How Kinetic Property Shapes Novelty Perceptions

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Abstract

This paper demonstrates a new substantive finding - kinetic property in advertising, defined as direction changes in the paths of moving on-screen ad elements, enhances consumer judgments of product novelty. Across six studies, we first outline an inference-based theory as to why the novelty-enhancing effect of kinetic property manifests – kinetic property generates impressions of how visually lively an ad is, which leads to inferences of product atypicality and consequently, higher novelty judgments. Second, we demonstrate boundary conditions by showing that (i) the positive effect for kinetic property obtains with incremental (and not radical) innovations, (ii) the effect dissipates when figure-ground contrast in the ad makes kinetic property less discriminable, (iii) contextual adaptation to kinetic property can mitigate this effect, and (iv) kinetic property enhances novelty judgments primarily when product category characteristics such as perceived market dynamism match with kinetic property-based executions. Substantive implications for firms marketing new products as well as for multimedia advertising are offered.

Keywords: Novelty, Kinetic, New product, Online, Inference
Product novelty is a critical determinant of marketplace success. Products perceived as new are adopted faster, show better sales and profits (Gourville 2006; Mukherjee and Hoyer 2001), and lead to stronger firm performance (Sorescu and Spanjol 2008; Sorescu, Chandy, and Prabhu 2003). Past research identifies product-related aspects such as technology, functionality, features/attributes or design (Chandy and Tellis 1998; Hoeffler 2003; Mugge and Dahl 2013; Mukherjee and Hoyer 2001) as well as contextual and non-product related factors such as framing or categorization (Moreau, Markman, and Lehmann 2001; Ziamou and Ratneshwar 2003) as antecedents to consumer judgments of novelty.

Within the latter literature, emerging research has examined the role of physical, often visually processed, properties of marketing communication (e.g., Pieters, Wedel, and Batra 2010). Recent work shows how properties such as angle of ad pictures, incompleteness of typeface logos, and package shapes drive perceptions of the target product or brand (Folkes and Matta 2004; Hagtvedt 2011; Peracchio and Meyers-Levy 2005). However, little is known about how dynamic elements in multimedia advertisements shape consumer perceptions. This gap is noteworthy given that dynamic ad elements such as motion graphics, kinetic typography, and infographics have become increasingly popular in the current multimedia environment.

As the multimedia environment has become more variegated and newer technologies such as Javascript or Flash developed, advertisers are now able to easily and cheaply generate animated content (Krasner 2008). One example that reflects the surge in popularity of animated ads is webpage advertising that utilizes motion elements – recent reports show that such rich media advertising garnered revenues of more than $1.3 billion in 2013 (Interactive Advertising Bureau [IAB] 2014, p. 13). Further, recent practitioner surveys also indicate that a growing number of marketers choose dynamic content as their preferred marketing tactic on account of its
cost-effectiveness (eMarketer 2013). Although anecdotal evidence is plentiful, there is little systematic research on why animations in ads may be effective or ineffective, and on outlining conditions circumscribing these expectations (for an exception, see Goldstein et al. 2014).

In the current research, we introduce kinetic property of motion as a key determinant that shapes consumers’ novelty perceptions. By “kinetic property,” we refer to changes in direction embedded in moving ad elements (such as a focal product’s image) within a webpage advertisement. We argue that kinetic property generates stronger impressions of the ad being visually lively; we define this visual impression as ad liveliness. This low-level visual impression leads to higher level inferences pertaining to how atypical the advertised product is, which in turn enhances consumers’ novelty perceptions. The above described inferential process is moderated by product-related factors such as innovation type and market dynamism, contextual factors such as adaptation as well as theoretical factors such as figure-ground contrast (Wagemans et al. 2012).

[Insert Figure 1 about here]

We base the above proposition on insights from psychophysics and vision research. In the psychophysics literature, novelty is conceptualized as being determined by perceptual reactions to physical stimulus properties (Berlyne and Parham 1968; Cupchik and Berlyne 1979; Gati and Ben-Shakhar 1990; Rauschenberger 2003). Such physical properties can vary across contexts and in the case of kinetic property in particular, can affect high-level social/cognitive inferences (e.g., Scholl and Gao 2013; Scholl and Tremoulet 2000). Since motion is a fundamental characteristic of animated ads, how consumers process motion can have profound consequences on their cognitions and inferences about products.
We build upon this intuition and present six studies that empirically investigate our core proposition - that kinetic property enhances novelty judgments. First, we demonstrate the novelty-enhancing effect of kinetic property and outline its underlying process (Study 1-2). Second, we demonstrate how kinetic property differentially affects consumers’ novelty-related inferences depending upon the type of innovation (incremental vs. radical; Study 3). Third, we delineate how figure-ground contrast, a theoretically relevant factor, moderates this effect (Study 4). Fourth, we show that the novelty-enhancing effect of kinetic property may be mitigated when consumers are repeatedly exposed to similar animated ads (i.e., moderation by adaptation; Study 5A). Finally, we find that the effect of kinetic property obtains when product category characteristics such as market dynamism match high kinetic property ads but does not hold when they do not match (Study 5B). Study 5 also documents the effect of kinetic property upon downstream outcomes such as willingness-to-pay (Study 5A) and purchase intentions (Study 5B) across two different product categories.

Our research makes both theoretical and managerial contributions. Broadly, we contribute to the literature exploring the impact of visual properties of communication methods (Cian, Krishna, and Elder 2014; Hagtvedt 2011; Peracchio and Meyers-Levy 2005) by (a) expanding the domain of inquiry from static to dynamic elements, and (b) uncovering a specific property of dynamic elements - kinetic property - that explains their differential effects. More importantly, we add to the nascent literature on dynamic media content whose focus has hitherto been on the attention-getting effects of such content in the context of TV commercials (Brasel and Gips 2008) or the downside of animations in online banner ads – as peripheral on-screen stimuli – in distracting users (Goldstein et al. 2014). We extend this emerging literature by
providing theoretical insights into when and how kinetic property in animated ads leads consumers to make product-related *inferences*.

From the managerial standpoint, although dynamic ad elements are widely used in the field, little systematic knowledge exists surrounding their usage. Moreover, existing literature primarily documents negative effects of animations (e.g., Goldstein et al. 2014; Yoo and Kim 2005). Departing from this perspective, this paper formally examines when and how animations can work as an effective marketing communication tactic. To this end, this paper identifies kinetic property as a managerially actionable, advertisement-design related variable and also outlines limits to the effective use of kinetic property in online advertising. Key managerial takeaways include the implication that marketers can enhance consumers’ novelty-related inferences without imposing significant perceptual/cognitive load using kinetic property. Overall, this research aims to better develop our understanding of how digital technologies shape consumer behavior in multimedia-rich environments (MSI 2014).

**Theoretical Development**

*Perceptual Determinants of Novelty*

Prior evidence from psychophysics suggests that how novel a stimulus is judged may not be constrained by its inherent characteristics but could also be driven by contextual variations. For example, a given stimulus element such as an irregular geometric shape is seen as more novel when its color or shape distinguishes it from other nearby elements (Berlyne and Parham 1968; Cupchik and Berlyne 1979). Similarly, Gati and Ben-Shakhar (1990) show that even repeatedly presented shapes are perceived as novel when contextual characteristics such as
viewing angle, viewing distance, or lighting are varied. Along the same lines, Rauschenberger (2003) finds that existing objects are judged as new when their luminance is contextually varied. Thus, variations in how a product is visually presented in multimedia advertisements can determine how novel it is judged.

Similar notions have been explored within marketing as well wherein visual properties in static ads (camera angles, orientations etc.) have been shown to affect advertising persuasiveness (Peracchio and Meyers-Levy 2005). Similarly, visual characteristics of product- or brand-related stimuli such as logos, has been shown to affect higher level cognitions (Hagtvedt 2011). However, little is known about how dynamic ads (i.e., ads containing moving elements) affect consumer perceptions. This question forms our focus.

Imagine a web-ad containing an image of a product moving across the screen. This ad does not use spokespersons or animated characters. The primary visual cues available to consumers are the product’s image and its on-screen motion path. Drawing upon the discussion on stimulus novelty, the movement of this image across the screen should provide inferential cues that can shape higher level cognitions. Prior vision research also supports this conjecture by documenting how on-screen motion can shape higher level judgments and inferences (Scholl and Gao 2013; Scholl and Tremoulet 2000).

**Kinetic Property of Motion**

We define kinetic property of motion as direction changes embedded in the motion trajectories of on-screen images. This definition draws upon previous work in the vision and motion perception literatures (e.g., Tremoulet and Feldman 2000) and we focus on the role of kinetic property in shaping higher level judgments related to visual stimuli.
Past research has documented that trajectory direction change is a motion-related property that leads visual stimuli to be perceived as being lively and drive higher level inferences. For example, Bassili (1976) shows that when a simple on-screen geometric object (e.g. a circle) is programmed on a path converging towards another object, it generates impressions of “chasing” the latter. Further, if the second object independently moves “away”, viewers judge the two objects as interacting with each other and as exhibiting high-level social behavior such as approach or avoidance. Similarly, Dittrich and Lea (1994) show that direction changes embedded in the motion paths of an on-screen 2D object can generate inferences of goal-directedness (even though viewers are aware that the object is inanimate). More interestingly and germane to our work, when the path of a moving on-screen object involved ostensibly spontaneous changes in direction, the object was perceived as being alive (Santos et al. 2008). As such, direction changes embedded in the motion trajectory of visual elements can shape visual liveliness because such a property is ordinarily exclusive to independent agents who can control their movement without relying on external forces (Tremoulet and Feldman 2000). This stream of literature has termed these visual perception-related phenomena as “perceptual animacy” (e.g., Scholl and Gao 2013) and commonly suggested that it can be formed primarily by how on-screen objects move.

