Empowering users to control ads and its effects on website stickiness

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Abstract
Website providers find it increasingly difficult to convince users to accept advertisements (ads) on their websites. In this study, we investigate ad quantity customization (AQC) as a practice to counter these challenges. AQC refers to the technological means through which website providers enable users to determine the amount of ads displayed on their websites. Drawing on psychological empowerment theory, we demonstrate in an online experiment with 395 participants that AQC can pay off: A website with AQC elicits significantly higher website stickiness than a website without AQC, even if the website without AQC contains no ads at all. We furthermore find that perceived empowerment, informational fit-to-task and perceived enjoyment mediate the effect of AQC on website stickiness. Our study thus contributes to Information Systems research on web customization and offers website providers actionable recommendations to keep their users involved, interested and retained.

Keywords Empowerment · Active control · advertisements · Stickiness

JEL classification D91 · M37 · C91

Introduction
Online advertisements (ads) have become an integral part of users’ browsing experience on many websites (Hong et al., 2021). As of 2018, 50% of Europe’s 500 most popular websites feature banner ads to finance their business activities, with 94% of news websites displaying ads on average more than 16 times per page (Libert & Nielsen, 2018). From a user perspective, ads are often seen as an unsolicited distraction that can induce information overload and a perceived loss of control (Aguirre et al., 2015; Liu, 2003; Rejón-Guardia & Martínez-López, 2014), which causes users to engage in avoidance behaviors, such as abandoning websites (Seyedghorban et al., 2016). This poses a serious threat to the business models of many website providers whose main objective is to convince users to stick to their websites and keep returning to them (Benlian, 2015; Köster et al., 2020). Additionally, a large share of users deploys ad blockers to “push back against the perverse design logic that has cannibalized the soul of the Web” (Wicker & Karlsson, 2017, p. 76). With close to half of all online users resorting to ad blocking (Globalwebindex, 2018), the proliferation of technologies that forcefully cancel out ads is an alarming signal of users’ urge for more control (Aseri et al., 2020).

Some website providers have started to acknowledge that users demand to be in control over their web experience (Alt et al., 2019; Hartemo, 2016). At the same time, recent advances in user interface technologies (e.g., overlays to collect user input) are paving the way for website providers to offer web customization (i.e., the psychological empowerment of users to control the form or content of a website) (Benlian, 2015; Jiang et al., 2010). Accordingly, first website providers devolve control over ads by offering their users ad customization options. For example, users on YouTube can oftentimes choose how long they want to watch an ad, up to skipping the ad altogether (Belanche et al., 2020; Dukes et al., 2020). This type of customization to control specifically the quantity of ads (e.g., the length of a video ad or the number of banner ads) is intriguing because it targets
ad clutter as one of the primary drivers of users’ frustration with ads (Seyedghorban et al., 2016). Therefore, website providers face a new and exciting opportunity to approach the ever contentious handling of ads on their websites by providing ad quantity customization (AQC) to their users. Essentially, such website provider-enabled AQC may critically influence users’ intention to stick to a website (i.e., their intention to return) as an indicator of users’ long-term commitment to a website (Benlian, 2015).

In addition to its critical relevance for practice, understanding the intricacies of AQC provides a rich opportunity for Information Systems (IS) research focusing on web customization (e.g., Ariely, 2000; Benlian, 2015; Jiang et al., 2010). Thus far, IS researchers investigating web customization have narrowed their attention toward websites’ primary editorial content (i.e., content related to the main purpose of the website), including customizing the content of news aggregators (Benlian, 2015), choosing the order in which product information is displayed (Ariely, 2000) and specifying how to interact with virtual mock-ups of real-world products (Jiang & Benbasat, 2007a). Nevertheless, customizing advertising content differs fundamentally from customizing editorial content, because users never asked to see any ads in the first place. In fact, as users are oftentimes irritated and annoyed by unsolicited ads, they try to avoid such advertising content as good as they can, up to abandoning the entire website (e.g., Belanche et al., 2020; Kumar et al., 2020; Seyedghorban et al., 2016). If users seek to avoid ads, will they see the possibility to customize ad quantity through AQC as an attractive asset or an unwelcome reminder of the ads they are trying to disregard? Moreover, if users want to avoid ads, would they much rather prefer not to customize ad quantity and instead view a website that is entirely free of ads by default? This idiosyncrasy of customizing advertising content engenders the relevance to understand whether and how offering AQC can affect users’ intention to stick to a website. Moreover, understanding the explanatory mechanism that drives the effects of AQC is instrumental to improve the effectiveness of web customization designs – particularly in the unique context of ads and AQC. The objective of this study is to address these opportunities for research by investigating the following research question:

RQ: How and why does website provider-enabled AQC influence users’ intention to stick to a website?

To address this research question, we drew on psychological empowerment theory (Human et al., 2020; Kim & Gupta, 2014; Spreitzer, 1995) and conducted an online experiment with 395 participants who experienced a website with different ad customization options. Our findings demonstrate that a website with AQC, where participants are invited to customize the amount of ads, elicits greater website stickiness than a website without AQC, where participants cannot influence ad quantity. Surprisingly, a website with AQC evokes even greater website stickiness than a website that is free of any ads by default. That is, participants generally stick more to a website when they are in control of the ad quantity, even if the alternative would be a website that never features any ads in the first place. Additionally, we show that the effect of AQC on website stickiness is carried over by the mediators perceived empowerment, informational fit-to-task and perceived enjoyment.

Our research provides two important theoretical contributions: First, our study sheds light on a thus far largely disregarded prospect of web customization by allowing users to customize ads. We thereby depart from previous research that has predominantly looked at the customization of websites’ editorial content (e.g., Ariely, 2000; Benlian, 2015; Jiang et al., 2010). In contrast to editorial content, users typically seek to avoid ads. For this reason, insights on how users respond to being asked to customize ads they did not ask for are particularly valuable for our understanding of web customization. More specifically, we examine AQC as a web customization feature that is capable of exploiting ads as website elements that users typically dislike seeing, but enjoy to customize. As such, we bring forward the customization of ads as a hitherto largely neglected, yet significant piece of web customization to capture and retain users on websites. This is important for IS research because it showcases diverse pathways to satisfy users’ need for individualized experiences. Second, we shed light on the mechanism through which AQC bolsters website stickiness. Previous research on web customization focused on the consequences of individualized content as the outcome of the customization process (e.g., Jiang & Benbasat, 2007b; Xue et al., 2020), but did not account for the significance of feeling empowered as the hallmark of web customization. We demonstrate that perceived empowerment is a critical mediator that carries over the observed effects of AQC via informational fit-to-task and perceived enjoyment. As such, we not only provide a nuanced picture of the mechanisms that are unique to web customization, but also underline the importance of perceived empowerment as a hitherto under-investigated construct in IS web customization literature. This is important as it enables IS research to identify moderating factors that help to improve the design and effectiveness of web customization. Beyond our theoretical contributions to research, our study provides extensive and counterintuitive insights for practitioners by revealing how websites can leverage AQC to convert ads from a possible deterrent into a valuable resource that boosts website stickiness.
Empowering users to control ads and its effects on website stickiness

Theoretical background

Web customization

To successfully capture and retain users, websites individualize their content (e.g., editorial content and advertising content) using web personalization and web customization (Garett et al., 2016; Tam & Ho, 2006). Web personalization is based on a system that collects user information alongside behavioral patterns to adjust the website’s content according to the system’s best guess of the user’s interest (e.g., YouTube drawing on users’ viewing history to suggest and recommend new videos) (Tam & Ho, 2005). In this case, users are merely being observed and therefore are only passively involved in how the website is individualized. Conversely, web customization grants users power to exercise active control over the website’s content using some sort of modification interface (e.g., selecting a website’s language) (Ariely, 2000; Benlian, 2015). In this way, users play an active role in how the website is shaped. Compared to web personalization, web customization is growing in relevance: Previous research increasingly emphasizes that users long for empowerment and demand to control website content themselves instead of being scrutinized by a system that—at best—is capable of making an informed guess (Matt et al., 2019; Sundar & Marathe, 2010; Sutanto et al., 2013). For this reason, studying web customization is a current and relevant opportunity that complements and expands insights from previous web personalization literature (e.g., Ho & Bodoff, 2014; Ho & Lim, 2018; Johar et al., 2014).

