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DESIGN QUALITY, DISTRACTION, AND TRUST: AN EXPERIMENTAL STUDY OF WEB INTERFACE MICRO ANIMATIONS

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ABSTRACT

Interface micro animations -- small, purposeful motion effects offering visual feedback on user or system activities -- are increasingly used to make digital interfaces feel more responsive and intuitive. Despite their growing prevalence, empirical evidence on how these animations shape users' perceptions of website quality and organizational trustworthiness remains limited. Using an experimental design, this study examines whether interface micro animations influence perceived website design quality and trust in the organization behind the site. Participants (N = 91) viewed either a static version of a hypothetical nonprofit website or an otherwise identical version incorporating micro animations and then completed an online survey measuring perceived design quality, animation distraction, and organizational trust. Regression analyses showed that micro animations did not directly improve perceptions of design quality or trust in the organization. Instead, the relationship between the presence of micro animations and website design quality ratings was moderated by perceived animation distraction. Perceived design quality, in turn, significantly predicted trust in the organization. These findings suggest micro animations can enhance user perceptions, but only when they are subtle and non-distracting. The results underscore the importance of evaluating the uses of micro animations during usability testing and considering alternatives for users who prefer less animation effects in digital interfaces.

KEYWORDS

Website Interface Micro Animation, Interface Design, Website Design Quality

1. INTRODUCTION

Interface micro animations are the small, functional motion effects in digital interfaces -- for example, a button visually "pressing down" when clicked or an icon animating to signal that a process is underway. Such micro animations provide immediate visual feedback, clarify state changes, and help make interactions feel more responsive and intuitive (Boyd & Bond, 2021). Common examples include hover and click responses, animated toggles, scroll-based fade

effects, and system-status icons (Alemar, 2021). Research indicates that these subtle cues improve users' ability to predict system behavior and reduce uncertainty during interactions (Akwukwuma et al., 2024). As these examples illustrate, micro animations extend beyond decoration and function as meaningful mechanisms for enhancing engagement, comprehension, and user-centered design.

In recent years, scholars and practitioners have increasingly recognized animation as a fundamental component of effective website design, comparable to typography, layout, and content structure (Ari, 2025; Martínez et al., 2023; Savoie, 2022). Martínez and her colleagues (2023) describe animation as a "key element" of contemporary interfaces as Biørn-Hansen et al. (2019) recognize its prevalence continues to rise as users encounter interactive motion in everyday digital environments. Professional design guidance similarly emphasizes animation's ability to guide attention, structure interactions, and create more polished online experiences (Savoie, 2022; UXPin, 2024). These professional recommendations align with academic literature showing that interface animation can help orient users on task process, enhance navigation efficiency, offer visual affirmation, and reward positive behaviors (Stewart, 2024). Collectively, these perspectives position interface animation as a central design element influencing how users perceive and interact with digital systems. At the same time, literature also suggests that animation can introduce distraction and increase cognitive load if poorly implemented (Li & Heng, 2021). Cheung et al. (2017) note that certain types of interface animation can slow task completion, elevate mental effort, or negatively affect visual attention patterns. Research in human–computer interaction has further shown that individual differences -- such as motion sensitivity and prior experience -- can influence whether animation is perceived as helpful or distracting (Alzahrani et al., 2022). These findings underscore that animation's effectiveness is contingent on context, task type, and user characteristics.

Despite this growing recognition, academic research in web design has historically paid limited attention to interface animation. Much early work examined animated advertisements or decorative content rather than task-oriented interface animations. As a result, there is limited empirical evidence about how micro animation influences users' experience and evaluation of digital space (Akwukwuma et al., 2024).

This study aims to address this gap by examining how interface micro animations influence users' perceptions of website design quality and their trust in the organization behind the site. Building on the dual perspective established in prior literature -- namely, that micro animations can enhance usability, clarity, and engagement, yet may also introduce distraction or cognitive load when misapplied -- this study focuses specifically on the small, functional motion cues embedded in contemporary interfaces. By centering attention on these small but consequential design elements, this research seeks to contribute an evidence-based understanding of micro animation as a core component of user experience design.

2. LITERATURE REVIEW AND HYPOTHESES

Web design is a key factor influencing users' perceptions and behaviors. High-quality website design has been shown to contribute positively to the success of e-commerce platforms (Flavian et al., 2009), whereas poorly designed websites are associated with user frustration and irritation (Hasan, 2016). Specific web design attributes have also been found to affect user trust and satisfaction (Faisal et al., 2016), as well as customer loyalty (Tsai, 2017). In addition, website

design quality can play a moderating role, influencing the relationship between e-service quality and customer satisfaction (Venkatakrishnan et al., 2023).