We draw upon the above discussion to posit that the presence of kinetic property in ads should generate stronger impressions of ad liveliness. That is, when an advertisement is designed with on-screen images that change direction while moving, such motion would signal animacy cues, and thus the advertisement overall should appear visually lively. In comparison to ads with kinetic property, a similar ad that contains the same on-screen images – but such images are moving without direction changes – should not generate such liveliness impressions. This is because in the latter case the moving images do not signal any animacy cues. This difference
should matter because past research shows that consumers often instantaneously infer product-related judgments from ad visuals (e.g., Peracchio and Meyers-Levy 2005).

Similar to past work in vision perception, the product image in the advertisement is also an inanimate object. Inanimate objects, by definition, should not be able to change direction on their own accord (even if they possess some momentum that keeps them “moving”). Thus, when a moving product image is embedded with kinetic property, it not only makes the advertisement visually lively, the enhanced visual liveliness also leads the product to stand out as atypical. Past work on categorization shows that atypicality increases to the extent that a category member (in our case, an inanimate product) has attributes (such as direction changes) that are distinct from other members (Loken and Ward 1990; Tversky 1977). Therefore, we expect that consumers draw greater inferences about product atypicality from ads that contain kinetic property as compared to animated ads that do not contain kinetic property.

Lastly, we argue that product atypicality inferences will lead to enhanced novelty judgments. The link between atypicality and novelty is also supported by prior categorization literature. For example, when an atypical product offers a new functionality, consumers are more likely to perceive the new functionality as truly new (Ziamou and Ratneshwar 2003). For instance, a furniture piece’s design was perceived as novel when it had atypical attributes compared to other furniture (Whitfield and Slatter 1979). Accordingly, when an advertised product is inferred as atypical, consumers’ atypicality inferences should drive greater novelty judgments. Recapping the preceding discussion, we hypothesize that:

H1a: The focal product will be perceived as more novel after exposure to the high (vs. low) kinetic property ad, and,
H1b: The effect of kinetic property on novelty judgments will be serially (and positively) mediated by ad liveliness and product atypicality respectively.
It is important to note that “ad liveliness” refers to perceptions of the focal ad appearing lively in a visual sense (e.g., alive with color, alive with movement, etc.) but does not imply that the focal ad is literally/biologically alive (and thus could be killed or made dead). Further, we focus on perceptions of ad liveliness rather than liveliness of specific on-screen images because past research has shown that holistic processing predominates over component-level processing when it comes to visual perceptions (e.g., Navon 1977). Prior marketing literature also documents that consumers’ sensory experience of visuals tends to often come from holistic impressions of all elements together rather than a bottom-up processing of individual elements (Orth and Malkewitz 2008). This idea is also mirrored in the broader literature on ad processing (e.g., Meyers-Levy 1989) as well as related areas such as preconscious processing (e.g., Janiszewski 1988) and embodied cognition (e.g., Chae and Hoegg 2013).

**Overview of Experimental Paradigm**

The basic experimental paradigm involved showing participants a web-based multimedia advertisement which introduced a fictitious new product followed by a survey containing dependent measures and covariates (for details on scale items, see Appendix A). We manipulated kinetic property by varying motion trajectories of the visual elements in the ad. In the high kinetic property ad, images and informative text about the product appeared sequentially on-screen in a way that there were multiple points of direction change in their respective motion trajectories (see Appendix B). In the low kinetic property ad, the same images appeared in the ad sequentially without direction changes (path trajectories remained unchanged from point of entry to point of rest). Unless otherwise noted, all other ad elements were identical.
Study 1: The Novelty-Enhancing Effect of Kinetic Property

Our main focus at this point is in isolating the role of kinetic property and explicating how it influences consumers’ novelty-related inferences. Thus, we include two ads that both contain moving elements - one possessing a change in direction (high kinetic property) and the other without it (low kinetic property). In this way, we can clearly pinpoint the role of kinetic property of motion and not conflate it with the presence or absence of motion itself. However, we also include a static ad as a comparison to the two kinetic property ads in order to better help understand (a) how dynamic ads (ads with movement) compare with static ads, and (b) within dynamic ads, if kinetic property has unique consequences. This question is also managerially relevant as prior research documents some findings that dynamic ads may be less effective compared to statics ads (Goldstein et al. 2014).

Stimuli, Design, and Procedure

Ninety-four undergraduates (55% male) participated in a single factor (kinetic property: high/low/static) between-subjects laboratory experiment in exchange for course credit. The high and low kinetic property stimuli were constructed as described in the earlier section (see Appendix B) while the static ad group saw a screen capture of the final frame (containing all relevant product details). Upon arrival, participants were randomly assigned to view one of three ads introducing a fictitious new smartphone. The focal smartphone was an incrementally new product, product descriptions reflected it, and participant ratings confirmed the same (mean novelty rating in the static ad was below the mid-point of the scale; \( M = 3.65, \ SD = 1.46 \)). After viewing the ad, participants rated its novelty (\( \alpha = .80 \)). We also measured participants’ attention
to the ad ($\alpha = .84$) in order to test for differences in attention across dynamism (moving vs. static) as well as kinetic property (high vs. low).

**Results and Discussion**

A one-way ANOVA on novelty perceptions revealed a significant main effect for kinetic property ($F(2, 91) = 4.50, p < .02$). Supporting H1a, planned contrasts showed that perceived product novelty was greater in the high (vs. low) kinetic property ad ($M_{\text{high KP}} = 4.67$, $SD = 1.36$, $M_{\text{low KP}} = 3.86$, $SD = 1.42$; $t(91) = 2.25, p < .03$). In addition, participants exposed to the high kinetic property ad rated the product as more novel than those exposed to the static ad ($M_{\text{static}} = 3.65$, $SD=1.46$; $t(91) = 2.85, p < .01$). There were no differences in novelty perceptions between the low kinetic property and static ads ($t(91) = .62, p > .5$). Taken together, the above pattern indicates that kinetic property, and not movement alone, predicts novelty judgments.

Moreover, while participants’ attention to the ad was greater for both high and low kinetic property ads ($M_{\text{high KP}} = 5.40$, $SD = 1.17$, $M_{\text{low KP}} = 5.21$, $SD = 1.26$) compared to the static ad ($M_{\text{static}} = 4.23$, $SD = 1.25$, $p\text{s} < .01$), attention was not different between the two kinetic property ads ($p > .5$). Taken together, these findings imply that both the dynamic ads were more attention-getting compared to the static ad – a pattern to be expected since moving objects are preattended by the human visual system (McLeod, Driver, and Crisp 1988). Yet, in order for motion to affect consumers’ inferences regarding product novelty, merely catching attention is not enough. Moving ad elements should also contain kinetic property. Without kinetic property, a dynamic ad does not generate visual liveliness, an important inferential cue for novelty-related judgments, and thus leaves novelty perceptions unchanged relative to static ads.

Past research exploring animated ads has documented distraction as a major drawback of animated ads because animations may interfere with viewers’ cognitive processing of ad
messages (Yoo and Kim 2005). The inclusion of the static ad condition also allowed us to explore whether kinetic property in the ad works as a distractor. The static ad group provided the baseline novelty ratings as they judged the focal product in the absence of animations of any kind. Further, given that the baseline novelty ratings placed the focal product at the incrementally novel end of the new product continuum, the increase in perceived novelty due to kinetic property cannot be attributed to distraction on account of kinetic property.

That is, if the high kinetic property ad distracts consumers from processing attribute details, product novelty judgments should revert to the baseline (due to guessing or regression-to-the-mean), whereas novelty judgments would remain at the baseline level with the low kinetic property ad. Thus, if distraction were in play, we should see at best, null effects or possibly negative effects of kinetic property. However, the pattern we observed was opposite to that predicted by the distraction account. To elaborate, novelty ratings in the high kinetic property ad are enhanced beyond the baseline ratings of the static control group, whereas this enhancement did not manifest in the low kinetic property ad. This finding implies that kinetic property actively serves to enhance perceived novelty. Why/how should it do so? To answer this question, we focus on the hypothesized inference making process underlying the novelty-enhancing effect of kinetic property and empirically test it via mediation analyses in Study 2.

**Study 2: Process Underlying the Novelty-Enhancing Effect of Kinetic Property**

We theorized that kinetic property enhances perceptions of ad liveliness due to which consumers infer how atypical the focal product is, which in turn shapes their novelty judgments. In this study, we empirically test our process hypothesis: kinetic property → ad liveliness →
product atypicality $\rightarrow$ product novelty. In addition, we also outline and test for competing process accounts and alternative explanations that include vividness, anthropomorphism, attitude towards the ad and distraction.