We present a review of the IS literature investigating customization features on websites in Table 1. Notably, previous studies examined web customization features that focus on editorial content, which is content that relates to the primary purpose of the website. For example, extant literature investigated users’ ability to customize the handling of personal data on websites (Mousavi et al., 2020), the design and content covered on aggregator websites (Benlian, 2015), and the selection, order and level of detail of online product information (Ariely, 2000; Jiang & Benbasat, 2007a, b; Xue et al., 2020). While insights on these customization features have made an important contribution to our understanding of web customization, their validity is restricted to the customization of sought-after editorial content. Contrary to editorial content that users expect and welcome when opening a website, advertising

Table 1 Review of IS literature on web customization

| Study            | Customization feature                                                                 | Observed outcome              | Mediators Unspecific to web customization | Mediators Specific to web customization |
|------------------|---------------------------------------------------------------------------------------|-------------------------------|------------------------------------------|----------------------------------------|
| Ariely (2000)    | Users customized in what sequence and with which level of detail product information should be presented to them | Decision quality              | –                                        | –                                      |
| Jiang and Benbasat (2007b) | Users customized which product features to be presented with by interacting with a digital twin | Intention to return          | Perceived diagnosticity, shopping enjoyment | –                                      |
| Jiang et al. (2010) | Users customized in which order and by which category to have products shown to them | Purchase intention          | Cognitive and affective involvement      | –                                      |
| Benlian (2015)   | Users customized which topics to receive news articles about and which color the website should presents itself in | Website stickiness          | Preference fit, perceived enjoyment      | –                                      |
| Xue et al. (2020) | Users customized which live product presentation and which corresponding information should be displayed | Participation and sharing    | Perceived usefulness, psychological distance | –                                      |
| Mousavi et al. (2020) | Users customized how their browsing data is collected, stored, and distributed | Self-disclosure behavior     | –                                        | –                                      |
| **This study**   | Users customize the quantity of ads displayed on the website                           | Website stickiness          | Informational fit-to-task, perceived enjoyment | Perceived empowerment                  |

Theoretical background

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content is often perceived as an unsolicited impediment to users’ goals. As a result, users engage in purposeful ad avoidance behaviors (e.g., scrolling away, closing the website) (e.g., Kumar et al., 2020; Seyedghorban et al., 2016). Notably, the more ads appear, the stronger users try to avoid them (Cho & Cheon, 2004). For this reason, ads present a unique opportunity to study quantity as a distinct customization mechanism, thereby complementing previous research investigating content, format and order of information. Moreover, given that ads are often perceived as unsolicited distractions, the intuitive ideal for users may be a website that does not bother its users to customize the number of ads, but instead eliminates ads altogether. However, it is far from clear whether users’ irritation with unsolicited ads is due to the mere existence of ads in general or rather results from being stripped of any control over these ads. Put differently, may users even welcome ads as part of a website if users have the power to customize them? Therefore, it is important to investigate not only how the presence versus absence of AQC influences website stickiness, but also how AQC compares to eliminating ads entirely.

In reviewing previous IS literature on web customization, we additionally found that first mediators (e.g., involvement, preference fit, perceived enjoyment and perceived risk) were investigated to understand why web customization affects outcomes such as website stickiness. In doing so, extant literature emphasizes the importance of uncovering both cognitive and affective pathways through which web customization affects user behaviors. Nevertheless, our understanding of the underlying mechanism is still limited in that previously analyzed mediators (e.g., perceived usefulness of the website) focus merely on the outcome of the customization process—that is, individualized content that matches users’ preferences better. While insights from extant literature are therefore just as well applicable to web personalization, they are unspecific to web customization and do not account for web customization’s unique effects. Specifically, as web customization features have been characterized as a means to empower users (e.g., Füller et al., 2009; Kim & Gupta, 2014), we need to understand whether and how users’ perception of being empowered influences their assessment of the website—in addition to the consequences of individualized content. Uncovering this mechanism unique and thus specific to web customization is important to inform the design and implementation of effective web customization features. As such, to contextualize and complement existing conceptualizations of the mechanisms of web customization, this study particularly includes perceived empowerment as a mediator specific to the context of web customization, while additionally taking into account informational fit-to-task and perceived enjoyment as cognitive and affective aspects critical to the individualization of websites.

### Psychological empowerment theory

Psychological empowerment theory conceptualizes psychological empowerment (hereafter perceived empowerment) as an individual’s experience of motivation that occurs when the necessary authority is given to utilize the potential of a work system (Spreitzer, 1995; Thomas & Velthouse, 1990). While intimately related to perceived control and sense of agency, perceived empowerment focuses particularly on the experience of being granted the ability to meaningfully influence activities in ways that were previously inaccessible (Alt et al., 2019; Amichai-Hamburger et al., 2008; Zimmerman, 1995). According to psychological empowerment theory, four cognitions are relevant to the perception of empowerment when performing a task: meaning, self-determination, impact and competence (Spreitzer, 1995). Meaning refers to the value an individual places on the task at hand. Self-determination describes an individual’s sense of autonomy in conducting the task. Impact is an individual’s belief that their choices make a difference in the process of performing the task. Lastly, competence captures an individual’s belief of being able to effectively perform the task. In practical terms, the process of empowerment is understood as “any means strengthening a person’s perception of self-determination and self-efficacy and reducing conditions contributing to feelings of powerlessness” (Füller et al., 2009, p. 74).

In the field of IS, the Internet has attracted researchers’ attention as an empowering technology that enables users to do or accomplish things they have found challenging to do or accomplish before (Amichai-Hamburger et al., 2008; Füller et al., 2009). In this context, websites can empower their users not only to receive information, but to actively participate in shaping its composition (Benlian, 2015). One key aspect of psychological empowerment theory warrants attention by IS research: Empowered users are more active and productive than users who are not (Thomas & Tymon, 1994). This notion is confirmed by several IS studies. For instance, in the work context, empowered users are more willing to contribute to knowledge management systems (Kang et al., 2017) and exhibit a greater propensity to utilize customer relationship management systems to the full potential (Kim & Gupta, 2014). Beyond the context of work, users express a stronger intention to reuse websites that empower them (e.g., Benlian, 2015; Jiang & Benbasat, 2007b; Kamis et al., 2008). In addition to stimulating user action, extant literature has found that empowerment leads to enhanced user satisfaction (Liang et al., 2006), greater user loyalty (Pierrakos et al., 2003), improved personal identification of users with the brand of the empowering website (Johnson et al., 2006) and overall more positive user attitudes toward the empowering website (Kalyanaraman & Sundar, 2006). On the flip side, making use of the empowerment
Empowering users to control ads and its effects on website stickiness

by actively controlling information may be a task in itself and therefore requires users’ willingness and capability to invest processing resources (Ariely, 2000).

Given that web customization is a form of devolving control to users, psychological empowerment theory is well suited to understand how AQC on websites can empower users and how this empowerment affects users’ intention to stick to a website.

Website stickiness

Providing AQC may arguably impact users’ assessment of the website in various ways, including users’ initial impression and attitude toward the website, their intention to keep exploring the website, their intention to switch to another website, their intention to recommend the website, their willingness to pay for the website’s offerings and their intention to return to the website. We choose to specifically investigate website stickiness (i.e., users’ intention to return) as the key user response to AQC for three reasons. First, research on the perception of online ads indicates that the largely negative user reactions toward ads can spill over to the hosting website and specifically reduce its stickiness. In contrast to editorial content, ads make a website less attractive to users: download times increase, pages clutter up, usability is reduced and the overall content loses value (Dewan et al., 2002). Consequently, users often perceive the presence of ads to reduce the quality of their experience as well as the website as a whole (Brajnik & Gabrielli, 2010; McCoy et al., 2007) and thus show lower intentions to return to the website (Li et al., 2002). Second, website stickiness reflects users’ long-term commitment to a website and their willingness to accept the website’s offerings. As such, website stickiness is a key contributor to the longevity of a website’s business model. Third, website stickiness is a commonly investigated outcome variable in IS research to study the effectiveness of web customization (e.g., Benlian, 2015; Kamis et al., 2008; Komik & Benbasat, 2006) and appeals to the importance to investigate user onboarding and interactions (e.g., Adam et al., 2021; Röthke et al., 2020; Schneider et al., 2020).

Research model and hypothesis development

Drawing on psychological empowerment theory (Human et al., 2020; Kim & Gupta, 2014; Spreitzer, 1995) and web customization literature, we hypothesize that a website offering AQC to its users will elicit perceived empowerment (H1). Subsequently, we posit that users’ perceived empowerment enhances users’ cognitive evaluation of the website in the form of (perceived) informational fit-to-task (H2) as well as users’ affective evaluation of the website in the form of perceived enjoyment (H3). We argue that both pathways affect users’ intention to stick to the website (H4, H5). As a result, we hypothesize perceived empowerment, informational fit-to-task and perceived enjoyment to mediate the effect of providing AQC on website stickiness (H6, H7, H8, H9). We present our research framework in Fig. 1.

