

Results and Discussion

To test the sequential mediation model (Hypothesis 3) we used Model 6 of the PROCESS macro in SPSS (Hayes 2017). We ran two iterations- one for each component of openness as the independent variable, with curiosity and flow as sequential mediators and product attitudes as the dependent variable in both iterations. Both models provided support for the sequential mediation relationship. The intellect component of openness was related to enhanced curiosity before the trial ($b = .4480$, $se = .1688$, $p < .01$), which increased flow during the trial ($b = .4674$, $se = .0655$, $p < .01$) and together sequentially mediated enhanced attitudes towards the song, as evidenced by a significant indirect effect [$\beta = .1848$, $SE = .0817$, 95% C.I. = .0370, .3616]. The results of the same analysis with openness as the independent variable demonstrated the same pattern, with it being related to enhanced curiosity before the trial ($b = .6086$, $se = .1654$, $p < .01$) and together with enhanced flow produced a significant indirect effect on attitudes towards the song [$\beta = .2544$, $SE = .0927$, 95% C.I. = .0920, .4560]. Lastly, we ran a correlation to determine whether those who were high in openness to experience did not simply enjoy electronic music more. The results of this analysis demonstrated that openness to experience and enjoyment of electronic music were not correlated ($r(122) = .112$, $p = .22$).

Study 2 replicates the findings of Study 1 using an individual difference variable demonstrating that participants who were high in openness to experience were also inherently more curious before listening to the song. Consequently, they were more likely to enter flow during listening, which in turn mediated more favorable evaluations of the song. These findings

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3 demonstrate a novel individual difference variable (openness to experience) that facilitates flow.
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5 Having demonstrated that flow is key to consumer-related outcomes, and that curiosity is one
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7 way to enter flow, we designed Study 3 to provide a more robust understanding of the
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9 phenomenological relationship between curiosity and flow, as this could open the door for
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11 marketers to enhance flow opportunities for consumers.
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17 **Study 3: The Moderating Role of Information Valence**

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19 Study 3 has two goals. The first goal of this study is to obtain insight into why curiosity
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21 leads to flow, which we achieve by severing their relationship using negative-valence
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23 information to elicit curiosity. The second goal of Study 3 is to manipulate curiosity in a new,
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25 stronger way to increase the generalizability of our findings and to increase the practical value of
26
27 the findings. Since the manipulation in Study 1 produced some marginal increases in curiosity,
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29 we seek a more powerful manipulation to strengthen the effect. While Study 2 demonstrated that
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31 individual differences in openness to experience provide a strong source of curiosity, we want to
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33 find something that marketers can control. We do so using a combination of product reviews and
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35 a preview of the content, which consumers are often exposed to and can influence their attitude
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37 formation and emotions (Huang and Korfiatis 2015). We intended to use product reviews to
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39 demonstrate that equal levels of curiosity can be generated from negative and positive valence
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41 information in the marketplace. We used the preview of the song to manipulate the amount of
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43 information that people received before the trial and ultimately influence their degree of
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45 curiosity. In Study 3 we again follow the logic of the inverted-u hypothesis used in Study 1 to
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47 manipulate curiosity, but we focus on the latter half of that relationship. That is, we provide a
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49 moderate amount of information or we provide too much information to decrease curiosity.
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We designed a pretest to serve several goals. First, we wanted to find negative and positive reviews that elicited equal levels of curiosity. Secondly, the pretest was designed to find a way of thwarting curiosity that is naturally found in the marketplace. To do so, we used content previews, suggesting that after curiosity has been aroused by reviews, a long preview will provide too much information and will thwart curiosity. This is also something that marketers should be aware of, as providing consumers with too much information will reverse the benefits of curiosity. Lastly, it was important to establish these relationships in a pretest because we did not want to measure curiosity in the main study, to ensure that measuring it before the trial did not account for or bolster the effects on flow that were found in Study 1. We also did not want to assess curiosity after listening to the song because people's perception of curiosity in retrospect would likely be heavily influenced by the trial experience itself.

Pretest

Participants ($N= 219$ Crowdfunder online panel workers, $M_{age}= 34.57$, 50.2% Female) either received two positive or two negative reviews of the song (see Appendix C for descriptions) and either went straight to the song after the reviews or were given a 30 second preview prior to listening in an effort to thwart curiosity via too much information. While the reviews contained the same information about the song, they differed in that they focused on aspects of the song that were either poorly (negative review) or well done (positive review). Before listening to the song, we assessed curiosity using the 2-item measure from the previous two studies ($r = .872$). After listening to the song, participants were asked to provide demographic information about their age and gender. The pretest thus followed a 2(review valence: positive vs. negative) x 2(song preview: yes vs. no) between-participants design.

