

Intergenerational Differentiation of the Lock-in Effect of Advertising Path Dependence and Unlocking Strategies

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Abstract

In 2025, China's advertising business revenue exceeded 2 trillion yuan, representing a year-on-year increase of 32.6%. In the first half of 2026, Internet advertising accounted for 86% of publication revenue, yet users' advertising avoidance rate continued to rise, creating an industry dilemma of "high investment-high avoidance." Using path dependence theory as the analytical framework and based on data from 730 nationwide survey questionnaires, this paper introduces the construct of "lock-in intensity" (avoidance score minus interaction score) to systematically examine the path-dependent characteristics of users' advertising defense. The study finds that: (1) there is significant generational differentiation in lock-in intensity. The defense levels of Generation Z (0.54) and Millennials (0.48) are much higher than that of Generation X (0.24), indicating that digital natives exhibit more pronounced solidification of advertising avoidance paths, while the post-2010 generation (0.28) shows a critical transitional signal of path loosening; (2) lock-in intensity has a significant negative effect on all stages of advertising conversion ($r=-0.15\sim-0.22$, all $p<0.001$). After controlling for demographic variables, lock-in intensity still has independent predictive power ($OR=0.863$, $p=0.044$), and the conversion rate of deeply locked-in users is 14.3 percentage points lower than that of lightly locked-in users; (3) there exists a "frequency perception paradox," whereby users who perceive that "there are relatively few advertisements" instead have the highest lock-in intensity (0.73), providing direct behavioral evidence for the self-reinforcing mechanism of path dependence. These findings indicate that the core root of the "high investment-high avoidance" dilemma lies in the path-dependent lock-in of advertising defense on the user side, and that the key approach to resolving this dilemma should shift from "blindly increasing delivery intensity" to "differentiated path unlocking."

Full Text

Intergenerational Differentiation of the Lock-in Effect of Advertising Path Dependence and Unlocking Strategies

How Can the Dilemma of “High Investment–High Avoidance” Be Solved?

Intergenerational Differentiation of the Lock-in Effect of Advertising Path Dependence and Unlocking Strategies: How to Crack the Dilemma of “High Investment - High Avoidance” ?

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Abstract: In 2025, China’s advertising business revenue exceeded 2 trillion yuan, a year-on-year increase of 32.6%. In the first half of 2026, Internet advertising accounted for 86% of advertising and publishing revenue. However, users’ advertising avoidance rate has continued to rise, forming an industry dilemma of “high investment–high avoidance.” Taking path dependence theory as the analytical framework and based on 730 nationwide questionnaire responses, this paper introduces the construct of “lock-in intensity” (avoidance score minus interaction score) to systematically examine the path-dependence characteristics of users’ advertising defense. The study finds that: (1) intergenerational lock-in intensity is significantly differentiated. The defensive level of Generation Z (0.54) and Millennials (0.48) is much higher than that of Generation X (0.24); digital natives show more obvious solidification of advertising-avoidance paths, while the post-2010 generation (0.28) presents a critical transition signal of path loosening; (2) lock-in intensity has a significant negative impact on the entire process of advertising conversion ($r=-0.15\sim-0.22$, all $p<0.001$). After controlling for demographic variables, lock-in intensity still has independent predictive power ($OR=0.863$, $p=0.044$), and the conversion rate of deeply locked-in users is 14.3 percentage points lower than that of shallowly locked-in users; (3) there exists a “frequency-perception paradox” : users who believe that there is “less advertising” have the highest lock-in intensity (0.73), providing direct behavioral evidence for the self-reinforcing mechanism of path dependence. The above findings indicate that the core root of the “high investment–high avoidance” dilemma is the path-dependent lock-in of users’ advertising defense. The core idea for solving this dilemma must shift from “blindly increasing delivery intensity” to “differentiated unlocking paths.”

Keywords: path dependence; advertising avoidance; lock-in intensity; inter-generational differentiation; self-reinforcement

Abstract: In 2025, China's advertising business revenue exceeded 2 trillion yuan, with a year-on-year growth of 32.6%, and Internet advertising accounted for 86% of the publishing revenue in the first half of 2026. However, the user advertising avoidance rate continues to rise, forming an industry dilemma of "high investment - high avoidance". Based on the path dependence theory and 730 national questionnaire data, this paper introduces the construct of "lock-in intensity" (avoidance score minus interaction score) to systematically examine the path dependence characteristics of users' advertising defense. The study finds that:

- (1) There is significant differentiation in intergenerational lock-in intensity. The defense level of Generation Z (0.54) and Millennials (0.48) is much higher than that of Generation X (0.24). Digital natives have more obvious characteristics of solidified advertising avoidance path, while the post-2010 generation (0.28) presents a critical transition signal of path loosening;
- (2) Lock-in intensity has a significant negative impact on the whole process of advertising conversion ($r=-0.15\sim-0.22$, all $p<0.001$), and still has independent predictive power after controlling demographic variables (OR=0.863, $p=0.044$). The conversion rate of deeply locked users is 14.3 percentage points lower than that of shallowly locked users;
- (3) There is a "frequency perception paradox", that is, users who think "advertising is less" have the highest lock-in intensity (0.73), which provides direct behavioral evidence for the self-reinforcing mechanism of path dependence. The above findings indicate that the core root of the "high investment - high avoidance" dilemma is the path-dependent lock-in of users' advertising defense. To solve this dilemma, we need to shift from "increasing investment intensity blindly" to "differentiated unlocking paths".

Keywords: path dependence; advertising avoidance; lock-in intensity; inter-generational differentiation; self-reinforcement

I. Introduction

In 2025, China's advertising business revenue exceeded the RMB 2 trillion threshold for the first time, reaching RMB 2,050.21 billion, a year-on-year increase of 32.6%^[1]. In the first half of 2026, internet advertising accounted for 86% of advertising revenue, and six provinces and municipalities together contributed 81.3% of national revenue^[2], indicating that advertising investment is accelerating its concentration in digital channels and leading regions. However, the rapid expansion of investment scale has not brought a simultaneous improvement in communication effectiveness: GlobalWebIndex research shows that more than 75% of internet users respond negatively to specific adver-

tisements, and ad-blocking penetration in the Asia-Pacific region has reached 50%^[3]; Statista surveys show that, among U.S. consumers, 61% dislike television advertising and 57% dislike online video advertising^[4]; CNNIC surveys further indicate that 83.5% of Chinese internet users dislike pop-up advertisements^[5]. Advertisers continue to increase the intensity of delivery, while users continue to strengthen avoidance behavior, forming a reverse-growth predicament of “high investment—high avoidance.”

This predicament is not a short-term fluctuation. The three main reasons why users block advertisements are, in order, ad overload (48%), advertisements being annoying (47%), and intrusiveness (44%)^[3]. Under a pattern in which internet advertising already accounts for 86% of advertising revenue, avoidance behavior is being consolidated from an occasional reaction into habitual defense. The increased investment by advertisers has not only failed to reach more users, but instead has further strengthened avoidance motivation among deeply locked-in groups: the more is invested, the deeper the avoidance, forming a negative cycle.

Existing research explains advertising avoidance mainly along two paths: from the perspective of advertising attributes, attributing avoidance to excessive intrusiveness, overly dense placement frequency, or low content quality^{[6][7]}; and from the perspective of user psychology, attributing avoidance to persuasion-knowledge activation or privacy concerns^[8]. Both types of explanation regard avoidance as users’ immediate response to specific advertising stimuli and imply the assumption that “optimizing advertising quality can effectively alleviate avoidance.” Yet if avoidance behavior no longer depends on the attributes of the advertisement itself, but instead depends on the degree to which users’ defensive pathways have become solidified—when avoidance evolves from a “passive response to low-quality advertisements” into an “automatic reflex toward all advertisements”—then merely optimizing advertising content is insufficient to fundamentally escape this predicament.

Path-dependence theory provides an analytical perspective for understanding this predicament. David^[9] proposed that once a dominant path forms in a technological system, increasing-returns mechanisms will continuously reinforce it and ultimately lock it into a specific state. North^[10] extended path dependence to the field of institutional change, pointing out that institutions likewise become locked in because of sunk costs and increasing returns. Lu Shuyi et al.^[11] applied this theory to the transformation of mainstream media and found that media organizations fall into path lock-in because of technological inertia, sunk costs, and cognitive solidification. However, existing studies all focus on the supply side (media organizations and advertisers). Whether users’ advertising-defense behavior on the user side (the demand side) exhibits a similar path-dependent lock-in still lacks empirical testing.

The core question of this article is: Does the “high investment—high avoidance” predicament in advertising communication involve path-dependent lock-in? Specifically, it pursues three sub-questions: (1) Is there differentiation in

the strength of advertising-defense lock-in among users of different generations? (2) How does lock-in strength affect advertising conversion leakage? (3) Is there evidence of a self-reinforcing mechanism?

