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Beyond Usage Behavior: How Internet Value Perception Shapes Public Trust via Life Satisfaction

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Article

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Abstract

The Internet has become the central medium for the exchange and dissemination of government information, industry news, and public opinion, and perceptions of the Internet's value profoundly shape public trust. Using balanced panel data spanning four waves from 2016 to 2022 constructed from the China Family Panel Studies (CFPS) and the China Statistical Yearbook, this study builds a mediated pathway of "Internet value perception — life satisfaction — public trust" and conducts empirical tests using two-way fixed-effects models, Bootstrap mediation tests, and instrumental variable methods. The results indicate: first, perceptions of the Internet's value exert a significant positive direct effect on public trust, and this effect remains robust after controlling for endogeneity; second, life satisfaction plays a significant mediating role, revealing a dual-path layered mechanism characterized primarily by direct cognitive projection and secondarily by affective mediation; third, the trust-enhancing effect of Internet value perception is particularly pronounced among younger cohorts and holds significantly for both urban and agricultural hukou groups as well as for high- and low-education groups. By shifting the research paradigm on the Internet and public trust from objective usage behaviors to subjective value perceptions, this study extends the theoretical boundary of the CAC model in digital contexts and provides empirical support for a shift in digital governance from hardware access to cultivation of perceptions.

Keywords

Internet; value perception; public trust; Internet value perception; life satisfaction

1 Introduction

Social actors make trust decisions in information acquisition by weighing benefits and costs based on perceived value. Technological advancement and economic development have accelerated the speed and expanded the reach of information dissemination via the Internet. The 57th China Internet Development Statistics Report noted that "as of December 2025, Internet penetration exceeded 80%, and the number of Internet users reached 1.125 billion." As the

infrastructure for information dissemination and social interaction, the Internet has become the primary channel for people to obtain information and is fundamentally reshaping the environment in which public trust is formed.

Public trust denotes the general trust that social members place in other members, social roles, and social institutions on the basis of ethical universality and moral subjectivity (Rong, 2011), and it plays a crucial role in maintaining social stability and governance effectiveness. However, the level of public trust has not risen in parallel with the rapid expansion of the Internet (Zhao et al., 2019). Does the Internet erode or foster public trust? Existing research has produced two opposing empirical narratives on this question. One strand, adopting a technology-as-tool perspective, finds a significant negative correlation between Internet use and public trust (Ni et al., 2022; Gao et al., 2024; Wen et al., 2025). Another strand, grounded in an information-empowerment perspective, reports a positive effect of Internet use on institutional confidence (Islam & Samak, 2025). The divergence between these findings mainly stems from differences in data samples and biases in the choice of core variables. The vast majority of studies rely on cross-sectional correlational analyses, which struggle to disentangle omitted-variable bias or reverse causality. Moreover, using indicators such as "frequency of use" or "duration of use" as core independent variables implicitly assumes—without verification—that use equates to endorsement, overlooking the subjective, meaning-laden processes individuals undergo while using the Internet.

Value perception, defined as consumers' overall evaluation of a product's utility based on perceived gains and sacrifices (Zeithaml., 1988), encompasses not only utilitarian judgments of worth but also emotional attachment, social meaning, and cognitive significance attributed by individuals (Sheth et al., 1991). When individuals encounter online information, they assess its perceived usefulness by evaluating argument quality and source credibility, and they decide whether to adopt information accordingly (Sussman & Siegal, 2003). Internet value perception captures individuals' subjective evaluations of the Internet's importance in their lives and thereby shapes how they weigh the pros and cons of online information and make trust decisions based on affective satisfaction.

Therefore, this study shifts the analytic focus on the Internet and public trust from usage behavior to perceived value, employing a "cognition–affect–tendency" model to reveal how "Internet value cognition" is transformed into "public trust" through "life satisfaction" as an experiential affective mediator. Using data sources including the China Family Panel Studies (CFPS), the China Statistical Yearbook, and the China Internet Development Statistics Report, this study empirically examines the effect of Internet value cognition on public trust and precisely identifies the mediating role of life satisfaction.

2 Literature Review and Research Hypothesis

2.1 Perceived Value and Public Trust

Individual perceived value can positively shape trust levels across different contexts. In consumer behavior research, perceived value has consistently been a core predictor of brand trust and purchase intention (Sweeney & Soutar, 2001); consumers' purchase and recommendation behaviors result from the joint effects of trust and perceived value (Chai et al., 2015). In the information systems domain, users' perceived value of technological tools significantly affects their technical trust in platforms (Wang, 2014; Hu et al., 2023), and perceived value exerts a moderate but significant positive effect on trust in digital platforms (Oesterreich et al., 2025). In e-government research, service quality significantly enhances citizen satisfaction via the mediating paths of perceived value and trust (Long et al., 2026), and perceived value and public trust play a chained mediating role between e-government service quality and national brand perceptions (Doan et al., 2026). When individuals cognitively endorse the value of an object, that evaluative judgment tends to translate into trust toward the object.

The Technology Acceptance Model (TAM) further elaborates perceived value theory: its core construct, perceived usefulness, is defined as the degree to which an individual believes that using a particular system will enhance their job performance (Davis et al., 1989). Perceived usefulness functions a priori as an antecedent that influences cognitive attitudes by affirming the system's importance. Based on these theoretical underpinnings, internet perceived value can be conceptualized as an individual's subjective, holistic assessment of the trade-offs between benefits received and costs incurred when using the internet, and of the internet's importance and utility in their life.