The effect of AQC on perceived empowerment

Following psychological empowerment theory, we argue that AQC elicits perceived empowerment by giving users the impression they (1) are more self-determined and (2) accomplish a greater impact when they can customize the amount of ads compared to when they cannot. First, AQC makes users believe they are more self-determined by bestowing users the freedom to control their web experience. Specifically, users are given the ability to select and thus control the number of ads displayed on the website. As such, they are in the driving seat to shape their web experience. This sense of choice – as the essence of customization – is well known to make users feel self-determined, with video games being the most prominent example (Kim et al., 2015; Przybylski et al., 2010). Further supporting this reasoning, IS research has demonstrated that users generally feel empowered when they have the opportunity to make technological choices (e.g., Füller et al., 2009; Junglas et al., 2019; Marathe & Sundar, 2011). Second, we expect users with access to AQC to feel empowered because they believe they have an impact on their web experience. Selecting an ad quantity of the user’s liking has immediate and tangible consequences that users...
experience when exploring the website. As such, users perceive that their choice makes an actual difference for how they get to experience the website. Realizing this impact leads users to feel empowered (Spreitzer, 1995).

In conclusion, we expect AQC to enhance users’ perceived empowerment. When AQC makes users feel self-determined and when AQC gives users the impression they have some impact on how their web experience unfolds, they feel empowered (Conger & Kanungo, 1988; Füller et al., 2009).

**H1:** A website offering AQC elicits higher perceptions of empowerment than a website without AQC.

### The effect of perceived empowerment on informational fit-to-task

An important measure to assess the quality of a website is (perceived) informational fit-to-task, which describes the extent to which information provided by the website meets users’ needs to gather information and carry out transactions (Liu & Goodhue, 2012; Loiacono et al., 2007; Parboteeah et al., 2009). While informational fit-to-task is closely related to the well-established construct of usefulness (of a website), we deliberately chose to investigate informational fit-to-task as it goes one step deeper and focuses specifically on the information a website provides. It is important to note that a website’s information does not just refer to its editorial content. Rather, all of the website’s elements contribute to users’ evaluation of how the provided information meets users’ needs— including potential advertising content.

We expect the feeling of empowerment induced by AQC to increase informational fit-to-task by amplifying users’ attentional effort to process the website’s content. The ability to influence the website by determining the quantity of virtually ubiquitous and typically immutable ads gives users the feeling to affect not just one element of the website, but rather to shape the formation of the website and its information as a whole. When users feel they are empowered to profoundly influence the website, they see themselves as a relevant part of the source that generates the composition of the website (Kalyanaraman & Sundar, 2006; Sundar et al., 2003). In that sense, users perceive the website with the customized ad quantity to relate to an aspect of themselves, which focuses greater attentional effort on all of the website’s information and amplifies users’ experience of the overall content and its effects (Sundar, 2012). In other words, providing AQC as a form of web customization that empowers users to shape the composition of ads as a fundamental component of websites can “invite deliberate and careful scrutiny of the website, rather than just casual browsing” (Kalyanaraman & Sundar, 2006, p. 115). We expect this increase in attention to occur even if users’ needs for information do not include advertising content whatsoever (e.g., because the task they are pursuing requires only the website’s editorial content). This is because, as long as users do not take the trouble to install an ad blocker, advertising content is an inherent part of users’ web experience that involuntarily affects users’ perceptions of the website’s information (e.g., Hong et al., 2021; Sun et al., 2013). In fact, even when users can merely customize a website’s coloring scheme (without affecting any of the content), users’ already infer greater informational value of the website (Benlian, 2015). As such, we expect the perception of empowerment to customize ad quantity to focus users’ attention toward the website as a whole, including its editorial and potentially advertising content.

Greater attentional effort, in turn, enhances users’ motivation to process the website’s contents (Cacioppo, 1986; Kim & Gupta, 2014). When users who feel empowered by the provision of AQC are more willing and interested to explore a website, they tend to take a closer look at the available information and process it more deeply, compared to when they lack such empowerment and only skim the website’s contents superficially. By examining the website’s content more closely, users are more likely to discover insights that are useful to them. Therefore, the mere feeling of empowerment— largely independent of how users customize the level of ad quantity—facilitates the extraction of value of the provided content (i.e., editorial and potentially advertising content). Consequently, we expect perceived empowerment to increase informational fit-to-task.

**H2:** Perceived empowerment increases informational fit-to-task of the website.

### The effect of perceived empowerment on perceived enjoyment

Whereas informational fit-to-task captures users’ cognitive evaluation of the website offering AQC, we propose that perceived empowerment also influences the affective evaluation of the website in the form of perceived enjoyment. Ingrained in the domain of technology acceptance research (Van der Heijden, 2004), enjoyment describes the intrinsic reward derived through the use of the website (Zhang, 2013).

Extant IS literature indicates that the feeling of empowerment induced by the provision of AQC likely enhances users’ perceived enjoyment with the website. Feeling in charge over the website’s ad quantity strikes a nerve for a majority of users eagerly seeking to gain control over conventionally immutable ads – as evident in the proliferation of third party ad-blockers (Gritickevich et al., 2021). Despite AQC confronting users with ads they did not ask for, the perception of being empowered to regulate ad quantity likely is of substantial significance to users’ perceived enjoyment.
This is because the perception of empowerment reflects the awareness of a sense of control (Spreitzer, 1995). Feeling in control is believed to directly enhance the enjoyability of interacting with IS, both in utilitarian contexts, such as organizational tasks (Klesel et al., 2019), as well as in hedonic contexts, such as video games (Kim et al., 2015; Przybylski et al., 2010). In fact, the perception of being empowered and able to exert control has been indicated to be one of the main reasons why users describe customizable systems as enjoyable (Bright & Daugherty, 2012; Füller et al., 2009). This link between perceptions of empowerment and enjoyment is likely of particular importance in the context of ads, where users experience severe dissatisfaction with websites overwhelming them with ads (Cho & Cheon, 2004; Seyedghorban et al., 2016). Therefore, we expect the belief of being empowered to control ad quantity to foment a sense of enjoyment in users. This line of reasoning is further supported by previous IS literature examining implications of empowering users: Providing task autonomy, bestowing informational control and enabling freedom of technology choice consistently fosters users’ perceived enjoyment with the empowering system (e.g., Kamis et al., 2008; Kim et al., 2015; Klesel et al., 2019). Accordingly, we expect perceived empowerment – enabled by the provision of AQC – to enhance users’ perceived enjoyment of the website.

H3: Perceived empowerment increases perceived enjoyment of the website.

**The effect of informational fit-to-task on website stickiness**

Informational fit-to-task likely contributes to the stickiness of a website. When the website’s editorial and advertising contents meet users’ information needs (e.g., because the perception of AQC-enabled empowerment amplified users’ attentional effort), the website “promote[s] lingering and capture[s] user attention” (Little, 2001, p. 53). The subsequent intensification of users’ engagement with the website increases their satisfaction and thus attitude toward the website (Kalyanaraman & Sundar, 2006; Liang et al., 2006). When users are more satisfied with the website, they are more likely to return. Therefore, we argue that informational fit-to-task increases users’ intention to stick to the website.

Extant IS research on the content customization of news aggregator websites confirms this reasoning: The improved match between users’ informational needs and the website’s content – resulting from users actively customizing the website – leads to increased website stickiness (Benlian, 2015). Moreover, similar to informational fit-to-task, the perceived usefulness of a customizable website enhances users’ intentions to stick to the website (Kamis et al., 2008). This notion is in line with research on technology acceptance that emphasizes perceived usefulness as a major influence to users’ reuse intentions (Adams et al., 1992).

H4: Informational fit-to-task of the website increases website stickiness.

**The effect of perceived enjoyment on website stickiness**

Parallel to informational fit-to-task, we also expect perceived enjoyment of interacting with the website to influence website stickiness. Previous research found that perceived enjoyment positively affects users’ attitudes and satisfaction with a technology’s interface (Jiang & Benbasat, 2007b). More interestingly, as users derive pleasure from enjoyable activities, enjoyment is an important predictor of users’ tendency to repeat the activity (Füller et al., 2009). Accordingly, prior studies could demonstrate that perceived enjoyment fosters online customer loyalty (Bandura, 1977) and leads to greater behavioral intention to keep using a system (Füller et al., 2009; Jiang & Benbasat, 2007a). Decisively, perceived enjoyment is known to increase users’ propensity to return to a website (Dahan & Hauser, 2002; Dholakia et al., 2004). When users enjoy interacting with a website, they are more likely to return to it. Consequently, we expect perceived enjoyment to increase website stickiness. This reasoning is supported by IS research attesting that the enjoyment resulting from web customization promotes the attractiveness of the empowering website (Benlian, 2015).

H5: Perceived enjoyment of the website increases website stickiness.