This article constructs a three-stage analytical framework of “historical accumulation—current state—future possibility”: using generation as the proxy variable for historical paths, different generations have grown up in different media environments, and generational differences map behavioral accumulation under different historical paths; using “lock-in strength” to conceptually measure the current depth of defense, operationally defined as the difference between avoidance scores and interaction scores, where the larger the positive value, the deeper the defense and the stronger the lock-in; and using ruptures in intergenerational lock-in strength to identify signals of critical transition—if the lock-in strength of one group is significantly lower than that of adjacent groups, it may indicate a loosening of path dependence.

II. Research Design

(I) Data Sources and Sample

The data come from the “Survey on Media-Use Habits across Different Generations,” conducted from March to April 2026 and distributed through the Wenjuanxing platform. A total of 730 valid questionnaires were collected. The sample covered four generations: Generation X (born 1965–1979), 174 respondents; Millennials (born 1980–1994), 182 respondents; Generation Z (born 1995–2009), 180 respondents; and the post-2010 generation (born after 2010), 194 respondents. The gender distribution was balanced (male 48.8%, female 49.0%). City tiers covered first-tier cities (72 respondents), new first-tier cities (227 respondents), second-tier cities (154 respondents), and other cities (277 respondents). Data quality was good: the median response time was 197 seconds, and only 2 respondents spent less than 60 seconds answering. The sample characteristics are shown in Table 1.

Table 1 Sample Characteristics (N=730)

Variable	Category	Frequency	Percentage/%
Generation	Generation X (1965–1979)	174	23.8
Generation	Millennials (1980–1994)	182	24.9
Generation	Generation Z (1995–2009)	180	24.7
Generation	Post-2010 generation (after 2010)	194	26.6
Gender	Male	356	48.8
Gender	Female	358	49.0
Gender	Prefer not to disclose	16	2.2
City tier	First-tier	72	9.9
City tier	New first-tier	227	31.1
City tier	Second-tier	154	21.1

Variable	Category	Frequency	Percentage/%
City tier	Other	277	37.9

(II) Variable Measurement

The core variable of this paper is “lock-in intensity.” From the questionnaire item “the most common behavior when encountering advertisements” (multiple choice), three types of avoidance behaviors (leaving immediately, silent playback, opening the membership shield) and three types of interaction behaviors (staying to watch, clicking to learn more, liking/commenting/reposting) were extracted. The avoidance score (0-3) subtracted from the interaction score (0-3) is defined as lock-in intensity, with a range from -3 to 3. A positive value indicates a stronger defensive tendency than an interactive tendency, that is, being in a “locked-in” state. The theoretical basis of this construct is as follows: the essence of path-dependent “lock-in” is the simplification of behavioral patterns. When avoidance behaviors continuously suppress interaction behaviors, the user’s behavioral choice set contracts, and the path becomes locked in.

In addition, the questionnaire also measured post-advertisement behavioral leakage (clicking to learn more, searching for the brand, entering a store/livestream room, adding to the shopping cart, actual purchase, sharing with friends, and “no action at all”), perceived advertising frequency, preference for advertising formats, acceptance of placement locations, and other variables, which were used for cross-analysis with lock-in intensity.

Reliability testing of the scales showed that the avoidance scale (3 items: leaving immediately, silent playback, opening the membership shield) had a Cronbach’s Alpha coefficient of -0.019, and the interaction scale (3 items: staying to watch, clicking to learn more, liking/commenting/reposting) had a coefficient of 0.244; both were below the acceptable threshold of 0.6, and the α values did not improve after item deletion. This result instead confirms the theoretical premise of this study: the three types of avoidance and interaction behaviors do not measure the same latent variable, but represent behavioral patterns at different levels—within the avoidance dimension, “leaving” and “silence” belong to immediate behavioral avoidance, while “opening membership” belongs to active mechanical avoidance, corresponding to different dimensions in the Speck & Elliott^[6] framework; within the interaction dimension

Among them, “stop and watch” is shallow passive interaction, “click to learn more” is mid-level active interaction, and “like/comment/repost” is deep social interaction; they also belong to different levels of participation. Therefore, the three types of behavior are summed into a composite score from 0 to 3. What is measured is the “breadth” rather than the “intensity” of avoidance/interaction behavior. Lock-in intensity (avoidance breadth minus interaction breadth) reflects differences in coverage between defensive behaviors and interactive behaviors in the user behavior choice set. Although this operationalization does not meet

the reliability requirements for latent-variable measurement, it is more consistent with this study's measurement objective of "behavioral-pattern breadth," and its predictive validity is verified through subsequent regression analyses.

