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Effects of Risk Attitude and Time Pressure on the Perceived Risk and Avoidance of Mobile App Advertising among Chinese Generation Z Consumers

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Abstract: Generation Z (Gen Z) consumers require special consideration because they are a distinct demographic, are less receptive to mobile advertising, and have not been thoroughly studied. This study seeks to advance ad avoidance research by creatively examining Gen Zers' perceived ad risk and ad avoidance in mobile applications (apps) and the role that risk attitude and time pressure play in these phenomena. The formal study was conducted in March 2023 via an online survey, and 312 sample data were identified for data analysis. It was found that there is a positive relationship between Gen Zers' perceived risk and their avoidance of app advertising, with time, performance, and privacy risks being the primary advertising risks. Gen Zers perceive higher advertising risk when they are under time pressure or are risk-averse, and time pressure is a more vital indicator of perceived risk than risk attitude. Time pressure also significantly affects mechanical avoidance (e.g., using an ad blocker) more than behavioral avoidance. Still, the risk attitude only positively affects Gen Zers' behavioral avoidance of app ads. This study concludes that ad avoidance can be reduced by reducing users' perceived risk and time pressure. Also, ads should be placed based on consumers' risk attitude. Future research needs to validate these findings in other cultures, compare Gen Z to other generations, and consider the consequences of ad avoidance.

Keywords: ad avoidance; mobile app advertising; Gen Z; perceived risk; risk attitude; time pressure

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1. Introduction

Mobile applications have altered the business ecosystem. Free apps that rely primarily on advertising revenue predominate in the app market. Users decide whether to pay for an app depending on its value, performance, enjoyment, and other considerations [1]. Mobile app advertisements refer to ads displayed within apps. With users' increasing consumption of apps, advertisers invested 23 percent more in 2021 than in 2020, and the trend was projected to continue [2].

China has the largest app market by value [3]. However, nearly half of the users are dissatisfied with the heavy advertising frequency of apps [4], and up to 87.3 percent of Chinese internet users dislike app advertising [5] and avoid it. Even though users use apps often, unlike other kinds of advertising, there is currently limited research on mobile app ad avoidance [6].

The term "ad avoidance" encompasses any strategies media users employ to limit their exposure to advertisements [7]. Ad avoidance (particularly the usage of ad blockers) results in substantial economic losses for ad platforms and advertisers [8] since it harms ad platforms, makes advertisements ineffective, and inhibits advertisers from reaching their business objectives [9]. It may threaten the sustainability of the prominent business model that relies on advertising to generate revenue [10] and hinder the sustainable development of the advertising industry [9]. Also, consumers' ad avoidance significantly reduces the dissemination of sustainable development concepts, as advertising is an important tool for

promoting these ideas [11]. Thus, it is important to look into why people avoid advertisements to maintain the sustainability of the advertising industry [12] and the world [11]. In addition, advertising avoidance strategies might evolve because of technical advancements [12]. New findings can be discovered by focusing on media characteristics [13]; hence, it is necessary to investigate the avoidance of mobile app ads.

At the same time, marketers regard Generation Z (Gen Z) as a distinct cohort [14]. Generation Z refers to those born between 1997 and 2012. They make more intelligent, pragmatic, and analytical decisions than prior generations [15]. They were born in the Internet era, prefer new technologies [16], and are the first generation of "digital natives." The Internet has always been a part of their lives; therefore, they are accustomed to using it to solve problems, and their expertise with digital devices is innate [17,18]. Also, when online, their attention span is shorter than that of previous generations, and they are multitasking and distracted [14,16].

China has the world's largest Gen Z population. Gen Zers view consumption differently than previous generations, and they grew up during China's economic boom, with better material and living conditions than previous generations. As a result, they have a different consumption mindset and behavior than previous generations [19].

Gen Zers primarily use mobile devices to access the Internet [20], but they prefer to avoid mobile advertising compared to other generations. Based on a study on the ad behavior of Gen X, Y, and Z consumers in 39 countries [21], it was discovered that while Gen Zers spend the most time on mobile devices, they also have the most negative attitude toward mobile ads and prefer controllable ads. Furthermore, 31% of Gen Zers have installed computer ad-blocking plug-ins, compared to only 22% of Generation X, and 26% of Gen Zers prefer to turn away from the mobile screen when confronted with ads, compared to only 19% of Gen Y and 13% of Gen X [21]. Even though it is essential to understand how Gen Zers avoid mobile ads to make effective ad campaigns [20], research on how Gen Zers avoid mobile advertising [22], specifically mobile app advertising, is still lacking.

Several gaps in the research on advertising avoidance need to be addressed. First, research on advertising avoidance behavior needs to be more comprehensive. Existing research has discovered that not all facets of ad avoidance have the same effect [23]. When consumers employ cognitive and behavioral avoidance strategies, they may still intentionally and unintentionally view advertisements [23] with an incidental exposure effect. However, when consumers adopt mechanical avoidance (e.g., ad-blocking software), a more radical form of avoidance, there is no chance that the advertisement will appear to them [10]. The growing prominence of ad blocking as a mechanical avoidance method, which is distinct from ordinary behavioral avoidance, necessitates the separation of mechanical avoidance from ad avoidance strategy research. In contrast, most previous studies treated mechanical avoidance as part of behavioral avoidance [24,25]. Furthermore, in 2022, China ranked second in ad blocker usage (43.4%), higher than the world level (37%) [26], which has caused a massive financial loss to China's advertising industry. While many studies currently address ad avoidance and users aged 14–24 are most likely to use ad blocking, the mechanical avoidance strategy [27], few studies have focused on mechanical ad avoidance by Chinese Generation Z consumers (mostly aged 14–24). It is necessary to create an up-to-date, inclusive measurement of ad avoidance [28], as well as to differentiate between different ad avoidance strategies and to focus on mechanical avoidance as a single tactic.