**Competing Process Accounts**

One could argue that kinetic property may enhance novelty by increasing the vividness of the ad. A stimulus can be considered vivid when it is attention-getting, emotionally interesting, imagery-provoking, memorable, or easier to elaborate (Keller and Block 1997). However, although vividness affects attention paid to the ad, it should not affect novelty since it does not offer any visual cues related to animacy that contribute to inferences towards atypicality. Therefore, we do not expect it to play a mediating role in the proposed causal chain.

Anthropomorphism is another possible alternative explanation. Kinetic property may lead to anthropomorphic inferences wherein the product is thought to be “human-like.” Note that anthropomorphism is generally perceived when nonhuman entities contain or elicit human forms (Kim and McGill 2011). However, our ad elements are restricted to product images which are visually and innately inanimate and thus, do not include any human references. Additionally, kinetic property – a motion-related property – does not contain any connotations of humanity. Thus, our theory leads us to expect kinetic property to generate visual liveliness without any attendant “human” and “life”-like judgments. Therefore, we do not expect anthropomorphic inferences/judgments to mediate our process. However, as with vividness, we measure and empirically test it in the causal chain.

We also examine whether attitudes to the ad ($A_{ad}$) has a process role. This examination is motivated by past work which shows that $A_{ad}$ can affect downstream judgments (MacKenzie, Lutz, and Belch 1986) and the conjecture that kinetic property may affect participants’ liking of
the ad. However, while $A_{ad}$ captures consumers’ affective reactions to the ad, ad liveliness refers to consumers’ visual impression of the ad and is restricted to the visual domain. Thus, we do not expect $A_{ad}$ to play a mediating role but nevertheless empirically test for it in Studies 2 and 3.

Lastly, even though Study 1 provides strong experimental evidence that distraction does not play a role in the effect observed, we further test for distraction using a different measure. In Study 2, we recruit a recall task to test whether kinetic property draws consumers’ attention away from product attribute information thereby leading to inflated novelty judgments.

**Stimuli and Pretest**

We created two versions (high and low kinetic property) of an advertisement introducing a fictitious new smartphone. As in Study 1, we used an incrementally new smartphone and a pre-test ($N = 30$, online panel) using the product in a static ad confirmed that *a priori*, the product is viewed as an incrementally new one ($M = 3.5$, $SD = 1.75$). A second pretest ($N = 83$; online panel) checked whether the two ads differed only on kinetic property and not on any other relevant dimensions. Participants were told that they would rate an ad on several dimensions and were randomly assigned to view one of two ads. We then asked them to rate kinetic property in the ad using a 100-point sliding scale: “I noticed direction changes in motion in the ad” ($0 = \text{strongly disagree}, 100 = \text{strongly agree}$). Participants also rated the ad’s visual appearance ($\alpha = .97$) and informativeness ($\alpha = .91$; for details, see Appendix A). As expected, those in the high (vs. low) ad condition detected greater kinetic property ($M_{\text{high KP}} = 69.46$, $SD = 25.18$, $M_{\text{low KP}} = 53.24$, $SD = 29.10$; $t(81) = 2.71$, $p < .01$). Importantly, the ads did not differ in terms of visual appearance ($M_{\text{high KP}} = 3.64$, $SD = 1.68$, $M_{\text{low KP}} = 3.54$, $SD = 1.54$; $t(81) = .29$, $p > .75$) or informativeness ($M_{\text{high KP}} = 4.30$, $SD = 1.44$, $M_{\text{low KP}} = 4.18$, $SD = 1.46$; $t(81) = .36$ $p > .7$).

**Main study**
Fifty-nine undergraduates (53% male) participated in a single factor (kinetic property: high/low) between-subjects laboratory experiment in exchange for course credit. Participants were randomly assigned to view one of two pretested ads subsequent to which they reported arousal (\(\alpha = .93\)) and ad liveliness (\(\alpha = .94\)). Next, we measured judgments of product novelty (\(\alpha = .74\)) and atypicality (\(\alpha = .78\)). We also measured participants’ attention to the ad (\(\alpha = .86\)). Later, as a measure to test for the role of distraction, we measured participants’ recall to check whether the kinetic property manipulation distracted from cognitive processing of ad messages. After the recall task, participants reported ad vividness (\(\alpha = .76\)), anthropomorphism perceptions (\(\alpha = .79\)) and attitude towards the ad (\(\alpha = .88\)) followed by demographic information.

**Results and Discussion**

*Product novelty.* A one-way ANOVA revealed a significant main effect for kinetic property (\(F(1, 57) = 9.69, p < .01\)). Supporting H1a, participants rated the product as more novel when kinetic property was high vs. low (\(M_{\text{high KP}} = 4.21, SD = 1.13, M_{\text{low KP}} = 3.26, SD = 1.21\)).

In addition, both participants’ recall (\(M_{\text{high KP}} = 2.25, SD = 1.26, M_{\text{low KP}} = 2.47, SD = 1.22; t(57) = .67, p > .5\)) as well as self-reported attention to the ad (\(M_{\text{high KP}} = 4.57, SD = 1.34, M_{\text{low KP}} = 4.48, SD = 1.59; t(57) = .22, p > .8\)) were not significantly different indicating that kinetic property did not differentially affect attention to the ad and thus, attribute encoding. This pattern indicates that distraction cannot explain the difference in novelty judgments between the high and low kinetic property ads. Additionally, there were no significant differences in arousal (\(M_{\text{high KP}} = 3.96, SD = 1.29, M_{\text{low KP}} = 3.40, SD = 1.49; t(57) = 1.53, p > .13\)) or \(A_{\text{ad}}\) (\(M_{\text{high KP}} = 2.76, SD = 1.38, M_{\text{low KP}} = 2.66, SD = 1.14; t(57) = .30, p > .75\) across the two ads.

*Process mediation.* Next, we estimated a serial multiple mediator model (Hayes 2012; model 6) to test our proposed underlying process (H1b). Regression coefficients appear in Figure
2. In support of H1b, bootstrap analyses revealed a significant serial mediation effect (.3139, 95% CI = .10 to .73). Other than this significant serial causal chain, all other causal chains in the model yielded confidence intervals including zero.

*Competing accounts.* In order to test for alternative causal chains, we first estimated a serial multiple mediator model with ad liveliness replaced with ad vividness. Kinetic property did not affect ad vividness (β = .16, t = .51, p > .6) and further, vividness did not affect atypicality inferences (β = .24, t = 1.83, p > .05). Process analysis further confirmed that the alternative process of ad vividness mediating the effect of kinetic property (kinetic property → ad vividness → product atypicality → product novelty) is not supported (.0191, 95% CI = -.03 to .16).

A second serial mediation analysis using anthropomorphism as a process variable again revealed no effect of kinetic property upon anthropomorphism (β = .20, t = .50, p > .6) and no effect of anthropomorphism upon atypicality (β = .15, t = 1.43, p > .15). Further, the overall alternative path via anthropomorphism (kinetic property → anthropomorphism → product atypicality → product novelty) was also not supported (.0153, 95% CI = -.03 to .18). Lastly, a third process model with A_ad as a mediator (kinetic property → A_ad → product atypicality → product novelty) also revealed no support for the indirect path (.0117, 95% CI = -.07 to .14).

[Insert Figure 2 about here]

To sum up, Study 2 yields support for our proposed process – kinetic property enhances ad liveliness which in turn increases how atypical the focal product is inferred. Further, increased atypicality drives greater novelty judgments. Moreover, the data suggests that in the context of kinetic property the alternative explanations of ad vividness, anthropomorphism, and A_ad do not hold. Lastly, Study 2 also confirms that kinetic property does not distract ad processing.
While the above evidence lends support to the hypothesized theory, one concern may be that the experimental procedure could have driven the effects. That is, since novelty was measured after participants reported their ad liveliness impressions, ad liveliness might have served as an anchor. To address this issue, we took two steps: first, we conducted a replication (N = 40) with a modified procedure to ensure clearer methodological separation (Podsakoff et al. 2003) and second, we estimated multiple SEM models with correlated errors. We found that (a), the revised empirical study replicated the above results including the serial mediation pattern and (b), across different SEM models (with and without correlated errors), the core effect and mediation paths remained robust, i.e., theoretical inferences do not change (details in Appendix C). Taken together, these follow-up analyses help rule out concerns that methodological issues (e.g., rating spillover or correlated measurement errors) led to the serial mediation pattern.

Going forward, we explore how the novelty-enhancing effect of kinetic property varies across different types of new products. Since kinetic property shapes novelty judgments through inference making, it is likely that product attribute information that is simultaneously conveyed along with kinetic property affects what kind of inferences are made. Thus, how influential kinetic property is as a visual cue should be moderated by the type of new product being advertised, i.e., whether it is an incrementally or radically new product (INP vs. RNP).

**Study 3: Two-channel Cue Provision and the Moderating Role of Innovation Type**

A robust literature documents how products differ on innovation levels and classifies them as being either incrementally or radically new (Chandy and Tellis 1998). Incrementally new products (INPs) are characterized by refinement of existing product attributes and are
consistent with consumers’ pre-existing knowledge while radically new products (RNPs) bring new attributes to the table that challenge consumers’ pre-existing knowledge and expand it (Hoeffler 2003). From a marketing communication standpoint, product-attribute information conveyed in an ad often helps separate incremental from radically new products.

