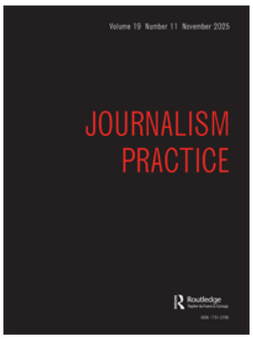

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Journalism Practice

ISSN: 1751-2786 (Print) 1751-2794 (Online) Journal homepage: www.tandfonline.com/journals/rjop20

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To cite this article: Ching-Chun Chen & Chen-Chao Tao (11 Feb 2025): Identity-Driven News Authentication Strategy in Echo Chambers, Journalism Practice, DOI: 10.1080/17512786.2025.2464209

To link to this article: https://doi.org/10.1080/17512786.2025.2464209

Published online: 11 Feb 2025.

JOURNALISM PRACTICE
https://doi.org/10.1080/17512786.2025.2464209

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Identity-Driven News Authentication Strategy in Echo Chambers

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ABSTRACT

Drawing on bounded rationality theory, dual processing theory, and social identity theory, this study proposes a model of a three-stage news authentication strategy and further examines identity-driven news authentication strategy in echo chambers. Analysis of Taiwanese national survey data (N = 1,453) indicates that people tend to rely on self-based news authentication, followed by social-based news authentication, and finally fact-checking news authentication. Moreover, people in echo chambers have a higher propensity to adopt social-based and fact-checking news authentication when social context and social motivations invoke their identification needs.

ARTICLE HISTORY
Received 8 January 2024
Accepted 2 February 2025

KEYWORDS
News authentication; echo chamber; bounded rationality; dual processing theory; social identity theory; fake news; Taiwan Communication Survey

The prevalence of fake news disguised as credible news that is aimed at manipulation and dispersed through multiple platforms (e.g., traditional media, online media, and social media) (Shin et al. 2018; Tandoc, Lim, and Ling 2017), as well as its rapid transmission through echo chambers (Garrett 2017), has attracted academic and governmental attention. News authentication acts are regarded as normative means to debunk fake news and stem its spread (Edgerly et al. 2020). Although contemporary society encourages people to authenticate information to be scientific and accountable citizens (Edgerly et al. 2020; Margolin, Hannak, and Weber 2018), individuals only selectively verify information.

Responding to the call for further research on individuals' authentication motivations and demographical characteristics (Edgerly et al. 2020; Margolin, Hannak, and Weber 2018), the current study aims to examine the news authentication strategies individuals adopt when they encounter news, particularly individuals in echo chambers. By extending the two-step audience's acts of authentication (3As) model (Tandoc et al. 2018), we integrate internal and external authentication into a three-stage news authentication process, consisting of self-based news authentication, social-based news authentication, and fact-checking news authentication. These three stages do not represent different sources of verification, but rather concepts based on theories of cognitive psychology. We believe that people are

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boundedly rational (Kahneman 2003; Metzger, Flanagin, and Medders 2010; Simon 1955) and that acts of authentication require varying degrees of cognitive effort and resources (Edgerly et al. 2020; Metzger, Flanagin, and Medders 2010), and that authentication behavior is driven by the social environment in which they are located and their personal motivations (Edgerly et al. 2020; Margolin, Hannak, and Weber 2018; Waruwu et al. 2020). First, self-based news authentication represents people relying solely on personal experience and intuition, using minimal cognitive resources to verify information without relying on external resources. The second stage of social-based news authentication represents people's tendency to use heuristic processing system, which require fewer cognitive resources, to make judgments when seeking external information verification. Therefore, it is easily influenced by indicators of social-based user-generated content, such as people's tendency to believe that restaurants with high ratings are better. The third stage, fact-checking news authentication, represents people actively fact-checking information using systematic processing system due to personal motivation when verifying external information. It is the most cognitively demanding and time-consuming type of authentication behavior. Through bounded rationality theory and the dual processing model, this study attempts to clarify the cognitive mechanisms behind people's news authentication behavior.

In addition, this study pays special attention to the news authentication behavior of those in echo chambers. Based on social identity theory and self-categorization theory (Perdue et al. 1990; Shin and Thorson 2017; Tajfel 1982; Waruwu et al. 2020), this study proposes an identity-driven news authentication strategy, arguing that people in echo chambers are prone to make heuristic judgments based on social information in the social environment. At the same time, they also activate systematic processing mechanisms due to the motivation to maintain their social identity, thus engaging in fact-checking authentication behavior.

We first introduce the three-stage news authentication process, followed by a review of how people in echo chambers adopt an identity-driven news authentication strategy. This study utilizes representative data from the 2019 Taiwan Communication Survey (TCS) to explore three-stage news authentication process and the role of social identity in shaping news authentication in echo chambers.

Literature Review

Three-Stage News Authentication Strategy in the Digital Age

Drawing on the framework of the two-step 3As model (Tandoc et al. 2018), we conceive of news authentication strategies as the ways in which individuals authenticate information through internal or external verification processes when they encounter news or political information. That is, people rely on their own knowledge or seek out more information to verify the authenticity of the news depending on their cognitive motivations. Specifically, we argue that news authentication is not merely a credibility assessment or quality evaluation of news but that people also judge news authenticity (Pennycook and Rand 2019). Moreover, the news authentication process may not ensure truth; it is a process for seeking truth rather than obtaining truth (Tandoc et al. 2018).