(III) Statistical Analysis Methods

Corresponding statistical methods were selected according to variable type: the Kruskal-Wallis test was used for intergenerational difference analysis (lock-in intensity was non-normally distributed); one-way ANOVA was used for comparisons of means across multiple groups (identity, city tier, frequency perception, etc.); Spearman correlation was used to analyze relationships between continuous variables; and point-biserial correlation was used to analyze the relationship between a dichotomous variable (whether a behavior was chosen) and lock-in intensity. To verify the robustness of the paradoxical results for frequency perception, supplementary Kruskal-Wallis nonparametric tests and Bootstrap resampling (10,000 resamples) were conducted. To test the independent predictive power of lock-in intensity for conversion, a three-level Logit regression model was constructed, sequentially incorporating lock-in intensity, demographic control variables (gender, city tier, identity), and generational dummy variables, followed by likelihood-ratio tests. The significance level was set at $\alpha = 0.05$. All statistical analyses were completed using Python (pandas, scipy, statsmodels).

III. Data Analysis

(I) Differentiation of Intergenerational Lock-in Intensity

The ranking of lock-in intensity across the four generations was: Generation Z (0.54) > Millennials (0.48) > Post-2010s (0.28) > Generation X (0.24). The Kruskal-Wallis test showed significant generational differences ($H(3) = 11.144$, $p = 0.011$). The avoidance scores and interaction scores of each generation are shown in Table 2.

Table 2 Avoidance/Interaction Scores and Lock-in Intensity by Generation

Generation	Avoidance Score (0-3)	Interaction Score (0-3)	Lock-in Intensity
Generation X	1.65	1.41	0.24
Millennials	1.46	0.98	0.48
Generation Z	1.41	0.86	0.54
Post-2010s	1.58	1.30	0.28
Overall	1.53	1.14	0.39

Figure 1 Defensive ad lock-in strength across generations (N=730)

Bar chart titled “Defensive Ad Lock-in Strength Across Generations.” The y-axis is labeled “Lock-in strength (avoidance-interaction).” The categories and values are: Generation X, 0.24; Millennials, 0.48; Generation Z, 0.54; post-2010 generation, 0.28.

Figure 1: Bar chart titled “Defensive Ad Lock-in Strength Across Generations.” The y-axis is labeled “Lock-in strength (avoidance-interaction).” The categories and values are: Generation X, 0.24; Millennials, 0.48; Generation Z, 0.54; post-2010 generation, 0.28.

This result presents two key characteristics.

First, digital natives exhibit deeper lock-in. The lock-in strength of Generation Z and Millennials (0.54 and 0.48) is significantly higher than that of Generation X (0.24). Judging from the behavioral data, Generation Z’s avoidance score (1.41) is not very different from that of Generation X (1.65), but its interaction score drops sharply: Generation Z has only 0.86, whereas Generation X reaches 1.41. In other words, Generation Z does not avoid ads more frequently; rather, its willingness to interact is lower. This finding overturns the common assumption that “young people are more open to advertising.” A possible explanation is that Generation Z and Millennials grew up in a digital-media environment saturated with advertising. Under long-term, high-frequency exposure to advertising stimuli, avoidance behavior is repeatedly reinforced, while interaction motivation continues to weaken because of declining trust in advertising, ultimately forming a more solidified defensive pathway. Generation X retains more traditional media-use habits; its frequency of ad exposure is relatively lower, and avoidance behavior has not yet become fully solidified.

Second, the post-2010 cohort shows a critical transition signal of pathway loosening. The lock-in strength of the post-2010 cohort (0.28) is significantly lower than that of Generation Z (0.54) and close to the level of Generation X (0.24). If path dependence followed a monotonically strengthening trend, then the post-2010 cohort, as younger digital natives, should theoretically have higher lock-in strength than Generation Z. The actual “intergenerational reversal” has two possible explanations: first, an age effect—the post-2010 cohort is still young (at most only 16 years old), and its defensive behavior toward advertising has not yet fully developed; second, a cohort effect—the post-2010 cohort grew up during the mature stage of the mobile Internet, where the ads they encounter are mainly information-feed native ads rather than traditional interruptive ads, and the iteration of ad formats may have reduced the probability that avoidance motivation is formed. In cross-sectional data, the two cannot be strictly separated. If it is entirely attributable to an age effect, the lock-in strength of the post-2010 cohort should gradually approach the level of Generation Z as age increases; if a cohort effect does exist, then it indicates that intergenerational replacement in modes of advertising contact is changing the conditions under which avoidance pathways are formed. Although no conclusion can yet

be drawn, the fracture-like decline in lock-in strength between the post-2010 cohort and Generation Z at least indicates that path dependence is not irreversible; when the advertising-contact ecosystem undergoes qualitative change, the conditions for optimizing defensive pathways will also change accordingly.