Second, existing research has shown that perceived risk can cause ad avoidance [29], but few studies have addressed systematic perceived ad risk [29]. Even fewer have accounted for psychological risk, the critical dimension affecting overall risk perception in some fields [30]. The perceived advertising risk dimension may not fully explain the perceived risk mechanism of action without psychological risk. Moreover, little research has refined the perceived risk's effect on various ad avoidance tactics. It is vital to differentiate between different avoidance tactics because the mechanisms of action are different [25].

Further, risk attitude is a stable personality trait [31,32] and an important variable influencing risk perception in many spheres [31,33,34]. However, there is a dearth of studies investigating how risk attitude affects perceived risk in the advertising sector. Recognizing that consumers' risk perceptions play a significant role in their decision to avoid advertisements [35], it is crucial to investigate how risk attitude affects perceived risk in advertising to comprehend the root reasons for consumer perceptions of advertising risk.

Last but not least, little research has examined the relationship between time pressure and the perceived risk of advertising [36]. There is a dearth of research on the impact of time pressure on perceived risk in mobile apps and the impact of various ad avoidance strategies, even though time pressure is an important variable influencing perceived risk [37,38].

Based on these gaps, the purposes of this study are as follows: first, to provide a comprehensive understanding of Gen Zers' avoidance of mobile app ads, which has been relatively understudied in prior research; second, to offer timely and in-depth insight into consumers' ad avoidance behaviors by categorizing Gen Zers' ad avoidance tactics and purposefully focusing on the mechanical avoidance that currently plagues the advertising industry; third, to systematically investigate the perceived advertising risk among Gen Zers; fourth, to research the impacts of risk attitude and time pressure on advertising risk, a vital factor influencing ad avoidance; and finally, to obtain insight into the mechanisms of advertising avoidance by examining the impact of perceived risk, time pressure, and risk attitude on several forms of advertising avoidance tactics.

The article examines the research regarding the critical theories upon which the hypotheses are formulated in the following. The research methods employed for this investigation are then described in detail. The article then describes the essential findings and the contributions of theory and practice. The article's conclusion addresses the limitations and prospects for future research.

2. Literature Review and Hypotheses Development

2.1. Ad Avoidance

Users of traditional media (TV, radio, newspapers, etc.) employ a variety of tactics to avoid advertisements, including cognitive avoidance (ignoring commercials), physical avoidance (skipping ads), and mechanical avoidance (changing channels or deleting ads) [7]. Based on the classification of previous research [7], users' avoidance strategies for Internet advertisements can be categorized as cognitive avoidance (e.g., deliberately ignoring ads), affective avoidance (e.g., disliking ads), behavioral avoidance (e.g., scrolling web pages, deleting ads, etc.) [39], and mechanical avoidance (e.g., using ad blockers) [40]. Follow-up research indicated that, contrary to popular belief, affective avoidance is not an advertising avoidance variable but rather an antecedent that influences cognitive and behavioral avoidance (including mechanical avoidance) [12].

In addition, consumers' avoidance responses to internet advertisements can be split into two types, active avoidance and passive avoidance, depending on how much mental effort is expended in dealing with the advertising. Passive avoidance includes averting one's eyes and waiting until the ad disappears with little effort. In contrast, active avoidance includes strategies like closing the window and clicking away, which are the least preferred behaviors by advertisers [41]. Positive avoidance includes both behavioral and mechanical avoidance, while passive avoidance refers to cognitive strategies [42].

The impact of various kinds of ad avoidance by consumers varies. Although cognitive avoidance can result in memory without ad perception [23], it has also been argued that cognitive avoidance suggests a low degree of cognitive processing that minimizes users' attention to advertising, which may diminish the ads' effectiveness from the start [25]. Alternatively, consumers should focus on advertisements before making any behavioral efforts to avoid them [25], as doing so improves attention to the advertising and, consequently, increases ad recall [23]. Users who actively try to avoid ads on their phones by moving them to the edges of the screen can see them by accident and remember them [43].

Ad blocking causes inefficiency in the digital advertising marketplace [44], yet ad blocking by consumers on news websites can increase news readership [45].

Different ad avoidance tactics can be influenced by different causes or by the same factors but in varying degrees. For instance, time pressure affects users' behavioral rather than the mechanical avoidance of commercials [38]. Threats to freedom relate to less cognitive avoidance and more behavioral avoidance in response to Facebook ads. In contrast, ad intrusiveness just leads to cognitive avoidance, and anger only leads to behavioral avoidance [25].

At mobile terminals, users avoid advertisements differently. Avoiding mobile advertisements requires user interaction [43]. Compared to desktop computers, mobile devices see higher rates of ad scrolling to the top and bottom edges [43]. Many people download ad-blocking tools to rid themselves of advertisements as much as possible [46].

Despite being behavioral avoidance [12], mechanical avoidance involves blocking ads to make advertising disappear and is thus a more extreme kind of avoidance, which is a quickly expanding yet the most problematic form of avoidance for marketers [10,46]. Mechanical avoidance (e.g., ad blocking) also threatens the ecology of Internet advertising by drastically reducing the amount of money customers spend on online purchases [47]. There have been many studies on mechanical avoidance in mobile advertising. However, most studies on ad avoidance treat mechanical avoidance as part of behavioral avoidance [24,25] rather than as a separate ad avoidance strategy and rarely focus on Gen Z. Nonetheless, research has revealed that users in the same age range as Gen Z, 14–24 years old, are the most likely to utilize ad blocking [27].

Most researchers treat mechanical avoidance as part of behavioral avoidance [24,25], which impedes a deeper understanding of mobile ad avoidance, even though the mechanisms of action of different ad avoidance strategies vary and mechanical avoidance is more common for Gen Zers. Advertising experts should differentiate between distinct types of ad avoidance [12]; thus, this study distinguished between ad avoidance techniques (i.e., cognitive avoidance, behavioral avoidance, and mechanical avoidance) concerning mobile devices.