By extending the two-step 3As model (Tandoc et al. 2018), we integrate internal and external authentication into a three-stage news authentication process consisting of self-based news authentication, social-based news authentication, and fact-checking news authentication. The three-stage news authentication strategy builds upon cognitive

psychology theories, in which individuals exert various levels of effort and cognitive resources in the authentication process.

Self-Based News Authentication

Self-based news authentication is the first stage of news authentication in the model. It involves a judgment of news authenticity based on one's own knowledge, experiences, prior attitudes, and biases. This stage can be completed rather quickly and easily for individuals without much effort or many cognitive resources. As Tandoc et al. (2018) pointed out in the 3As model, "at the most basic level, people rely on their own sense of judgment (2757)." Their results from open-ended survey responses revealed that self-based authentication is the most fundamental and common means of authenticating information on social media. Moreover, research shows that people still require analytical thinking to identify authentic information without external resources. Pennycook and Rand (2019) found that people rarely rely on analytical thinking and thus believe fake news. Hence, they argued that people are too lazy to allocate cognitive resources when encountering news. Furthermore, people rarely avoid the influence of their prior attitudes and biases, even when thinking analytically. The results found that people tend to judge fake news that is consistent with their ideology to be accurate news and more credible (Edgerly et al. 2020; Pennycook and Rand 2019).

Social-Based News Authentication

The second stage of news authentication is social-based news authentication. It relies on social-based user-generated content (UGC) to authenticate news (Metzger, Flanagin, and Medders 2010). Social-based UGC includes quantitative (e.g., the number of likes/shares/comments, the rating/ranking scores) and qualitative metrics (e.g., friends' recommendations, comments, reviews, forum discussions, blog posts and Wikipedia content) (Messing and Westwood 2014; Postigo 2016). Due to the prevalence of the Internet, smartphones, and social computing technologies (e.g., social media, blogs, instant message applications, Wikipedia), it is easy for individuals to utilize collective intelligence to make judgments and credibility assessments (Metzger, Flanagin, and Medders 2010). Compared to own experiences, social-based news authentication requires additional effort to gather information; however, it requires a lower cognitive allocation and less effort to seek out and understand fact-checking information. Accumulated research shows that social-based information provides heuristic cues, in particular social cues and qualitative metrics, for people to evaluate and judge information quickly and efficiently (Messing and Westwood 2014; Metzger, Flanagin, and Medders 2010). However, the challenges of social-based news authentication involve the transparency of sources and their motivations, which results in a mixture of misinformation and truth in social-based information and makes assessment difficult.

Fact-Checking News Authentication

The final stage of news authentication is fact-checking news authentication. It is an authentication act in which people actively fact-check information by themselves or seek clarifications or corrections from fact-checking organizations. Fact-checking has been viewed as an imperative for curbing the diffusion and negative consequences of fake news, and fact-checkers have grown tremendously in recent years (Amazeen,

Vargo, and Hopp 2019; Walter et al. 2020). Fact checkers consist of media-based fact checkers, nonprofit third-party fact checkers (e.g., International Fact-Checking Network), and citizen-based fact checkers, and their main objectives are to inform the public and correct false claims (Vargo, Guo, and Amazeen 2018; Walter et al. 2020). However, fact-checkers selectively correct specific political discourses due to limited resources (Garrett, Nisbet, and Lynch 2013), which makes the transmission of fact-checking messages less visible than social-based information. Furthermore, although fact-checking messages are fact based, they can be too complicated to understand because they often contain biographical information and information on the correction procedures (Garrett, Nisbet, and Lynch 2013; Margolin, Hannak, and Weber 2018; Tandoc et al. 2018). Hence, we argue that fact-checking news authentication requires higher cognitive resources and effort to seek and process information.

Underlying Cognitive Mechanisms of the Three-Stage Model

To further clarify the underlying cognitive mechanisms, we argue that the three-stage model can be explained by bounded rationality theory and dual processing theory. The primary assumption in the model is that authentication acts require additional cognitive effort (Edgerly et al. 2020; Metzger, Flanagin, and Medders 2010). According to bounded rationality theory (Kahneman 2003; Metzger, Flanagin, and Medders 2010; Simon 1955), people may not always behave rationally because of limited cognitive resources and restricted external environments. It emphasizes that individuals tend to rely on heuristic-induced biases, intuitions and accessibility when making judgments (Kahneman 2003). We argue that this process is active in self-based news authentication.