To determine the effectiveness of our manipulations, we ran a 2(review valence) x 2(song preview) ANOVA on curiosity. The analysis revealed only a main effect of song preview ($F(1, 215) = 5.13, p = .024, \eta^2 = .023$), as participants who listened to the preview were less curious about the song ($M = 4.78$) than those who listened to it immediately after reading the reviews ($M = 5.28$). Importantly for the main study, participants who did not listen to the preview were equally curious regardless of whether they were given positive ($M = 5.30$) or negative reviews ($M = 5.26, F(1, 215) = .018, p = .89$). Together, these results support the efficacy of our manipulations – we found positive and negative song reviews elicit equal levels of curiosity and that providing a song preview following the reviews thwarts curiosity.

Main Study Design and Measures

The main study utilized the same design as the pretest but without a measure of curiosity in order to reduce any potential demand effects of assessing it prior to the product trial and influencing the results by virtue of being measured. After listening to the song, participants ($N = 212$ Crowdfunder online panel workers, 51.4% Female, $M_{\text{age}} = 36.02$) completed the final questionnaire, which included the flow measure, followed by the manipulation check regarding the valence of the reviews and demographic information related to age and gender. The manipulation check was asked following the dependent measures to limit the influence of asking that question on perceptions of the song.

Manipulation check. The manipulations were assessed using two items ($r = .967$), which were ranked on a 7-point scale. The two items asked participants, “were the reviews of the song that you read before listening” negative/ positive and bad/ good.

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3 *Flow.* Two methods were used to measure flow in order to capture whether people
4 experienced flow overall (yes/no) and to explore the nature of the linear relationship between
5 curiosity and the two dimensions of flow. First, the flow-quote method (yes/no) was used to
6 assess the overall influence of the manipulations on flow (Csikszentmihalyi and
7 Csikszentmihalyi 1988). Next, we separated flow into its two primary dimensions—fluency (6
8 items, $\alpha = .915$) and absorption (4 items, $\alpha = .882$, Rheinberg et al. 2003; Lavoie et al. 2021) —
9 in order to examine the nuanced relationships with curiosity and information valence.

19 Results and Discussion

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21 *Manipulation check.* A 2x2 ANOVA on the perceived positivity of the song reviews
22 revealed only a main effect of valence ($F(1, 209) = 223.27, p < .001, \eta^2 = .517$). Participants in
23 the positive review condition indicated that the song reviews provided to them were significantly
24 more positive ($M = 6.25, SD = 1.27$) than did those in the negative review condition ($M = 2.87,$
25 $SD = 1.96, d = 2.07$). Importantly, the mean rating of those who received positive reviews was
26 on the positive side of the neutral scale midpoint (4) and the mean rating of those who received
27 negative reviews was on the negative side of the scale midpoint.

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29 *Flow.* In order to test information valence's ability to thwart the relationship between
30 curiosity and flow overall, we ran Model 1 of the PROCESS Macro in SPSS using the curiosity
31 manipulation (preview versus not) as the independent variable, the dichotomous measure of flow
32 as the dependent measure, and information valence as the moderator variable. This model was
33 selected because it allows for a dichotomous dependent variable. The analysis revealed a
34 significant interaction between curiosity and information valence ($\beta = 1.408, S.E. = .5583, 95\%$
35 $C.I. = .3139, 2.5024$). Furthermore, analysis of the conditional effects of curiosity on flow for
36 positive and negative reviews revealed a significant positive relationship between curiosity and
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3 flow for those who received positive information about the song ($\beta = .9053$, $S.E. = .3951$, 95%
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5 C.I. = .1309, 1.6797), but a non-significant relationship among those who received negative
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7 information ($\beta = -.5028$, $S.E. = .3945$, 95% C.I. = -1.2759, .2703). This suggests that curiosity
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9 leads to flow when it is elicited by positive information, but not when it is elicited by negative
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11 information.
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15 Next we sought to examine the relationships between curiosity, information valence and
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17 the two dimensions of flow. A 2(preview) x 2(review valence) ANOVA on fluency revealed a
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19 significant interaction ($F(1, 209) = 3.90$, $p = .05$, $\eta^2 = .018$). A planned comparison of the two
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21 curiosity conditions indicated that those who read positive reviews had a more fluent experience
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23 ($M = 5.10$, $SD = 1.45$) than those who read negative reviews ($M = 4.36$, $SD = 1.50$, $F(1, 209) =$
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25 7.70 , $p < .01$, $d = .50$). However, a planned comparison between the two curiosity conditions in
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27 relation to absorption suggests that those who read positive reviews did not differ in absorption
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29 ($M = 3.94$) from those who read negative reviews ($M = 4.01$, $F(1, 209) = .065$, $p = .80$).
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33 Together, these results suggest that curiosity elicited by negative information does not enhance
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35 flow due to thwarting the fluency aspect of it.
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39 Study 3 shows that the relationship between curiosity and flow can be prevented by using
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41 negative-valence information to elicit curiosity, which provides a keen insight into this
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43 relationship. Although curiosity facilitates flow's characteristic experiences of fluency and
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45 absorption, the experience of fluency is limited when curiosity is elicited via negative-valence
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47 information. Study 3 also provides insight into marketing strategies that can be used to elicit
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49 curiosity and flow. In particular, the results demonstrate that while content previews can elicit
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51 curiosity, if they give too much information they can backfire.
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GENERAL DISCUSSION

The results of this research demonstrate that curiosity prior to a product trial of music facilitates entering the optimal state of flow state while listening to the music, which in turn mediates positive attitudes towards it. We demonstrate that curiosity can be manipulated by the amount of product information or a sample of the product and that people that are more open to experience are naturally more curiosity before a product trial. Furthermore, we elucidate how curiosity produces flow by showing that their relationship is dependent on the valence of the information that is used to elicit curiosity. Curiosity elicited from positive information facilitates both the fluency and absorption dimensions of flow, but when curiosity is elicited via negative information, the fluency aspect of flow is thwarted. These findings make several contributions to marketing theory and practice as discussed below.