Now consider a multimedia ad execution that contains kinetic property. Here, we start with the premise that such an ad conveys two types of diagnostic cues simultaneously. First, pictorial and text ad elements directly inform consumers of attribute information. Such information forms an explicit cue that should be cognitively processed to evaluate the focal product. Second, kinetic property embedded in the moving ad elements conveys sensory cues (ad liveliness; as demonstrated in Studies 1 and 2). Thus, both types of communicative cues - cognitive and sensory - are provided simultaneously in the given ad. This two-channel cue provision notion finds parallels in research on advertising (Messaris 1997; Peracchio and Meyers-Levy 2005), attitudes (Chaiken and Maheswaran 1994; Petty, Cacioppo, and Schumann 1983) as well as embodied cognition (Chae and Hoegg 2013; Sundar and Noseworthy 2014).

Further, we posit that between these two types of cues, sensory cues will be processed earlier and faster. This conjecture is also supported by past work on preattentive processing: because kinetic property is a sensory input, it should be visually preattended (Greenwald and Leavitt 1984; Jarvenpaa 1990) before attribute information is cognitively elaborated upon. Thus, novelty judgments should be almost instantaneously formed when an ad execution contains kinetic property. Such judgments should precede inferences derived from cognitive processing of attribute information. Prior work on elaboration and ad processing also suggests that attribute information processing is relatively effortful and slow in comparison to perceptual processing (Chaiken and Maheswaran 1994; MacInnis and Jaworski 1989).
Taken together, it follows that the presence of kinetic property in an ad should change the locus of inference from product attributes to ad liveliness. That is, in the presence of kinetic property, consumers rely less on attribute information to derive downstream judgments. Note that we do not suggest that attribute information is not processed (or less attended to); it is merely not adequately recruited by the consumer in the inferential process. Results from pre- and post-tests for Study 3 support this expectation (details in Study 3 method section).

Why should the shift in the locus of inference matter? Consider a new product advertised via an ad execution containing moving ad elements. If the locus-of-inference argument holds, we should observe the following: first, in the case of the low kinetic property ad, although kinetic property is processed earlier through the sensory route (i.e., the shift in inferential cue occurs), since the ad does not offer strong visual liveliness cues, novelty perceptions should be determined by cognitively processed attribute information. Thus, in this case, by definition RNPs should be perceived as more novel than INPs.

In contrast, when there is high kinetic property in the ad, the ad conveys meaningful visual liveliness cues due to the presence of direction changes embedded in moving elements (as seen in Studies 1 and 2). This cueing should lead to stronger atypicality/novelty inferences in the case of INPs (replication of H1). However, in the case of RNPs, since a priori novelty judgments are relatively higher, it would be difficult to further enhance novelty judgments using kinetic property. Thus, novelty judgments for RNPs will remain unchanged. Taken together, kinetic property will enhance novelty judgments for INPs, but not so for RNPs thereby reducing the difference in judged novelty between INPs and RNPs. Based on the above conceptualization, we formally hypothesize that:

**H2:** The difference in novelty judgments between INPs and RNPs will be significantly less (greater) after exposure to the high (vs. low) kinetic property ad.
At this point we would like to highlight again that distraction or attentional differences should not drive the differential effects of kinetic property across product types. That is, kinetic property does not interfere with attention capture and/or learning of information ad (as shown in Study 2), but it changes the locus of inference from attribute information to ad liveliness. If attention differences or distraction are causal, consumers should differ in their attention towards the ad and/or encoding of attribute information: we do not find evidence for any such differences in our data (details in Study 3 results). Furthermore, if distraction is in play and kinetic property leads respondents to guessing or random responding, we should also observe differences in the variance of novelty judgments between conditions: Levene’s test of equality of variance does not support this expectation ($p > .25$).\(^5\)

**Stimuli and Pretest**

For this study we created ads introducing a fictitious new tablet. We utilized a commonly available tablet as the INP stimulus, and a new type of tablet providing advanced technology and functionality (e.g., flexible OLED display and interchangeable hardware) as the RNP stimulus. Product images were included in the stimuli. Kinetic property was manipulated similar to previous studies. A pretest ($N = 84$; online panel) indicated that kinetic property was greater in the high (vs. low) kinetic property ad ($M_{\text{high\ KP}} = 73.28$, $SD = 20.62$, $M_{\text{low\ KP}} = 52.10$, $SD = 29.44$; $t(82) = 3.83$, $p < .001$). The two ads did not differ on visual appearance ($\alpha = .96$; $M_{\text{high\ KP}} = 4.14$, $SD = 1.80$, $M_{\text{low\ KP}} = 3.90$, $SD = 1.77$; $t(82) = .61$, $p > .5$) or informativeness ($\alpha = .92$; $M_{\text{high\ KP}} = 4.38$, $SD = 1.51$, $M_{\text{low\ KP}} = 4.57$, $SD = 1.25$; $t(82) = .62$, $p > .5$).

**Main Study**

One hundred and seventeen undergraduates (52% male) participated in a 2 (innovation type: RNP/INP) x 2 (kinetic property: high/low) between-subjects factorial online experiment in
exchange for course credit. Participants were randomly shown one of the four pretested advertisements after which they were administered the survey containing dependent measures and covariates. We measured ad liveliness (α = .89), product novelty (α = .88), and product atypicality (α = .90). We also captured participants’ attention to the ad (α = .91), arousal (α = .87), and $A_{ad}$ (α = .94). Lastly, participants provided demographic information.

Results and Discussion

Product novelty. A 2 (innovation type) x 2 (kinetic property) ANCOVA with $A_{ad}$ as a covariate revealed a significant main effect for innovation type ($M_{RNP} = 4.35$, SD = 1.49, $M_{INP} = 3.36$, SD = 1.40; $F(1, 112) = 20.45$, $p < .001$) and no main effect for kinetic property ($p > .75$). Further, the two-way interaction between innovation type and kinetic property was significant ($F(1, 112) = 11.83$, $p < .001$). As hypothesized, planned contrasts revealed that when kinetic property was low, novelty ratings were greater for RNPs than for INPs ($F(1, 112) = 33.04$, $p < .001$), whereas when kinetic property was high, novelty ratings were not significantly different across RNPs and INPs ($F(1, 112) = .56$, $p > .45$).

Importantly, a within-group contrast shows that this reduction in differences was partly driven by the enhancement of novelty judgments for the incrementally new product ($F(1, 112) = 5.82$, $p < .05$) – replicating the core effect found in earlier studies. Interestingly, we also find that kinetic property reduced the novelty judgments of RNPs ($F(1, 112) = 7.35$, $p < .01$) – a pattern consistent with the shift-in-locus-of-inference argument outlined earlier.

The main effect for $A_{ad}$ was significant and positive ($F(1, 112) = 50.42$, $p < .001$), but removing $A_{ad}$ as a covariate does not change any results. Additional ANOVAs with attention (all $ps > .15$), arousal (all $ps > .2$), and $A_{ad}$ (all $ps > .2$) as dependent measures indicate no differences across conditions. Means and standard deviations appear in Table 1.
We also conducted a post-test (N=29; within-subjects design; randomized presentation of stimuli) to see if participants’ attention towards product attributes, i.e., attribute encoding levels, systematically differed across conditions. Results show that attribute information was adequately encoded (M = 2.42, SD = .91, range = 0 - 4). Further, there were no differences in attribute recall between the high and low kinetic property ads across innovation type (p > .8) thereby mitigating concerns of differential attention between conditions. Lastly, the core serial mediation pattern observed in Study 2 was replicated for the data in this study as well (.2382, 95% CI = .03 to .50).

To recap, Study 3 shows that the novelty-enhancing effect of kinetic property is circumscribed by innovation type: kinetic property increases novelty perceptions when innovation type is incremental, but does not so when innovation type is radical. We now focus on explicating the role of a theoretically motivated factor circumscribing the novelty-enhancing effect of kinetic property – figure-ground contrast (Guido 2001; Wagemans et al. 2012).

Study 4: Moderation by Figure-Ground Contrast

Figure-ground contrast is a factor that relates to the ease with which humans process visual stimuli (Guido 2001; Jarvenpaa 1990). This theory suggests that how a visual stimulus is processed is not just determined by an isolated aspect of the stimulus; instead, it is often a consequence of feature contrast between different stimulus elements (Milosavljevic et al. 2012). This is because one element in a frame often affects how other elements are visually processed. For example, in order for foreground figures to be sufficiently processed, they should be distinguishable from background settings. Thus, depending upon how visually demanding an ad
background is, the foreground kinetic property may be more (or less) distinguishable and consequently, differentially effective. In a conceptual article, Lurie and Mason (2007) suggest that when figures are distinguishable from ground settings, they are likely to exert a greater impact on judgments and perceptions. Also, Pieters, Wedel, and Batra (2010) show that figure-ground contrast shapes the visual complexity of a print ad in turn affecting brand identifiability.

We recruit similar insights for Study 4. We utilize an optical-illusion inducing background (see Appendix D) to manipulate figure-ground contrast between kinetic property – our foreground element – and the ad background. Building upon the above discussion, we suggest that when figure-ground contrast is low, i.e., the ad background is visually demanding, kinetic property will be less likely to “pop-out” in relation to the background. Therefore, its impact on novelty judgments should be mitigated. In contrast, when figure-ground contrast is high, i.e., the background is less visually demanding kinetic property will be distinguishable and the earlier observed effects on novelty will manifest. Formally,

**H3:** With high figure-ground contrast, novelty judgments will be greater for the high (vs. low) kinetic property ad but with low figure-ground contrast there will be no difference.