2.2. Hypothesis Development

2.2.1. Perceived Risk and Ad Avoidance

Consumers' perceptions of risk strongly impact their behavior [48–50], and marketing strategists should first recognize and address the risk their customers perceive [51]. Originally a psychological concept, perceived risk was then introduced into marketing management [52]. It is defined as "the uncertainty of the outcome of a series of actions" [52] and is evaluated differently by each customer. The two critical components of perceived risk are uncertainty and the seriousness of potential outcomes from poor decision-making [53]. Because consumers are more likely to avert loss than maximize utility during purchasing, perceived risk is more helpful in describing consumer behavior [54].

Perceived risk is context-dependent [31] and multi-dimensional [49,50]. It includes social risk (the risk of being judged negatively by others as a result of consumption errors), financial risk (the risk of financial loss due to consumption), physical risk (the risk that consumption behavior may harm physical health), performance risk (the risk that consumption behavior does not achieve the expected performance), time risk (the risk of wasting time due to consumption) [29], and psychological risk (the risk of harming one's emotions due to inappropriate consumption) [55].

Concerns about the risks associated with advertisements affect whether consumers accept them [56,57]. Perceived utility and perceived sacrifice are the most important factors influencing consumers' acceptance of mobile advertisements [35]. The severity of perceived loss reinforces users' motivation to turn off personalized ads [58]. This calls for research into the significance of risk perception during the distribution of advertisements. Perceived risk in mobile advertising is the degree to which consumers are unsure about the negative repercussions of opening, reading, or responding to an ad [59]. Performance risk, privacy

risk, time loss risk, and freedom risk are some concerns customers have about online targeted advertising [29].

Perceived risk (i.e., the privacy risk of personalized advertising and its opportunity cost risk) elicits consumer reactance to online personalized advertising (OPA) [60]. In contrast, reactance is a significant cause of ad avoidance [25]. Perceived risk also diminishes consumers' perceived ad value, resulting in adverse advertising effects [61]. Privacy risk can lead to ad avoidance [56,62], and some studies have found that privacy risk is the most significant risk leading to ad avoidance, followed by performance risk, with freedom risk and time risk playing a lesser role [29]. However, previous research on perceived risk in advertising has given less attention to psychological risk, which in some areas has been demonstrated to be the most influential dimension of perceived risk on consumer perceptions [30] or behavior. Irritation, a sense of being deceived, etc., have also been shown to be essential factors influencing ad avoidance [63]; therefore, this study extends the previous investigation of perceived advertising risk dimensions [29] by incorporating psychological risk into the perceived advertising risk dimensions; that is, perceived advertising risk includes performance risk, time risk, freedom risk, privacy risk, and psychological risk.

Previous studies have shown that perceived risk can lead to overall ad avoidance [29], and further research has demonstrated that the mechanisms of action of different ad avoidance strategies are distinct [25]. Thus, this study divides the methods of ad avoidance and proposes the following hypotheses:

Hypothesis 1a. *The perceived risk of app ads positively affects Gen Zers' cognitive avoidance.*

Hypothesis 1b. *The perceived risk of app ads positively affects Gen Zers' behavioral avoidance.*

Hypothesis 1c. *The perceived risk of app ads positively affects Gen Zers' mechanical avoidance.*

2.2.2. Risk Attitude, Perceived Ad Risk, and Ad Avoidance

Generation Z's response to advertising is significantly influenced by personality [13,64]. A person's risk attitude, an innate preference for risk, is a stable personality trait that does not alter in response to contextual changes [31,32]. Customers' risk attitude can shed light on and even be used to anticipate their actions [32]. Moreover, prior research has shown that risk attitude significantly impacts risk management more than specific perceived risks [65]. Depending on their risk attitudes, people can be classified as risk-averse (unwilling to take the risk), risk-neutral (indifferent to risk), or risk-seeking (enjoying risk) [66].

Risk attitude influences individuals' risk perceptions. For example, the more risk-averse farmers' risk attitudes are, the higher their perceived risk of food quality damage and unhealthiness [33]. At the same time, risk-taking decision-makers have lower risk perceptions for projects [34]. Additionally, it has also been discovered that risk attitudes can influence customers' perceptions of risk in transactions [31]. The study also revealed that younger people are more likely to take risks [67]. Few studies have examined the impact of risk attitudes on perceived ad risk. This study assumes that the more risk-averse the risk attitude is, the higher Gen Z consumers perceive the advertising risk. As a result, the following hypothesis is proposed:

Hypothesis 2. *The more risk-averse the Gen Zers are, the higher the perceived risk of app ads.*

Risk attitude can also directly impact users' intentions [68] and behavior [69]. Risk attitude has been proven to be a key factor influencing Internet shopping [31], Internet finance [70], online service platform pricing [66], and so on. Risk-seeking individuals prefer risky decisions, while risk-averse people favor low-risk strategies. For example, risk-seeking consumers have a better online shopping experience and satisfaction [31] and prefer to use P2P (person-to-person) borrowing [71], risk-seeking Millennials s have a higher intention to purchase genetically modified food [72], and risk-averse farmers are less

risk-tolerant than risk-neutral farmers and therefore spend more on pesticides to ensure their income [33], while risk-averse persons are more likely to take protective measures during an epidemic [69].

While risk attitude has been shown to predict consumer behavior significantly [32], the relationship between risk attitude and ad avoidance has rarely been examined. Considering that users are uncertain about the negative consequences of opening, reading, or responding to an advertisement [59], viewing an advertisement can be considered risky behavior, and ad avoidance is a risk management strategy. With the increase in mobile advertising, problems such as clutter and ad worthlessness have become more common [12,73], and consumers have a more negative view of ads [63] and question the value of the ads [74]. Consumers perceive a risk of losing time, control, or privacy when they see mobile advertising [75]. As a result of combining the literature and focus interview groups, this study concludes that when confronted with ads, Gen Zers tend to believe that viewing an ad is highly likely not to yield the expected gain or expose one to risks such as loss of time, control, or privacy and that risk-averse Gen Z consumers prefer to avoid potential losses by avoiding ads; thus, the following hypotheses are proposed:

Hypothesis 3a. *Gen Zers, who are risk-averse, engage in more cognitive avoidance of app ads.*

Hypothesis 3b. *Gen Zers, who are more risk-averse, engage in more behavioral avoidance of app ads.*

Hypothesis 3c. *Gen Zers, who are more risk-averse, engage in more mechanical avoidance of app ads.*

2.2.3. Time Pressure, Perceived Ad Risk, and Ad Avoidance

As with space, time is a limited resource that should be considered to gain a holistic picture of human behavior [76]. When people feel they lack time to complete their tasks, they experience time pressure [38].