Theoretical Contributions

The primary contribution of this research is demonstrating novel factors that positively influence the quality of a product trial experience, including both the affective and cognitive aspects and in doing so, consumer attitudes towards the trialed product. Extant research has focused on factors that influence the likelihood of engaging in a product trial or not (e.g. Steenkamp and Gielens 2003), while the factors that influence the quality of the trial have been largely overlooked. Of the limited research that has explored this topic, it has focused on the ability of advertising to influence the cognitive aspects of aspects of attitude formation within a product trial (e.g. Kempf and Laczniak 2001). Our research extends these findings by demonstrating how to use curiosity to encourage the optimal state of flow (Csikszentmihalyi 1990). Moreover, while the extant literature focuses on the ability of advertising to influence the product trial experience, sometimes demonstrating that it does not have any influence (Hoch and

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3 Ha 1986) our studies contribute to this by showing the effectiveness of content previews and
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5 written descriptions of the product.
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8 Our moderation findings also advance the literature by explicating the nature of the
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10 relationship between curiosity and flow. The current literature suggests a uniformly strong and
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12 positive relationship between curiosity and flow, with curiosity as an antecedent to flow (e.g.
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14 Kashdan, Rose and Fincham 2004; Schutte and Malouf 2020). Some researchers have gone as far
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16 as to posit curiosity as a dimension of flow (e.g. Hoffman and Novak 1996; Ozkara, Ozmen, and
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18 Kim 2016; Pelet, Ellis and Cowart 2017). We contribute to this overall discussion by
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20 demonstrating that curiosity can exist separate from flow. We also demonstrate that the
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22 relationship is more nuanced than previously thought. In particular, the relationship depends on
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24 the valence of information that elicits curiosity. Our findings also clarify why the two are related,
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26 such that the relationship is partly based on the ability for curiosity to bolster fluency, which
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28 accounts for the inherently enjoyable aspect of flow. This is also consistent with findings that
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30 curiosity can elicit pleasure in obtaining new information (Litman 2005).
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36 Our findings also have theoretical implications for the persuasion and customer
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38 acquisition literatures. The combination of curiosity and flow was capable of increasing attitudes
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40 towards a new song from a relatively unknown genre of music. This is an especially noteworthy
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42 from a persuasion standpoint given the powerful attitudes that people form towards musical
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44 genres, which generally occurs due to music's importance to identity (North and Hargreaves
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46 1999). It is important to note the role of the indirect effect in our findings and thus, the
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48 importance of flow in attitude change. Curiosity did not have a particularly strong direct effect
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50 on attitudes in our studies, but it did have a strong indirect effect through flow. That is, our
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52 results suggest that curiosity's role in attitude change helps people become fully engrossed in a
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3 product trial in an enjoyable way (i.e. flow). Our results suggest that flow is what is most
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5 important in driving attitude change and that curiosity is one way to encourage it to happen.
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8 By demonstrating that curiosity can influence flow while listening to music, our research
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10 also contributes to the emerging literature that reveals flow can be elicited by factors beyond the
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12 balance between high levels of skill and task demands has become convention in flow research
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14 (e.g. Keller et al. 2011). Moreover, in demonstrating an individual difference factor (i.e.
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16 openness to experience) that is capable of facilitating flow via increased curiosity, our results
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18 also contribute to research on individual difference antecedents to flow, which has identified the
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20 importance of optimal stimulation levels (Steenkamp and Baumgartner 1992) and autotelic
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22 personalities (Hoffman and Novak 1996).
23
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25 26 *Practical Implications*