(II) Behavioral Funnel Suppression Effect

Lock-in strength not only reflects attitudinal tendencies, but also directly suppresses advertising conversion. The questionnaire covered six stages in the behavioral funnel after ad exposure: click...

clicked to learn more, searched for the brand, entered the store/live-streaming room, added to the shopping cart, made an actual purchase, and shared with friends. Correlation analyses were conducted between lock-in strength and each stage; the results are shown in Table 3.

Table 3. Correlation coefficients between lock-in strength and advertising conversion behaviors (Spearman/point-biserial)

Post-advertising behavior	Selection rate/%	Correlation coefficient r	Significance p
A. Clicked to learn details	36.3	-0.148	<0.001
B. Searched for brand/product	30.7	-0.179	<0.001
C. Entered store/live-streaming room	32.1	-0.220	<0.001
D. Added to shopping cart	31.0	-0.178	<0.001
E. Actual purchase	25.2	-0.163	<0.001
F. Shared with friends	25.8	-0.201	<0.001
G. Would not take any action	62.7	+0.154	<0.001

Figure 2. Inhibitory effect of lock-in strength on advertising conversion behavior (N=730)

Note: *** indicates $p < 0.001$

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Lock-in strength was significantly negatively correlated with every stage of the funnel (all $p < 0.001$). Among them, “entering the store/live-streaming room” was the most strongly inhibited ($r = -0.220$), followed by “sharing with friends” ($r = -0.201$), while “searching for the brand” ranked third ($r = -0.179$). The closer the behavior was to the back end of the funnel—that is, the more it required deep participation—the stronger the inhibitory effect of lock-in strength. The only positive correlation was with “would not take any action” ($r = +0.154$): the deeper the lock-in, the more users tended to show no response at all.

From the perspective of user segmentation, among deeply locked-in users, 69.1% said they “would not take any action,” whereas among selectively engaged users (high avoidance but also high interaction), this proportion was 55.7%. The conversion rate of lightly locked-in users (with negative lock-in strength) reached 62.0%, while that of deeply locked-in users was only 47.7%, a gap of 14.3 percentage points. The Spearman correlation between lock-in strength and the overall conversion rate was $r = -0.081$ ($p = 0.029$). Although the effect size was not large, considering that conversion is influenced by multiple factors such as price, product category, and channel, the independent role of lock-in strength ...

the contribution remains statistically significant.

To further test the independent predictive power of locking strength for conversion, a three-level Logit regression model was constructed, with advertising conversion (0/1) as the dependent variable. Model 1 included only locking strength; the coefficient was -0.167 (OR = 0.846, $p = 0.017$), meaning that for each one-unit increase in locking strength, the probability of user conversion decreased by approximately 15.4%. After Model 2 controlled for gender, city tier, and identity variables, the coefficient of locking strength was -0.143 (OR = 0.867, $p = 0.049$), still maintaining statistical significance. After Model 3 further incorporated the intergenerational dummy variable, the coefficient of locking strength was -0.148 (OR = 0.863, $p = 0.044$), with no change in either direction or significance. Likelihood-ratio tests showed that Model 2 significantly improved fit relative to Model 1 (LR $\chi^2 = 28.18$, $p < 0.001$), and Model 3 also showed a marginal improvement relative to Model 2 (LR $\chi^2 = 8.09$, $p = 0.044$). This indicates that the introduction of control variables enhanced the explanatory power of the model, but the independent predictive effect of locking strength remained after controlling for demographic characteristics. A supplementary OLS linear probability model test yielded results consistent with the Logit regression ($\beta = -0.034$, $p = 0.050$), further verifying the robustness of the results and showing that the negative effect of locking strength on adver-

tising conversion is not driven by demographic characteristics, but instead has independent predictive power.

The above data indicate that locking strength is not simply “disliking advertising,” but rather a systematic suppression of the entire consumer decision chain. Advertisers increase investment on the delivery side, but the funnel of locked users has already narrowed at the first stage; that is, they do not click, do not search, do not enter the store, and incremental investment cannot reach them.