Consumers' risk perception can be impacted [36] and, in some cases, even heightened [77] by time pressure. Time pressure affects people's responses to uncertainty [78] and influences consumers' risk perceptions of the purchase [79]. In the case of smart healthcare products, for instance, consumers under time pressure gaze at the product longer and perceive greater product value and quality [80]. Time pressure may significantly bolster the negative link between risk and benefit perception [79]. Therefore, this study hypothesizes that Gen Zers under high time pressure have higher advertising risk perceptions and proposes the following hypothesis:

Hypothesis 4. *Time pressure positively affects the perceived risk of app ads among Gen Zers.*

Additionally, time pressure influences an individual's choices [81,82], making individuals under time pressure less likely to engage in healthful food-related activities [83]. The interaction between time pressure and context influences consumer decisions [84]. The perceived value of promotions in social e-commerce can increase consumers' shopping intentions; however, perceived time pressure can mitigate the positive effects of perceived emotional and social values on shopping intentions [85]. Time pressure can shorten consumers' ability to think critically. When consumers are under intense time pressure, product explanation in live marketing is more effective at facilitating purchase intent [86].

Customers' responses to advertising can be influenced by time pressure. Users reading on the screen under time pressure only process the information superficially [87]. Time pressure can reduce consumers' willingness and capacity for processing information [37], reducing their likelihood of engaging with online advertising [42] and increasing their propensity to avoid advertising messages [37,38] and social media messages [88]. Time pressure increases consumers' avoidance of television [38] and radio ads [37] but not print ads [37], and this effect varies by nation [38]. Time pressure significantly impacts the effectiveness of mobile advertising; people under time pressure rarely process advertising messages, are easily annoyed by ads, and develop negative attitudes [89]. Little research

has been conducted on the effect of time pressure on ad avoidance among Gen Z app users. Based on the above analysis, this study proposes that time pressure affects Gen Zers' ability to process ads, resulting in increased ad avoidance, and so the following hypotheses are proposed:

Hypothesis 5a. *Time pressure positively influences Gen Zers' cognitive avoidance of app ads.*

Hypothesis 5b. *Time pressure positively influences Gen Zers' behavioral avoidance of app ads.*

Hypothesis 5c. *Time pressure positively influences Gen Zers' mechanical avoidance of app ads.*

Hypotheses 1–5 were used to construct Figure 1, a graphical representation of mobile app advertising risk and avoidance behaviors and their causes.

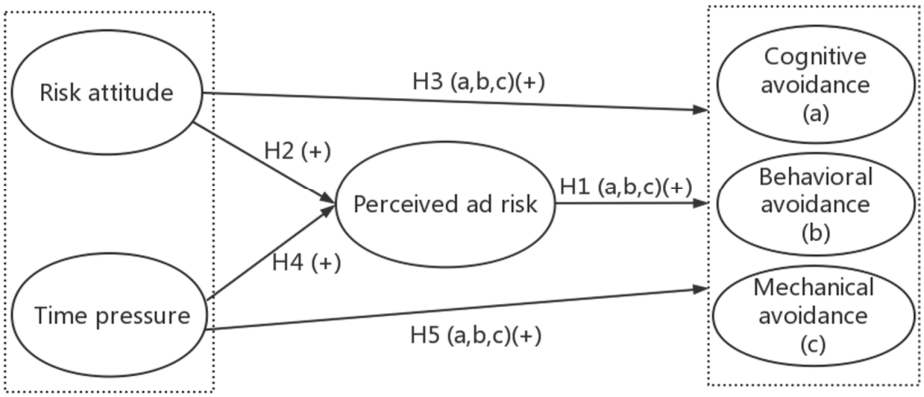


Figure 1. Theoretical model.

3. Methods

3.1. Sampling and Data Gathering

Generation Z (born between 1997 and 2012) app users in China comprise the study population for this research. In this study, data were gathered through focus group interviews and questionnaires. Two groups of Gen Z secondary school students were interviewed through focus groups to learn their perspectives on the appropriateness of existing scales, strategies for avoiding app advertisements, and the risks they perceive when confronted with app advertisements. There were ten students in each group, six males and four females, a gender distribution ratio roughly equivalent to that of Chinese internet users. A pre-test with 50 Gen Zs was carried out in February 2023, following which some of the questionnaire content was revised.

The formal study was conducted in March 2023, with Gen Zers recruited through Sojump (http://www.sojump.com, accessed on 31 March 2023) to complete the questionnaire. It employs convenience sampling. Although convenience sampling does not allow for the generalization of results, it is nonetheless widely utilized since it is appropriate for researchers with limited resources and for studies that intend to be exploratory, as was the case here. The questionnaire began with an age option to ensure participants were between 1997 and 2012. Trap questions were placed in the middle of the questionnaire to filter out individuals who did not fill out the questionnaire meticulously. Simultaneously, to encourage participants to complete the questionnaire, each participant who finished the questionnaire were eligible to qualify for a bonus of up to CNY 10 (China's currency; CNY 10 is equivalent to 1.4 USD). A total of 345 individuals completed the questionnaire, and 312 valid questionnaires were obtained after removing those who did not fulfill the age category and those who answered the trap questions incorrectly or in less than 90 s. The valid response rate is 90.43%, and the sample size is higher than the 300 advocated by scholars for factor analysis [90]. Table 1 shows the participants' characteristics.

Table 1. Sample profiles.