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28 Our findings also make several contributions to marketing practice. Most notably, our
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30 results demonstrate how marketers can use information to optimize the trial of their product and
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32 why they must be careful about how much information is given. For example, in Study 1 we
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34 demonstrate that giving too little or too much information limited curiosity and in turn flow and
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36 product attitudes. It is common to provide consumers with a preview of the product or service,
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38 but as we demonstrate in Study 3, a preview can provide too much information and subsequently
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40 decrease curiosity. Our manipulations also demonstrate that marketers do not need to rely on
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42 advertising to influence the trial experience, which can be quite expensive. Revealing product
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44 information and giving a preview can increase curiosity and can be done at minimal cost and
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46 done right before the trial itself.
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52 Our findings also highlight the relevance of flow to marketers as an optimal experience
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54 and the benefits that it has in product trials. As discussed above, our results suggest that flow is
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3 the underlying mechanism driving attitudes and that curiosity is one way to encourage it to
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5 happen in product trials. This has practical implications in that marketers should make efforts to
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7 encourage flow in other ways, as situational factors other than the product itself would be likely
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9 to influence flow during a trial. Controlling the environment to allow for full attention to be paid
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11 to the product by reducing distractions and the potential for negative emotions would help foster
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13 the absorption dimension of flow. Sounds and visuals could also be added to the experience to
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15 enhance the fluency of the experience, as would ensuring the right amount of challenge if the
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17 product is mastery or performance related (Csikszentmihalyi 2000).
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22 The ability for curiosity and ultimately flow to drive attitude change towards a new type
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24 of music in such a short amount of time also has important implications for practitioners with
25
26 regards to best-practices in customer acquisition, and for companies who are continuously
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28 releasing new products. This is because of the relative intolerance that people tend to have to
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30 new kinds of music, as music tastes are tightly linked to one's identity (Tarrant, North and
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32 Hargreaves 2002). Indeed, it is possible that curiosity and flow can be used to mitigate
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34 psychological barriers to trying new products and to produce meaningful attitude change (Roy
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36 and Lahiri 2004; Saine, Nguyen, Besharat and Trocchia 2018).
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41 It is important to note that not all sources of information about a product will elicit equal
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43 amounts of curiosity. Marketers should consider what information to leak to consumers to peak
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45 their curiosity in a way that has the strongest effect. This is evidenced when comparing the
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47 strength of the manipulations in Studies 1 and 3. In particular, our results from Study 1 suggest
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49 that providing information on how the product is made may not be as powerful in eliciting
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51 curiosity as showing teasers of the product itself, which was used in Study 3. This suggests that
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53 when possible, marketers should try to reveal small, attractive aspects of the product itself to
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3 enhance curiosity. However, we only used two different sources of information to manipulate
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5 curiosity, so future research should explore other avenues.
6

7 *Limitations and Opportunities for Future Research*

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10 Our findings and the limitations of our studies open the door for many potentially fruitful
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12 future inquiries. Having demonstrated flow as a mediating mechanism of product attitudes in
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14 product trials, future research can explore other ways to foster flow. For example, research could
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16 explore how different forms of advertising, including the nature of information they provide
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18 influences flow through constructs like affect and familiarity, which should contribute to the
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20 fluency of the experience (Topolinski and Strack 2009). Based on our moderation findings, it is
21
22 important for advertising to elicit a positive frame to induce a more fluent and enjoyable trial
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24 experience. With regards to different types of advertising, this suggests that transformational
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26 advertising, which is focused on influencing the experience of using a brand and making the
27
28 usage experience richer, warmer and more exciting (Aaker and Stayman 1992) should be
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30 superior to other forms of advertising such as informational ads which are focused on building
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32 awareness. Within transformational advertising, the nature of the information, including the
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34 visual or audible stimulation (Creusen, Veryzer and Schoormans, 2010) could also be
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36 manipulated to influence the trial experience, as consumers try to embody the affective
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38 experience shown in the advertisement.
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45 There are also opportunities to explore how to influence the trial of different types of
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47 products and how the relationships we demonstrate may differ. For example, in Study 3, positive
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49 and negative reviews elicited equal curiosity. We expect that this effect was in part driven by the
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51 intangible, subjective nature of the product (i.e. music) that our participants trialed. It would be
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3 interesting to see if positive and negative reviews would equally influence curiosity of more
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5 tangible goods and ultimately, how they would influence flow when trying them.
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8 Our findings are also limited in that they only deal with a select few manipulations of
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10 curiosity. Future work should explore other methods of manipulating curiosity. In his seminal
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12 writing, Berlyne (1954) provides insight into curiosity manipulations by distinguishing two types
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14 of curiosity: perceptual and epistemic curiosity. Perceptual curiosity is evoked and sustained by
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16 novel perceptual stimuli, which tends to be primarily visual, but can also include hearing, touch,
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18 smell, and taste (Collins, Litman, and Spielberger 2004). While perceptual curiosity is related to
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20 novelty-seeking through sensations (Zuckerman 1979), epistemic curiosity is described as a drive
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22 ‘to know,’ and is thus more related to information seeking (Spielberger and Starr 1994).
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26 Our results also portray a positive relationship between curiosity, flow and ultimately
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28 product attitudes. However, it would be intriguing to explore the negative consequences of
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30 curiosity. For instance, it is possible that stimulating curiosity towards a product category may
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32 backfire via deferred choice, leading to decision paralysis and difficulty in choosing between
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34 many comparable products by increasing the desire to explore other products (Diehl 2005).
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37 Ultimately, there appear to be many avenues for future research related to optimizing product
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39 trials, and we hope that our findings will spark the curiosity to explore them.
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Figure 1 – Mediation Model