(III) Frequency Perception Inertia

The core mechanism of path dependence theory is “self-reinforcement” : once one enters a certain path, feedback mechanisms cause it to deepen continuously. This paper identifies empirical evidence that directly supports this mechanism: frequency perception inertia.

The questionnaire asked users, “What do you think about the frequency with which advertisements appear?” The responses were cross-analyzed with locking strength, and the results are shown in Table 4.

Table 4 Frequency Perception and Locking Strength

Frequency perception	Mean locking strength	Standard deviation	Sample size
D. Less frequent	0.73	1.01	52
B. Rather frequent, but acceptable	0.51	1.09	243
A. Too frequent, seriously affects the experience	0.34	1.09	170
C. Moderate	0.24	1.09	221
E. Indifferent	0.23	0.91	44
Overall	0.39	1.08	730

Figure 3 Perceived Advertising Frequency and Lock-in Strength–Paradox (N=730)

The data-analysis results present a significant counterintuitive feature: users who believe that “there are few advertisements” have the highest lock-in strength (0.73); users who believe the advertising frequency is “moderate” instead have the lowest lock-in strength (0.24). The ANOVA test shows significant between-group differences ($F(4, 725) = 3.576, p = 0.007$). In view of the relatively small

Bar chart titled “Perceived Advertising Frequency and Lock-in Strength (Paradox).” Y-axis: “Lock-in strength.” Categories and values: “Low” 0.73; “High, but acceptable” 0.51; “Too high, seriously affects experience” 0.34; “Moderate” 0.23; “Indifferent” 0.23.

Figure 3: Bar chart titled “Perceived Advertising Frequency and Lock-in Strength (Paradox).” Y-axis: “Lock-in strength.” Categories and values: “Low” 0.73; “High, but acceptable” 0.51; “Too high, seriously affects experience” 0.34; “Moderate” 0.23; “Indifferent” 0.23.

sample size of the “low” group ($N = 52$), an additional Kruskal-Wallis nonparametric test was used to verify the robustness of the results; the test result was likewise significant ($H = 14.161$, $p = 0.007$). Dunn’s post-hoc comparisons show that the difference between the “low” group and the “moderate” group remains statistically significant after Bonferroni correction ($p = 0.004$). Bootstrap self-help resampling (10,000 resamples) verified the stability of the mean for the “low” group; its 95% confidence interval was $[0.462, 1.000]$, which did not overlap with the 95% confidence interval of the “moderate” group $[0.092, 0.379]$, ruling out the possibility that the false signal was caused by small-sample fluctuation.

A possible explanation is that, because deeply locked-in users have long avoided advertisements (through subscription, muting, etc.) and technological shielding (opening memberships), the number of advertisements they actually encounter is already very small; as a result, they instead “do not perceive” the presence of advertisements. This is not because advertisements have truly decreased, but because users’ avoidance paths have already been consolidated to an unconscious level: they no longer “see” advertisements because avoidance has become an automatic behavioral reflex. This is precisely the behavioral manifestation of the self-reinforcing mechanism of path dependence: avoidance behavior reduces advertising exposure; reduced exposure lowers attention; lowered attention further weakens the motivation to change, forming a closed loop. Conversely, users who consider the advertising frequency “moderate” are precisely those who are still normally exposed to advertisements (with relatively high interaction scores) and have not yet entered the path of avoidance reinforcement.

The theoretical significance of this finding lies in the fact that it transforms the “self-reinforcement” of path dependence from an abstract concept into an observable behavioral pattern. The inverse relationship between perceived frequency and lock-in strength constitutes empirical evidence for the closed loop of “avoidance $\rightarrow$ reduced exposure $\rightarrow$ perceptual distortion $\rightarrow$ solidified avoidance.”

(IV) Differentiation of Lock-in by Identity and Regional Dimensions

Identity differences are a stronger stratifying dimension than generational differences. The mean lock-in strength of the student group (middle-school students

and college students) is 0.54, whereas that of workplace workers is only 0.18 ($F(4, 725) = 4.576$, $p = 0.001$). Students are in an environment with the highest density of information reception, where advertisement-avoidance pathways are repeatedly triggered and reinforced. The media use of workplace workers is more purposeful, and task-oriented usage patterns may reduce the frequency of defensive avoidance. The effect size of identity differences ($F = 4.576$) is greater than that of generational differences ($F(3, 726) = 3.580$), and the Kruskal-Wallis [[unclear: sentence continues off page]]

the same direction as the results), suggesting that lock-in is not only related to age, but also to living environment and usage motivation.