Characteristics		Frequency	Percentage (%)
Gender	Male	172	55.1
	Female	140	44.9
Age	Under 18 years	145	46.5
	18–26 years	167	53.5
Educational	Below high school	16	5.1
	High school	184	59.0
	College	39	12.5
	Undergraduate	44	14.1
	Graduate	29	9.3
Time spent on the app	Less than 1 h per day	20	6.4
	1–3 h per day	61	19.6
	3–5 h per day	98	31.4
	More than 5 h per day	133	42.6

3.2. Measures

The risk attitude scale comprised four items derived from Wärneryd [91]. Time pressure was measured using a three-item scale developed by Prendergast et al. [37]. For the perceived risk, this study drew from the prior literature and the results of focus group interviews. It defined the perceived risk of advertising as a second-order reflective construct comprised of perceived performance risk, time risk, privacy risk, freedom risk, and psychological risk. The first four perceived risk scales were adapted from Wang et al. [29] and contained a total of twelve items, while the perceived psychological risk scale was adapted from Laroche et al. [92] and included three items.

This research draws on the findings of researchers [7,38] that have distinguished mechanical avoidance as a distinct variable from common behavioral avoidance. This research includes cognitive, behavioral, and mechanical avoidance as strategies for avoiding advertisements. The three-item cognitive avoidance of advertising scale and the four-item behavioral avoidance of advertising scale were developed from studies by Kelly et al. [12] and McKee [22]. In contrast, the three-item mechanical avoidance scale was created from a combination of a previous study [38] and focus group interviews.

The items utilized in the present study are detailed in Table 2. On a 7-point Likert scale, where "strongly disagree" (1) and "strongly agree" (7) were the extremes, respondents rated their level of agreement with every phrase.

Table 2. Reliability and validity of the measurement model.

Construct	Factor Loadings	CR	AVE	Cronbach's Alpha
Risk attitude (first-order reflective)		0.877	0.641	0.875
Before making any decisions, I will think carefully.	0.80			
Before I buy something, I want to learn more about it.	0.85			
I steer clear of taking risks.	0.77			
To avoid regret later, I would instead take my time comparing options.	0.78			
Time pressure (first-order reflective)		0.843	0.642	0.845
I feel like I am too busy to relax.	0.74			
I often spend time in between too many things.	0.81			
"Too much to do, too little time"; this phrase applies to me very much.	0.85			
Perceived risk (second-order reflective)		0.904	0.656	0.933
Perceived performance risk (first-order reflective)	0.89	0.804	0.578	0.798
The products advertised on the app are different from the actual ones.	0.76			
The app's recommended advertisements do not meet my expectations.	0.78			
The advertisements prohibit my use of the app.	0.74			

Table 2. *Cont.*

Construct	Factor Loadings	CR	AVE	Cronbach's Alpha
Perceived privacy risk (first-order reflective)	0.83	0.920	0.792	0.922
Private information obtained to display app advertisements may be misused.	0.89			
My personal information gathered through app advertising may be distributed to unknown individuals or companies by merchants without my knowledge or approval.	0.91			
Private information gathered through app advertising could be abused.	0.87			
Perceived time risk (first-order reflective)	0.90	0.878	0.706	0.877
Returning or replacing goods will take longer because the products advertised in the app do not meet my expectations.	0.82			
App advertising disrupts my time.	0.86			
It takes a long time to choose and compare app ads.	0.84			
Perceived freedom risk (first-order reflective)	0.64	0.884	0.717	0.853
App advertisements attempt to make decisions for me.	0.82			
Ads in apps restrict my freedom of choice.	0.85			
App advertisements take away my control.	0.87			
Perceived psychology risk (first-order reflective)	0.76	0.852	0.658	0.843
App ads might be an insult to intelligence.	0.75			
App advertisements can be annoying.	0.85			
App advertisements make me unhappy.	0.83			
Cognitive avoidance (first-order reflective)		0.831	0.622	0.824
I purposefully redirect my attention away from the app advertisements.	0.84			
I purposefully ignore the app's advertisements.	0.81			
Even if the ads on the app catch my attention, I do not click on them.	0.71			
Behavioral avoidance (first-order reflective)		0.876	0.638	0.873
I scroll up or down the page to avoid the ads when using the app.	0.82			
When using the app, I take the opportunity to do something else when I encounter an ad.	0.74			
I will click to skip or close the ads when using the app.	0.86			
When I encounter an ad on an app, I mute the ad.	0.77			
Mechanical avoidance (first-order reflective)		0.873	0.697	0.873
I have installed ad blocker(s) to avoid ads in the app.	0.87			
To avoid ads in the app, I set up ad blocking.	0.87			
To avoid ads in the app, I choose software (platform) that can block ads.	0.76			

4. Data Analysis and Results

4.1. Measurement Model

SPSS 25.0 and AMOS 26.0 are both statistical software designed by IBM Corporation (New York, NY, USA). The former can be used for descriptive statistical analysis, reliability and validity tests, and exploratory factor analysis. In contrast, the latter can be used for confirmatory factor analysis for scale validity testing and constructing structural equation modeling to test research hypotheses. SPSS 25.0 and AMOS 26.0 were used to analyze the data in this study.

A measurement's reliability and validity are two of its most important features; only by guaranteeing the two can reliable data be acquired. Cronbach's alpha was employed in this research to examine internal reliability; a result above 0.7 indicates good reliability [93]. Overall, the study's scale has a Cronbach's alpha of 0.90, and each variable has an alpha value above 0.7. The overall Cronbach's alpha for the perceived advertising risk scale is 0.933, with a Cronbach's alpha of 0.798 for the perceived performance risk, 0.922 for the perceived privacy risk, 0.877 for the perceived time risk, 0.853 for the perceived psychological risk, and 0.843 for the perceived freedom risk. Table 2 displays the questionnaire results, which show high reliability overall.