Trust in public institutions is essentially an attitude grounded in cognitive evaluation. Individuals form judgments based on institutional operating rules, procedural fairness, and value congruence (Zucker, 1986); the stability and predictability of institutions and the degree to which institutional values align with individual values jointly constitute the cognitive foundation of institutional trust (William & Richard, 2001). When an individual judges the internet to be "important to them," this perceived value implies that the internet has become a trustworthy information environment, which in turn can be converted into trust in public institutions. In other words, internet perceived value essentially reflects an individual's propensity to trust the "information institution": when individuals perceive the information environment provided by the internet as transparent, accessible, and valuable, this cognitive appraisal generalizes to trust in public institutions.

Internet perceived value and public trust both belong to the category of individuals' cognitive evaluations and are essentially the projection of the same type of cognitive appraisal onto different objects. When individuals cognitively endorse the internet's value in their lives, this value appraisal is likely to be converted into trust in public institutions and generalized trust in fellow citizens. Based on the foregoing theoretical synthesis, we propose the following hypothesis:

H1: Internet perceived value has a significant positive effect on public trust. That is, the higher an individual's subjective evaluation of the internet's importance, the higher their level of

trust in public institutions.Subsections may be included, with generally no more than three levels of headings.

2.2 Perceived Value and Life Satisfaction

Life satisfaction is an individual's global cognitive and affective evaluation of their overall quality of life (Diener et al., 1985). Perceived value theory posits that individuals' value judgments about technological tools influence attitudes and usage experiences, which ultimately affect their overall life quality assessments, thereby shaping the relationship between Internet use and life satisfaction (So & Kim, 2022). Mobile Internet use significantly affects workers' employment and income (Yuan et al., 2021), and Internet-based e-health services provide patients with improved pathways to medical care (Dieris-Hirche et al., 2023). Among middle-aged and older adults, higher frequency of Internet use is associated with greater life satisfaction (Jiang et al., 2026).

However, changes in life satisfaction are driven not only by use behaviors but also by individuals' perceptions of the importance and value of the Internet. Rural residents who use the Internet obtain richer information, increase their economic returns, and narrow the urban–rural income gap (Gao et al., 2018), reflecting an individual-level recognition of the Internet's meaningful value. Perceived importance of digital devices and the Internet is significantly and positively associated with life satisfaction, and perceptions have a more stable effect on life satisfaction than behaviors (Wong et al., 2024). In social media contexts, the effects of perceived value have likewise been confirmed: hedonic value positively influences Internet satisfaction, while social value positively affects both Internet satisfaction and life satisfaction (Hsiao, 2020). Perceived value explains variations in life satisfaction better than usage behavior. Extending this logic to the context of perceived Internet value, when individuals cognitively recognize the Internet as valuable for their lives, this evaluative perception translates into more positive assessments of their own life quality. We therefore propose the following hypothesis:

H2: Perceived value of the Internet has a significant positive effect on life satisfaction.

2.3 The Mediating Role of Life Satisfaction

Life satisfaction, as an individual's subjective evaluation of life quality according to personal standards, has been shown in multiple studies to be associated with public trust (Zhao et al., 2019; Islam & Samak, 2025). Perceived value theory posits that individuals' value judgments about technological tools influence their attitudes and usage experiences, which ultimately affect their overall evaluations of life quality (So & Kim, 2022; Hsiao, 2020). When individuals cognitively recognize the internet as valuable to their lives, this evaluative judgment translates into positive perceptions of their own life quality. Satisfied individuals are more likely to project

these positive evaluations onto the social systems in which they participate. Analysis of data from the 2019 China Social Conditions Comprehensive Survey indicates that life satisfaction mediates the relationship between social security fairness and trust in government (Zhi et al., 2022), and enhancements in subjective well-being have been found to increase political trust (Zhang et al., 2025). Synthesizing these two pathways, perceived value of the internet first converts into positive affective evaluations of personal life quality, and this life satisfaction further generalizes into public trust. As an existential experience, life satisfaction in this study captures how individuals' global affective evaluations of their lives spill over to institutional trust. Therefore, life satisfaction is specified as a core mediating mechanism in this research: it receives the value-based perceptual appraisal and transforms it into affective life satisfaction, which in turn enhances public trust. Accordingly, we propose the third hypothesis:

H3: Life satisfaction significantly mediates the relationship between perceived internet value and public trust.

3 Research Methods

3.1 Data Sources and Sample Selection

The data used in this study primarily derive from the China Family Panel Studies (CFPS) waves of 2016, 2018, 2020, and 2022, supplemented by relevant annual data from the China Statistical Yearbook and the Statistical Report on Internet Development in China, to construct a four-wave balanced panel. CFPS, implemented by the Institute of Social Science Survey at Peking University, is a national, comprehensive longitudinal survey covering 25 provinces/municipalities/autonomous regions in China, and employs a multistage probability sampling design to obtain a nationally representative sample. Since its launch in 2010, the database has accumulated over a decade of panel data, providing high-quality micro evidence for studying social dynamics in China. The sample selection retained individuals aged 18 to 60 and excluded observations with missing values on variables such as public trust, perceived value of the Internet, life satisfaction, and age. After data cleaning, the final sample comprises 3,715 observations per wave, yielding a four-wave balanced panel of 14,860 observations in total.