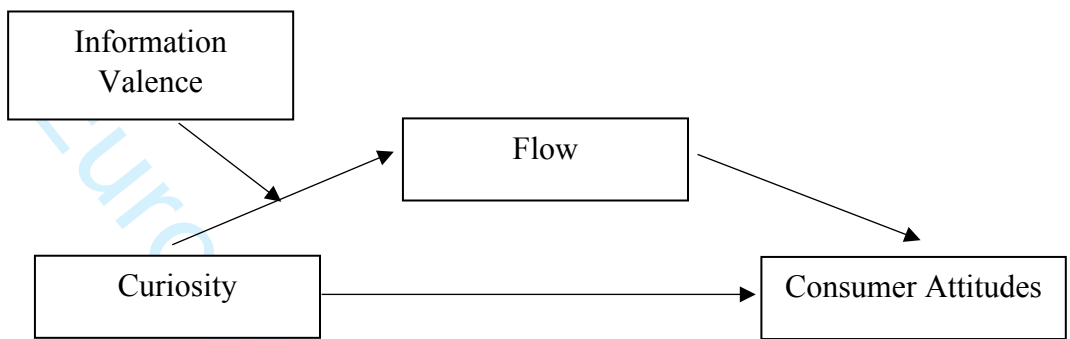


Table 1- Consequences of Curiosity Literature

Paper	Consequence(s)	Moderator(s)	Mediator(s)	Context	Measure
Daume and Huttl-Maack (2019)	Increased attitudes towards products	N/A	Enhanced expectations, Positive Affect	Advertising	State: Manipulated
Yang, Carlson and Chen (2020)	Increased attitudes towards an advertisement	N/A	N/A	Advertising (Virtual Reality)	State: Measured (mediator)
Thomas and Vinuales (2017)	Increased attitudes towards social media post, desire to engage in an experience	N/A	N/A	Social Media	State: Measured
Menon and Soman (2002)	Increased memory, learning, product evaluation, information search quality (time and attention devoted)	Time	N/A	Advertising (Online)	State: Manipulated
Wang (2019)	Increased preference for indulgent products (reward)	Threatening Information	Reward-approach orientation	Advertising/ Shopping	State: Manipulated
Wang and Huang (2017)	Increased likelihood to choose indulgent products (rewards)	Reward Satiation	Desire for information (reward-seeking goal)	Watching TV, Reading	State: Manipulated
Hill, Fombelle, and Sirianni (2016)	Increased purchase motivation	N/A	Satisfaction with mystery appeal	Advertising, Websites	State: Manipulated
Martenson (2018)	Variety seeking	N/A	Adventure proneness, Novelty seeking, Trips taken	Vacation/ travel choices	Individual Difference
Ho and Dempsey (2010)	Increased sharing of online content	N/A	Consumption of online content	Internet usage	Individual Difference

Hsee and Ruan (2016)	Increased information seeking, exposure to aversive stimuli	Cognitive appraisal of consequences	N/A	Information seeking	State: Manipulated
Kover (1995)	Increased involvement	N/A	N/A	Advertising (Teaser ads)	Theoretical
Marvin and Shohamy (2016)	Increased learning	N/A	Disparity in anticipated and received reward	Answering trivia questions	Measured
Kang et al. (2009)	Increased learning, memory	N/A	Anticipation of reward	Answering trivia questions	State: Measured
Trehan and Maan (2012)	Increased attention, interest	N/A	N/A	Advertising (Teaser ads)	Theoretical
Baumgartner and Steenkamp (1996)	Increased information seeking and variety seeking	N/A	N/A	Product purchase, Consumption Information search	Measured
Kashdan, Rose and Fincham (2004)	Exploratory behavior, absorption, well-being, openness to experiences	N/A	N/A	Individual Differences	Individual Difference
Kashdan et al. (2009)	Exploratory behavior, novelty seeking, openness to experience, personal growth	N/A	N/A	Individual Differences	Individual Difference
Gallagher and Lopez (2007)	Increased psychological well-being	N/A	Exploration	Individual Differences	Individual Difference
Park, Peterson and Seligman (2004)	Increased psychological well-being	N/A	N/A	Individual Differences	Individual Difference
Ozkara, Ozmen and Kim (2016)	Increased information satisfaction	N/A	N/A	Online Search	State: Measured

Pelet, Ettis and Cowart (2017)	Enhanced flow	N/A	N/A	Social media usage	State: Measured
Schutte and Malouff, (2020)	Increased creativity	N/A	Flow	Idea Generation	State: Measured
Kruger and Evans (2009)	Seek harmful information	Time	N/A	Information Seeking	State: Manipulated
Laran and Tsiros (2013)	Purchase likelihood	Affect	N/A	Free gift offers	Uncertainty: Manipulated
Goldsmith and Amir (2010)	Purchase likelihood	Cognitive appraisal	N/A	Free gift offers	Uncertainty: Manipulated
Koo and Ju (2010)	Positive affect (pleasure, arousal)	Website atmospherics (graphics)	N/A	Online shopping	State: Measured