**Stimuli and Pretest.**

We created online ads introducing a fictitious new digital camera. A pretest (N = 83; online panel) indicated that kinetic property was greater in the high (vs. low) kinetic property ad ($M_{high\ KP} = 66.05$, $SD = 26.34$, $M_{low\ KP} = 50.40$, $SD = 27.02$; $t(81) = 2.67$, $p < .01$) and further, the two ads did not differ on visual appearance ($\alpha = .94$; $M_{high\ KP} = 2.74$, $SD = 1.32$, $M_{low\ KP} = 2.81$, $SD = 1.50$; $t(81) = .23$, $p > .8$) or informativeness ($\alpha = .93$; $M_{high\ KP} = 3.82$, $SD = 1.38$, $M_{low\ KP} = 4.22$, $SD = 1.36$; $t(81) = 1.34$, $p > .15$).

**Main Study**
Seventy-five undergraduates (56% male) participated in a 2 (figure-ground contrast: high/low) x 2 (kinetic property: high/low) between-subjects laboratory experiment in exchange for course credit. Participants were asked to imagine that they were visiting a website to buy a new digital camera and were randomly shown one of four pretested ads introducing a new digital camera (an incremental new product). To manipulate figure-ground contrast, we used two versions of an optical-illusion inducing image as the ad background (see Appendix D).

After viewing the website ad, participants reported their arousal ($\alpha = .90$) and novelty judgments ($\alpha = .73$). We also measured attribute recall to test if the background graphic impeded participants’ cognitive processing. Analyses showed that recall was not significantly different across conditions (all $p$s > .35), indicating that the figure-ground contrast manipulation was isolated to the visual domain and did not affect cognitive processing (i.e., did not impose cognitive load). Participants then responded to the manipulation check measures for figure-ground contrast on seven point scales: “How difficult was it to identify the relevant information from the graphics in the ad background?”, “How hard was it to tell apart the product information from the graphics in the ad background?”, and “How distracting were the graphics in the ad background while you viewed the ad?” ($\alpha = .87$). Finally, they indicated attention to the ad ($\alpha = .87$) and $A_{ad}$ ($\alpha = .92$) followed by demographic information.

**Results and Discussion**

*Manipulation check.* A t-test revealed that the figure-ground contrast manipulation was successful ($M_{low\ contrast} = 5.54$, $SD = 1.35$, $M_{high\ contrast} = 4.41$, $SD = 1.69$; $t(73) = 3.20$, $p < .01$).

*Product novelty.* A two-way ANOVA revealed no significant main effects ($p$s > .05) but as hypothesized, the two-way interaction between figure-ground contrast and kinetic property was significant ($F(1, 71) = 5.09$, $p < .03$). As illustrated in Table 1, when figure-ground contrast
was high, novelty judgments were greater in the high (vs. low) kinetic property ad (F(1, 71) = 7.75, p < .01). However, when figure-ground contrast was low, novelty judgments were equivalent across two ads (F(1, 71) = .12, p > .7). There were no differences in arousal (all ps > .6) or attention to the ad (all ps > .3) across all conditions. Lastly, as with Studies 2 and 3, A_ad did not differ by ad type; also, including/removing A_ad as covariate does not change results.

The results above indicate that with lower figure-ground contrast kinetic property becomes less distinguishable which in turn reduces the likelihood of the ad providing the visual liveliness cues needed for enhancing novelty, in turn, leading consumers to base their judgments on attribute information. This has the effect of reducing novelty judgments – in line with the inherent innovativeness of the product (an incrementally new digital camera). Thus, these results are consistent with the inference-based rationale advanced in H2.

Across Studies 3 and 4, we have laid out conditions where product-related (innovation type in Study 3) or process-related (figure-ground contrast in Study 4) factors moderate the effect of kinetic property. Furthering these studies, in Study 5 we introduce two managerially motivated moderators: visual adaptation to animations and product category characteristics. In addition, we also examine downstream variables like willingness-to-pay and purchase intentions.

**Study 5: Moderation by Ecologically Relevant Factors**

In Study 5, we outline two ecologically relevant factors and demonstrate their moderating role. First, we deal with the characteristics of the environment in which consumers may be viewing an ad. Specifically, we examine how the nature of preceding ads can affect the processing of kinetic property-laden ads – adaptation (vs. not) in Study 5A. Second, Study 5B
deals with how product category characteristics of the advertised product interact with kinetic property. For this, we focus upon how the fit between a specific product category characteristic - market dynamism - and kinetic property affects consumers’ inference making.

**Study 5A: Contextual Adaptation**

Prior research has proposed that how consumers respond to an ad is often determined by the preceding stimuli (Cox, Cox, and Mantel 2010; Puccinelli, Wilcox, and Grewal 2015). For example, Puccinelli, Wilcox, and Grewal (2015) report that emotions induced by preceding movies lead viewers to avoid the following energetic commercials. This argument is also in line with related research exploring adaptation effects (Folkes and Matta 2004; Nelson, Meyvis, and Galak 2009). These researchers suggest that exposure to preceding stimuli (e.g., product packages or advertisements) not only leads consumers to quickly adapt to their experiences of the stimuli, but also decreases their responsiveness to the following target stimulus.

The above discussion offers the substantive implication that an ad viewing context that leads consumers to adapt to a specific ad feature (i.e., kinetic property in our case) would alter intended advertising effects. Drawing upon this notion, we propose that when consumers are exposed to a series of similarly animated ads (i.e., adaptation condition), their novelty judgments will be less affected by kinetic property since they would be adapted to animated visuals in the focal ad. In contrast, the novelty enhancing effect of kinetic property will manifest when consumers are not visually adapted to animations (i.e., non-adaptation condition). Taken together, H4: In the non-adaptation condition, novelty judgments will be greater for the high (vs. low) kinetic property ad but in the adaptation condition, there will be no difference.

**Study 5A Stimuli, Design, and Procedure**

We developed high and low kinetic property ads introducing a fictitious, incrementally new smartphone. The kinetic property manipulation followed earlier studies. We also prepared
four different web-ads introducing other incrementally new products as ad stimuli preceding the focal ad. Related work on repetition suggests that two or three exposures are usually sufficient to induce adaptation (e.g., Campbell and Keller 2003). In order to avoid tedium we had participants view five ads in total, including the focal ad. To minimize product-category confounds, we also used consumer electronics products (laptops, tablets, digital cameras, and printers) in the four preceding ads. For the adaptation group, animations of the same kind being used in the focal ad were embedded into the four preceding ads, so that participants are contextually adapted. For the non-adaptation group, a random set of four different ads (using the same products as above) was presented followed by the focal ad. Importantly, for both the adaptation and non-adaptation conditions we took care to ensure that relevant physical ad features such as the size of the product image, the number of images, number of trajectories, trajectory length, start and end points of individual trajectories as well as the amount of textual information presented in the four preceding ads were identical to that of the focal ad.

Two hundred and thirty (*M*<sub>age</sub> = 37.33 years; 57% male) consumers from an online panel participated in a 2 (adaptation: non-adaptation/adaptation) x 2 (kinetic property: high/low) between-subjects factorial experiment. Participants were told that they would be shown five different online advertisements and evaluating one of five ads. Then, they were randomly assigned to one of four conditions. The four preceding ads were presented in a randomized order and the focal ad was always shown at the end. After viewing all five ads, participants read a filler story. Subsequently, participants reported their arousal (*α* = .88), product novelty judgments (*α* = .86) and willingness to pay (WTP). We also measured participants’ recall of attribute information. After the recall task, participants indicated attention to the ad (*α* = .91), *A*<sub>ad</sub> (*α* = .88), and
the ad’s visual appearance (α = .97) and informativeness (α = .88). They then responded to a manipulation check measure for kinetic property followed by demographic information.

**Study 5A Results and Discussion**

*Manipulation check.* Independent samples t-tests indicated that kinetic property was greater in the high (vs. low) kinetic property ad (M\text{high KP} = 55.11, SD = 31.55, M\text{low KP} = 37.03, SD = 27.54; t(228) = 4.62, p < .001).

*Product novelty.* A two-way ANOVA revealed no significant main effects (ps > .1) but a significant two-way interaction (F(1, 226) = 5.19, p < .05) emerged in support of H4 (means and standard deviations in Table 1). Replicating our core effect, within the non-adaptation group, novelty judgments were greater in the high (vs. low) kinetic property ad (F(1, 226) = 5.07, p < .05), whereas within the adaptation group, novelty judgments were equivalent across both ads (F(1, 226) = 1.05, p > .3). Additionally, there were no differences in participants’ arousal (p > .9), attention to the ad (p > .6), A\text{ad} (p > .8), recall (p > .5), the ad’s visual appearance (p > .6), and informativeness (p > .6) across the two kinetic property conditions.