3.2 Variable Selection

3.2.1 Dependent Variable: Public Trust

Public trust is the primary dependent variable in this study and reflects individuals' general

level of trust toward fellow citizens, social roles, and social institutions. Drawing on Qu Rong's (2011) conceptualization—public trust as the general trust social members place in other members, social roles, and institutions based on ethical universality and moral agency—this study measures public trust using three items from the CFPS questionnaire: (1) trust in strangers (qn10024); (2) trust in local government officials (qn10025); and (3) trust in doctors (qn10026). Each item uses a 0–10 numeric scale (0 = completely distrust, 10 = complete trust). Public trust is computed as an unweighted sum of these three items. The summated rating scale's advantage lies in its simplicity, interpretability, and robustness across samples, providing optimal interpretability and cross-sample stability (Spector, 1992). The raw total score obtained by summing the three items is then transformed to a 0–10 scale via Min–Max normalization to form the public trust index, where higher scores indicate higher public trust. In the four survey waves used in this study, the scale's internal consistency (Cronbach's α) ranged from 0.78 to 0.82, indicating satisfactory reliability.

3.2.2 Key Explanatory Variable: Perceived Value of the Internet

Perceived value of the Internet denotes individuals' overall subjective evaluation of the importance and usefulness of the Internet in their lives. It is measured using five CFPS items: (1) the Internet is an important channel for obtaining information; (2) the Internet is an important tool for socializing; (3) the Internet is helpful for learning; (4) the Internet is helpful for work; and (5) the Internet is helpful for daily life. Each item is rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). When items share a consistent scoring scale, unweighted summation preserves the original information most effectively and avoids information loss that may occur with dimensionality reduction (Ross & Kevin, 2020). Accordingly, this study constructs the perceived Internet value index by summing the five items. Cronbach's α for the index was 0.890 (2016), 0.995 (2018), 0.984 (2020), and 0.980 (2022), indicating good to excellent internal consistency. After summing the five item scores to form a raw total, Min–Max normalization is applied to convert the index to a 0–10 scale to maintain the same metric as the public trust index.

3.2.3 Mediator: Life Satisfaction

Life satisfaction is measured by the CFPS item "How satisfied are you with your life? (qn12012)" and is used as the mediator in the mediation analysis. This item has been consistently included across CFPS waves, ensuring good temporal comparability. The original data use a 1–5 Likert scale, with higher scores indicating greater life satisfaction. Although a single-item measure cannot capture the multidimensionality of life satisfaction as comprehensively as multi-item scales, single-item measures are widely used in large-scale surveys due to their

brevity and temporal stability, and they exhibit high convergent validity with multi-item scales.

3.2.4 Control Variables

The study controls for age, marital status, years of education, frequency of online learning, self-rated health, and frequency of physical exercise. Education (Education) is recoded from the questionnaire's edu_last educational level into actual years of schooling (illiteracy/no schooling = 0 years, primary school = 6 years, junior high = 9 years, senior high = 12 years, junior college = 15 years, bachelor = 16 years, master = 19 years, doctorate = 22 years) to provide a meaningful quantitative measure. Online learning frequency (Online Learning) and hukou type (Hukou) are specified as binary variables. Self-rated health (Self-rated Health) is reverse-coded from CFPS item qp201 ("How would you rate your health?") as follows: 1 = very poor, 2 = poor, 3 = fair, 4 = good, 5 = very good; the range is 1–5, with higher values indicating better self-assessed health. Exercise frequency (Exercise Frequency) is derived from CFPS items qp701/qp701n and recoded as the number of exercise sessions per week, ranging from 0 to 30; values above 30 are truncated to 30, with higher values indicating more frequent exercise. Time-invariant individual characteristics such as hukou and province are absorbed by individual fixed effects (Wooldridge, 2010) and therefore do not require separate inclusion in the model.

3.3 Model specification

This study employs a two-way fixed effects (TWFE) model to examine the effect of perceived internet value on public trust and the mediating role of life satisfaction. Compared with the conventional individual fixed effects model, the two-way fixed effects model incorporates year fixed effects in addition to individual fixed effects, thereby absorbing macro shocks that are constant across individuals but vary over time—such as economic cycles, policy changes, and pandemic shocks—and more effectively mitigating estimation bias arising from omitted time-varying confounders (Wooldridge, 2010).

Model (1): total effect model

$$Trust_{it} = \alpha_1 + c \cdot Perception_{it} + \gamma_1 X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Model (2): a-path model

$$Satisfaction_{it} = \alpha_2 + a \cdot Perception_{it} + \gamma_2 X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Model (3): b-path and direct effect model

$$Trust_{it} = \alpha_3 + c' \cdot Perception_{it} + b \cdot Satisfaction_{it} + \gamma_3 X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Where subscripts i and t denote individual and year, respectively, with t corresponding to 2016, 2018, 2020, and 2022. $Trust_{it}$ is the public trust index for individual i in year t (0–10 scale); $Perception_{it}$ is the perceived internet value index for individual i in year t (0–10 scale); $Satisfaction_{it}$ is the life satisfaction of individual（i） in year（t） (1–5 scale); X_{it} is a vector of control variables, including age, marital status, years of education, frequency of online learning, self-rated health, and frequency of physical exercise; μ_i represents individual fixed effects, absorbing all time-invariant individual heterogeneity; λ_t denotes year fixed effects, absorbing time trends common to all individuals; and ε_{it} is the idiosyncratic error term.

Model (1) tests whether the total effect（c） is statistically significant; Model (2) tests whether the effect of the independent variable on the mediator (a-path) is significant; Model (3) tests whether the mediator affects the outcome (b-path) and whether the independent variable has a direct effect on the outcome (c). If a and b are both significant and c declines (or becomes insignificant) after including the mediator, the presence of a mediation effect is supported (Baron & Kenny, 1986). All regressions use cluster-robust standard errors clustered at the individual level to account for potential serial correlation and heteroskedasticity among observations of the same individual across years.