The next two stages of news authentication are closely associated with bounded rationality theory and dual processing theory. In bounded rationality theory, individuals are content to satisfice and make minimum efforts unless they are motivated by certain purposes (Metzger, Flanagin, and Medders 2010). These ideas can be further connected with dual processing theory (Evans 2008; Petty and Cacioppo 1986; Powell et al. 2019), which claims that individuals tend to process information through a heuristic processing system rather than a systematic processing system to save cognitive resources. The heuristic processing system is rather fast, automatic, and emotional and relies on heuristic cues, such as perceived expertise, recommendations, social metrics, likability, and homophily, for judgment (Metzger, Flanagin, and Medders 2010; Powell et al. 2019). Hence, we argue that social-based news authentication relies heavily on the heuristic processing system. In contrast, systematic processing systems are slow and controlled and require motivation to reach a certain cognitive threshold via a higher need for orientation, personal relevance, or issue importance (Lo, Wei, and Lu 2017; Petty and Cacioppo 1986; Powell et al. 2019; Waddell 2020). Hence, we argue that people with higher motivations are more likely to use fact-checking tools and more willing to process information through a systematic processing system. Amazeen, Vargo, and Hopp's (2019) study is in line with our theoretical argument and found that people with a higher need for orientation were more likely to share fact-checking messages to strengthen their existing attitudes. In summary, we propose our first hypothesis:

> H1: The propensity of self-based news authentication is higher than that of social-based news authentication, and that of social-based news authentication is higher than that of fact-checking news authentication.

Identity-Driven News Authentication Strategy in Echo Chambers

Drawing on social identity theory and self-categorization theory, we propose an identity-driven news authentication strategy in echo chambers. We argue that individuals have stronger motivations to seek external verification (i.e., social-based and fact-checking news authentication) when they have a higher cognitive need for identity maintenance. According to social identity theory and self-categorization theory (Perdue et al. 1990; Shin and Thorson 2017; Tajfel 1982; Waruwu et al. 2020), people have a strong tendency to identify with a social group (i.e., membership in echo chambers in this case), whereby identity elicits them to categorize people into in-groups and out-groups. The emphasis of both theories is the process of intergroup bias, in which people exhibit a positive attitude towards in-groups and a negative attitude towards out-groups to maintain social identity, positive self-esteem and lower uncertainty (Perdue et al. 1990; Shin and Thorson 2017; Tajfel 1982). In particular, intergroup bias is activated when encountering certain types of stimuli, such as messages aligned with in-group favoritism and out-group derogation (Knobloch-Westerwick, Mothes, and Polavin 2017). For instance, people tend to interpret in-group rumors positively and out-group rumors negatively (DiFonzo et al. 2014). Similarly, echo chambers with stronger social identity and connection with homogenous in-groups apparently show this tendency (Shmargad and Klar 2019; Williams et al. 2015).

Despite previous research on credibility assessment showing information evaluation to be a singular endeavor or a one-off activity, recent research has found that social context and social motivation influence peoples' information processing (Margolin, Hannak, and Weber 2018; Waruwu et al. 2020). For instance, Waruwu et al. (2020) found that people are more likely to interpret information based on in-group consensus as social validation. Furthermore, the motivations of news authentication are to maintain self-image and preserve group cohesion rather than increase one's own political understanding. Therefore, we argue that identity-driven news authentication strategies in echo chambers should consider both social context and social motivation.

Social Context

In terms of social context, an echo chamber is a bounded and segregated media environment dominated by one-sided opinions maintained by reciprocally reinforcing like-minded voices who prevent rebuttals (Shmargad and Klar 2019; Williams et al. 2015). From the perspective of social identity theory, individuals in echo chambers are more susceptible to in-group shared world values and collective opinions and further tend to rely on in-group norms to evaluate and authenticate information (Waruwu et al. 2020). Related research has pointed out that echoing effects are related to the spiral of silence as well as homophily (Jacobson, Myung, and Johnson 2016; Williams et al. 2015). One manifestation is that people feel social pressure from majority views, so they tend to observe in-group norms and perceive the opinion climate in echo chambers to avoid conflicts and conform to collective social norms (Jacobson, Myung, and Johnson 2016). Another manifestation is homophily, in which people are more likely to interact with like-minded people to strengthen in-group beliefs and attitudes (Williams et al. 2015). Taken together, we argue that social context, in particular echo chambers, motivate

individuals to adopt social-based news authentication, and thus, we propose a second hypothesis:

H2: Individuals in echo chambers are more likely to adopt social-based news authentication.

Social Motivation

Although fact-checking news authentication requires the most cognitive effort, it requires stronger motivation to be triggered. Previous research shows that people take authentication acts to fulfill social needs, such as to enhance solidarity, maintain social cohesion, build positive self-images, and share collective values, rather than for personal motivations (Margolin, Hannak, and Weber 2018; Waruwu et al. 2020). That is, social motivations are essential for individuals to authenticate information through external resources. In the case of echo chambers, we argue that fact-checking news authentication can also be driven by social motivations, particularly when individuals' intergroup biases are activated. Recent studies provide empirical evidence for this argument. Edgerly et al. (2020) conducted an online experimental survey to examine when people authenticate news. They found that when news is congruent with individuals' partisanships, it leads to higher perceived accuracy of the news and further results in higher intention to verify the news. In other words, people verify news regardless of the truth of the news, and their primary motivations are to confirm their favorable identities, especially for evidence-based fact-checking messages that have stronger persuasion effects (Amazeen, Vargo, and Hopp 2019). Moreover, Shin and Thorson (2017) examined more explicit and robust acts of sharing fact-checking messages rather than implicit acts of fact-checking consumption. They found that active partisans are more likely to share fact-checking messages that celebrate in-group identity and demoralize the opposing group. Partisan selective sharing can not only strengthen group identification by displaying loyalty to and earn trust from in-groups but also control the information flow and interpretation of fact-checking messages. Therefore, we propose a third hypothesis:

H3: Individuals in echo chambers are more likely to adopt fact-checking news authentication.