**The mediating effects of perceived empowerment, informational fit-to-task and perceived enjoyment**

The links between perceived empowerment, informational fit-to-task and perceived enjoyment (delineated in H1 to H5) indicate a particularly relevant role of these constructs. When an independent variable causes an intervening variable and when this intervening variable in turn causes the dependent variable, then the intervening variable can be understood as a mediator (MacKinnon et al., 2002). Applied to our research model, we suggest that AQC affects perceived empowerment (H1) and that perceived empowerment, in turn, increases informational fit-to-task (H2) and perceived enjoyment (H3), indicating perceived empowerment as a mediator. More precisely, we argue that the hypothesized increase in informational fit-to-task is not a direct consequence of providing AQC. Rather, empowering users with AQC...
instills users with a sense of empowerment that in itself is instrumental in encouraging users to carefully process the website’s content, making them more likely to find information relevant to them and therefore perceiving a greater informational fit-to-task. Similarly, we argue that the same sense of empowerment – triggered by the provision of AQC – is the true reason users believe they have the upper hand over ads as website elements they typically have no say in, sparking a perception of enjoyment in users. Therefore, the effects of providing AQC on both informational fit-to-task and perceived enjoyment hinge on users’ perception of empowerment as a crucial mediator.

H6: Perceived empowerment mediates the effect of AQC on informational fit-to-task and perceived enjoyment.

Apart from perceived empowerment governing the effect on informational fit-to-task and perceived enjoyment, we furthermore hypothesize that informational fit-to-task and perceived enjoyment each affect website stickiness (H4, H5), thereby indicating both constructs as mediators (MacKinnon et al., 2002). Specifically, we argue that users who feel empowered are more intent to return to the empowering website not simply due to the perception of empowerment itself, but rather because this sense of empowerment incites informational fit-to-task, which satisfies users’ cognitive needs, and perceived empowerment, which satisfies users’ affective needs. With both cognitive and affective needs met, users are more willing to stick to the website. Thus, to what extent perceived empowerment leads users to stick to the website is highly dependent on the occurrence of both informational fit-to-task and perceived enjoyment as decisive mediators.

H7: Informational fit-to-task mediates the effect of perceived empowerment on website stickiness.
H8: Perceived enjoyment mediates the effect of perceived empowerment on website stickiness.

If perceived empowerment mediates the effect of providing AQC on informational fit-to-task and perceived enjoyment (H6), and if informational fit-to-task and perceived enjoyment mediate the effect of perceived empowerment on website stickiness (H7, H8), then all three constructs of perceived empowerment, informational fit-to-task and perceived enjoyment are instrumental mediators that carry over the overall effect of AQC on website stickiness.

H9: Perceived empowerment, informational fit-to-task and perceived enjoyment mediate the effect of AQC on website stickiness.

Research methodology

Experimental website and manipulation of AQC

We chose the context of online news websites to test the effects of AQC, thereby following previous scholars studying web customization (e.g., Benlian, 2015; Bright & Daugherty, 2012; Sundar & Marathe, 2010). As for the type of ads, we chose banner ads as the most popular ad form on webpages (i.e., dedicated space displaying advertising content in the form of images and text) (Interactive Advertising Bureau, 2019). To minimize confounding effects through ad content, we used the banner ad database of Oracle Data Cloud (Oracle, 2019) and its function to randomly select banners to collect a set of ads for our experiment. For the purpose of the experiment, we created our own news website which we based on a real online news outlet to maximize realism. To determine an appropriate reference website to emulate, we set two criteria: (1) Ad quantity needed to be representative of popular news websites and (2) participants should be largely unfamiliar with the website to minimize confounding effects due to previous experience with the website. We conducted a pre-test with 60 participants from Amazon Mechanical Turk who rated their familiarity with and their perception of ad quantity (using the construct of ad clutter by Cho and Cheon (2004)) of five news websites randomly selected from the Alexa list of top 50 news websites (Alexa Internet, 2019). For our benchmark of a popular news website, we included the website of The Washington Post as the top ten news outlet with the highest daily pageviews per visitor (Alexa Internet, 2019). Comparing the participants’ assessment of the five randomly selected websites, we eventually chose The Epoch Times as our reference website, which exhibited the lowest levels of familiarity and no significant difference in perceived ad quantity (based on ad clutter) to the website of The Washington Post (independent samples t-test, t = 0.108, p > 0.05).

To test our hypotheses, we conducted a between-subject online experiment with three conditions of our experimental website. The website featured a news article and varied in ad quantity and placement of the ads was aligned with the layout of the reference website we emulated. (2) In addition to the default website, we introduced a second control condition with no ads at all (hereafter ad-free website). (3) Lastly, our treatment condition website offering AQC (hereafter AQC website) provided an explanation of the website’s offer to choose how many of the ads on the website will be shown, alongside a continuous scale to select the preferred ad quantity setting (see Fig. 2). The display of ads drew on the same pool of banners as the default website.
Empowering users to control ads and its effects on website stickiness

The AQC functionality allowed participants to choose any ad quantity setting between 0% (i.e., equivalent to the ad-free website) and 100% (i.e., equivalent to the default website). The starting point for the adjustment of ad quantity was the layout of the default website. If a participant specified an ad quantity less than 100%, individual ads were randomly selected to be prevented from loading, such that the overall number of ads matched the participant’s requested specification. For example, if the participant opted to have 50% of the website’s ads shown, the website randomly selected half of the ads of the default website not to display. The random selection ensured to minimize confounding influences of ad content and placement. Hence, by selecting their preferred ad quantity, participants influenced their subsequent web experience.

The resulting three variations of the experimental website are depicted in Fig. 3.

**Experimental procedure**

The experimental procedure guiding the subjects through one of the three variations of our experimental website is presented in Fig. 4: (1) First, participants were given instructions to the experiment in which they were asked to access our experimental website and read a news article about the background of aviation accidents involving Boeing 737 MAX – an impartial and objective topic we chose to minimize preconceived opinions. Participants were given the ostensible task to learn about what might have caused the accidents (see Appendix Fig. 2 Configuration of ad quantity for the AQC website (exemplary setting of 50% ad quantity displayed).

**The Epoch Times**

You can use the slider to customize how many of the ads on our website are shown.
Current setting: 50% of the ads are shown.
Show no ads 0% 20% 40% 60% 80% 100% Show all ads

Fig. 2 Excerpt of the experimental website for the two control conditions (default website, ad-free website) and the treatment condition (AQC website). Note: The AQC website shows an exemplary 50% ad quantity, but could range in its appearance between the two extremes of the default and the ad-free website.

Fig. 3 Excerpt of the experimental website for the two control conditions (default website, ad-free website) and the treatment condition (AQC website). Note: The AQC website shows an exemplary 50% ad quantity, but could range in its appearance between the two extremes of the default and the ad-free website.

(1) Default website (100% ads) (2) Ad-free website (0% ads) (3) AQC website (example shows 50% ads)
section “Participant Instructions”). (2) Thereafter, a cover page welcomed the participants to the website and introduced the website as a news outlet (see Appendix section “Cover Page”). (3) Next, we randomly assigned participants to one of the three conditions. Participants who were part of the two control conditions were directly sent to the next step. Participants in the treatment condition were given instructions on the AQC feature and were asked to select their preferred setting (see Fig. 2). (4) Subsequently, all participants experienced the main part of the website for a duration of 90 s by reading an article with varying ad quantity, subject to either each user’s previously chosen ad quantity or to the control condition they were part of. Incidentally, we did not allow participants in the treatment condition to interrupt their reading of the article to go back and readjust their AQC setting for two reasons. First, we wanted to ensure that, on the one hand, participants would be aware of the AQC feature, but on the other hand, still focus on the article. Put differently, it was important to us to measure how providing AQC affects participants’ experiences with the website’s contents instead of observing the effects of repeatedly “playing around” with the AQC feature. Second, we wanted to avoid that some participants would access the AQC feature much more often than others (e.g., driven by a general uncertainty in making decisions). Varying exposures to our treatment would have undermined the comparability of the results across our participants in the treatment group. (5) The final part covered a questionnaire about the participants’ perception of the website, alongside controls and demographics. Lastly, participants were debriefed that the AQC feature offered to them on the website was only available for the purpose of this experiment and was not publicly accessible on the reference website we emulated.

Measurement

We used validated scales from literature, reported in Table 2. We focused on Website Stickiness as our dependent variable measured with three items adapted from Benlian (2015). We measured our mediators Perceived Empowerment with two items adapted from Füller et al. (2009), Informational Fit-to-Task with three items adapted from Parboteeah et al. (2009) and Perceived Enjoyment with three items adapted from Benlian (2015). While we measured Perceived Enjoyment using a semantic differential with the extremes at (1) and (7), all other items were measured using 7-point Likert-type scales ranging from strongly disagree (1) to strongly agree (7). Importantly, we informed participants that the term “website” in each of our scales referred to the article page from The Epoch Times with all its elements including article content and ads.