4 Results

4.1 Descriptive statistics

In the final analysis sample (Table 1), public trust (0–10 scale) had a mean of 4.854 (SD = 1.661), and perceived value of the internet (0–10 scale) had a mean of 6.784 (SD = 2.391); both variables approximated normal distributions. Life satisfaction (1–5 scale) had a mean of 3.788 (SD = 0.899), indicating that the sample's overall self-rated life satisfaction was at a moderately high level. Among control variables, the mean age was 36.56 years, mean years of education was 11.19 years (approximately high school graduate), 77.6% were married, 48.2% participated in online learning, self-rated health averaged 3.251 (moderately high), average frequency of physical exercise was 4.06 times per week, and 38.7% had urban household registration. Year distribution showed 2016, 2018, 2020, and 2022 each accounted for 25%, constituting a balanced panel.

Table 1. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	Definition / Coding
Public trust	4.854	1.661	0	10	Sum of three trust items (qn10024–qn10026), min-max normalized to 0–10

Internet value perception	6.784	2.391	0.4	10	Sum of five perception items (ku/qu301–305/951–955), normalized to 0–10
Life satisfaction	3.788	0.899	1	5	Single-item 5-point scale: 1=very dissatisfied, 5=very satisfied
Age	36.564	9.882	18	60	Actual age in years
Years of education	11.188	3.501	0	22	Converted from edu_last: 0=illiterate, 22=PhD
Married	0.776	0.417	0	1	1=married (first or remarried), 0=otherwise
Online learning	0.482	0.5	0	1	1=participated in online learning (binary, harmonized across waves)
Self-rated health	3.251	1.019	1	5	Reverse-coded: 1=poor, 5=excellent (from qp201)
Exercise	4.061	3.194	0	28	Frequency of physical exercise in the past week (times/week, from qp701/qp701n)
Hukou	0.387	0.487	0	1	1=urban hukou (non-agricultural/resident), 0=agricultural hukou (from pa301/qa301)

Notes: The overall sample comprises 14,860 observations, with 3,715 observations in each of the four waves.

4.2 Baseline regression models

Model (1) tested the total effect of perceived internet value on public trust (Table 2). The coefficient was 0.0602 (cluster-robust SE = 0.0081, $p < 0.001$), indicating that a one-unit increase in perceived internet value was associated with an average increase of 0.060 points in public trust, supporting hypothesis H1.

Model (2) tested the effect of perceived internet value on life satisfaction (the a path); the coefficient was 0.0410 ($p < 0.001$), meaning a one-point increase in perceived value was associated with a 0.041-point increase in life satisfaction, supporting hypothesis H2.

Model (3) included both perceived internet value and life satisfaction simultaneously. Results showed that life satisfaction's effect on public trust (the b path) was 0.1434 ($p < 0.001$); after controlling for life satisfaction, the direct effect of perceived internet value (c') was 0.0543 ($p < 0.001$), remaining highly significant. These findings indicate that life satisfaction partially mediates the relationship between perceived internet value and public trust; whether hypothesis H3 is supported requires formal mediation testing.

Table 2. Baseline Regressions: Three-Step Mediation Analysis

Variable	(1) Total Effect Y=Public Trust	(2) a Path M=Life Satisfaction	(3) b & c' Paths Y=Public Trust
Internet value perception	0.0602*** (0.0081)	0.0410*** (0.0048)	0.0543*** (0.0080)
Life satisfaction	—	—	0.1434*** (0.0166)
Age	0.0519 (0.0487)	-0.0274 (0.0194)	0.0558 (0.0470)
Married	0.0876 (0.0621)	0.2470*** (0.0391)	0.0522 (0.0623)
Years of education	-0.0129† (0.0078)	-0.0233*** (0.0051)	-0.0096 (0.0078)
Online learning	-0.0300 (0.0288)	-0.0299† (0.0175)	-0.0257 (0.0287)
Self-rated health	0.0623*** (0.0155)	0.0838*** (0.0096)	0.0503*** (0.0155)
Exercise	-0.0055 (0.0043)	0.0072** (0.0026)	-0.0065 (0.0043)
Urban hukou	-0.1012† (0.0610)	-0.0694† (0.0366)	-0.0912 (0.0613)
Year fixed effects	Yes	Yes	Yes
Individual fixed effects	Yes	Yes	Yes
R^2 (within)	0.0766	0.0746	0.0836
Observations	14,860	14,860	14,860
Number of individuals	3,715	3,715	3,715

*Notes: Cluster robust standard errors (at the individual level) in parentheses; *** p<0.001, ** p<0.01, * p<0.05, † p<0.1.*

4.3 Mediation tests

This study employed both the Delta method and the Bootstrap method to cross-validate and more comprehensively assess the mediating effect of life satisfaction; results are presented in Table 3. The Delta method, based on the normality assumption and using a first-order Taylor expansion to approximate the standard error of the indirect effect, can rapidly provide significance judgments in large samples. The Bootstrap method does not rely on normality assumptions and constructs an empirical distribution of the indirect effect by repeated resampling with replacement from the original sample, providing more reliable statistical inference in small samples or nonnormal conditions (Preacher & Hayes, 2008). Combining the two methods yields both explicit p-values and robust confidence interval estimates.