Given its pivotal role, web design quality has been studied extensively in the literature. Studies examining website visual design and user perceptions of website design quality frequently conceptualize design quality as a component of overall website quality. Wells, Valacich, and Hess (2011) identified visual appeal as one of four dimensions of website quality, along with navigability, security, and download delay. Their study found that higher-quality retail websites (e.g., those with greater visual appeal and faster download times) encouraged users to perceive the products offered as being of higher quality. Of particular note is their observation that visual appeal exerted the strongest influence on perceptions of overall website quality. The authors attributed this effect to the fact that visual appeal can be quickly and reliably assessed as soon as a user arrives on a webpage.

Grange and Barki (2020) similarly reported that website design quality—including visual quality, page layout quality, and navigation quality—significantly enhances users' perceptions of both information quality and overall site quality. Likewise, Lorenzo-Romero and colleagues (2013) found that website aesthetics play a key role in shaping users' perceptions of overall design quality and their purchase intentions over time.

Despite these findings, most prior studies have not considered animation as a potential component of website visual design. Only Pengnate and Sarathy (2017) allude to animation, noting multimedia as a design element studied in earlier work (Hong et al., 2004, as cited in Pengnate & Sarathy, 2017).

However, the use of micro animation has been extensively studied across various types of interfaces, including software and mobile applications (Merz et al., 2016), in-vehicle information systems (Kim et al., 2023), and brain–computer interfaces (Pitt et al., 2022). Prior research has found that well-designed interface animations are associated with positive emotional responses (Fang et al., 2019), reduced cognitive load (Ma et al., 2018), and more favorable perceptions of the interface (Boyd & Bond, 2021). However, animated interfaces can also distract (Kim et al., 2023) or frustrate users (Ma et al., 2018).

Much of the research on website animation, however, has focused on animated banner advertisements (Cheung, Hong, & Thong, 2017). For example, Liu et al (2019) found that animated banner ads, compared to static versions, attract greater user attention more quickly and more frequently. Some research, however, has examined animation within website content itself. Cheung et al. (2017) found that adding a "water waves" animation (p. 616) to the background of an e-commerce product listing's title increased users' attention to all webpage content, particularly to the product with the animated title. Laroche and colleagues (2022) further reported that animated product images on retail websites elicited greater user pleasure, which in turn fostered more positive attitudes toward the website and stronger purchase intentions. While these studies address animation embedded in content (e.g., product listings), rather than interface animation, they highlight the potential of animation to enhance communicative effectiveness and user engagement.

The use of animation within web interfaces has been promoted in the field for its functional and experiential benefits. Web design professionals pointed out that animation can guide user attention to important content (Savoie, 2022, Go-Global.com, 2025), convey ideas more effectively than text alone (UXPin, 2024), and maintain user engagement through dynamic presentation (Sidkey & Co Inc, 2022; Reeves, 2019). Academic studies corroborate these claims, demonstrating that interface animations can provide system feedback in ways that clarify

interaction processes (Chevalier et al., 2016). For example, animated transitions can signal changes in state, while button animations can confirm the successful registration of user input, thereby reinforcing the clarity and efficiency of interaction. In their comprehensive review of literature on user interface, user experience, and multimedia design, Martínez et al. (2023) concluded that animation is essential to interface quality and, when applied appropriately, can increase attention to important elements, reduce perceived loading times, and provide valuable feedback to users. Boyd and Bond (2021) examined interface micro interactions specifically, in the context of a mobile application. Comparing animated and static interfaces, they found that animation modestly improved perceived learnability and made the interface more interesting and likable. Based on this literature, we propose:

H1. Incorporating interface micro animations on web pages leads to higher perceived design quality.

However, animation may also negatively affect user experience by increasing mental workload. Research demonstrates that animation can disproportionately capture attentional resources, drawing focus to the animated element while diverting attention from other important content on the page (Cheung et al., 2017). This imbalance may be especially problematic in browsing contexts, where users are exploring broadly rather than searching for a specific target (Hong et al., 2007). In such cases, animation has been shown to impair task performance and reduce perceptions of interface quality. Prior research also showed that decorative or non-essential animations can impose additional cognitive load, distracting users from central information and impairing recall of both textual content and the animations themselves (Pink & Newton, 2020). Collectively, these findings caution against indiscriminate use of animation, as it may hinder comprehension and reduce perceived design quality. These effects may be especially pronounced among users more susceptible to distraction by animated features. Accordingly, we propose:

H2. Perceived distraction of micro animations moderates the effect of micro animations on perceived design quality.