With regard to controls, we measured demographics (i.e., participants’ Age and Gender) as factors identified to influence individuals’ perception of control (Slagsvold & SØrensen, 2008). Furthermore, to account for participants’ potential preexisting attitudes toward the website of The Epoch Times resulting from previous visits, we asked whether participants had ever accessed the website prior to our survey (i.e., Website Familiarity) (Michailidou et al., 2008). Moreover, the usage of an ad blocker suppressing ads may affect how participants react to ads they are not used to anymore. As such, we asked participants if they were currently using an ad blocker on a regular basis (i.e., Previous Ad Blocker Use) (Wills & Zeljkovic, 2011). Both Website Familiarity and Previous Ad Blocker Use were implemented as binary variables (i.e., 0 = no, 1 = yes). Lastly, to take into account effects resulting from participants’ irritation with the quantity of ads displayed, we measured Perceived Ad Clutter with three items adapted from Cho and Cheon (2004).

As our manipulation check, we measured Perceived Customizability using a self-developed 7-point Likert-type scale inspired by previous web customization research (Bright & Daugherty, 2012). Additionally, we integrated two attention checks to notice whether participants read each item carefully. Lastly, we asked participants about their Perceived
Empowering users to control ads and its effects on website stickiness

Realism of the experiment, also measured with a 7-point Likert-type scale.

Results

Sample description and controls

We recruited 545 participants from Amazon Mechanical Turk, a crowdsourcing platform that has established itself as a viable platform for behavioral research and experiments (Behrend et al., 2011). Research has demonstrated that the survey results of Amazon Mechanical Turk respondents exhibit high reliability and provide higher-quality data than student or online convenience samples (e.g., Behrend et al., 2011; Buhrmester et al., 2016; Steelman et al., 2014). In addition, Amazon Mechanical Turk is a suitable platform to reach internet-savvy users, who are highly appropriate for our experiment setting because they are frequent users of websites. We restricted participation to users with a high approval rating (at least 95%), which is considered an appropriate measure to ensure high data quality (Goodman & Pao-lacci, 2017). Out of those 545 participants, we excluded 122 participants who failed one or both of our attention checks as well as 28 participants who left the questionnaire prematurely, resulting in a final data set of 395 responses.

Table 3 summarizes the descriptive statistics of our conditions. Furthermore, of all participants in the AQC condition, 46% selected to have 0% ad quantity shown, 8% opted for 100% ad quantity and 46% chose an intermediate level of ad quantity. Overall, participants did not utilize AQC to shed ads altogether, but instead opted to have on average 25% of the website's ads displayed.

We verified the comparability of our participants across our experimental conditions by conducting several one-way analyses of variance. We did not find significant differences in terms of participants’ Gender, Age, Website Familiarity, Previous Ad Blocker Use and Perceived Realism between the groups (all \( p > 0.05 \)). Thus, the results confirm a successful randomization in the assignment of our participants to our different experimental conditions. To examine the effectiveness of our experimental conditions, we conducted several independent samples t-tests: Perceived Ad Clutter was significantly lower in the control condition of the ad-free website than in the control condition of the default website (\( t = -14.36, p < 0.001 \)), Perceived Customizability was significantly higher in the treatment condition of the AQC.
website than for both control conditions of the ad-free website and the default website ($t = 23.06, p < 0.001$) and there was no significant difference in Perceived Customizability between the two control conditions ($t = 0.18, p > 0.05$). Therefore, we are confident that our experimental conditions worked as intended. Lastly, our respondents indicated that they found the experiment highly realistic (mean = 6.46; std. dev. = 0.98).

Reliability and validity

We conducted a confirmatory factor analysis (CFA) to test the instrument’s convergent and discriminant validity (Levine, 2005). Table 2 reports the employed items together with the CFA results. Our constructs exceed the recommended level of 0.70 (Nunnally, 1994) for both measures of internal consistency (i.e., Cronbach’s alpha and composite reliability). The average variance extracted (AVE) of each construct ranged from 0.699 to 0.895 and is thereby higher than the relevant threshold of 0.50 (Hair et al., 2016). All items fulfilled the minimum loading requirement of 0.70 between the item and the corresponding factor. Thus, all constructs met the specifications for convergent validity. Additionally, for satisfactory discriminant validity, the square root of AVE from the constructs was greater than the variance shared between the construct and other constructs in the model (see Appendix Table 6) (Fornell & Larcker, 1981). Furthermore, the heterotrait-monotrait ratio of correlations (Henseler et al., 2015; Voorhees et al., 2016) exhibited values less than the threshold of 0.85 for all constructs, indicating support of discriminant validity (see Appendix Table 7). Lastly, the Harman one-factor extraction test resulted in 43% explained variance through a single factor, which is lower than the recommended maximum threshold of 50% (Podsakoff et al., 2003) and therefore indicates no issues of common method bias. Hence, the constructs in our study are both theoretically and empirically distinguishable and are not significantly affected by common method bias.

Hypothesis testing

To test the direct and indirect effects of our research model, we analyzed our research model with structural equation modeling (SEM), following recommended practice (Urbach & Ahlemann, 2010). We used Smart PLS 3.3.7 and analyzed our model with the consistent partial least squares (PLS) algorithm, which is specifically designed for hypothesis testing. While consistent PLS is largely comparable to covariance-based SEM, we chose consistent PLS primarily for its strength to identify mediating effects through the iterative introduction of new constructs and relations (Richter et al., 2016) – as is recommended, for example, for research investigating the mechanisms of technology acceptance, such as website stickiness (Dijkstra & Henseler, 2015). This strength to uncover mediation mechanisms is particularly important for our study’s focus on a serial mediation with three mediators (i.e., perceived empowerment, informational fit-to-task and perceived enjoyment). Moreover, the consistent PLS algorithm can offer advantages over covariance-based SEM when it is unclear whether the response data is normally distributed and when researchers seek to minimize the risk of potential misspecification of the model (Dijkstra & Henseler, 2015; Richter et al., 2016).

Direct effects

We conducted independent analyses for each of the two control conditions: We first compared the website offering AQC with the default website, and then compared the website offering AQC with the ad-free website. We hereby coded AQC as a binary variable (i.e., 0 = absent, 1 = present). We tested our
Empowering users to control ads and its effects on website stickiness

hypotheses linking *AQC*, *Perceived Empowerment* (EMP), *Informational Fit-to-Task* (IFTT) and *Perceived Enjoyment* (ENJ) to *Website Stickiness* (STICK) in three ways: First, we verified whether all three mediators contribute to the overall model validity. To that end, we established a baseline model including only our independent variable *AQC* and our dependent variable *Website Stickiness*. We then iteratively augmented this model by including one mediator after the other (see Appendix Figs. 7 and 8). As our final model comprising all mediators yielded the greatest model validity (i.e., highest $R^2_{adj}$ for our dependent variable *Website Stickiness*) for both control groups, we find first indication for the relevance of each mediator in explaining why *AQC* affects *Website Stickiness*.

Second, we analyzed each of the individual paths in our final model, in line with our proposed hypotheses (see Fig. 5). The results of the bootstrapped PLS analyses outlined in Table 4 support our hypothesis *H1* that the provision of *AQC* positively affects users’ *Perceived Empowerment* (default website as baseline: $\beta=0.208$, $t=3.122$, $p<0.01$; ad-free website as baseline: $\beta=0.286$, $t=5.274$, $p<0.001$). In line with *H2* and *H3*, *Perceived Empowerment* positively affects *Informational Fit-to-Task* (default website as baseline: $\beta=0.560$, $t=8.545$, $p<0.001$; ad-free website as baseline: $\beta=0.286$, $t=5.274$, $p<0.001$) and *Perceived Enjoyment* (default website as baseline: $\beta=0.683$, $t=13.021$, $p<0.001$; ad-free website as baseline: $\beta=0.630$, $t=13.770$, $p<0.001$). As such, we find

Table 4 Bootstrapping of all direct effects linking *AQC* to *Website Stickiness*

| Direct effect | Website offering *AQC* vs. default website | Website offering *AQC* vs. ad-free website |
|---------------|---------------------------------------------|-------------------------------------------|
| AQC $\rightarrow$ EMP | 0.208 (0.067) | 0.286 (0.054) |
| AQC $\rightarrow$ IFTT | -0.059 (0.067) | -0.053 (0.052) |
| AQC $\rightarrow$ ENJ | 0.042 (0.06) | -0.032 (0.052) |
| AQC $\rightarrow$ STICK | 0.061 (0.044) | 0.016 (0.044) |
| EMP $\rightarrow$ IFTT | 0.560 (0.066) | 0.535 (0.055) |
| EMP $\rightarrow$ ENJ | 0.683 (0.052) | 0.630 (0.046) |
| EMP $\rightarrow$ STICK | 0.173 (0.072) | 0.088 (0.069) |
| IFTT $\rightarrow$ STICK | 0.125 (0.049) | 0.209 (0.055) |
| ENJ $\rightarrow$ STICK | 0.491 (0.068) | 0.548 (0.074) |

*p* $< 0.05$, **p* $< 0.01$, ***p* $< 0.001$; Bootstrapping with 5,000 samples and a 95% confidence interval; EMP = Perceived Empowerment, IFTT = Informational Fit-to-Task, ENJ = Perceived Enjoyment, STICK = Website Stickiness.