Convergent validity, which examines the degree of correlation of each item under the same dimension, and discriminant validity, which measures the degree of correlation

between distinct dimensions, are two validity tests. Standardized factor loading, composite reliability (CR), average variance extracted (AVE), and other methods may be used to assess convergent validity [94]. Confirmatory factor analysis (CFA) is a method used to determine whether the correspondence between factors and measurement items remains consistent with the researcher's predictions. It verifies the model's structural, convergent, and discriminant validity. Thus, CFA was performed in this study using AMOS 26.0 to validate the validity of the variables.

Before conducting CFA, exploratory factor analysis was performed in this study utilizing principal component analysis and maximum variance rotation to check whether these data were suitable for factor analysis. KMO = 0.912, χ^2 = 3253.198 (approximate chi-square value of Bartlett spherical test), df = 105, sig = 0.000, and 80.379% of the variance is explained for the perceived advertising risk scale. Analyses revealed that the entire scale has a KMO = 0.921, a chi-square value of the Bartlett spherical test χ^2 = 6391.917, a degree of freedom of 406, a significance level of sig = 0.000, and an amount of variance explained of 80.917%. The indicator data meet all requirements and are appropriate for factor analysis. Thus, CFA was employed to assess the measurement's validity.

The CFA for the six factors (risk attitude, time pressure, perceived risk, cognitive avoidance, behavioral avoidance, and mechanical avoidance) has a good fit: χ^2 = 970.497, DF = 445, CFI = 0.924, IFI = 0.924, TLI = 0.915, RMSEA = 0.062, and SRMR = 0.055. The standardized factor loading for each item in this research is more significant than 0.6, attaining the suggested cutoff levels [93], indicating that the latent variables are well represented. Furthermore, the AVE of each latent variable is more potent than 0.5, and the CR value is more significant than 0.8. This indicates that the scale has good consistency and convergent validity.

For discriminant validity, the square root of the AVE value of each variable should be greater than the absolute value of its correlation coefficient with the other variables [94]. As shown in Table 3, the square roots of the AVE values for all variables in this study are greater than the correlation coefficients between them and other variables, indicating that the scale has good discriminant validity.

Table 3. Discriminant validity *.

	Construct	Mean	SD	1	2	3	4	5	6	7	8	9	10
1	Risk attitude	5.34	1.20	**0.80**									
2	Time pressure	4.72	1.30	0.42	**0.80**								
3	Perceived performance risk	4.90	1.20	0.36	0.41	**0.76**							
4	Perceived privacy risk	5.04	1.42	0.45	0.45	0.62	**0.89**						
5	Perceived time risk	5.05	1.30	0.42	0.47	0.72	0.66	**0.84**					
6	Perceived psychology risk	4.85	1.40	0.31	0.38	0.57	0.63	0.50	**0.81**				
7	Perceived freedom risk	4.49	1.46	0.27	0.34	0.42	0.52	0.49	0.60	**0.85**			
8	Cognitive avoidance	5.00	1.28	0.44	0.47	0.63	0.58	0.68	0.49	0.44	**0.79**		
9	Behavioral avoidance	5.24	1.26	0.51	0.49	0.57	0.59	0.69	0.45	0.39	0.75	**0.80**	
10	Mechanical avoidance	4.70	1.50	0.26	0.48	0.40	0.38	0.49	0.34	0.36	0.53	0.59	**0.83**

* N = 312. All correlations are significant at $p < 0.01$. Numbers bolded on the diagonal are AVE square roots. Values outside the diagonal are correlations between variables. SD = Standard deviation.

The study then examined the specification of the second-order variable—perceived advertising risk. χ^2 = 220.191, DF = 82, CFI = 0.957, IFI = 0.957, TLI = 0.945, RMSEA = 0.074, and SRMR = 0.046 are the results of the confirmatory factor analysis of the second-order five-factor model (the second-order factor is perceived advertising risk, and the five first-order factors are perceived performance risk, perceived privacy risk, perceived time risk, perceived psychological risk, and perceived freedom risk). Perceived time risk (0.90), perceived performance risk (0.89), perceived privacy risk (0.83), perceived psychological

risk (0.76), and perceived freedom risk (0.64) are ranked according to their standardized factor loading for the first-order factors. The composite reliability of the second-order factor perceived advertising risk is 0.904, and the AVE value is 0.656; the composite reliability of the first-order factor perceived performance risk is 0.804, and the AVE value is 0.578; the composite reliability of the perceived privacy risk is 0.902, and the AVE value is 0.792; the composite reliability of the perceived time risk is 0.878, and the AVE value is 0.706; the perceived psychological risk has a composite reliability of 0.852 and an AVE value of 0.658; and the perceived freedom risk has a composite reliability of 0.884 and an AVE of 0.717. Overall, the data presented suggest that the scales have acceptable reliability and convergent and discriminant validity.

4.2. Structural Model and Hypotheses Testing

This study used structural equation modeling to test the hypotheses, and data analysis was conducted using the AMOS 26.0 software; the results are presented in Figure 2. The model has the following good fit indices: χ^2 = 909.196, DF = 441, CFI = 0.932, IFI = 0.933, TLI = 0.923, RMSEA = 0.058, and SRMR = 0.056.

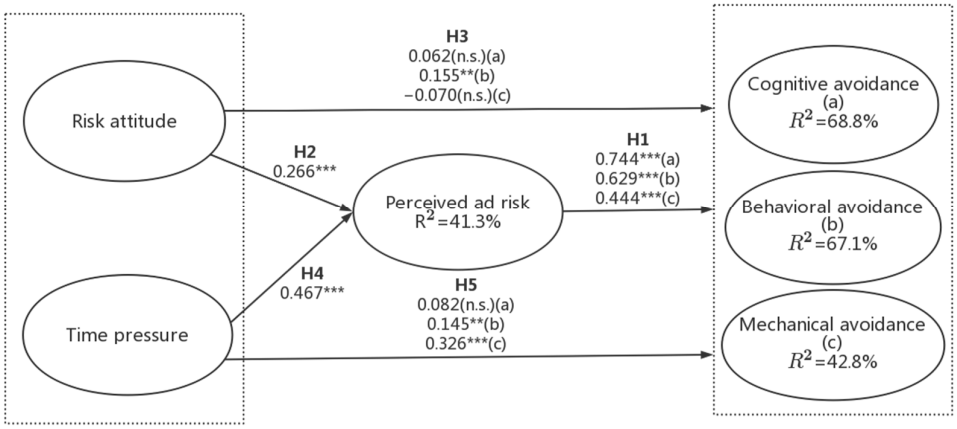


Figure 2. Structural model results. Notes: ** $p < 0.05$, *** $p < 0.001$, n.s. non-significant.