*Willingness-to-pay.* Consistent with prior research on the downstream effects of novelty judgments (Ziamou and Ratneshwar 2003), we expect willingness to pay to reflect the pattern observed for novelty judgments. Additionally, novelty should mediate the effect of kinetic property on WTP. A two-way ANOVA on WTP revealed no significant main effects (ps > .2) but revealed a significant two-way interaction between adaptation and kinetic property (F(1, 226) = 3.99, p < .05). As shown in Table 1, within the non-adaptation group, WTP was greater with high (vs. low) kinetic property ads (F(1, 226) = 5.02, p < .05) but within the adaptation group, WTP was not different across two ads (F(1, 226) = .31, p > .55).
Bootstrap analyses with kinetic property as antecedent, WTP as criterion, contextual adaptation as moderator and novelty judgments as mediator reveal support for moderated mediation (Hayes 2012, model 7). Specifically, the effect of kinetic property on WTP via novelty was significant and positive within the non-adaptation group (9.5359, 95% CI = 2.06 to 22.44), but not so within the adaptation group (-4.1662, 95% CI = -16.22 to 3.72).

To recap briefly, Study 5A shows that when consumers are contextually adapted to kinetic animations, the effect of kinetic property is mitigated. This finding implies that contextual factors such as the immediate environment in which the consumer views an ad can lead adaptation to advertising features and determine their subsequent responses. We also show that enhanced novelty judgments by kinetic property further affect consumers’ WTP.

**Study 5B: Market Dynamism**

In our studies so far, we show effects for kinetic property for high-technology products (e.g., smartphones, tablets, and digital cameras). Such products are often characterized by highly dynamic and fast-changing technologies, customer needs, or firm strategies (Henard and Szymanski 2001). In contrast, other product categories involve relatively stable technologies or longer product life cycles, and thus remain much the same in markets (Aaker and Jacobson 2001; Rubera and Kirca 2012). Past research defines this characteristic as market dynamism and suggests that market dynamism varies substantially across brands or product categories (Maltz and Kohli 1996; Mizik and Jacobson 2008). In Study 5B we examine how consumers’ perceptions of market dynamism interact with kinetic property executions.7

To elaborate, when a given product category has a highly dynamic nature, consumers would expect to see dynamic visual features in its product advertisements. Also, consumers’ response to the focal product would be more favorable when their *a priori* expectations of ad
features for a given product category are met. Past research supports this conjecture (e.g., Chae and Hoegg 2013, Cian, Krishna, and Elder 2014). For example, Cian, Krishna, and Elder (2014) show that consumers evaluate a modern brand more favorably when the brand’s logo has dynamic design. However, when a given product category is more stable (i.e., less dynamic), novelty is likely to be a less important determinant of marketplace success (Rubera and Kirca 2012). In this case, ad executions aimed at enhancing novelty are also likely to be less impactful. Consumers should not expect to see ad executions aimed at bolstering novelty perceptions. In our case, high kinetic property ads should thus be less relevant/expected. Combining the above, we suggest that kinetic property-laden executions would be effective in enhancing novelty judgments for a product category that is high in market dynamism (such as smartphones, mobile apps, etc.), but should not be effective for low market dynamism product category (such as home furnishings, office products, etc.). Formally,

H5: When the focal product category is high in market dynamism, product novelty judgments will be greater for the high (vs. low) kinetic property ad, but when the focal product category is low in market dynamism, there will be no difference.

In Study 5B, we examine hypothesis 5 by priming (high or low) market dynamism for the focal product due to the necessity to minimize product-category confounds. ⁸

**Study 5B Stimuli, Design, and Procedure**

For this study we used printers as the focal product. We created two versions of market dynamism descriptions for the U.S. printer market. Depending upon the market dynamism condition, the U.S. printer market was described as having either quickly or slowly changing product models, consumer preferences, and promotion/advertising strategies (see Appendix E). We also developed two ads introducing a fictitious, incrementally new printer by varying kinetic property. Kinetic property was manipulated in the same manner as previous studies.
Ninety-six undergraduates (49% male) participated in a 2 (market dynamism: high/low) x 2 (kinetic property: high/low) between-subjects factorial laboratory experiment in exchange for course credit. Upon arrival, participants were told that they would be evaluating a new printer and asked to read an excerpt from online news describing the US printer market. Then, they were randomly assigned to read one of the two (high or low) market dynamism descriptions. Next, participants were randomly shown one of the two (high or low) kinetic property advertisements.

After viewing the ad, participants reported their arousal (α = .91), product novelty judgments (α = .77) and purchase intentions (α = .85). Next, we also measured participants’ recall of attribute information. After the recall task, we measured participants’ attention to the ad (α = .90), A_{ad} (α = .89), the ad’s visual appearance (α = .95) and informativeness (α = .80). Participants then responded to the manipulation check measures for market dynamism and kinetic property on seven-point scales. For the market dynamism manipulation check, we asked participants to rate how slowly or quickly product models, consumer preferences for features, selling strategies and promotion/advertising strategies change in the printer market (1 = very slowly, 7 = very quickly; α = .92). Finally, participants provided demographic information.

**Study 5B Results and Discussion**

**Manipulation checks.** A t-test revealed that the high market dynamism group rated the printer market as changing more quickly in terms of product models, consumer preferences, selling strategies and promotion/advertising strategies (M_{high dynamism} = 5.58, SD = 1.04, M_{low dynamism} = 3.18, SD = 1.36; t(94) = 9.76, p < .001). Kinetic property was greater in the high (vs. low) kinetic property ad (M_{high KP} = 5.06, SD = 1.68, M_{low KP} = 4.15, SD = 1.54; t(94) = 2.78, p < .01).
**Product novelty.** A two-way ANOVA revealed no significant main effects ($ps > .15$) but as hypothesized, a significant two-way interaction emerged between market dynamism and kinetic property ($F(1, 92) = 4.80, p < .05$). Specifically, within the high market dynamism group, novelty judgments were greater in the high (vs. low) kinetic property ad ($F(1, 92) = 5.91, p < .05$), whereas within the low market dynamism group, novelty judgments were equivalent across the two ads ($F(1, 92) = .49, p > .45$). Participants’ arousal ($p > .05$), attention to the ad ($p > .8$), $A_{ad}$ ($p > .15$), recall ($p > .1$), the ad’s visual appearance ($p > .4$) as well as informativeness ($p > .15$) were not significantly different across the two kinetic property conditions.

**Purchase intentions.** A two-way ANOVA revealed a significant two-way interaction ($F(1, 92) = 6.38, p < .05$). No other effects were significant ($ps > .15$). Within the high market dynamism group, purchase intentions were greater with high (vs. low) kinetic property ads ($F(1, 92) = 3.83, p < .05$), but were not different across ad type within the low market dynamism group ($F(1, 92) = 2.61, p > .1$). Further, novelty judgments mediated the effect of kinetic property on purchase intentions when market dynamism was high (.4922, 95% CI = .09 to .98), while this path was not significant when market dynamism was low (-.1695, 95% CI = -.66 to .23).

In Study 5B, we outline a second managerially relevant moderator – market dynamism. Study 5B demonstrates that the novelty-enhancing effect of kinetic property holds when the focal category’s market dynamism is high but dissipates when it is low. We also show that kinetic property, under certain conditions, positively affects downstream purchase intentions. Study 5B is also consistent with prior work that has shown that product novelty may not always be desired (Gourville 2006). This implication is particularly relevant for more stable product categories.

**General Discussion**
Across six studies, we outline a new substantive finding – kinetic property embedded in ads enhances consumer judgments of product novelty. Study 1-2 document the phenomenon and explicate the underlying process - kinetic property generates impressions of ad liveliness which lead to inferences of product atypicality and consequently, higher novelty judgments. Study 3 shows that kinetic property is effective in heightening novelty judgments for incremental, but not radical, innovations. Study 4 further extends this framework by outlining a theoretically driven moderator: figure-ground contrast. Specifically, the core effect is mitigated when figure-ground contrast makes kinetic property less discriminable. Study 5A and 5B outline two substantively motivated contextual moderators: adaptation (Study 5A) and market dynamism (Study 5B). Study 5A shows that contextual adaptation can mitigate the effect of kinetic property while Study 5B shows how kinetic property is effective when the category being advertised is perceived to have higher (vs. lower) levels of market dynamism. Study 5A-B also document downstream effects of kinetic property upon willingness to pay and purchase intentions.

**Theoretical Contributions**

This initial investigation examining the effect of kinetic property in advertising contributes to extant literature in several aspects. Firstly, our primary contribution lies in uncovering a new determinant of consumers’ novelty judgments – kinetic property in ads. Prior marketing research exploring animations has focused either on animation as personifications or avatars (e.g., Holzwarth, Janiszewski, and Neumann 2006), or upon how animations in banner ads distract web-users from performing a focal task and thus annoy them (Goldstein et al. 2014). In contrast, by integrating theory from psychophysics, vision research, and marketing, we pinpoint a specific property of animations, kinetic property – defined as direction-changes in on-
screen motion paths – that could make animated ads more effective. Likewise, our work contributes to the nascent literature on multimedia advertising (Goldstein et al. 2014, Puccinelli, Wilcox, and Grewal 2015). More generally, it adds to the literature on the impact of visual properties of marketing communication (e.g., Cian, Krishna, and Elder 2014; Hagtvedt 2011).