The Delta-estimated indirect effect (a × b) was 0.00589, with a standard error of 0.00091, z

= 6.48, $p < 0.001$, and a 95% confidence interval of [0.00410, 0.00767], which does not include 0. The Bootstrap method, with 1,000 resamples, produced a percentile confidence interval of [0.00271, 0.00993] and a bias-corrected confidence interval of [0.00238, 0.00913], both excluding 0. Results from both methods are consistent and support hypothesis H3: life satisfaction significantly mediates the relationship between perceived internet value and public trust.Subsections can be included, with generally no more than three levels of headings.

Table 3. Mediation Effect Test of Life Satisfaction

Path / Effect	Coefficient	Std. Err.	95% Confidence Interval	p-value	Proportion
Total effect (c)	0.0602***	0.0081	—	p = 0.001	—
a path	0.0410***	0.0045	—	p < 0.001	—
b path	0.1434***	0.0156	—	p < 0.001	—
Direct effect (c')	0.0543***	0.0074	—	p < 0.001	—
Indirect effect (Delta method)	0.00589*	0.00091	[0.00410, 0.00767]	$p = 9.30\times10^{-11}$	9.8%
Indirect effect (Bootstrap)	0.00556*	0.00186	[0.00238, 0.00913] (BC)	—	9.2%

*Notes: All tests are two-tailed with α = 0.05. Delta method (Sobel test) assumes normal distribution of the indirect effect (Sobel, 1982). Bootstrap method (1,000 replications, clustered at the individual level) does not rely on the normality assumption and is therefore reported as the primary inference for the indirect effect (Efron, 1987). BC = bias-corrected confidence interval. Proportion = indirect effect / total effect × 100%. For total effect, the exact p-value is 0.00064; for a, b, c' paths, and Delta method indirect effect, exact p-values are below 0.001. *** p<0.001, ** p<0.01, * p<0.05*

4.4 Endogeneity Test

Although the individual fixed-effects model mitigates omitted variable bias to some extent, the relationship between perceived Internet value and public trust may still be subject to reverse causality. Following related studies (Chen et al., 2025), this paper employs provincial Internet penetration as an instrumental variable for individual Internet use, which has been widely adopted in the literature (Xing et al., 2025). According to the China Internet Network Development Statistical Report, mobile Internet has become the primary access channel for the Chinese public; therefore, this study selects provincial per capita mobile data usage as the instrumental variable, which satisfies relevance. Provincial-level mobile data usage is determined by each province's Internet infrastructure and communication technology—supply-side, macro-level factors that are exogenous to individual-level public trust—thus satisfying the exogeneity condition.

Table 4. Endogeneity Test: Instrumental Variable Two-Stage Least Squares (IV-2SLS)

Variable	First Stage (DV=Internet Value Perception)	Second Stage (DV=Public Trust)
Instrument: ln(per capita mobile traffic)	0.6337*** (0.0183)	—
Internet value perception (fitted)	—	0.1676*** (0.0259)
Age	-0.0246*** (0.0023)	0.0033 (0.0026)
Married	0.0294 (0.0499)	-0.1475** (0.0539)
Years of education	0.0993*** (0.0058)	0.0439*** (0.0068)
Online learning	1.4784*** (0.0340)	0.0287 (0.0537)
Self-rated health	0.0880*** (0.0169)	0.1751*** (0.0182)
Exercise	0.0305*** (0.0057)	-0.0156** (0.0054)
Urban hukou	0.1113** (0.0416)	-0.1430*** (0.0447)
Year dummies	Yes	Yes
Individual FE	Yes	Yes
First-stage F statistic	1204.11	—
Kleibergen-Paap rk LM (p-value)	—	0
Cragg-Donald Wald F	989.92	—
Observations	14,860	14,860

*Notes: Cluster-robust standard errors in parentheses; *** p<0.001, ** p<0.01. The instrument is provincial-level per capita mobile data traffic (log), sourced from China Statistical Yearbooks and Ministry of Industry and Information Technology.*

We apply two-stage least squares; results are presented in Table 4. In the first-stage regression, the coefficient of the instrument on perceived Internet value is 0.6337 ($p < 0.001$), and the first-stage F statistic is 1204.11, well above the Stock–Yogo 10% bias critical value of 16.38, ruling out weak instrument concerns. The Kleibergen–Paap rk LM test ($p < 0.001$) rejects the null of underidentification. Second-stage estimates show that the coefficient of perceived Internet value is 0.1676 ($p < 0.001$); after addressing endogeneity it remains significantly positive and is larger than the baseline FE estimate (0.0602), indicating that the standard FE estimate may have underestimated the true effect due to measurement error or omitted variables. These results further strengthen the credibility of the causal inference.

4.5 Robustness checks

Table 5. Robustness Checks

Model	Dependent Variable	Internet Perception Coefficient	Indirect Effect	Key Path Coefficients	Key Statistics	Observations
(A) Random-effects ordered logit	Public trust (4 categories)	0.1939* (0.0103)	—	—	Wald χ^2 = 767.00***	14,860
(B) Arithmetic mean index (two-way FE)	Public trust (continuous)	Total effect (c): 0.0626* (0.0072)** Direct effect (c'): 0.0573* (0.0072)**	0.00539* (0.00081)**	a = 0.0384*** (0.0039) b = 0.1405*** (0.0155)	R^2 (within) = 0.0856	14,860

*Notes: All tests are two tailed with α = 0.05. *** p < 0.001. In (A), the coefficient for urban hukou is negative and statistically significant at p = 0.006 (not shown; see main text). The indirect effect is estimated via the Delta method. The exact p values for the total and direct effects in (B) are below 0.001.*