Method

Sample

We used secondary data from the 2019 Taiwan Communication Survey (TCS), an annual national study of media usage and its effects collected from 7 July 2019–20 October 2019. The TCS was funded by the Ministry of Science and Technology in Taiwan. The TCS conducted face-to-face interviews through multistage stratified random sampling, and then, data were reweighted to census proportions for sex, age, education, and region. Therefore, it resulted in a representative Taiwanese sample (N = 2000). Research has shown that Taiwan has been severely targeted by fake news and computational propaganda in the online sphere and traditional news media, and the fake news is generated both internally (e.g., political parties and commercial companies) and externally by mainland China (Neylan 2021; Wang and Chiang 2019; Woolley and Howard 2018). Moreover, Taiwan has high internet penetration and slanted news media aligned with political parties; that is, pan-blue media favor the Kuomintang (KMT), and pan-green media support the Democratic Progressive Party (DPP) (Wu and Guo 2017). Therefore, Taiwan

is suitable for examining how people authenticate fake news in echo chambers because news media and online media provide fertile ground for the creation of echo chambers and fake news diffusion. To examine individuals' news authentication strategies in the digital age, we targeted individuals who consume news either from national daily newspapers, broadcasting and cable news channels or from online media (final sample N = 1,453). The average age was 49.06 years (SD = 14.73), and 45.36% were male.

Measurements

News Authentication Strategy

The news authentication strategy scale is an 8-item binary scale revised from Newman et al. (2018) and Mavridis (2018) and was used to measure the three-stage news authentication strategy. Respondents were given the following prompt: "Please select the means you might use to verify the authenticity of news you encounter (1 = yes, 0 = no)." The news authentication means included (1) using fact-checking tools; (2) seeking out related information about the news; (3) seeking clarification about the news; (4) discussing with families and friends; (5) referring to experts' opinions about the news; (6) referring to comments below the news; (7) relying on your own knowledge and experiences; and (8) being skeptical. In this study, we performed a binary factor analysis (Keprt and Snášel 2004) in R using the psych software package (Revelle 2020). The factor analysis provided a three-factor solution that explained 38% of the variance, with Factor 1 explaining 20% of the variance, Factor 2 explaining 11%, and Factor 3 explaining 7%. The factor items were determined based on two criteria: factor item loadings above the 0.32 level and stronger significant loadings on cross-loadings (Carpenter 2018). Following the suggestion of Carpenter (2018), we then validated the dimensional structure of the measures by confirmatory factor analysis, and the model fit acceptably well, with CFI = 0.99, RMSEA = 0.024 and SRMR = 0.41. Therefore, we confirmed that the news authentication strategy can be divided into three measures: fact-checking news authentication (3 items; M = 0.21, SD = 0.28), social-based news authentication (3 items; M = 0.28, SD = 0.29), and self-based news authentication (1 item; M = 0.74, SD = 0.44). The responses to the retained items were summed and averaged to form the scales representing each measure. A detailed interpretation of each measure is shown in Table 1.

Echo Chamber

To measure the extent to which individuals lived in echo chambers, we used the partisan news repertoire index to explore the presence of echo chambers in a high-choice media environment (Chen and Tao 2020). The partisan news repertoire index is a personal-oriented indicator that first examines the types of news repertoires in which groups of individuals reside and further computes the scores of news repertoires to reflect the degree to which individuals live in echo chambers. To compute the partisan news repertoire index by the following equation, we followed Chen and Tao's (2020) procedure.

$$\text{Partisan News Repertoire Index} = \text{HHI} \times \left[B \times 1 + G \times (-1) + N \times 0 + A \times \left(\frac{B-G}{B+G}\right)\right]$$

In this equation, a higher positive score on the partisan news repertoire index indicates a greater pan-blue media orientation, a higher negative score indicates a greater pan-green

Table 1. Binary factor analysis of news authentication strategy.

Item	Factor 1	Factor 2	Factor 3
Factor 1: Fact-checking news authentication			
Use fact-checking tools	0.55		
Seek related information about the news	0.6	0.45	
Seek clarification about the news	0.84		
Factor 2: Social-based news authentication			
Discuss with families and friends		0.37	
Refer to experts' opinion about the news	0.33	0.44	
Refer to comments below the news	0.35	0.53	
Factor 3: Self-based news authentication			
Rely on own knowledge and experiences			0.71
% variance explained by each factor	20	11	7

Note. Loadings in bold represent the item that best describes each factor.

Table 2. Characteristics of Partisan News Repertoire for Four Classes.