Fig. 5 Final model results of the effects of *AQC* on *Website Stickiness*. Note: *p* $< 0.05$, **p* $< 0.01$, ***p* $< 0.001$
**support** for both H2 and H3. Moreover, **Website Stickiness** is enhanced by both **Informational Fit-to-Task** (default website as baseline: $\beta=0.125, t=2.537, p<0.01$; ad-free website as baseline: $\beta=0.209, t=3.801, p<0.001$) and **Perceived Enjoyment** (default website as baseline: $\beta=0.491, t=7.257, p<0.001$; ad-free website as baseline: $\beta=0.548, t=7.453, p<0.001$).

Therefore, our results **support H4** and H5. In addition, when comparing the AQC website against the default website, we find a remaining direct effect of **Perceived Enjoyment on Website Stickiness** ($\beta=0.173, t=2.404, p<0.05$). This indicates that, while **Informational Fit-to-Task and Perceived Enjoyment** qualify as complementary mediations, a third mediation path beyond our research model may exist (Zhao et al., 2010). Lastly, we performed a multigroup analysis with one group comprising those participants that experienced **Customizable Ads** and those who experienced **Default Ads** as well as a second group comprising those who experienced **Customizable Ads** and those who experienced **No Ads**. We found that none of our hypothesized paths exhibited any significant difference between the two groups with the two different control conditions. As such, we find support that the effects between AQC, **Perceived Enjoyment, Informational Fit-to-Task, Perceived Enjoyment** and **Website Stickiness** are highly comparable for both cases of contrasting an AQC website to a default website and contrasting an AQC website to an ad-free website.

**Indirect effects**

In addition to confirming the individual paths between our constructs, we verified whether **Perceived Enjoyment, Informational Fit-to-Task**, and **Perceived Enjoyment** carry over the effect of AQC on **Website Stickiness** by conducting bootstrap analyses of our indirect effects. The results in Table 5 paint a consistent picture for both control groups (i.e., default website and ad-free website): We find a significant indirect effect of AQC on **Informational Fit-to-Task** via **Perceived Enjoyment** (default website as baseline: $\beta=0.116, t=2.981, p<0.01$; ad-free website as baseline: $\beta=0.153, t=4.523, p<0.001$) as well as of AQC on **Perceived Enjoyment** via **Perceived Enjoyment** (default website as baseline: $\beta=0.142, t=3.223, p<0.01$; ad-free website as baseline: $\beta=0.180, t=5.020, p<0.001$). As the remaining direct effects of AQC on **Informational Fit-to-Task** and on **Perceived Enjoyment** were shown to be non-significant, we find an indirect-only mediation (formerly referred to as full mediation) of **Perceived Enjoyment** (Zhao et al., 2010). We therefore find **support for H6**. Additionally, we find significant indirect effects of **Perceived Enjoyment on Website Stickiness** via **Informational Fit-to-Task** (default website as baseline: $\beta=0.070, t=2.341, p<0.05$; ad-free website as baseline: $\beta=0.113, t=3.370, p<0.01$) and via **Perceived Enjoyment** (default website as baseline: $\beta=0.336, t=6.000, p<0.001$; ad-free website as baseline: $\beta=0.345, t=6.664, p<0.001$). In the case of the default website as the baseline, the remaining direct effect of **Perceived Enjoyment on Website Stickiness** was still significant, indicating a complementary mediation in which a third, unaccounted mediator may be present – even though in the case of the ad-free website as the baseline we did not find any remaining direct effect. Accordingly, these results **support H7** and H8. Most importantly, we find significant indirect effects of our overall mediation paths via **Perceived Enjoyment** and **Informational Fit-to-Task** ($AQC \rightarrow EMP \rightarrow IFTT \rightarrow STICK$, default website as baseline: $\beta=0.014, t=2.014, p<0.05$; ad-free website as baseline: $\beta=0.032, t=2.782, p<0.01$) and via **Perceived Enjoyment and Perceived Enjoyment** ($AQC \rightarrow EMP \rightarrow ENJ \rightarrow STICK$, default website as baseline: $\beta=0.070, t=2.993, p<0.01$; ad-free website as baseline: $\beta=0.099, t=4.285, p<0.001$). We further validated these paths by conducting a bootstrap mediation analysis based on linear regression with 5,000 samples and a 95% confidence interval using **PROCESS** by Hayes (2018). The results in Appendix Table 10

**Table 5** Bootstrap analysis of all indirect effects linking AQC to Website Stickiness

| Indirect effect | Website offering AQC vs. default website | Website offering AQC vs. ad-free website |
|----------------|------------------------------------------|-----------------------------------------|
|                | Mean (std. dev.) T statistic | Mean (std. dev.) T statistic |
| AQC → EMP → IFTT | 0.116 (0.039) 2.981 ** | 0.153 (0.034) 4.523 *** |
| AQC → EMP → ENJ | 0.142 (0.044) 3.223 ** | 0.180 (0.036) 5.020 *** |
| EMP → IFTT → STICK | 0.070 (0.030) 2.341 * | 0.113 (0.033) 3.370 ** |
| EMP → ENJ → STICK | 0.336 (0.056) 6.000 *** | 0.345 (0.052) 6.664 *** |
| AQC → EMP → IFTT → STICK | 0.014 (0.007) 2.014 * | 0.032 (0.012) 2.782 ** |
| AQC → EMP → ENJ → STICK | 0.070 (0.023) 2.993 ** | 0.099 (0.023) 4.285 *** |
| AQC → EMP → STICK | 0.036 (0.020) 1.766 | 0.025 (0.021) 1.193 |
| AQC → IFTT → STICK | -0.007 (0.010) 0.731 | -0.011 (0.012) 0.894 |
| AQC → ENJ → STICK | 0.020 (0.029) 0.702 | -0.018 (0.029) 0.621 |

*p < 0.05, **p < 0.01, ***p < 0.001; Bootstrapping with 5,000 samples and a 95% confidence interval* 

EMP = **Perceived Enjoyment**, IFTT = **Informational Fit-to-Task**, ENJ = **Perceived Enjoyment**, STICK = **Website Stickiness**
Empowering users to control ads and its effects on website stickiness

Demonstrate that the 95% confidence interval of both proposed mediation paths exclude zero, thereby corroborating our findings from our PLS analyses. We thus find coherent support for H9. Therefore, our results consistently support our proposed hypotheses that AQC induces Perceived Empowerment, which then fosters Informational Fit-to-Task and Perceived Enjoyment as critical concepts responsible for Website Stickiness. Resulting from this overall mechanism, users stick more to a website offering AQC than to both a website with non-customizable ads and a website that does not feature any ads at all.

Discussion

This study addresses how and why the possibility of AQC provided by a website affects users’ intention to stick to this very website. In an online experiment with 395 participants we find that a website with customizable ads (i.e., AQC present) evokes significantly greater website stickiness than a website with default ads (i.e., AQC absent) – despite participants pursuing a task that does not require viewing any ads. This implies that users appreciate to customize ads even if those ads are supposedly irrelevant for users’ objective when browsing the website. This insight underscores the powerful influence ads inevitably exert on users. We additionally compare whether participants would prefer a website without any ads (i.e., AQC absent), rather than being asked to customize ad quantity. While a website without ads unsurprisingly elicits greater website stickiness than a website with default ads, we counterintuitively find that a website with customizable ads achieves even greater website stickiness than a website without ads. Put differently, as long as users are empowered to customize ad quantity, they express a greater intention to return to a website that explicitly features ads than to a website that never had any ads in the first place. This finding is intriguing as it demonstrates that users value customization of website elements they typically want to avoid (i.e., ads) higher than the actual avoidance itself. This implies that users exhibit a firm need to exert control over unsolicited website elements that is so powerful that it even exceeds their desire of simply not being confronted with these elements at all. In line with our results, this inclination results from users’ perception of empowerment, which plays a critical role in explaining the effects of the provision of AQC on website stickiness. Specifically, providing AQC imbues participants with a sense of empowerment that we find to influence participants in two ways: On the one hand, the perception of empowerment enhances participants’ cognitive evaluation of the website in the form of greater informational fit-to-task, while on the other hand, the feeling of empowerment also augments participants’ affective evaluation of the website in the form of increased perceived enjoyment. Both enhanced informational fit-to-task and augmented perceived enjoyment consequently promote participants’ intention to stick to the website. As such, the perception of empowerment, triggered by the provision of AQC, invigorates users to engage more intensely with the website – a vital stimulant that users lack in the supposed ideal of simply omitting ads.