To verify the robustness of the baseline findings, we conduct tests along two dimensions: model specification and variable measurement. Results are presented in Table 5. First, we replace the estimation model with a random-effects ordered Logit. The public trust score is recoded as a four-category ordinal variable, and re-estimated using a panel random-effects ordered Logit model. The coefficient on perceived internet value is 0.1939 ($p < 0.001$), consistent in sign with the baseline result, and the likelihood-ratio test ($chibar^2(01) = 3025.92$, $p < 0.001$) supports the use of a random-effects specification. This indicates that the baseline conclusion does not depend on the linear functional form. In this model, urban household registration is significantly negative (-0.1851, $p = 0.006$), which is consistent in direction with the linear FE results. Second, we alter the measurement of the core independent variable. We use the arithmetic mean of the five perceived-internet-value items (instead of the total score) as an alternative measure and re-run the fixed-effects mediation analysis. The total effect is 0.0626 ($p < 0.001$), the a-path is 0.0384 ($p < 0.001$), the b-path is 0.1405 ($p < 0.001$), and the direct effect is 0.0573 ($p < 0.001$); the indirect effect (Delta method) is 0.00539 ($p < 0.001$). The directions and significances of all paths are highly consistent with the baseline conclusions, indicating that the core findings do not depend on the specific construction of the indicator.

4.6 Heterogeneity analysis

We examine whether the impact of perceived internet value on public trust varies across groups along two dimensions: individual characteristics and regional characteristics. Results are shown in Table 6. All subgroupings are based on individuals' actual status in each period, preserving temporal variation in individual attributes. The coefficient for the youth group is 0.0716 ($p < 0.001$), which is twice that of the middle-aged group (0.0344), indicating that the trust-enhancing effect of perceived internet value is more pronounced among young people—likely related to higher levels of internet integration and reliance in this cohort. Effects for urban and agricultural household registration are both significantly positive with small differences between them, suggesting that the promotive effect of perceived internet value on public trust is broadly applicable across household registration groups and that the digital divide may be narrowing at the level of value perception. Both the low-education and high-education groups show significant effects with minor differences, implying that education does not exhibit a marked moderating role and that the trust gains from perceived internet value hold across education levels. Regarding regional heterogeneity, coefficients for the four major economic regions are all significantly positive but display a clear gradient: the Northeast shows the strongest effect (0.0798), followed by the West (0.0713) and the East (0.0678), while the Central region shows the weakest effect (0.0359). This pattern reflects structural differences in regional internet development and the foundations of social trust. In the Northeast, traditionally tight social networks may facilitate the translation of perceived internet value into institutional trust; in the West, policies such as the "Digital Silk Road" have driven leapfrog development of internet infrastructure, producing the largest information gains.

Table 6. Heterogeneity Analysis

Grouping Variable	Subgroup	Coefficient of Internet Perception	Robust SE	p-value	Observations	Individuals
Age	Young (≤44)	0.0716***	0.0095	<0.001	11270	3082
	Middle-aged (>44)	0.0344†	0.0179	0.055	3590	1,161
Hukou	Urban	0.0631***	0.0132	<0.001	5755	1,685
	Agricultural	0.0586***	0.0106	<0.001	9105	2,466
Education	High (≥12 years)	0.0619***	0.0117	<0.001	7793	2,259

	Low (<12 years)	0.0649***	0.0129	<0.001	7067	2,063
Region	Eastern	0.0678***	0.0131	<0.001	5719	1564
	Central	0.0359*	0.0163	0.028	3763	1021
	Western	0.0713***	0.0164	<0.001	3288	872
	Northeastern	0.0798***	0.0232	0.001	2090	539

*Notes: All models control for age, married, education, online learning, health, exercise, hukou, and year fixed effects; cluster-robust standard errors; *** p<0.001, ** p<0.01, * p<0.05, † p<0.1.*

5 Discussion

5.1 The effect of perceived value on public trust

From the perspective of perceived value, this study provides new theoretical support for academic debates concerning the relationship between the Internet and trust. Perceived value of the Internet exerts a significant positive direct effect on public trust (total effect = 0.0602, $p < 0.001$), and this effect remains robust after controlling for endogeneity (IV estimate $\beta = 0.1676$, $p < 0.001$). As shown in Figure 1, this positive relationship between Internet value perception and public trust is consistently observed across the four survey waves (2016–2022).

Internet-use behavior and perceived value are concepts at different levels: use behavior reflects objective facts, whereas perceived value denotes an individual's evaluative judgement of the media information environment. Even when objective usage patterns converge, individual differences in perceived value can produce markedly different tendencies in public trust. In an era where the Internet is the primary information source, raising public trust depends not on the frequency or duration of individual Internet use but on enhancing individuals' perceived importance of the Internet. Future research on digital governance should pay greater attention to netizens' perceived value rather than focusing solely on usage behavior. The findings echo the core propositions of the Technology Acceptance Model (TAM) and align with cognitive-based theories of institutional trust. Perceived usefulness, as an individual's value judgement of a technological tool, a priori shapes cognitive attitudes and subsequently influences technology adoption. This study extends that logic to the domain of public trust: when individuals perceive the Internet as “very important” to themselves, such perceived value implies that the Internet has been internalized as a trustworthy information environment, which in turn translates into trust in public institutions. As the institutionalized carrier of information dissemination in modern society, the Internet invites individuals to form cognitive judgements based on institutional operating rules, procedural fairness, and value congruence, which then inform their trust inclinations.