Prior research also establishes a strong connection between website design quality and user trust. Fimberg and Sousa (2020) developed and tested a checklist of design components that foster the user trust essential to e-commerce, emphasizing that visual elements of design are particularly influential in creating positive first impressions that build trust. Pengnate and Sarathy (2017) investigated such impression-based trust in the context of unfamiliar vendor websites, finding that perceived visual appeal not only influenced perceived ease of use but was also a stronger predictor of trust than ease of use itself. They also reported gender differences: for men, both visual appeal and usability contributed to trust, while for women, visual appeal alone was the primary factor. These findings align with earlier studies showing that visual first impressions positively influence perceived website credibility (Robins & Holmes, 2008; Lowry et al., 2014). Based on this body of research, we propose:

H3. Higher perceived website design quality leads to higher trust in the organization the website represents.

However, because prior research has not examined interface micro animation as part of the visual or aesthetic dimension of website design in relation to trust, we further ask:

RQ: What is the effect of incorporating micro animation on users' trust in the organization?

The overall research model is presented below in Figure 1.

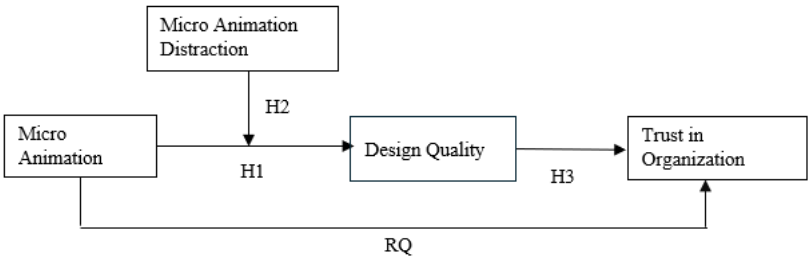

Figure 1. Research model

3. METHOD

3.1 Research Design

To study the relationship among micro animation, perceived website design quality, and trust in the organization, this study adopts an experiment design. The experiment was conducted asynchronously online to allow participants to join at their convenience. As a result, the experiment occurred as part of their ordinary web browsing experience to enhance the ecological validity of the study. Upon visiting the project website, participants were randomly assigned to either the control or experiment group. Both groups shared the same instructions and went through the same process. After giving consent, participants were presented with an instructions page, on which they were asked to play the role of local residents interested in volunteering at a local nonprofit that served the community by planting trees. Tree-planting was selected because of its high acceptance (Tyson & Kennedy, 2020). Participants were directed to learn more about the work of tree-planting nonprofits by browsing the homepages of three different hypothetical tree-planting nonprofit organizations. The first two website homepages contained no micro animation. Participants in the control group were then directed to visit a version of the third site that was also without micro animation. Experiment group, on the other hand, visited an animated version of the third site. A total of 11-page components were enhanced with micro animation effects in the animated version, include content fading in when being scrolled into view, button growing and changing color on mouse hovering over, and animated number counters. Figure 2 complies screenshots of the final stimulus website participants visited, including the home page and the registration form. Micro animation effects incorporated in the animated version were also identified in Figure 2.

Several considerations went into the design of the stimuli homepages. The content of all homepages, including text and image content, was pulled and adapted from existing tree-planting nonprofit websites to enhance the authenticity of the sites, with identifying branding such as names, logos, and color schemes changed to avoid the effects of brand recognition.

Additionally, because the study was designed to allow participants to engage with the experiment during their ordinary browsing, their perceptions may have been influenced by the websites they visited immediately beforehand. To establish a comparable baseline, participants

in both the control and experimental groups were asked to visit two static websites created by the researchers before proceeding to either the static or animated version of the final experimental site.

Moreover, to ensure participants spent reasonable time and browse each page in full before moving on, participants were directed to browser the homepages for at least 30 seconds and scrolled to the bottom of the page. Only after these requirements were met, clicking on any hyperlink on the page would bring up a pop-up allowing participants to confirm they were finished browsing and to move on to the next site.