Contributions to research

By exploring the intricacies of empowering users to customize ad quantity on websites, we offer two noteworthy contributions to IS literature on web customization. First, our study sheds light on a thus far underexplored prospect of web customization by addressing a website’s ads as content users never asked for. Extant research on web customization focused on the outcomes of allowing users to customize the primary editorial content of a website (e.g., which news topics users would receive articles for) (e.g., Ariely, 2000; Benlian, 2015; Jiang et al., 2010). In doing so, insights of previous literature primarily pertain to the customization of content that users are known to expect, welcome and be interested in. However, advertising content is fundamentally distinct in that users typically neither ask to see nor appreciate ads when accessing a website, oftentimes resulting in strong ad avoidance behaviors (e.g., leaving the website) (Seyedghorban et al., 2016). By asking users to customize the quantity of ads, we extend the locus of web customization research to website elements that users typically seek to refrain from. More specifically, we reveal that, despite inevitably directing users’ attention toward unsolicited ads, users appreciate AQC by exhibiting a greater intention to stick to the website. This insight provides a new perspective to web customization literature, as it demonstrates that users enjoy customizing website elements that they usually perceive as irritating. Moreover, we find that, as long as users can customize ad quantity, they stick more to a website with ads than to the intuitive ideal of a website without any ads by default. As such, we demonstrate that web customization (e.g., AQC) is capable of lifting website stickiness by purposefully including and exploiting typically unwelcomed website elements (e.g., ads) as objects users enjoy to customize. This finding is particularly interesting for research on web customization, because it exposes that users value the ability to customize unwanted elements higher than simply avoiding these elements altogether. Taken together, we reveal ad customization as a hitherto underexplored and significant piece of web customization complementing previous research. This is important also for the broader stream of research on individual IS usage because it contributes to the quest of satisfying users’ need for individualized experiences.

Second, our study addresses an important gap in web customization research in terms of understanding the underlying causal mechanisms of how and why web customization impacts users’ responses to a website. Despite previous studies having
started to unravel the rationale of why web customization affects various user outcomes on websites (e.g., Benlian, 2015; Jiang & Benbasat, 2007b; Jiang et al., 2010), extant explanations focus merely on the significance of individualized content that matches users’ preferences better (e.g., improved usefulness of the website). In that sense, previous literature does not account for the idiosyncrasy of web customization that sets it apart from web personalization – the empowerment of users to exert active control. By investigating not only content-oriented mediators in the form of informational fit-to-task and perceived enjoyment, but particularly users’ perception of feeling empowered, we are among the first to shed light on the mechanism that is unique to web customization. More specifically, our findings imply that offering AQC increases users’ intention to stick to a website because the provision of AQC imbues users with a sense of empowerment. It is this sense of empowerment that stimulates users’ involvement with the website as a whole, both cognitively in the form of greater informational fit-to-task as well as affectively in the form of increased perceived enjoyment. As such, we reveal empowerment as a key element that is pivotal to the effect mechanism of web customization and that hitherto has been under-investigated in IS web customization literature. This contribution is important as it allows IS research to not only unblackbox the effect mechanisms that are specific to the phenomenon of web customization, but also to identify moderating factors through which we can improve the design and effectiveness of web customization.

**Practical implications**

Beyond our theoretical contributions, our findings offer extensive insights for website providers that seek to attract and retain their users more effectively. On the one hand, our results indeed confirm the common belief that displaying ads provokes users in that they are less willing to stick to the website compared to when ads are omitted altogether. On the other hand, we also discover that users do not oppose ads in general. Instead, we find that users’ potentially negative reactions are mainly driven by a lack of empowerment over the ads. Surprisingly, including ads on a website while simultaneously empowering users with AQC convinces users to stick more to the website than eliminating ads altogether. These outcomes bring about influential implications for website providers in that ads are not inevitably harmful to users’ evaluation of a website. Instead, when coupled with AQC, website providers can remodel ads into an asset that enhances users’ web experience and thus increases their intention to stick to the website. One step further, AQC may even help website providers to persuade ad-block users to whitelist their website and accept some amount of ads they agree with to support both the website as well as its dependent provider.

While AQC is a potent mechanism to address users’ attitudes toward ads, one must consider that allowing users to tamper with the amount of ads displayed may come at a price for websites. Ad revenue is primarily driven by the number of impressions and the number of clicks on ads. Although participants in our experiment did not use AQC to cancel out ads altogether, they indeed selected fewer ads than what was considered the default amount (i.e., on average 25% of the default ads). As such, the number of ad impressions was reduced compared to the default amount. Although click rates on ads may increase to some degree because users consider ads more important and relevant when they agree to receive them (Hartemo, 2016), AQC may overall still impact a website’s ad revenues. In return, AQC considerably boosts a website’s stickiness. Hence, whether and to what extent AQC creates value for a website depends on the objectives of its provider. For example, IS research investigating websites’ reliance on ads revealed that websites benefit more if they curtail the amount of ads during their growth period and delay the full display of ads to a later point in time when a reliable user base has been established (Dewan et al., 2002). We provide an alternative and perhaps more economical perspective to this finding: Instead of holding back ads to attract more users, websites could draw on AQC to fuel their growth. This not only allows to retain users more effectively through higher website stickiness, but also to feature ads and generate associated ad revenue earlier on, thereby strengthening the websites’ business model during and perhaps beyond their growth phase.

Lastly, our finding that the key enabler for users’ appreciation of web customization lies in perceived empowerment indicates an opportunity for websites beyond customizing the amount of ads. In essence, website providers can retain their users more by making them feel empowered. Accordingly, it is less important for users to objectively be in control, but rather to feel in control over their web experience. Website providers can build on this insight by designing customization interfaces that emphasize to users how this website offers a greater level of freedom and influence over the way the website can be experienced than what users would commonly expect. As such, websites may find ways to capture users through empowerment also beyond the context of customizing ads.

**Limitations and directions for future research**

This study is subject to limitations and provides several avenues for future research. To study users’ responses to AQC, we conducted an online experiment in which participants were asked to customize an experimental website’s quantity of ads, followed by reading a news article with as many ads as participants had opted for. This approach includes some limitations: First, to aid comparability, each participant in our AQC treatment group could only customize ad quantity when entering the experimental website, without having the option to readjust their choice at a later point in time to find a setting that suits them better. Without the possibility for participants to optimize their customization choice, our results may underestimate...
the effectiveness of AQC – nonetheless without affecting the resulting implications. Second, our experimental setup focused on capturing participants’ evaluation based on a one-time visit of our experimental website that does not account for long term effects of interacting with the AQC feature. We can only conjecture that a one-time exposure may indeed be sufficient to induce a prolonged benefit of AQC due to the first impression effect, which suggests that individuals’ first exposure to a website has a disproportionately great effect on their judgment. This effect is quite strong, as a positive first impression (e.g., based on the provision of AQC) will only start to be questioned after many subsequent interactions contradict individuals’ first impression (Lim et al., 2000). Third, although we accounted for three mediating constructs, our analysis with informational fit-to-task and perceived enjoyment as mediators yielded a remaining direct effect of perceived empowerment on website stickiness – potentially indicating toward another effect mechanism caused by perceived empowerment that may offer an interesting opportunity for future research. Fourth, while participants’ subjective evaluation of their intention to stick to the website is a useful indicator for the effectiveness of providing AQC, our findings could be complemented with experimental designs aimed to capture objective variables such as time spent on the website. To address these limitations and extend the findings of our online experiment, we call for future research to investigate the provision of AQC in a field setting. Specifically, it would be of interest to study how users interact with the AQC option when they can readjust their setting in the course of multiple browsing sessions and how the benefits of increased website stickiness develop over time. Furthermore, to investigate contextual influences of users’ responses to AQC, future research could study the role of diverse cultural backgrounds, the impact of users’ attitude toward ads, the relevance of users’ motivation to access a website and the significance of users’ device types with potentially smaller screen sizes exacerbating the irritation with ads.