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3 Comments to Author:
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5 Associate Editor Summary Evaluation:
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7
8 Your manuscript was read by the same knowledgeable reviewer who reviewed the most recent
9 version of the manuscript. Throughout, the reviewers have appreciated your efforts put in in
10 revising the manuscript. I do agree with the reviewer that the revised manuscript looks stronger
11 than its previous version. However, the reviewer also sees some lingering major concerns with
12 the current version. After reading the report and also studying the paper myself, I share the
13 concerns:
14

- 15 • Please ensure the reply comments are reflected in the manuscript. For example, authors
16 mention providing the effect sizes, however, I do not see that for the ANOVAs reported. For
17 instance, on pg. 27 (re. Study 3) I do not see the effect sizes being reported. Why not report the
18 effect sizes of the ANOVAs?
19
- 20 • Please work on the practical implications of your results.
- 21 • Please follow reviewer's comments on S1 and address them.

22 Overall, although there is some progress, I request authors to carefully address the reviewers'
23 comments.
24
25

26 Thank you for providing support for our research and for giving us an opportunity to further
27 revise our manuscript. We reflected on the comments of the reviewer and we have addressed
28 each of their comments below. Most notably, we added a substantial revised description of the
29 findings in Study 1 across pages 20-21 and we added a new section that summarizes the set of
30 the findings and elaborates on the practical implications in the general discussion starting on
31 page 32 and continuing to page 33.
32

33 In addition to addressing the comments of the reviewer, our reflection of their comments made
34 us realize that we needed to address something else. In particular, we added a discussion of
35 the theoretical importance of flow in the attitude change process, given how powerful it was
36 revealed to be when breaking down the indirect effect in Study 1.
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39 We believe that we have fully addressed their concerns and that the practical insights of the
40 research are now much clearer- we hope that you agree.
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3 Reviewer: 1
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5 Comments:
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7 I appreciate the effort and the work that the authors have put in this time around.
8

9 We are glad that you see the amount of effort that we put in to the revision and we appreciate
10 your continued commitment to making our paper better. Your comments on this round led to
11 some important reflection on our findings and they inspired us to add a great deal of discussion
12 of the findings in Study 1 and the practical implications of our findings overall. We have outlined
13 our response to each of your comments below.
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18 With reference to one of my previous comments - on pg. 18 in the section Design and
19 Measures, the authors mention, "...meanwhile everyone was listening to the same song (a 3-
20 minute clip of the song Indigo by the artist Fehrplay)".
21

22 We are unsure if this comment is asking for something else added or if it was an approval of the
23 addition we made last time by explaining the details of the song that was listened to by
24 participants.
25
26

27
28 The authors also mention providing the effect sizes, however, I do not see that for the ANOVAs
29 reported. For instance, on pg. 27 (re. Study 3) I do not see the effect sizes being reported. Why
30 not report the effect sizes of the ANOVAs?
31

32 We have added these in the new version of the manuscript, thank you for catching that. We
33 originally left them out because they were not the focal analysis. We focused on the mediation
34 relationship in Studies 1 and 2 and on the moderation relationship in Study 3, but we agree that
35 it adds value to report them, so we have done that.
36
37

38 I am still unconvinced regarding Study 1. Look at this JCR research - Tom Meyvis, Stijn M J Van
39 Osselaer, Increasing the Power of Your Study by Increasing the Effect Size, Journal of
40 Consumer Research, Volume 44, Issue 5, February 2018, Pages 1157–1173. In very abstract of
41 the JCR article the authors talk about how increasing sample size should not be the mantra.
42 Although the positioning is new, but look at your manipulation check (as I had mentioned
43 before) - even with that sample size, the means are marginally different. The additional problem
44 in my mind is that the 'flow' pairwise comparisons are similarly marginal. Again, I ask the
45 question that I had before - statistical significance (in some cases albeit marginal) is there, but is
46 that practically significant? From study 1 flow means, am I (as a marketer, say) going to be
47 practically benefitted from providing my consumers moderate and large amounts of information -
48 being that it costs me to do that?
49

50 Your concern over the practical implications inspired us to do a great deal of reflection on the
51 findings of Study 1 and how they fit with the overall empirical package. We believe that each of
52 the concerns you mention stem from the relatively weak manipulation of curiosity in Study 1.
53 The marginal result was in one condition of the manipulation check and subsequently one
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3 condition related to flow, but importantly, not the dependent measure. It is also important to note
4 that the indirect effect was still significant despite these marginal results.
5

6 We respectfully disagree that there is no meaningful (practical) relevance shown in Study 1 for
7 the following reasons. There were no marginal differences across the conditions on attitudes,
8 which is the dependent measure. Not only were the mean differences on the dependent
9 measure all statistically significant, the differences address your concern in relation to the
10 practical significance as the moderate information condition was the only one in which ratings
11 were positive (above 4/7). So, the moderate information pulled people from a negative
12 perception (3.82, 3.99) to a positive one (4.5). We believe that this is of practical value.
13 Moreover, the indirect effect through flow is also significant in Study 1, which as we explain later
14 in more detail later contributes to the total effect and should mitigate concern over practical
15 benefit.
16
17