On the last website, after completing the browsing requirements, participants were directed to access the volunteer page and complete a sign-up form, in which all contact information fields were pre-filled so participants were not compelled to supply any personally identifying information. The only information participants had to supply for the form were preferred type of volunteer work and availability by day; participants were told on the instructions page to select "Tree Planting" for the type of work and Saturday as the day they were available. After submitting the form, participants were taken to the confirmation page and then automatically redirected to the online survey. They were instructed to think about the last website and its organization when answering the survey questions.

No identifiable information was collected from participants during the research. The research protocol, including all stimuli and survey materials, was approved by the Institutional Review Board in the authors' institution.

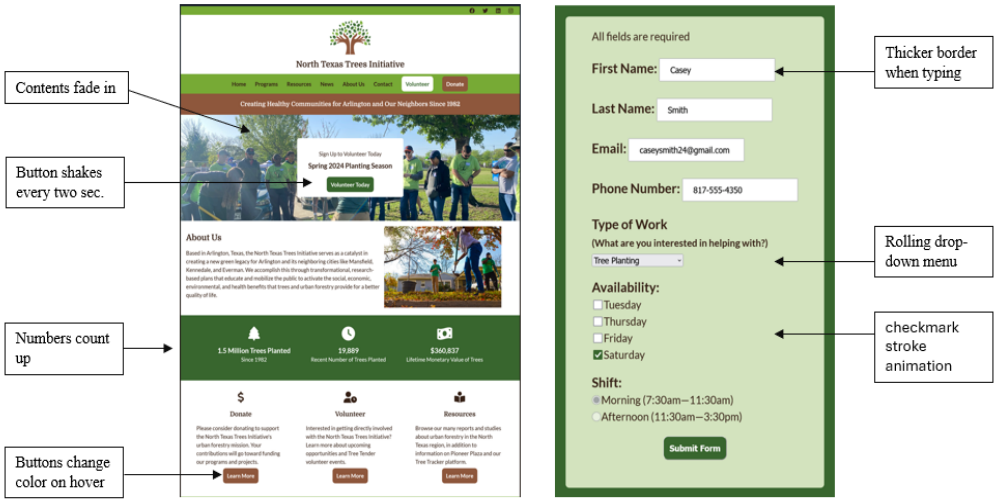

Figure 2. Final stimulus site screenshot

3.2 Measures

Perceived website design quality

Three items adapted from Aladwani & Palvia (2002) were used to measure participants' perception of website design quality. Participants were asked to rate their agreements (5-point

Likert scale) with the following statements: “The website looks attractive.”, “The website looks organized.”, and “The website looks professionally designed.” This scale demonstrates good reliability ($\alpha = .88$).

Initial trust in the organization
It measures participants’ initial trust in the organization represented in the last stimulus website they visited. Four items were adapted from Jarvenpaa et al. (2000). Participants were asked to rate their agreement on 5-point Likert scales with the following statements: "This organization is trustworthy", "This organization wants to be known as one who keeps promises and commitments.", "It is hard to trust this organization to keep my best interests in mind." (reverse coded), and "This organization’s behavior meets my expectations." The internal consistency of this scale is acceptable ($\alpha = .79$).

Perceived animation distraction
Participants were asked to rate on a 5-point Likert scale how much micro animations bring distraction to their website viewing experience.

3.3 Data Collection

Participants were recruited via email from a university and a church in north Texas. A total of 91 responses were included in the analyses. Among them 45 viewed the static version and 46 viewed the animated version. Overall, 68% (62) of responses were from female and 32% (29) from males. Participants’ ages range from 18 to 80 The majority of participants (69%) were aged 30 or younger. The average age of respondents is 30.9 (SD=15.08).

4. DATA ANALYSIS

Description analyses of the variables including the means and standard deviations as well as the results of bivariate correlation analyses are reported in Table 1. The correlation analyses found the perceived Website design quality is positively and significantly associated with trust in organization ($r=0.60$, $p<0.05$). It presents a strong signal that website design quality may enhance the trustworthiness perception of the organization. Age and gender are not significantly correlated with perceived animation distraction, website design quality, or trust in the organization.

To examine the hypotheses, multiple ordinary least squares hierarchical regression analyses were performed. To account for the moderating effect of perceived animation distraction, an interaction term was created by multiplying perceived animation distraction and website version and entered into the regression models. Both perceived animation distraction and website version variables were centered before the creation of the interaction term. Variable inflation factors were calculated for all variables to assess multicollinearity risks, and they were within acceptable limits (O'brien, 2007).