News repertoire	Sample size	News components	B	G	N	A	HHI	PNRI
Class 1 (*Pro-Green*)	247 (17%)	Social Media, Instant Messaging App, ETtoday, News Aggregator App, Yahoo, Google News, Apple Daily Website, SET TV Website	0	3	0	5	1	−8
Class 2 (*Nonpartisan Aggregators*)	712 (49%)	Social Media, Instant Messaging App	0	0	0	2	0	0
Class 3 (*Pro-Blue*)	334 (22.99%)	CtiTV News, Instant Messaging App, Yahoo	1	0	0	2	1	3
Class 4 (*Balanced Omnivores*)	160 (11.01%)	Liberty Times, Apple Daily, United Daily News, China Times, Social Media, Instant Messaging App, ETtoday, Yahoo	2	3	0	3	0.52	0.83

Note. HHI indicates the Herfindahl-Hirschmann Index, B/G/N/A indicates the total number of blue media/green media/neutral media/algorithm-based media, and PNRI indicates the Partisan News Repertoire Index in the news repertoire.

media orientation, and 0 indicates a neutral or balanced news orientation. Table 2 describes the details of each news repertoire, and we used the absolute value of the partisan news repertoire index to examine the degree of people in the echo chambers (see https://figshare.com/articles/online_resource/supplementary_documents/14312894 online supplementary material for details of the analysis of the partisan news repertoire index).

Control Variables

The control variables included three demographic variables: gender, age, and education. Education was measured by five categories (1 = illiterate, 2 = home school/elementary, 3 = junior high school, 4 = college/university, 5 = postgraduate degree; $M = 4.24$, $SD = 0.93$).

Analytical Strategy

Statistical analyses were conducted using SPSS version 22. To test H1, we first identified three types of news authentication by binary factor analysis (mentioned above) and then used paired samples t-test statistics to compare the propensity of three types of news authentication. We tested whether self-based news authentication was the most common, followed by social-based news authentication, and then fact-checking news authentication. In this way, we could provide empirical support for the model of a

three-stage news authentication strategy. To test H2 and H3, we used hierarchical regression analysis to examine the effects of echo chambers on identity-driven news authentication. The analysis used the echo chamber measure as an independent variable and social-based and fact-checking news authentication as dependent variables, controlling for gender, age, and education. All control variables were included in the first block, followed by the main effect variable in the second block.

Results

The Model of a Three-Stage News Authentication Strategy

To extend the framework of audiences' acts of authentication, the current paper is rooted in theories of cognitive psychology to propose a model of a three-stage news authentication strategy. That is, we predicted that people are more likely rely on self-based news authentication, followed by social-based news authentication, and then fact-checking news authentication (H1). We used three paired samples t-test statistics to compare the propensity of the three types of news authentication.

As shown in Table 3, the first t-test ($t = 33.99$, $df = 1452$, $p < .001$, Cohen's $d = 1.23$) shows that the propensity of self-based news authentication ($M = 0.74$) is significantly higher than that of social-based news authentication ($M = 0.28$). This difference shows that people were more likely to authenticate news based on their own knowledge and experiences than by using social-based information. The second t-test ($t = 38.83$, $df = 1452$, $p < .001$, Cohen's $d = 1.44$) shows that the propensity of self-based news authentication ($M = 0.74$) is significantly higher than that of fact-checking news authentication ($M = 0.21$). This difference shows that people are more inclined to authenticate news based on their own knowledge and experiences than by using fact-checking messages. The third t-test ($t = 8.88$, $df = 1452$, $p < .001$, Cohen's $d = 0.25$) shows that the propensity of social-based news authentication ($M = 0.28$) is significantly higher than that of fact-checking news authentication ($M = 0.21$). This difference shows that people are more likely to authenticate news by using social-based information than by using fact-checking messages. In summary, these results revealed that people have a higher propensity to use self-based news authentication when they encounter news, followed by social-based news authentication, and then fact-checking news authentication. Hence, H1 was supported, and we provided empirical support for the model of the three-stage news authentication strategy.

Table 3. The results of paired samples t-test statistics and Cohen's d.

	Mean	SD	t-test	df	Cohen's *d*
Pair 1					
Self-based	0.74	0.44	33.99***	1452	1.23
Social-based	0.28	0.29			
Pair 2					
Self-based	0.74	0.44	38.83***	1452	1.44
Fact-checking	0.21	0.28			
Pair 3					
Social-based	0.28	0.29	8.88***	1452	0.25
Fact-checking	0.21	0.28			

Note. N = 1453. * $p < .05$; ** $p < .01$; *** $p < .001$.

Identity-Driven News Authentication Strategy

The primary purpose of the current paper was to explore the extent to which social identity contributes to external news authentication in echo chambers and thereby provide starting points for testing the theoretical claims embedded in the conceptualization of "identity-driven news authentication strategy" and "echo chamber." To this end, we used hierarchical regression analyses.

H2 concerns the effects of echo chambers on social-based news authentication. The results from the hierarchical regression model (model 2) suggest that echo chambers are positively associated with social-based news authentication ($\beta = .14$, $p < .001$). Of the control variables in the model, education ($\beta = .13$, $p < .001$) was positively related to social-based news authentication, while age ($\beta = -.11$, $p < .001$) was inversely related to social-based news authentication (see Table 4). In model 2, echo chambers had a modest, but statistically significant, and positive impact on social-based news authentication ($\Delta R^2 = 1.9\%$). Thus, people in strong echo chambers are more likely to adopt social-based authentication than those in weaker echo chambers, and H2 was supported.