18 We do not believe that the marginal curiosity manipulation in one condition is a concern with
19 regards to practical implications of curiosity since the direct and indirect effects on attitudes
20 were statistically significant in that study. Rather, we think that this suggests that the
21 manipulation of curiosity in Study 1 was relatively weak. So, we agree with you that the source
22 of curiosity in Study 1 was relatively weak but that means the practical value of that
23 manipulation of curiosity should be tempered, not the practical value of curiosity itself. We think
24 it is important to keep and to highlight this finding, as showing the relative weakness of that
25 manipulation compared to the manipulation in Study 3 adds practical value by helping marketers
26 understand how to best increase curiosity using different methods. Together, the two different
27 manipulations highlight the practical importance of choosing the right information to present to
28 have the strongest influence on curiosity. Specifically, showing information about how the
29 product is made has relatively weak practical impact compared to showing teasers of the
30 product. This is important for marketers to know, since they are both used in practice.
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33 We also think that the marginal increase in curiosity and flow in one condition while still
34 achieving a significant indirect effect adds theoretical value by highlighting the power of the
35 mediator (flow). The goal of Study 1 was to support the mediation relationship- curiosity matters
36 to the degree that it increases flow. Study 1 supports this, in particular the flow-attitude
37 relationship is very strong, as it was powerful enough to create an indirect effect despite
38 relatively weak (marginal) increases in curiosity.
39
40

41 To address your concerns we have integrated the aforementioned points into the paper in the
42 following ways:
43

- 44 1. In the last paragraph on page 20 we acknowledge the weakness of the manipulation in
45 Study 1 when discussing the results of the study. We use this as an opportunity to
46 suggest that there may be stronger sources of curiosity, which we use to motivate
47 Studies 2 and 3 where we explore curiosity based on individual differences and a
48 different manipulation, respectively.
49
- 50 2. We enriched the discussion of the mediation findings of Study 1 on pages 20-21 to
51 highlight the value of flow in the indirect effect. The significant indirect effect despite the
52 relatively weak manipulation of curiosity suggests that the effect that curiosity has on
53 attitudes is largely driven by flow (the b path of the indirect effect).
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3 The logic that supports this is as follows (which we now partly explain in the discussion
4 of the findings). The total effect of X on Y is partitioned into a combination of a direct
5 effect of X on Y, and an indirect effect of X on Y that is transmitted through the mediator
6 (Agler & De Boeck 2017). In other words, the relationship between X and Y is
7 decomposed into a direct link and an indirect link. The indirect effect is the product of the
8 linear relationship between X and the Mediator and between the Mediator and Y. A
9 significant indirect effect despite a weak (marginal) increase in X in Study 1 suggests
10 that the mediator (flow) has a notably strong relationship with X.
11
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13 We believe that the indirect effect's role in the total effect also helps to mitigate your
14 concerns over the limited practical significance of the direct effects, as the mediation
15 logic suggests that the total effect can be driven by an indirect effect with little to no
16 direct effect (Hayes, 2017).
17
18

- 19 3. We also acknowledged the need to strengthen the curiosity manipulation in the
20 description of the manipulation in Study 3 on page 24. We suggest that revealing
21 information in the form of product reviews and teasers of the product are another
22 potentially stronger source of curiosity that marketers can and do use.
23
24
- 25 4. We added a reflection paragraph in the general discussion starting at the end of page 32
26 when discussing practical implications. We compare the curiosity manipulations in
27 Studies 1 and 3 in an effort to explain the practical implications of the research. We
28 reiterate the practical significance of curiosity being largely driven by its indirect influence
29 on flow. We also added a discussion of how the practical value is partly based on what
30 information is used to elicit curiosity. We highlight the relatively weak manipulation in
31 Study 1 and contrast it with the stronger manipulation in Study 3 based on the
32 combination of providing reviews and a preview of the product itself. The takeaway is
33 that providing information on how the product is made may not hold as much practical
34 value in eliciting curiosity as showing reviews or teasers of the product itself.
35
36
- 37 5. In the process of addressing your concerns we also realized that our discussion of the
38 theoretical contributions lacked enough acknowledgement for the role of flow. In the
39 paragraph at the end of page 30 going onto page 31 we now highlight the prominence of
40 the indirect effect (through flow), and explain what it means from a temporal perspective,
41 as curiosity before the trial is of value mostly because it helps people become fully
42 engrossed in the trial in an enjoyable way (i.e. flow). Thus, curiosity matters by shaping
43 the way that people interact with and experience the trial (i.e. by giving rise to flow). The
44 theoretical takeaway is the importance of flow in attitude change, with curiosity being
45 one way to encourage flow to happen.
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50 References

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54 *regression-based approach*. Guilford publications.
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3 Regarding Study 3, I have gone over it and I am ok with the way it has been set up and run. The
4 practical implications should be tempered by the fact some of the results are marginally
5 significant.
6

7 As outlined above, this was a major focus of our revision. We bolstered the discussion of the
8 practical insights for marketers and discussed it at several points in the paper.
9