As shown in Figure 2, perceived ad risk significantly and positively influences Gen Zers' cognitive avoidance (standardized β = 0.744, $p < 0.001$), behavioral avoidance (standardized β = 0.629, $p < 0.001$), and mechanical avoidance (standardized β = 0.444, $p < 0.001$) of app ads, supporting hypotheses H1a, H1b, and H1c.

Risk attitude significantly and positively influences Gen Zers' perceived advertising risk (standardized β = 0.266, $p < 0.001$) and behavioral avoidance of app advertising (standardized β = 0.155, $p < 0.05$) but not cognitive avoidance (standardized β = 0.062, $p > 0.05$) or mechanical avoidance of app advertising (standardized β = −0.070, $p > 0.05$), so H2 and H3b are supported, and H3a and H3c are not supported.

Time pressure positively and significantly affects perceived advertising risk (standardized β = 0.467, $p < 0.001$), behavioral avoidance (standardized β = 0.145, $p < 0.05$), and mechanical avoidance (standardized β = 0.326, $p < 0.001$) but not cognitive avoidance (standardized = 0.082, $p > 0.05$). Therefore, H4, H5b, and H5c are supported, whereas H5a is not.

5. Discussion

5.1. Main Findings

The model explains a relatively high share of the examined constructs' variance. Risk attitude, time pressure, and perceived ad risk explain 68.8%, 67.1.3%, and 42.8% of the variance for cognitive, behavioral, and mechanical ad avoidance, respectively. Risk attitude and time pressure explain 41.3% of the perceived ad risk construct variance. This implies that perceived risk, risk attitude, and time pressure are important variables driving Gen Zers' app ad avoidance.

Cognitive avoidance (M = 5.00) and mechanical avoidance (M = 4.7) are prevalent among Gen Zers. However, behavioral avoidance (M = 5.24) is relatively preferred, suggesting that Gen Zers actively move ads out of view when they see them. Similarly, a previous study found that mobile ad avoidance is interactive, meaning users intentionally move ads to less-noticed positions on mobile screens after seeing them [43]. Cognitive avoidance is a passive avoidance strategy, while behavioral and mechanical avoidance are positive [42], implying that Gen Zers prefer positive and passive avoidance strategies. However, Gen Zers tend to be risk averse (M = 5.34). This contradicts the findings of previous research, which indicated that risk-averse individuals prefer to react passively to risk [65]. This study concludes that Gen Zers are risk-averse and prefer active and passive avoidance strategies.

Gen Zers are more likely to cognitively avoid app ads due to perceived ad risk than to avoid them through behavioral means. Gen Z consumers are more prone to engage in cognitive and behavioral ad avoidance and even adopt mechanical ad avoidance when they perceive a higher level of ad risk. Furthermore, the measurement model shows that the perceived time risk is the most important for Gen Zers, with a standardized factor loading of 0.90 on the perceived ad risk construct, followed by the perceived performance risk (0.89), the perceived privacy risk (0.83), the perceived psychological risk (0.76), and the perceived freedom risk (0.64). This contradicts the findings of a previous study that found that for Chinese consumers, privacy concern risk is the most critical perceived risk and time risk is the least important [29]. This contradictory result may indicate that members of China's digital native generation, Gen Z, have divergent views on the privacy concerns brought up by app advertising.

People are open to ads if they provide benefits, and this value can even motivate them to give up some privacy [62]. When consumers receive ads tailored to their interests, they are less likely to worry about misusing their personal information [62]. According to previous research, privacy concerns play a more minor role than perceived advertising intrusiveness and monetary rewards in encouraging people to accept mobile location-based advertising [95]. Further, people today generally feel pressed for time. The time cost is a significant factor affecting consumer purchases, and this study also indicated that Gen Z consumers are also apprehensive about the potential time risk connected with advertisements when they are ineffective. In addition, younger Millennials understand how new forms of advertising function [96], making them more willing to accept advertisements as a kind of payment for free services. Gen Zers are digital natives, familiar with advertising, and appreciate sharing personal data [74]. It is possible that Gen Zers are less concerned about their privacy because they understand the trade-offs of receiving free and personalized app services, due to increased privacy protection measures and knowledge of how advertising works.

Risk attitude can influence the perceived risk of advertising and behavioral avoidance of advertising. Perceived ad risk for Gen Zers increases in proportion to how risk-averse they are. Although Gen Z consumers have a risk-averse attitude and prefer to avoid ads, the risk attitude can only directly influence Gen Zers' behavioral avoidance of app ads; that is, the more risk-averse the Gen Zers' risk attitude, the higher the perceived ad risk, and the more they avoid ads at the behavioral level. It was also found that risk attitude could only predict cognitive and mechanical avoidance through perceived risk, contrary to prior research that suggested a risk-taking propensity encourages ad blocker use [10]. Nonetheless, risk attitude affects whether or not people avoid ads. Thus, risk attitude, like in other areas [33,34], is a crucial predictor of perceived advertising risk and behavior.