The city-tier effect is significant. Users in first-tier cities have a lock-in intensity of only 0.083, whereas other cities reach 0.574 ($F(3, 726) = 9.088$, $p < 0.001$). The advertising ecosystem in first-tier cities is more mature, and users may have more choices (such as membership services and payment for premium content), so ad avoidance need not rely on behavioral defense; instead, it is solved through technical means, thereby reducing lock-in at the behavioral level.

Four-quadrant user profiles. Based on the two-dimensional scores of avoidance–interaction, 730 users can be divided into four categories (Figure 4): **deeply locked-in type** (30%, $n=217$), with an avoidance score of 2.07, an interaction score of only 0.36, and lock-in intensity as high as 1.71; this is the group with the deepest defense. Its generational composition is dominated by Millennials (29%) and Generation Z (28%), confirming the finding that digital natives are more deeply locked in. This group’s behavioral funnel is severely contracted: 69.1% report that they “will take no action,” the actual purchase rate is only 17.1%, and the sharing rate is only 15.2%; they almost completely withdraw from the consumption chain driven by advertising. The **selective participation type** (17%, $n=122$) has an avoidance score of 2.62 (the highest among the four types), but its interaction score also reaches 2.58, and its lock-in intensity is only 0.04. This group “both avoids and interacts”: they will skip advertisements that do not interest them, but are still willing to participate deeply when encountering suitable content. Its generational composition is polarized: Generation X (40%) and the post-2010 generation (37%) account for much higher proportions than Millennials (13%) and Generation Z (10%), suggesting that both older and younger groups retain stronger selective interaction capacity. This group leads comprehensively in conversion rates: 63.9% click to learn more, 66.4% enter the livestream room, and 55.7% actually purchase—all far higher than the other three types—indicating that “selective interaction,” rather than “full openness,” is the most efficient advertising-response model. The **open type** (48%, $n=354$) has negative lock-in intensity (-0.38), and its interaction tendency is greater than its avoidance tendency; however, the proportion reporting “will take no action” still reaches 60.5%, indicating that low avoidance is not equivalent to high conversion. The **indifferent type** (5%, $n=37$) shows almost no response to advertisements, which may represent a desensitized state after excessive

Figure 4 User defense stratification clustering (N=730)

Figure 4: Figure 4 User defense stratification clustering (N=730)

exposure to advertising.

The practical implication of four-quadrant stratification is that: the gap in advertising conversion rates between the deeply locked-in type and the open type is not the largest; truly efficient conversion comes from the selective participation type. Although this group has the highest avoidance score, precisely because of its differentiated response pattern of “skipping low-quality ads and staying for good ads,” it instead becomes the premium audience for advertising delivery. This means that the goal of advertising strategy should not be to “reduce all users’ avoidance,” but to “transform deeply locked-in users into selectively participating users,” that is, to restore their interaction capacity rather than eliminate their avoidance behavior.

Figure 4 User defense stratification clustering (N=730)

IV. Research Conclusions and Policy Recommendations

(I) Research Conclusions

Using path-dependence theory as the analytical framework and based on 730 domestic questionnaire responses, this paper examines the structural causes of the “high input–high return avoidance” dilemma in advertising communication. The core findings are as follows:

First, advertising defense shows intergenerational path differentiation. The lock-in intensity of Generation Z and Millennials (0.54 and 0.48) is significantly higher than that of Generation X (0.24), indicating that long-term advertising exposure strengthens the avoidance path. The post-2010 generation has a lower lock-in intensity (0.28) than Generation Z, presenting a possible signal of critical transition; however, with cross-sectional data this signal cannot strictly distinguish age effects from cohort effects and requires longitudinal tracking for verification.

Second, lock-in intensity systematically suppresses advertising conversion. Every funnel stage from click to purchase is significantly negatively affected ($r = -0.15 \sim -0.22$, all $p < 0.001$), and the conversion rate of deeply locked-in users is 14.3 percentage points lower than that of lightly locked-in users. Logit regression analysis further confirms that, after controlling for gender, city tier, identity, and generation, lock-in intensity still has independent negative predictive power for conversion (OR = 0.863, $p = 0.044$), indicating that lock-in is not an attitudinal issue but a systemic obstruction in the entire decision chain.

Third, frequency-perception dissociation provides behavioral evidence for the self-reinforcing mechanism of path dependence. Because of long-term avoidance, deeply locked-in users fail to perceive the existence of advertisements; avoidance

behavior has become unconscious, forming a self-reinforcing closed loop of “reduced advertising exposure through avoidance behavior—low exposure reinforces avoidance habits.”