Moreover, this research focused on website stickiness as the core user response. While this construct is a suitable indicator of users’ interest in a website, we need future research to expand our knowledge on the financial ramifications of AQC. Specifically, we require insights to what extent websites can monetize AQC, for example through a broader user base increasing the number of ad impressions, through closer attention toward ads and thus higher click-through rates and through paid subscriptions as a prerequisite to continued access to AQC. Similarly, IS researchers can draw on their experience in users’ decision making to understand how and why users select a specific ad quantity option. Such knowledge may be instrumental for website providers to influence users in their decision to support the website while simultaneously benefitting from an enhanced web experience. By guiding users in their ad quantity decision, AQC could strengthen the business model not only of growing websites seeking to expand their user base, but also of mature websites interested in monetizing their traffic.

Lastly, this study concentrated on website provider-enabled customization of ad quantity. Future research could investigate whether offering users to customize the content or format of ads on websites could lead to similar levels of website stickiness and ad acceptance. On a broader note, research could expand our knowledge on web customization by studying how website provider-enabled customization competes with users’ detrimental self-empowerment, such as ad-blocking. Understanding whether and how web customization can successfully address and convince users to refrain from forceful intervention can be a pivotal step for IS research to provide guidance to website providers struggling with their ad-revenue-based business models.

Conclusion

Websites featuring ads face increasing pressure to attract and retain users that are becoming progressively intolerant of ad clutter. Consequently, website providers are starting to loosen their firm grip on the ads displayed on their website by offering AQC as a website feature that empowers users to customize the website’s ad quantity. In the field of web customization, several studies investigated how users customize websites’ primary editorial content (i.e., content related to the main purpose of the website). However, advertising content is fundamentally distinct from editorial content in that users oftentimes perceive ads as unsolicited and irritating – raising the question whether users have any interest in customizing ads they typically seek to avoid. As such, the purpose of this study was to uncover whether, how and why website provider-enabled AQC can influence users’ intention to stick to a website.

We examined the effectiveness of providing AQC in an online experiment and analyzed the results using partial least squares. The results indicate that a website with AQC elicits higher website stickiness than a website without AQC. Counterintuitively, we find that even a website entirely free of ads is not as attractive to users than a website offering AQC, contradicting the common belief that users perceive ads as generally negative. In fact, users even appreciate the introduction of ads on websites, as long as they can customize these ads’ quantity. Furthermore, our results suggest that the effect of AQC on website stickiness is primarily driven by users’ sense of being empowered, which enhances both users’ cognitive as well as affective evaluations of the website. These findings underline the importance of feeling empowered as a thus far neglected mechanism of web customization. The results have important theoretical implications for our understanding of web customization and provide strong practical implications for website providers seeking new ways to take advantage of their ads.
Appendix

Participant instructions

Your task:
Imagine it is Saturday and you are surfing on the Internet at home. You recently developed an interest in commercial aviation and are curious to know what happened in the series of accidents involving Boeing 737 MAX aircrafts. After a quick Google search, you hit on an article from the news portal The Epoch Times. You access the website with the intention to find out what might have caused the accidents.

Cover page

Assessment of measurement model

Table 6 Fornell-Larcker criterion demonstrating discriminant validity (Fornell & Larcker, 1981)

|                                | STICK | EMP  | IFTT | ENJ  | CLUTT | PCUST |
|--------------------------------|-------|------|------|------|-------|-------|
| Website Stickiness (STICK)     | 0.946 |      |      |      |       |       |
| Perceived Empowerment (EMP)    | 0.632 | 0.933|      |      |       |       |
| Informational Fit-to-Task (IFTT)| 0.543 | 0.547| 0.946|      |       |       |
| Perceived Enjoyment (ENJ)      | 0.724 | 0.656| 0.501| 0.928|       |       |
| Perceived Ad Clutter (CLUTT)   | -0.397| -0.390| -0.331| -0.259| 0.935|       |
| Perceived Customizability (PCUST)| 0.332| 0.426| 0.212| 0.317| -0.220| 0.925|
Assessment of structural model

Table 8  Effect sizes (Cohen’s $f^2$) of AQC website vs. default website (Cohen, 1988)

|                | EMP | IFTT | ENJ | STICK |
|----------------|-----|------|-----|-------|
| AQC (absent vs. present) | 0.043 | 0.003 | 0.002 | 0.007 |
| Perceived Empowerment (EMP) | **0.301** | **0.538** | 0.033 |
| Informational Fit-to-Task (IFTT) | **0.300** | 0.030 |
| Perceived Enjoyment (ENJ) | **0.389** |

Note: $f^2$ values of 0.020, 0.150, 0.350 indicate a predictor variable’s low, medium, or large effect in a structural model (Cohen, 1988)

As evident from Tables 8 and 9, the effect of AQC on perceived empowerment can be considered moderate (0.043 / 0.093), whereas perceived empowerment exerts strong effects on both informational fit-to-task (0.301 / 0.364) and perceived enjoyment (0.538 / 0.555). Lastly, the resulting effect on website stickiness is driven less by informational fit-to-task (0.030 / 0.064), but more by perceived enjoyment (0.389 / 0.398). This means that while AQC exerts a moderate impact on perceived empowerment, this shift in empowerment powerfully affects both informational fit-to-task and perceived enjoyment, whereas the latter contributes particularly strongly to enhanced website stickiness. As such, we find support that the feeling of empowerment as a stimulant for the highly influential perception of enjoyment can be considered the primary driver of the increase in website stickiness.

Table 9  Effect sizes (Cohen’s $f^2$) of AQC website vs. ad-free website (Cohen, 1988)

|                | EMP | IFTT | ENJ | STICK |
|----------------|-----|------|-----|-------|
| AQC (absent vs. present) | **0.093** | 0.004 | 0.002 | 0.001 |
| Perceived Empowerment (EMP) | **0.364** | **0.555** | 0.009 |
| Informational Fit-to-Task (IFTT) | **0.064** |
| Perceived Enjoyment (ENJ) | **0.398** |

Note: $f^2$ values of 0.020, 0.150, 0.350 indicate a predictor variable’s low, medium, or large effect in a structural model (Cohen, 1988)
Fig. 7  Iterative introduction of the mediators perceived empowerment, informational fit-to-task and perceived enjoyment for AQC website vs. default website. Note: *p < 0.05, **p < 0.01, ***p < 0.001
Empowering users to control ads and its effects on website stickiness

Fig. 8  Iterative introduction of the mediators perceived empowerment, informational fit-to-task and perceived enjoyment for AQC website vs. ad-free website. Note: *p < 0.05, **p < 0.01, ***p < 0.001
### Table 10  Bootstrapping of linear regression indirect effects of AQC on Website Stickiness using PROCESS by Hayes (2018)

| Pathway of indirect effect | Website offering AQC vs. default website | Website offering AQC vs. ad-free website |
|----------------------------|-----------------------------------------|------------------------------------------|
|                            | Effect (Boot SE) | Boot LLCI | Boot ULCI | Effect (Boot SE) | Boot LLCI | Boot ULCI |
| AQC → EMP → IFTT           | 0.360 (0.118)   | 0.138     | 0.610     | 0.413 (0.098)   | 0.235     | 0.619     |
| AQC → EMP → ENJ            | 0.506 (0.148)   | 0.210     | 0.793     | 0.590 (0.117)   | 0.363     | 0.822     |
| EMP → IFTT → STICK         | 0.106 (0.034)   | 0.042     | 0.173     | 0.177 (0.040)   | 0.105     | 0.260     |
| EMP → ENJ → STICK          | 0.345 (0.056)   | 0.238     | 0.455     | 0.370 (0.053)   | 0.265     | 0.474     |
| AQC → EMP → IFTT → STICK   | 0.061 (0.031)   | 0.012     | 0.133     | 0.113 (0.040)   | 0.049     | 0.206     |
| AQC → EMP → ENJ → STICK    | 0.248 (0.081)   | 0.097     | 0.419     | 0.274 (0.071)   | 0.145     | 0.427     |
| AQC → EMP → STICK          | 0.147 (0.081)   | 0.018     | 0.333     | 0.083 (0.072)   | -0.048    | 0.235     |
| AQC → IFTT → STICK         | -0.028 (0.039)  | -0.121    | 0.037     | -0.041 (0.043)  | -0.138    | 0.030     |
| AQC → ENJ → STICK          | 0.099 (0.112)   | -0.116    | 0.325     | -0.044 (0.095)  | -0.225    | 0.147     |

Bootstrapping with 5,000 samples and a 95% confidence interval using PROCESS model 81 by Hayes (2018)

EMP = Perceived Empowerment, IFTT = Informational Fit-to-Task, ENJ = Perceived Enjoyment, STICK = Website Stickiness, SE = standard error, LLCI = lower limit confidence interval, ULCI = upper limit confidence interval

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