Table 1. Correlations and descriptive statistics (Means and standard deviations on diagonals)

	Age	Gender (Female=1, Male=2)	Website version (Static =1; Animated=2)	Perceived animation distraction	Perceived website design quality	Perceived trust in the organization
Age	30.91 (15.08)	.24*	-.15	.01	.07	-.21
Gender		-	.06	-.01	-.05	-.15
Website version			-	.14	.07	.09
Perceived animation distraction				2.32 (.86)	-.20	-.19
Perceived website design quality					3.91 (.87)	.60**
Trust in organization						3.92 (.61)

N = 91; * p<0.05; ** p<0.01

The first set of regression analyses explore three models predicting perceived website design quality. The results were reported in Table 2. Age and gender were added to the model to control for these two demographic factors. Neither age nor gender was a statistically significant predictor in these models.

To address H1, model 1 include only the website version in addition to the demographic variables. The results show that Model 1 is not statistically significant (F=0.46, p>0.05). Website version is not a statistically significant predictor of perceived website design quality. It indicates that incorporating micro animations does not necessarily enhance users' perception of website design quality. H1 is not supported.

Table 2. Predicting perceived website design quality

Model	1	2	3
Age	.1	.11	.08
Gender	-.08	-.08	-.07
Website version	.09	.12	.10
Perceived animation distraction		-.22*	.60
Website version * Perceived animation distraction			-.25*
F	.46	1.46	2.39*
R squared	.02	.06	.12
Adjusted R squared	-.02	.02	.07

N = 91; * p<0.05; ** p<0.01

To address H2, we first entered the perceived animation distraction in Model 2 (Table 2) to test its main effect. While the coefficient of perceived animation distraction shows statistical significance, the whole model does not (F=1.46, p>0.05). We then entered the interaction term in Model 3. The results show that Model 3 is statistically significant (F=2.39, p<0.05). It explains about 7% of the variance of perceived website design quality. The only statistically

significant predictor in the model is the interaction between website version and perceived animation distraction (β= -.25, p<.05). H2 is supported.

The moderating effect of perceived animation distraction is illustrated in Figure 3. Among participants who were more prone to animation distractions, the static version was rated as having higher design quality than the animated version. In contrast, participants with lower perceived animation distraction rated the animated version higher in design quality than the static version. In other words, the extent to which micro animations enhanced perceptions of website design quality depended on the degree to which users perceived these animated effects as distracting.

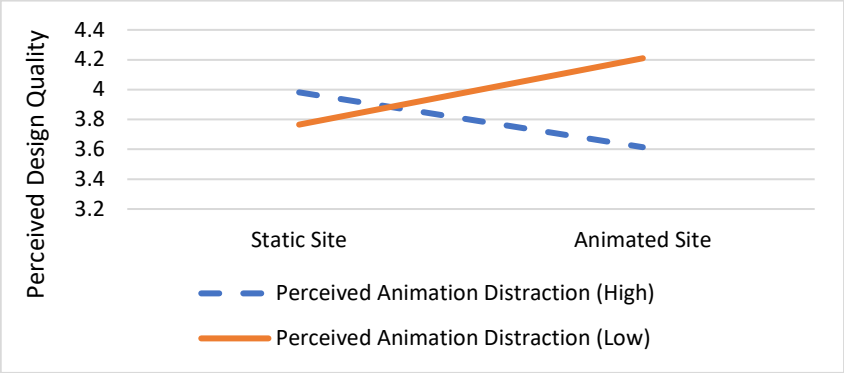

Figure 3. Interaction between website version and perceived animation distraction

To test H3, related variables were entered in three blocks to perform a set of hierachical regression analsysis predicting participants' trust in the organization represented in the last stunulus site. The results of three regression models were reported in Table 3. Model 1 includes age, gender, and website version to test the main effect of embedding micro animation. Model 1 is not statistically significant (F=0.46, p>0.05). The results provide no evidence that incorporating micro animation contributes to trust in the organization directly. Perceived animation distraction and the interaction terms were entered in Model 2, which is statistically significant (F=2.37, p<0.05) and explains 7% of the variance in trust in organization. However, none of the independent variables in this model is a statistically significant predictor. It indicates that collectively the set of independent variables is related to the dependent variable, while no individual item has a strong enough effect on its own. For model 3, perceived website design quality was added in the analysis. The results show that model 3 is statistically significant (F=10.37, p<0.001) and explains 39% of the variance in participants' trust in organization. Model 3 is a much stronger model than model 2 with two statistically significant predictors, age and perceived website design quality. The negative coefficient of age (β= -.22, p<.01) indicates that older participants tended to express lower trust in the organization the last stimulus website represented. The stronger predictor is, however, the perceived website design quality (β= .59, p<.001). The higher design quality participants saw in an organizational website, the more they trust the organization. H3 is supported. No other independent variable in this model, include website version, makes statistically significant contribution to predict the trust in organization. In other words, embedding interface micro animation did not affect user trust directly.