Taken together, the above findings show that the “high input—high return avoidance” dilemma in the advertising industry is not simply a problem of imbalance between supply and demand, but a structural product of users’ dependence on advertising-defense paths. Advertisers continue to increase investment on the delivery side, yet the conversion funnel for deeply locked-in users has already narrowed at the entry stage, displaying systemic defensive characteristics of “no clicking, no searching, and no entering stores,” making incremental investment difficult to reach target users effectively. The core approach to overcoming this dilemma must shift from “blindly increasing delivery intensity” to “precisely implementing differentiated unlocking” : first, accurately identify the characteristics of deeply locked-in groups and reduce the probability of triggering highly intrusive advertisements; second, design weakly persuasive advertising content forms and use users’ decision-making scenarios to temporarily remove defensive paths.

(II) Policy Recommendations

Advertising delivery strategies should face up to the reality of lock-in differentiation. Nearly one-third of users are in a deeply locked-in state; continuing to increase delivery to this group is not only ineffective, but may instead further strengthen avoidance motivation due to the perception of “advertising overload.” A more reasonable strategy is to reduce behavior-triggered advertisements (pop-ups and interstitials) for deeply locked-in groups, and shift toward low-intrusion positions such as comment areas or unobstructive sidebars. The data of this study show that this position is the only generally acceptable placement unrelated to lock-in intensity ($r = 0.048$, $p = 0.193$), meaning that even deeply locked-in users can accept it.

Lock-in differentiation at the regional dimension likewise deserves strategic attention. The lock-in intensity of users in first-tier cities is only 0.083, far below the 0.574 level of users in other cities. At present, advertising resources are highly concentrated in first-tier cities, but users in these markets have partly achieved “passive unlocking” through technical means such as membership services and payment for high-quality content. By contrast, in third-, fourth-, and lower-tier cities, users’ advertising avoidance depends more on behavioral defense methods such as swiping away and muting; their degree of path lock-in is deeper, yet the quality of advertising services they obtain is relatively insufficient. Therefore, differentiated unlocking strategies need to take regional characteristics into account. In lower-tier city markets, the need to reduce advertising intrusiveness and improve the informational value of content is more urgent.

The design of unlocking paths can proceed in two directions. First, reduce the

persuasive intensity of advertisements. The advertising forms most preferred across generations are concentrated in “humorous creativity” (73.0%) and “authentic product reviews” (71.6%), both of which are characterized by weak persuasion and high informational value. This is consistent with the recent rise of documentary-style advertising: brands no longer present a perfect image, but instead use authentic and weakly persuasive methods.

appear as products, attempting to bypass users’ persuasion-knowledge defenses. Second, unlock through task-driven scenarios. The data show that users who are “buying something/making a decision” have the lowest locking intensity for willingness to view advertisements ($r = -0.150$), indicating that task scenarios can temporarily 解除 defensive pathways: when users need information in shopping decisions, the “interference” attribute of advertising decreases, its “tool” attribute rises, and defensive motivations are covered by functional needs.

Intergenerational differentiation is the third core dimension of unlocking strategies. The avoidance scores of Generation Z and the post-2000 generation are close to those of Generation X (1.41 vs 1.65), but their interaction scores decline significantly (0.86 vs 1.41). The core root of their locking is not higher avoidance frequency, but rather lower willingness to interact. For these two generational groups, the strategic focus should be placed on restoring their capacity for interaction. Interactive advertising (voting, trials, AR try-outs, etc.) can be used to rebuild users’ motivation to participate, rather than simply reducing the frequency of ad placement. Generation X has relatively high scores for both avoidance and interaction, making it a potential high-quality group of the “selective participation” type. The strategic focus should be on increasing content information density; practical goods and tutorial-type advertisements are most attractive to this group (62.6%). The post-2010 generation is at a critical transition window in the formation of pathways, and its modes of advertising contact are undergoing intergenerational change. The strategy should be “prevention first”: avoid placing highly intrusive advertisements on platforms commonly used by minors, so as to prevent avoidance pathways from becoming solidified at the initial stage of formation. At the operational level, deeply locked users can be precisely identified through platform behavioral data: users who frequently skip advertisements, habitually mute them, or have already purchased ad-free membership services are highly likely to have high locking intensity. Advertisers may down-rank such users in the delivery system, reduce their exposure to high-trigger advertisements, and tilt resources more toward selective-participation and open-type user groups.

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