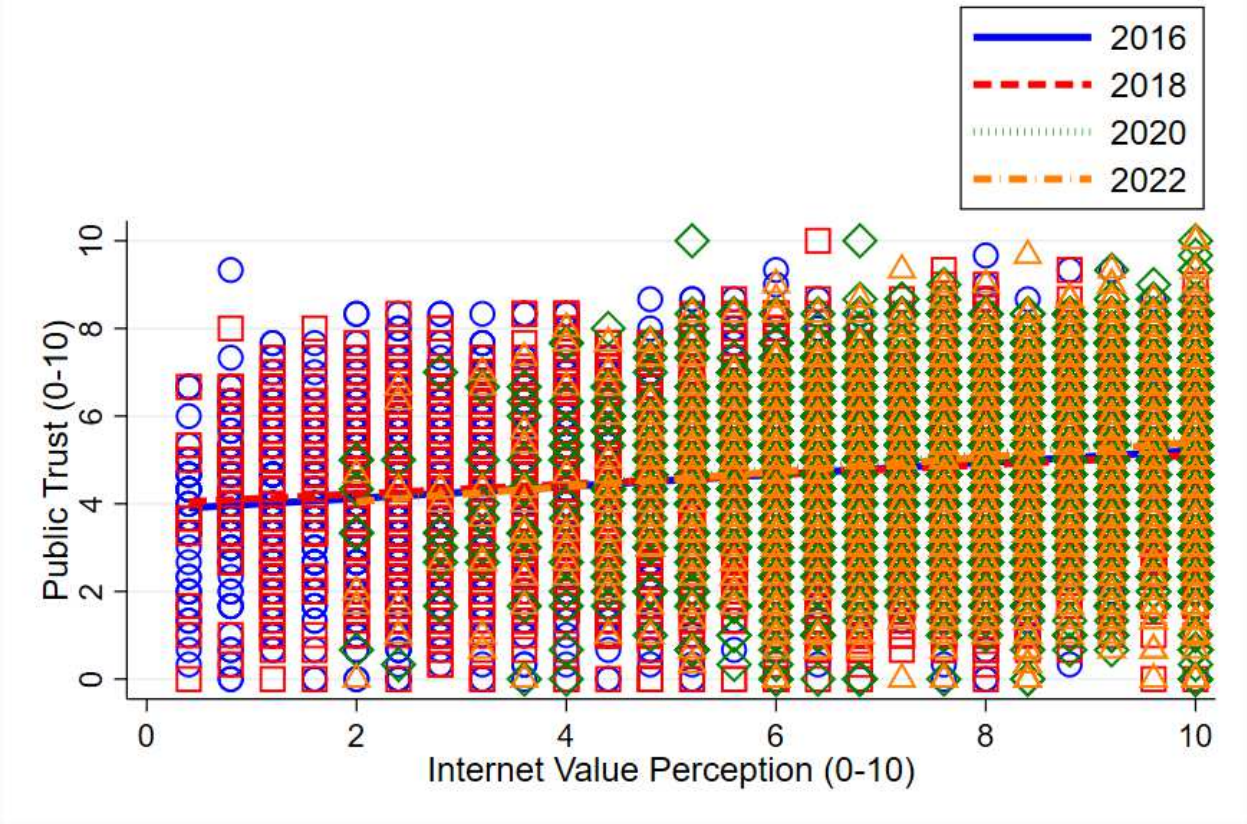


Figure 1. The relationship of Internet Value Perception on Public Trust

5.2 The mediating conversion mechanism of life satisfaction

Decomposition of the mediation effect shows that although life satisfaction serves as a significant mediator between perceived Internet value and public trust, the indirect effect accounts for only 9.8% of the total effect, far smaller than the direct effect (90.2%). The decomposition indicates that the influence of perceived Internet value on public trust is dominated by the direct pathway, with the indirect pathway playing a subsidiary role. This finding extends the path-weight hierarchization theory of the "Cognitive–Affective–Conative" (CAC) chain model (Hilgard, 1980). The CAC model posits that affective mediation is the necessary pivot for translating cognition into behavioral tendency (Loh et al., 2021; Huang & Zhang, 2024) and does not distinguish differences in effect magnitude across pathways, thereby implicitly assuming affective mediation as the core route. Through mediation testing in the domain of digital media trust, this study empirically demonstrates a two-path layered mechanism characterized by "cognition primarily projecting directly, affective mediation secondarily transmitting," which provides two key refinements to the CAC explanatory framework. First, the transformation from cognition to behavioral tendency can proceed via parallel dual channels

rather than necessarily relying on affective mediation. Second, cognition regarding digital media possesses a direct-projective property that substantially reduces the transmission weight of affective mediation, thereby offering boundary conditions for differentiated applications of the CAC model across contexts.

5.3 Reconstructing the Stratified Theory of the Digital Divide Based on Information Dependence and Social Embeddedness

Subsample regressions reveal that the trust-enhancing effect of perceived internet value is significantly stronger among low-education groups, married individuals, and respondents in western regions. These heterogeneous findings can be integrated within a two-dimensional analytical framework—information dependence and social embeddedness—thereby deeply extending the traditional three-tier digital divide theory.

First, information dependence theory explains educational and regional stratification. Traditional digital divide research has long emphasized gaps in physical access and usage skills (Jiang et al., 2026) but has overlooked differences across groups in their reliance on the internet for information. For low-education and western-region populations, the internet functions as the primary carrier of social cognition; their high information dependence amplifies the efficiency with which perceived internet value is converted into public trust. In contrast, highly educated and eastern-region groups possess greater baseline cognitive resources, treating the internet as a supplementary information source, so the marginal gains in cognitive evaluation from internet use diminish steadily.