It was unexpectedly discovered that time pressure is a significant variable in determining the perceived risk of advertising. Gen Z consumers are more influenced by time pressure than risk attitude when evaluating the risk of app advertisements. In contrast, risk attitude is frequently recognized as an essential factor in determining perceived risk in other study areas [33]. Moreover, similar to a previous study on TV ad avoidance in the United Kingdom [38], this study found that time pressure can positively influence behavioral and mechanical avoidance of ads and that time pressure has a more significant effect on

mechanical avoidance than on behavioral avoidance, i.e., when time pressure is higher, Gen Zers are more likely to engage in behavioral avoidance of app ads and even more likely to use tools to block ads. These findings may be related to individual preferences for risky decisions at different times. Individuals experiencing high time pressure concentrate more on the negative aspects (the loss) and are less likely to take risks than those experiencing medium or low pressure [97]. People's aversion to loss increases under time pressure, leading them to opt for safer options [81]. Advertisements on mobile devices can cost users time, control, and privacy [75]. Users engage with media primarily to achieve a goal. When an ad interrupts them, they can choose between returning to their original activity or viewing the ad, with the former being predictable and the latter full of uncertainties [59]. Perceived risk is characterized by uncertainty [52]; hence, viewing the ad is risky. When people are under time pressure, they often choose not to view the ad and thereby avoid the potential risk.

5.2. Theoretical Contribution

This study adds to the body of knowledge on ad avoidance. While ad blocking is becoming more prevalent today, prior studies have paid less attention to this mechanical aspect of mobile ad avoidance. This study examines the mechanical avoidance of app ads by Chinese Gen Zers and offers a more thorough understanding of users' ad avoidance strategies in the context of new technologies.

Second, the applicability of perceived risk theory is extended in this research. This study summarizes five common dimensions of perceived advertising risk: time, performance, privacy, psychological, and freedom risk. It validates their importance based on Gen Zers' advertising avoidance characteristics. In this manner, perceived risk theory is expanded in advertisement avoidance research.

Third, this research expands previous studies on ad avoidance by including participants' risk attitudes. This research shows that risk attitude directly or indirectly impacts ad avoidance by affecting perceived risk. The more risk-averse the users are, the more likely they are to perceive advertising as riskier and, as a result, avoid it behaviorally. This study confirms the applicability and significance of risk attitude in the study of ad avoidance behavior, and future research on ad avoidance should consider risk attitude as an essential factor.

Finally, this research contributes to the growing body of knowledge of the impact of time pressure on ad avoidance and related processes. Previous studies [37,38] have primarily focused on the immediate effect of time pressure on ad avoidance. This research confirms earlier findings that time pressure is a direct cause of Generation Z's behavioral and mechanical avoidance of advertising and demonstrates that time pressure is a crucial element in determining advertising risk. Generation Z's cognitive ad avoidance and the other two types of ad avoidance may also be affected by time pressure because of its effect on their perceived ad risk. Therefore, the new study helps to broaden research and better understand the psychological process consumers go through when deciding whether or not to see an advertisement.

5.3. Practical Implications

Not only do consumers of Gen Z ignore advertisements, but they actively avoid them. Behavioral avoidance alone may still result in sporadic exposure, but the ad will never be viewed if users engage in mechanical avoidance. Prior research has shown that users scroll advertisements to the margins of their cell phone screens, where they are less visible [43]. This means ads in separate panels are easily moved from the audience's view. To prevent users from actively avoiding ads, ad practitioners should subtly integrate ads into content to reduce the likelihood of removal. App platforms should optimize the interface experience so that consumers are not angered by excessive, interruptive, and useless ads, which causes them to block ads.

Ad avoidance, particularly cognitive avoidance, may also be reduced by lowering consumers' perceptions of risk. Factor loadings for each measure of perceived risk show that time, performance, and privacy risks are significant perceived risks associated with advertising for Gen Zers. This suggests that ad delivery should alleviate users' fears that ads will waste their time, provide relevant advertising content, and protect their privacy to reach this demographic.

Ad avoidance may also be minimized by decreasing time pressure. According to the findings of this research, time pressure might increase the perceived ad risk and lead to behavioral and mechanical avoidance of ads. Users should not feel rushed or stressed out because of ads. People are more inclined to view ads if they feel free of rush. Therefore, using techniques like a countdown or shortening the message is a good idea.

The influence of risk attitude on users' responses to advertisements should also be considered. In addition to directly contributing to behavioral ad avoidance, a risk attitude that favors risk avoidance also exacerbates behavioral ad avoidance by raising the perceived risk. Advertising practitioners can design and distribute advertisements according to varying risk attitudes.

6. Limitations and Future Research

Despite contributing to the literature on Gen Z's avoidance of mobile advertising, this research has certain limitations. First, this research did not employ random sampling, limiting the generalizability of the findings because of the difficulties of obtaining an accurate database of Gen Z customers. Secondly, this research used the Chinese Gen Z population as its sample. Results from this research might not apply to other cultures due to inherent cultural differences. Third, this research exclusively examined how Gen Z consumers react to advertisements, rather than older generations. The consumption habits of Gen Zers may be better understood if compared to those of previous generations. Finally, this study only investigated the reasons for ad avoidance and does not discuss the results of using various ad avoidance strategies. Given that some research has shown that mobile ad avoidance is interactive and has occasional exposure effects and that ad avoidance is more common today, it is vital to investigate the results of using different avoidance strategies.

Overall, further research on Gen Z's ad avoidance behaviors should be undertaken in different cultural contexts and compare and contrast Gen Z's ad avoidance behaviors with those of other generations to explore Gen Z's more specific traits. Future studies should also look into the consequences of various ad avoidance approaches.

Nonetheless, this study builds on previous research to demonstrate the significant role of risk attitude and time pressure in influencing advertising risk and avoidance strategies. These research results serve as essential industry references. Perceived advertisement risk is a significant factor in ad avoidance, with perceived time risk, performance risk, and privacy risk being the most prominent risks perceived by Gen Z. Time pressure and risk attitude can influence perceived risk and lead directly or indirectly to ad avoidance. To avoid the adverse influence of these factors, advertisers can deliver advertisements based on risk attitude, make advertisements brief and personalized, and safeguard users' privacy, thereby enabling users to save time, meet their needs, and eliminate privacy concerns.

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