10
11
12 Also, the flow (in Study 1) is essentially below the mid-point regardless of the amount of
13 information - am I correct in observing this?
14

15 Yes, that is correct. The raw data shows that there are quite a few people who did not
16 appreciate the music and scored very low on many of the flow questions (1/7) which would have
17 pulled the averages down. We think that this is a stringent test of the efficacy of the
18 relationships as they were able to pull the average up from such a low starting point. While the
19 average is low, the pattern is what is important along with the fact that several people scored
20 high on the measure.
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24 Thank you again for another constructive review. We believe that thanks to your comments the
25 new version of the manuscript has improved and that the practical implications are clear.
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Appendix A- Study 1 Manipulations

1. Low Information Condition:

You have been assigned to listen to **progressive house music**.

2. Moderate Information Condition:

You have been assigned to listen to **progressive house music**.

Progressive house tunes often feature a long build-up section followed by a breakdown and then a climax. Progressive songs slowly increase the amount of different sounds layered onto each other like slowly adding pieces to a puzzle. You can hear different sounds being introduced one at a time, eventually combining into the larger pattern.

3. High Information Condition:

You have been assigned to listen to **progressive house music**.

Progressive house tunes often feature a long build-up section followed by a breakdown and then a climax. Progressive songs slowly increase the amount of different sounds layered onto each other like slowly adding pieces to a puzzle. You can hear different sounds being introduced one at a time, eventually combining into the larger pattern.

Electronic music is produced from a wide variety of sound resources—from sounds picked up by microphones to those produced by electronic oscillators (generating basic acoustical wave forms such as sine waves, square waves, and sawtooth waves), complex computer installations, and microprocessors—that are recorded on tape and then edited into a permanent form.

The progressive house genre features elements of dub, deep house, Italo house, big riffs and extended track lengths. Track tempos typically range from 120 to 134 beats per minute. The roots of progressive house can be traced back to the early 1990s rave and club scenes in the United Kingdom, Europe, Australia and Northern America. A combination of US house, UK house, Italian house, German house, and techno largely influenced one another during this era. The term was used mainly as a marketing label to differentiate new rave house from traditional American house.

Appendix B: Measurement Items

Flow Short Scale (10-items; Rheinberg et al. 2003; Engeser and Rheinberg 2008)

Please rate the following measures from 1=not at all to 7= very much so based on your experience playing the game (listening to music)

Fluency subscale (6 items)

- My thoughts ran fluidly and smoothly
- I knew what I was doing each step of the way
- I felt that I had everything under control
- I had no difficulty concentrating
- My mind was completely clear
- My thoughts seemed to happen naturally and on their own

Absorption Subscale (4 items)

- I was totally absorbed into the experience
- I felt just the right amount of challenge
- I lost track of time
- I was completely lost in thought

Openness to Experience (BFAS scale, DeYoung et al. 2007)

1 (strongly disagree) to 5 (strongly agree)

Openness Subscale

- Enjoy the beauty of nature.
- Believe in the importance of art.
- Love to reflect on things.
- Get deeply immersed in music.
- Do not like poetry. (R)
- See beauty in things that others might not notice.
- Need a creative outlet.
- Seldom get lost in thought. (R)
- Seldom daydream. (R)
- Seldom notice the emotional aspects of paintings and pictures. (R)

Intellect Subscale

- Intellect Am quick to understand things
- Have difficulty understanding abstract ideas. (R)
- Can handle a lot of information.
- Like to solve complex problems.
- Avoid philosophical discussions. (R)
- Avoid difficult reading material. (R)
- Have a rich vocabulary.
- Think quickly.
- Learn things slowly. (R)
- Formulate ideas clearly.

Appendix B – Cont'd

Flow Questionnaire (Csikszentmihalyi and Csikszentmihalyi 1988)

“My mind isn't wandering. I am not thinking of something else. I am totally involved in what I am doing. My body feels good. I don't seem to hear anything else. The world seems to be cut off from me. I am less aware of myself and my problems”

“My concentration is like breathing I never think of it. When I start, I really do shut out the world. I am really quite oblivious to my surroundings after I really get going.”

“I am so involved in what I am doing. I don't see myself as separate from what I am doing.”

Appendix C: Study 3 Song Reviews

Negative-Valence Reviews

Song Review 1:

“I didn’t like the way they mixed the fades with each other. They seemed to be choppy and too distinct from each other. The same for the bass and the drops, they didn’t work together. Not much synchrony throughout.”

Song Review 2:

“I didn’t like this piece of music. They did not put the highs and lows together very well. I also did not like how they contrasted the different beats, they didn’t fit together. Confusing song.”

Positive-Valence Reviews

Song Review 1

“I really liked the way they progressively transitioned with the fades to harmonize the different beats into one continuous rhythm. The bass was also mixed perfectly with the drops. Incredible synchrony throughout.”

Song Review 2

“Really nice piece of music. They had a nice balance of ups and downs. I liked how they contrasted different beats throughout, they really fit with each other. Powerful song.”