Second, social capital embeddedness explains heterogeneity by marital status. Multilevel social network interactions can accumulate generalized social trust (Putnam, 2000). Married individuals maintain long-term family, neighborhood, and kinship ties offline; as an online tool for social connection, the internet's perceived value can continuously spill over into institutional trust through high-frequency social interactions. Unmarried individuals have smaller social networks and lower connection density, constraining the social spillover effects of media cognition and producing a marital-group differential effect. This finding incorporates digital media into mechanisms of social capital reproduction and forges a theoretical link between online media cognition and offline social embeddedness.

Taken together, the observed pattern of heterogeneity demonstrates that the media-mediated effects on public trust in the digital age result from the joint influence of groups' information dependence and the degree of social embeddedness, addressing explanatory limits of single-dimension digital divide theories.

5.4 Paradigm Shift from Hardware Deployment to Cultivating Perceptual Literacy

Based on the theoretical inferences outlined above, this study translates theoretical propositions into actionable digital trust governance policies and establishes a theoretical support system for differentiated, precision governance. First, the emphasis of digital governance should shift from hardware access expansion to cultivating the public's media-value perception. Simply expanding broadband coverage addresses only objective usage behavior and does not alter the public's subjective appraisal of the Internet information environment. Only by improving the quality of online information, strengthening information security and assurance mechanisms, and enhancing positive media perception across the population can public trust be promoted at its root. Second, although life satisfaction transmits only about 10% of the media-cognition effect, it still serves as a supplementary buffering channel in the cognition–trust linkage. Improving livelihoods and increasing citizens' sense of gain can function as long-term complementary measures in trust governance. Third, digital governance resources should be allocated with precision toward specific groups and regions. Heterogeneity analyses indicate that digital literacy training aimed at the general public may require bespoke design to deepen perceptions of the Internet's value, and targeted digital-trust interventions may be necessary.

5.5 Theoretical Limitations and Directions for Future Research

The theoretical construction in this study remains subject to boundary constraints, which point to a clear research agenda for further theoretical extension. First, limitations in causal identification: this study employs instrumental variables to mitigate reverse causality, but cannot fully eliminate confounding from time-varying omitted variables, making completely clean causal inference difficult. Second, scope for expanding the CAC mediating mechanisms: life satisfaction explains only roughly 10% of the total effect, indicating that the cognition–trust chain model still contains substantial unidentified mediating pathways. Third, constraints of sample boundaries: the research covers only Internet users and lacks a non-user comparison sample; thus, the current theory applies only to the connected population.

Although the four-wave panel data span pre- and post-pandemic periods, they do not distinguish mechanism differences between crisis contexts and normal social conditions. Future work could adopt difference-in-differences and related designs, incorporate variables such as generalized social trust and media literacy into the models, and construct an expanded, multi-mediator CAC theoretical framework. Including non-user samples would allow comparison of the differential roles of access behavior versus cognitive appraisal, thereby refining the universal applicability of digital trust theory and further consolidating the causal theoretical chain linking media cognition and public trust.

6 Conclusion

This empirical study demonstrates that individuals' perceived value of the Internet positively influences their trust in public institutions, indicating that higher Internet value perception can directly enhance individuals' identification with and confidence in public institutions via cognitive-level generalization of trust in the information environment. At the same time, this influence is indirectly transmitted to institutional trust by elevating life satisfaction as an affective experience. Together these form a two-path layered mechanism dominated by cognitive direct projection and supplemented by affective mediating transmission. The findings extend the theoretical boundaries of the CAC model in the domain of digital-media trust, showing that cognitive-to-behavioral inclination conversion operates through parallel channels and that affective mediation is not a necessary route for cognition to transform into trust.

Public trust governance in the digital era will benefit from a paradigm shift from "hardware access construction" toward "cultivation of public media perception." Incorporating the enhancement of public value recognition of the Internet into the digital governance agenda—by optimizing online information quality, strengthening information protection mechanisms, and improving digital literacy education—can make the Internet an empowering tool for fostering public trust and improve the governance effectiveness of digital empowerment.

7 Data availability

The constructed four-wave panel dataset and variable documentation are provided in the supplementary materials. The original data can be obtained from the official websites of the China Family Panel Studies and the China Statistical Yearbook, URLs: https://www.isss.pku.edu.cn/cfps/gycfps/cfpsjj/index.htm (registration and application required), https://www.stats.gov.cn/sj/ndsj/.

8 Ethics Approval and Informed Consent Statements

The China Family Panel Studies (CFPS) is a human-subject research project conducted by the Institute of Social Science Survey (ISSS) at Peking University. The CFPS project was reviewed and approved by the Biomedical Ethics Review Committee of Peking University (Peking University Biomedical Institutional Review Board) (approval number: IRB00001052-14010). This approval number remains consistent across all CFPS survey waves. The provincial-level mobile traffic data used in this study are derived from publicly available official statistics (China Statistical Yearbooks) and do not involve human participants. As this study involves only secondary analysis of de-identified individual data and publicly available

aggregated official statistics, with no direct contact with human participants, no additional ethical approval was required. This study was conducted in accordance with relevant regulations and guidelines for secondary analysis of de-identified publicly available data. All procedures followed the ethical standards of the institutional research committee and the principles of the Declaration of Helsinki. As the study involves only secondary analysis of de-identified data from the publicly available China Family Panel Studies (CFPS) dataset and aggregated official statistics, with no direct contact with human participants, no additional regulatory approvals were required

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