H3 predicted that stronger echo chambers are positively related to fact-checking news authentication. As demonstrated in Table 4, the hierarchical regression model (model 3) showed that echo chamber positively predicted fact-checking news authentication ($\beta = .13$, $p < .001$). In model 3, age ($\beta = -.11$, $p < .001$) and education ($\beta = .12$, $p < .001$) were significant predictors, and echo chambers had a modest, but statistically significant, and positive impact on fact-checking news authentication ($\Delta R^2 = 1.6\%$). Therefore, individuals in strong echo chambers are more likely to adopt fact-checking news authentication than those in weaker echo chambers, and H3 was supported.

Furthermore, we examined the effects of echo chambers on self-based news authentication. The results from hierarchical model 1 (see Table 4) indicated no statistically significant relationship between echo chambers and self-based news authentication. Taken together, our results revealed that identity-driven news authentication phenomena did occur. In other words, if individuals reside in stronger echo chambers, they are more likely to be motivated by social identity, whereby they authenticate news through external verification, such as by using social-based tools and fact-checking messages. Moreover, we found that individuals who are younger and have higher education have a higher propensity to authenticate news not only internally but also externally.

Table 4. Hierarchical regression models of identity-driven news authentication.

	Model 1 Self-based news authentication	Model 2 Social-based news authentication	Model 3 Fact-checking news authentication
Block 1: demographics			
Age	−0.12***	−0.11***	−0.11***
Education	0.14***	0.13***	0.12***
Gender	−0.05	−0.04	−0.04
ΔR^2	5.8%	5.8%	5.8%
Block 2: Main effects			
Echo chamber	−0.04	0.14***	0.13***
ΔR^2	0.1%	1.9%	1.6%
Total ΔR^2	5.9%	7.7%	7.4%

Note. N = 1453; cell entries are final-entry ordinary least squares (OLS) standardized beta (β) coefficients. * $p < .05$; ** $p < .01$; *** $p < .001$.

Discussion and Conclusion

With the prevalence of malicious fake news disguised as true news and rapid transmission through echo chambers, the current study aimed to examine the news authentication strategies individuals adopt when they encounter news, particularly for those in echo chambers. Drawing on bounded rationality theory, dual processing theory, and social identity theory, we propose a model of a three-stage news authentication strategy and identity-driven news authentication strategy in echo chambers. First, people are likely to rely on self-based news authentication, followed by social-based news authentication, and then fact-checking news authentication. Second, people in echo chambers have a higher propensity to adopt social-based and fact-checking news authentication when social context and social motivations invoke their identification needs. These findings have several theoretical and practical implications.

First, our results suggest that people tend to allocate minimal cognitive effort in the news authentication process and often rely on heuristic processing systems to verify information, unless they have stronger motivations to seek out more related information or solid evidence. To use the words of Pennycook and Rand (2019), people are susceptible to fake news because they are too "lazy" to think analytically. This orientation may lead to being misled by fake news itself as well as biased judgments. For instance, Pennycook and Rand (2019) found that people make more errors in judging the authenticity of news headlines when they think less analytically. Moreover, they found that people perceived fake news with a congruent partisanship to be more accurate. Similarly, the study of Colliander (2019) also found that positive comments in response to fake news increases individuals' positive attitudes, intention to share, and willingness to make positive comments on fake news. Furthermore, the low propensity of adopting fact-checking news authentication echoes the arguments of the minimal effects of fact-checking messages (Amazeen, Vargo, and Hopp 2019; Margolin, Hannak, and Weber 2018; Vargo, Guo, and Amazeen 2018). Our results support previous studies that show the diffusion networks of fake news to be more sizable than fact-checking networks (Shin et al. 2017; Vargo, Guo, and Amazeen 2018).

Second, and looking into the context of echo chambers, our results suggest that social identity drives external news authentication strategies, as we consider both social context and social motivations to activate identification needs. We demonstrate that when individuals reside in echo chambers, they tend to rely on heuristic social-based information to authenticate news. As Waruwu et al. (2020) conceptualized individuals' news authentication strategies as a form of social validation, we also found people in echo chambers to be guided by in-group norms and motivation to strengthen group cohesion. Consequently, the tendency of social validation in echo chambers may not only polarize individuals' in-group beliefs but also provide fertile ground for fake news transmission (Shmargad and Klar 2019; Williams et al. 2015). Furthermore, we found that people in echo chambers are more inclined to use fact-checking news authentication than those not in echo chambers. This is consistent with the findings of Amazeen, Vargo, and Hopp (2019) and Shin and Thorson (2017), in which partisans prefer to selectively share fact-checking messages that are congruent with in-group favoritism and out-group derogation. Therefore, it contradicts the objectives of fact-checkers, which aim to inform the public and correct false political claims (Vargo, Guo, and Amazeen 2018). Even worse, fact-

checking messages become political tools for partisans, and people in echo chambers may control the information flow of fact-checking messages and recontextualize the interpretation of facts (Shin and Thorson 2017).