Table 3. Predicting trust in the organization

Model	1	2	3
Age	-.17	-.18	-.22**
Gender	-.12	-.11	-.07
Website version	.07	.10	.03
Perceived animation distraction		-.17	-.07
Website version * Perceived animation distraction		-.16	.01
Perceived website design quality			.59***
F	1.79	2.37*	10.37***
R squared	.06	.12	.43
Adjusted R squared	.03	.07	.39

N = 91; * p<0.05; ** p<0.01; *** p<0.001

5. DISCUSSION AND CONCLUSION

This study explored the relationship between interface micro animation, perceived design quality of organizational website, and the initial trust in the organization. Consistent with findings in the literature (Cyr et al, 2008, Fimberg & Sousa, 2020), our results also show that perceived website design quality is a statistically significant contributor to the initial trust in the organization represented by the website. Gaining this initial trust can pave the way to user retention for e-commerce sites (Faisal et al, 2017). One potential way to enhance users' perception of website design quality is to incorporate interface micro animations. However, our results do not support a direct main effect of interface micro animation on design quality perception. Instead, data show that the effect of adding micro animations varies depending on how participants saw these micro animations. Participants' perception of animation distraction moderates the effect of micro animation on perceived website design quality. Among participants who tend not to see animation effects as distractions, the animated version of the stimulus site did receive higher design quality rating than the static version.

Overall, the regression model explains 7% of the website quality perception variance. This result indicates that the interaction between website version and perceived animation distraction is a small but statistically significant factor in shaping visitors' impression on website design quality. This result suggests a more cautious approach in implementing micro animations in websites. Designers should avoid micro animation effects being perceived as distractions. As suggested by Ávila Muñoz et al. (2023), the implementation of interface animation should serve a clear functional purpose rather than act solely as decoration. and they should align with users' mental models to accurately reflect actions and maintain context. Animations should guide attention only when necessary, avoiding unnecessary motion that competes with the primary task. Finally, moderation is essential. Interface animations should be simple, restrained, and easy to interpret. Applying these principles enables designers to leverage the benefits of micro animations while minimizing their potential to disrupt the user experience.

Additionally, interface animation effects should be intentionally incorporated into the usability testing plan rather than evaluated informally or after implementation. Designers should carefully assess key animation parameters -- including duration, auto-start behavior, looping frequency, and overall density -- to ensure that motion supports user goals rather than interrupting them. Testing should include a range of tasks so designers can observe whether

animations provide helpful feedback, introduce delays, or draw attention away from essential content. To promote accessibility and inclusivity, designers may also consider offering a non-animated or reduced-motion version of the interface, which can better accommodate users with motion sensitivities, cognitive load concerns, or personal preference for more static interactions.

Martínez et al (2023) also observed that implementation of interface animation, rather than being based on a specific methodology, tends to be instead based on "the individual empirical experience of the creators, and without any a priori guarantee of usefulness or success" (p. 164). This points to a need for research inquiring as to what variables influence the effectiveness (or lack thereof) of interface animations. The present study is one step towards strengthen our understanding of the relationship between interface micro animation and user perceptions.

One limitation of this study is the narrow range of tasks participants were asked to complete. In the experiment, users were instructed primarily to browse the website and fill out a sign-up form. The influence of micro animations on user perceptions may differ substantially when individuals engage in other types of tasks—particularly those that vary in attentional demands or cognitive load. Relatedly, users' expectations can shift depending on the type of website they visit (Cebi, 2013), which may in turn shape how they evaluate interface animations and interpret their overall browsing experience.

Another limitation lies in the lack of differentiation among the micro animations included in the study. The experimental site incorporated several types of micro animations, such as attention-calling cues and transitional effects, but these were treated as a single design feature. As a result, the study could not isolate the distinct effects of different animation types. Future research should examine how specific categories of micro animations influence user experience across varied task contexts and website types, enabling a more nuanced understanding of when and how micro animations support or hinder usability.

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