Second, we outline a novel theoretical framework as to why kinetic property generates positive effects on consumer novelty judgments. To this end, we delineate an inference-based process mechanism. Stronger impressions of visual liveliness lead consumers to infer the advertised product as atypical of its category which in turn, leads to greater judgments of product novelty. Our explication of process also contributes back to the parent literature on perceptual animacy (e.g., Tremoulet and Feldman 2000). Prior visual perception literature has primarily treated perceptual animacy as an end state of visual processing and little research has examined its impact on subsequent outcomes (for an exception, see Gao, McCarthy, and Scholl 2010). Furthering past work, we not only link perceptual animacy, a low-level vision-perception construct to high-level cognition and inference (i.e., perceptions about ads, atypicality, and novelty of advertised products), but also show that this extended linkage further shapes consequential downstream outcomes such as willingness-to-pay and purchase intentions.

Third, we uncover theoretically and substantively relevant boundary conditions: (1) innovation type (2) figure-ground contrast between kinetic property and ad background, and (3) contextual adaptation and market dynamism. By delineating these boundary conditions, we show when and where the positive effect of kinetic property on novelty judgments manifests or is moderated across four studies. Combining these results with evidence for our proposed mechanism, we offer theoretical insights for future research on animated advertisements.

Managerial Implications
Although dynamic content such as motion graphics and kinetic typography are extensively used in online advertising, there exist few substantive guidelines that can help firms’ decision-making in this regard. This research aims to provide theoretically grounded insights on the role of dynamic content in marketing communications.

First, we demonstrate that kinetic property enhances novelty judgments, particularly when the product is an incremental innovation. This finding opens up opportunities for non-dominant firms (e.g., low-innovation or low-budget brands) to more effectively advertise their new products. Although radical innovations receive much attention from scholars as well as marketers, the lion’s share (by some account up to 75%; Min, Kalwani, and Robinson 2006) of new product introductions is actually incremental. Moreover, the strategy of pursuing a strong base of incremental innovations is also beneficial since they are associated with lower risk and normal profits (Sorescu and Spanjol 2008). Given this context, we believe that the insight that kinetic property can help better communicate novelty for incremental innovations offers substantively significant implications for a variety of firms and a broad array of new products.

Second, as Study 4 makes clear, the manner in which kinetic property is executed within a multimedia ad can also have strong effects on its effectiveness. If other elements within the ad execution combine in a way that figure-ground contrast is reduced, we find that kinetic property becomes less discriminable. As a result, its novelty-enhancing effect is mitigated. This is an especially important issue for multimedia advertising executions where different visual inputs can be utilized together in a single ad and our research offers tactically relevant insights on factors that can help design more visually balanced advertisements.

Third, Study 5A-B offer relevant contextual boundaries to when and where marketers should utilize kinetic property. Study 5A shows that short-term adaptation to animated ads can
lead them to quickly get used to kinetic property and thus, its positive effect could be mitigated. Insights from these findings are particularly relevant given recent advances in behavioral targeting. Since behavioral targeting enables an online ad to be displayed on a specific webpage by tracking consumers’ browsing behavior (Schumann, Wangenheim, and Groene 2014), it may help marketers determine when and where to position animated ads and maximize advertising effectiveness. This issue is highly relevant to the current online multimedia environment where consumers are often exposed to various contents sequentially or simultaneously.

In Study 5B, we outline how perceived market dynamism acts as a second substantively important moderator. As results show, kinetic property has a positive impact on novelty judgments in more (vs. less) dynamic product categories. This finding accentuates the importance of taking consumers’ *a priori* expectations or mental models about product categories into account when deploying kinetic property. These two factors outlined across Study 5A-B are particularly important since they have a subsequent impact on behavioral outcomes.

Overall, we suggest that kinetic property in ads often represents a middle ground between overwrought animations on one hand and simple static content on the other. Thus, advertisements embedded with kinetic property offer an avenue to communicate with consumers without imposing significant visual or affective load. Results across our experiments show that kinetic property does not significantly influence consumers’ arousal or attention and further, can coexist with attribute information within ads without distraction. As such, it offers marketers a robust, subtle and powerful mechanism to communicate product novelty.

*Caveats, Limitations, and Future Research*

Given our focus on explicating the process underlying the effect of kinetic property on novelty perceptions, our primary aim was in addressing the most likely candidate alternative
explanations. Based on a review of the literature, we identified attention, ad vividness, anthropomorphism, affective reactions to the ad (A_{ad}), arousal, ad informativeness, and the ad’s visual appearance as the most likely candidates and controlled for them and/or tested for their role as alternative explanations or additional predictors.

We also invested significant effort into examining the role of distraction as an alternative explanation since the distraction/attention lens has underscored past theoretical examinations of animation. Across six studies, we tested for distraction effects by testing for differences in (1) self-reported attention, (2) encoding/recall of attribute information, and, (3) the variance in responses (via Levene’s test for equality of variance). Although distraction is a theoretically relevant and conceptually plausible alternative explanation, we find no differences across groups on all these measures indicating that distraction, differential attention or guessing are less likely to have played a role in explaining the pattern of results across studies. However, we also acknowledge that these are indirect measures and do not explicitly and directly capture how kinetic property is visually processed by consumers. As such, an important limitation of this research is the lack of a direct measure of visual attention such as eye-tracking data.\(^9\) Since our process account is primarily an inferential one, we believe this limitation does not affect our interpretation as to the process underlying the effect of kinetic property, especially in light of confirmatory evidence from other measures that directly tap into the inferential process.

Nevertheless, new research using eye-tracking technology can help clarify it better and extend this research forward significantly.

Kinetic property may be easily incorporated in various online multimedia platforms such as social media and mobile applications by virtue of its simplicity. However, caution is called for in the use of this tactic, especially in contexts where adaptation is likely. Firms may better served
by recruiting kinetic property in single-appearance web-ads and ads where placement is not embedded within a larger sequence of competing ads.

Finally, there may be other variables that this research does not take into account or contexts where some of the alternative explanation variables explored here may become consequential. For example, the effect of kinetic property could be different depending upon advertising formats. In the current research, ad stimuli were presented as online advertisements that primarily convey 3 to 4 main product attributes in a relatively short time frame (20-25 seconds). Would the positive effect for kinetic property be replicated if it were embedded in traditional TV commercials? Since TV advertising often aims at brand building, it tends to focus more on increasing brand awareness and recall (Draganska, Hartmann, and Stanglein 2014) rather than enhancing visual effects. With this objective, in the case of TV commercials marketers may want to use visuals that deliver a relatively large amount of information in a coherent way. Thus, to obtain the positive effect for kinetic property in traditional TV commercials, the design of animations may need to be more sophisticated than that used in online advertising. In this sense, future research can examine the role played by coherence, quality, or pleasure/affect as moderators that shape the effect of kinetic property.10

In line with the above discussion, whereas we focus on a visual perception related aspect, future research can also explore how kinetic property interacts with other sensory modalities (e.g., auditory or haptic). The current research provides a springboard for new work on how multisensory communicative cues may interact with each other and when one input may dominate the other. As the consumer environment becomes more saturated with multimedia and multisensory inputs, understanding the role of kinetic property thus offers a useful theoretical lens for future research.
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FOOTNOTES

1. Although product atypicality and novelty are very similar constructs, prior work suggests that a product of a category could be seen as more or less novel than another without being judged as atypical of the category in question (Hekkert, Snelders, and Wieringen 2003). Thus, we believe that atypicality and novelty are not the same although they share the same nomological network. However, we also empirically examined this issue by testing for discriminant validity between the two constructs. Confirmatory factor analysis (CFA) using data pooled across multiple studies (N = 883) show support for discriminant validity (Δχ² (1) = 4.67, p < .05; Anderson and Gerbing 1988). A stronger and more conservative test suggested by Fornell and Larcker (1981) also confirmed discriminant validity - average variance extracted (AVE) for atypicality (.84) and novelty (.66) were higher than the squared correlation between the two constructs (.53).

2. We thank Reviewer 2 for this recommendation.

3. As a follow-up to Study 1, we also conducted an additional within-subject study to incorporate participant-specific baseline ratings in the analysis. In the follow-up study, sixty-nine undergraduates reported their novelty ratings before they were shown the focal ad. After an unrelated filler task, participants were randomly shown one of two kinetic property ads and rated product novelty. Replicating Study 1, a one-way ANCOVA on novelty judgments with participants’ priors as a covariate revealed that product novelty judgments were greater in the high (vs. low) kinetic property ad (M_high KP = 3.22, SD = 1.34, M_low KP = 2.44, SD = 1.24; F(1, 66) = 8.00, p < .01).

4. We thank the Associate Editor for the recommendation on the follow-ups.

5. We thank Reviewer 1 for this recommendation.

6. We thank the Associate Editor for the recommendation on Study 5A.

7. We thank Reviewer 1 and 2 for their recommendations on Study 5B.

8. A different study (N = 104) also examined the moderating effect of market dynamism by actually varying product categories (smartphones vs. table lamps) and replicated the findings observed in Study 5B.