The theoretical implication of the study is twofold. First, we extend the two-step 3As model and further provide empirical support for the proposed model of a three-stage news authentication strategy. Based on bounded rationality theory and dual processing theory, we explain the psychological mechanism that determines why and when people turn to external authentication. Moreover, we argue that fake news is not a new phenomenon; in particular, the intertwined relationship between social media and traditional media reinforces the diffusion and persuasive influence of fake news (Woolley and Howard 2018). Hence, our model focuses on news authentication in a high media choice environment, which fills the gap in mainstream research on social media contexts (Tandoc et al. 2018). Second, we examine the primary motivations to authenticate news in echo chambers and further find evidence for identity-driven news authentication strategies. Our findings reveal the importance of social validation on individuals' information processing, which indicates that news authentication is not purely a cognitive endeavor of individuals themselves (Waruwu et al. 2020). In line with Metzger, Flanagin, and Medders (2010) and Waruwu et al. (2020), future studies should consider social factors when examining credibility evaluation and information authentication.

Our findings have practical implications for fact checkers and government and media literacy education. Since individuals without specific motivations prefer to use heuristics or accessible information for news authentication (Tandoc et al. 2018; Waruwu et al. 2020), fact-checkers and the government should consider how to make fact-checking messages more accessible and more understandable with less cognitive effort. For instance, fact-checkers and the government can cooperate with global technological companies (e.g., search engines, social media, and instant messaging apps) to make fact-checking messages more visible when algorithms detect fake news. Moreover, lowering the level of comprehension required for fact-checking messages is also essential. For example, infographics and videos may have more power than complex correction reports. On the other hand, the willingness of news authentication is positively related to the fear of negative consequences on social relationships and personal reputation (Margolin, Hannak, and Weber 2018; Waruwu et al. 2020). Hence, media literacy education should focus on social motivations, which encourage people to authenticate news before sharing fake news as a social good (Duffy, Tandoc, and Ling 2020). As a result, the sharing of fake news could be reduced despite its continued ubiquity.

This study has limitations that need to be noted. First, based on the results of a binary factor analysis of news authentication strategies, we used a single item to measure self-based news authentication. However, it may reduce content validity to capture an abstract concept (Carpenter 2018), and future studies should aim to develop multi-item measures to ensure validity. Second, the current study focused on social-related factors (i.e., social context and social motivations) to examine news authentication acts in echo chambers. However, previous research has accused opinion leaders of creating homogenous echo chambers (Guo et al. 2020), and many studies found the powerful role of opinion leaders in influencing followers' attitudes and behaviors (Kononova and Akbar 2015; Zhang, Zhao, and Xu 2016). Hence, future studies should include opinion leadership when examining news authentication behaviors. Third, the limitation of using

quantitative approach to examine news authentication strategies in echo chambers should be acknowledged. We measured echo chamber effect by using the partisan news repertoire index, which focuses on the media-level rather than the news-level. In other words, the measurement dose not capture participants' news selection process, which the news they encounter may already align with their conscious or unconscious interests or biases (Knobloch-Westerwick, Mothes, and Polavin 2017; Messing and Westwood 2014). Future research could employ qualitative methods, such as interviews or focus groups, to gain a deeper understanding of participants' news selection processes and how these processes influence their news authentication behaviors. Finally, the echo chamber measure assumes the symmetry of two political parties. Although previous research found asymmetry between partisan groups in verification and fact-checking message sharing behaviors (Pennycook and Rand 2019; Shin and Thorson 2017), a meta-analysis study found no difference in partisan bias for political information acceptance between different political parties (Ditto et al. 2018). Future studies should consider partisan asymmetry effects.

Acknowledgments:

Data analyzed in this article were collected by the research project of the Taiwan Communication Survey (TCS), which is supported by the Ministry of Science and Technology of R.O.C. The authors appreciate the assistance in providing data by the institute aforementioned. The views expressed herein are the authors' own. DOI:10.6141/TW-SRDA-D00184-1

We are grateful to the anonymous reviewers and the editor for their valuable comments and suggestions, which improved the quality of this manuscript.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

Data availability statement

Supplementary materials are openly available at the project's online repository (https://figshare.com/articles/online_resource/supplementary_documents/14312894). The source of original data is from Taiwan Communication Survey (TCS) — The third time of the second period (2020/7/8) — SPSS File (note. 2019 data) (https://crctaiwan.dcat.nycu.edu.tw/AnnualSurvey.asp).

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References

Amazeen, M. A., C. J. Vargo, and T. Hopp. 2019. "Reinforcing Attitudes in a Gatewatching News era: Individual-Level Antecedents to Sharing Fact-Checks on Social Media." *Communication Monographs* 86 (1): 112–132. https://doi.org/10.1080/03637751.2018.1521984.

Carpenter, S. 2018. "Ten Steps in Scale Development and Reporting: A Guide for Researchers." *Communication Methods and Measures* 12 (1): 25–44. https://doi.org/10.1080/19312458.2017.1396583.

Chen, C.-C., and C.-C. Tao. 2020. "Partisan News Repertoire and Echo Chamber in High-Choice Media Environment." 2020 annual Conference of the Association for Education in Journalism and Mass Communication.

Colliander, J. 2019. "'This is Fake News': Investigating the Role of Conformity to Other Users' Views When Commenting on and Spreading Disinformation in Social Media." *Computers in Human Behavior* 97 (March): 202–215. https://doi.org/10.1016/j.chb.2019.03.032.

DiFonzo, N., J. Suls, J. W. Beckstead, M. J. Bourgeois, C. M. Homan, S. Brougher, A. J. Younge, and N. Terpstra-Schwab. 2014. "Network Structure Moderates Intergroup Differentiation of Stereotyped Rumors." *Social Cognition* 32 (5): 409–448. https://doi.org/10.1521/soco.2014.32.5.409.