9. We thank Reviewer 3 for this recommendation.

10. We thank the Associate Editor for this insight.
<table>
<thead>
<tr>
<th>Study 3 Innovation Type</th>
<th>Study 4 Figure-ground Contrast</th>
<th>Study 5A Adaptation</th>
<th>Study 5B Market Dynamism</th>
</tr>
</thead>
<tbody>
<tr>
<td>INP RNP</td>
<td>High  Low</td>
<td>Non-adaptation Adaptation</td>
<td>High Low</td>
</tr>
<tr>
<td><strong>Product Novelty</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Kinetic Property</td>
<td>3.77 (1.24) 4.06 (1.26)</td>
<td>4.47 (1.18) 3.70 (.86)</td>
<td>4.86 (1.22) 4.16 (1.48)</td>
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<tr>
<td>Low Kinetic Property</td>
<td>2.98 (1.45) 4.61 (1.65)</td>
<td>3.45 (1.20) 3.82 (1.11)</td>
<td>4.29 (1.31) 4.40 (1.44)</td>
</tr>
<tr>
<td><strong>Arousal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Kinetic Property</td>
<td>3.58 (1.32) 3.24 (1.23)</td>
<td>3.53 (1.30) 3.63 (1.44)</td>
<td>4.37 (1.30) 4.02 (1.47)</td>
</tr>
<tr>
<td>Low Kinetic Property</td>
<td>3.62 (1.16) 3.46 (1.32)</td>
<td>3.38 (1.50) 3.39 (1.46)</td>
<td>4.41 (1.44) 4.00 (1.47)</td>
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<tr>
<td><strong>Attention</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Kinetic Property</td>
<td>4.52 (1.60) 4.67 (1.52)</td>
<td>4.06 (1.50) 3.78 (1.07)</td>
<td>5.04 (1.45) 4.94 (1.39)</td>
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<tr>
<td>Low Kinetic Property</td>
<td>4.08 (1.71) 4.04 (1.66)</td>
<td>3.60 (1.72) 3.95 (1.32)</td>
<td>4.92 (1.58) 4.86 (1.65)</td>
</tr>
<tr>
<td><strong>Attitudes toward the ad</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Kinetic Property</td>
<td>3.24 (1.44) 3.33 (1.73)</td>
<td>2.94 (1.50) 1.77 (.72)</td>
<td>4.17 (1.64) 3.67 (1.85)</td>
</tr>
<tr>
<td>Low Kinetic Property</td>
<td>3.04 (1.42) 2.83 (1.44)</td>
<td>2.90 (1.39) 2.47 (1.37)</td>
<td>3.92 (1.59) 3.84 (1.64)</td>
</tr>
</tbody>
</table>

Note: Raw means and SDs (in parentheses) are reported in each cell.
Study 1, Study 2 - Phenomenon and Underlying Process

Moderators

Product Type-Related:
Study 3 - Innovation Type

Process-Related:
Study 4 - Figure-ground Contrast

Marketing-Practice Relevant:
Study 5A - Adaptation
Study 5B - Market Dynamism

Study 1, Study 2 - Phenomenon and Underlying Process

Antecedent

Kinetic Property

Process

Ad Liveliness
Product Atypicality

Consequences

Product Novelty
Willingness to Pay
Purchase Intentions

FIGURE 1 – Conceptual Overview
Study 2: The Indirect Effect of Kinetic Property on Novelty Perceptions

Notes: Number of bootstrap samples = 5,000. Regression coefficients are unstandardized.

*p < .05
**p < .001
APPENDIX A

Dependent Measures and Covariates

Ad Liveliness (Items Anchored at 1 = “Strongly Disagree,” and 7 = “Strongly Agree”)
The ad you just saw appeared, (1) “Alive”, (2) “Lively”, (3) “Energetic.”

Product Atypicality (Items Anchored at 1 and 7)
In my opinion, the product in the ad is: (1) “Common/unusual”, (2) “Typical/not typical.”

Product Novelty (Items Anchored at 1 and 7)
In my opinion, the product in the ad is: (1) “Old/new”, (2) “Familiar/novel”, (3) “Routine/fresh.”

Purchase Intentions (Items Anchored at 1 and 7)
To me, buying the product in the ad is, (1) “Improbable/probable”, (2) “Unlikely/likely”, (3) “Impossible/possible.”

Arousal (Items Anchored at 1 and 7)
How do you feel right now? (1) “Passive/active”, (2) “Mellow/fired up”, (3) “Low/high energy.”

Attention (Items Anchored at 1 = “Strongly Disagree,” and 7 = “Strongly Agree”)
(1) “I paid close attention to the ad.” (2) “I fully concentrated upon the ad.” (3) “I was deeply engrossed in the ad.”

Attitudes Towards the Ad (Items Anchored at 1 and 7)
Please evaluate the advertisement that you saw earlier: (1) “I dislike the advertisement/I like the advertisement.” (2) “In my opinion, the advertisement is bad/In my opinion, the advertisement is good.” (3) “I feel negative towards the advertisement/I feel positive towards the advertisement.”

Ad Vividness (Items Anchored at 1 and 7)
Please rate the advertisement you saw earlier: (1) “Not vivid/vivid”, (2) “Not specific/specific”, (3) “Not concrete/concrete”, (4) “Not detailed/detailed.”

Anthropomorphism (Items Anchored at 1 = “Strongly Disagree,” and 7 = “Strongly Agree”)
(1) “It appears to have intention,” (2) “It appears to have free will”, (3) “It looks like a person.”

Visual Appearance (Items Anchored at 1 = “Strongly Disagree,” and 7 = “Strongly Agree”)
(1) “I like the way the ad looks,” (2) “The ad is attractive,” (3) “The ad is aesthetically appealing.”

Informativeness (Items Anchored at 1 = “Strongly Disagree,” and 7 = “Strongly Agree”)
“The ad is: (1) Informative, (2) Useful, (3) Understandable, (4) Sufficient.”
APPENDIX B

Study 2 Ad: Final Screenshot of Ad

Note: Numbers indicate the order in which each visual element appears in the ad. This screenshot represents the end-state of the ad.

Study 2 Ad: Motion-Path Description

High Kinetic Property Ad

Low Kinetic Property Ad

Note: Arrows describe the direction (from the start to the end of each trajectory) of motion paths (of the ad element #2 and #9). Each dot in the motion path of the high kinetic property ad indicates a point where each element changes direction on-screen.
APPENDIX C

The Empirical Replication of Study 2

A replication of Study 2 was conducted via an online experiment (single factor design, N = 40). We used the same ad stimuli and measures as in Study 1, but measured product novelty judgments before measuring the mediator variables. Moreover, the two mediators were each measured after separate filler tasks to ensure clearer methodological separation (Podsakoff et al. 2003). With this revised experimental procedure as well, we found the novelty-enhancing effect of kinetic property ($M_{\text{high}} = 4.33$, SD = 1.47, $M_{\text{low}} = 3.41$, SD = 1.44; $F(1, 38) = 4.00, p < .05$). Further, the original serial mediation pattern also replicated (see below figure). Bootstrap analyses show support for a significant serial mediation process identical with the process currently documented in the paper (1.0011, 95% CI = .57 to 1.63). As before, other covariates and alternative explanations are not supported (all relevant $ps > .2$).

The Indirect Effect of Kinetic Property on Product Novelty

* $p < .05$, ** $p < .001$

Notes: Number of bootstrap samples = 5,000. Regression coefficients are unstandardized.

Structural Equation Modeling (SEM) Analyses

To analytically incorporate correlated measurement errors in the serial mediation model, we conducted the follow-up Structural Equation Modeling (SEM) analyses with the pooled data from Study 2 (N = 59) and replication (N = 40). These follow-up analyses (N = 99) also lend support to the proposed theoretical model.
To elaborate, we estimated three different models –

- Model I - without correlated measurement errors,
- Model II - with correlated errors between ad liveliness and atypicality as well as between atypicality and novelty, and,
- Model III - correlated errors between ad liveliness and product novelty (with atypicality errors not being correlated with the other two constructs)

Overall, our proposed theoretical model (kinetic property → ad liveliness → atypicality → novelty) received robust support irrespective of whether measurement errors were correlated or not. Importantly, mediating path coefficients between the constructs of interest remained significant (all relevant $p < .001$) and the direct path from kinetic property to novelty was not significant ($p > .25$) across all three models. Therefore, theoretical insights do not change whether we estimate a model with or without correlated measurement errors. We also estimated an alternative specification in which product novelty acted as mediator and atypicality and ad liveliness were DVs; this model exhibited generally poor fit (CFI < .89; RMSEA > .17) and fit the data significantly worse vis-à-vis the focal theory (per a chi-square difference test).
APPENDIX D

Study 4 Ad Stimuli

High Figure-ground Contrast

Low Figure-ground Contrast
APPENDIX E

Study 5B Market Dynamism Descriptions

High (Low) Market Dynamism

A Dynamic (Stable) Industry? The US Printer Market

The printer market is becoming a fast-changing (a relatively slow-changing) one every year. Consumer preferences for product features have quickly increased (have not quickly changed) over the last 5 years and customers now demand more than just printing; they want (still want) multiple features including copying and scanning. In response to rapidly changing consumer preferences (In line with firmly established consumer preferences), new printing technologies are continuously developing and new printers are constantly being introduced (printing technologies also have remained much the same and product life cycles have become longer). For example, the average shelf-life for laser printers today is 8-10 months (2-3 years) and it is getting even shorter (relatively longer than other consumer electronics). In addition, many firms are actively adapting to various forms of multimedia advertising (still relying on TV advertising or retail flyers) to promote their new products.