Ditto, P. H., B. S. Liu, C. J. Clark, S. P. Wojcik, E. E. Chen, R. H. Grady, J. B. Celniker, and J. F. Zinger. 2018. "At Least Bias is Bipartisan: A Meta-Analytic Comparison of Partisan Bias in Liberals and Conservatives." *Perspectives on Psychological Science* 14 (2): 273–291. https://doi.org/10.1177/1745691617746796

Duffy, A., E. Tandoc, and R. Ling. 2020. "Too Good to be True, Too Good not to Share: The Social Utility of Fake News." *Information Communication and Society* 23 (13): 1965–1979. https://doi.org/10.1080/1369118X.2019.1623904.

Edgerly, S., R. R. Mourão, E. Thorson, and S. M. Tham. 2020. "When Do Audiences Verify? How Perceptions About Message and Source Influence Audience Verification of News Headlines." *Journalism and Mass Communication Quarterly* 97 (1): 52–71. https://doi.org/10.1177/1077699019864680.

Evans, J. S. B. T. 2008. "Dual-Processing Accounts of Reasoning, Judgment, and Social Cognition." *Annual Review of Psychology* 59 (1): 255–278. https://doi.org/10.1146/annurev.psych.59.103006.093629.

Garrett, R. K. 2017. "The "Echo Chamber" Distraction: Disinformation Campaigns are the Problem, not Audience Fragmentation." *Journal of Applied Research in Memory and Cognition* 6 (4): 370–376. https://doi.org/10.1016/j.jarmac.2017.09.011

Garrett, R. K., E. C. Nisbet, and E. K. Lynch. 2013. "Undermining the Corrective Effects of Media-Based Political Fact Checking? The Role of Contextual Cues and Naïve Theory." *Journal of Communication* 63 (4): 617–637. https://doi.org/10.1111/jcom.12038.

Guo, L., A. Rohde, J. & Wu, and H. D. 2020. "Who is Responsible for Twitter's Echo Chamber Problem? Evidence from 2016 U.S. Election Networks." *Information Communication and Society* 23 (2): 234–251. https://doi.org/10.1080/1369118X.2018.1499793.

Jacobson, S., E. Myung, and S. L. Johnson. 2016. "Open Media or Echo Chamber: The use of Links in Audience Discussions on the Facebook Pages of Partisan News Organizations." *Information Communication and Society* 19 (7): 875–891. https://doi.org/10.1080/1369118X.2015.1064461.

Kahneman, D. 2003. "A Perspective on Judgment and Choice: Mapping Bounded Rationality." *American Psychologist* 58 (9): 697–720. https://doi.org/10.1037/0003-066X.58.9.697.

Keprt, A., and V. Snášel. 2004. "Binary Factor Analysis with Help of Formal Concepts." *CEUR Workshop Proceedings* 110:90–101.

Knobloch-Westerwick, S., C. Mothes, and N. Polavin. 2017. "Confirmation Bias, Ingroup Bias, and Negativity Bias in Selective Exposure to Political Information." *Communication Research*, 1–21. https://doi.org/10.1177/0093650217719596.

Kononova, A., and M. Akbar. 2015. "Interpersonal Communication, Media Exposure, Opinion Leadership, and Perceived Credibility of News and Advertising During the December 2012 Parliamentary Election in Kuwait." *International Journal of Communication* 9:1206–1228.

Lo, V. H., R. Wei, and H. Y. Lu. 2017. "Issue Importance, Third-Person Effects of Protest News, and Participation in Taiwan's Sunflower Movement." *Journalism and Mass Communication Quarterly* 94 (3): 682–702. https://doi.org/10.1177/1077699016670122.

Margolin, D. B., A. Hannak, and I. Weber. 2018. "Political Fact-Checking on Twitter: When Do Corrections Have an Effect?" *Political Communication* 35 (2): 196–219. https://doi.org/10.1080/10584609.2017.1334018.

Mavridis, G. 2018. *Fake News and Social Media: How Greek Users Identify and Curb Misinformation Online*.

Messing, S., and S. J. Westwood. 2014. "Selective Exposure in the Age of Social Media: Endorsements Trump Partisan Source Affiliation When Selecting News Online." *Communication Research* 41 (8): 1042–1063. https://doi.org/10.1177/0093650212466406.

Metzger, M. J., A. J. Flanagin, and R. B. Medders. 2010. "Social and Heuristic Approaches to Credibility Evaluation Online." *Journal of Communication* 60 (3): 413–439. https://doi.org/10.1111/j.1460-2466.2010.01488.x.

Newman, N., R. Fletcher, A. Kalogeropoulos, D. A. L. Levy, and R. K. Nielsen. 2018. "Reuters Institute Digital News Report 2018." In *Reuters Institute Digital News*, edited by N. Newman, 8–30. Oxford, England: University of Oxford.

Neylan, J. 2021. "The Impact of Online Disinformation on Democracy in Taiwan." Proceedings of the 54th Hawaii International Conference on System Sciences, 2585–2593.

Pennycook, G., and D. G. Rand. 2019. "Lazy, not Biased: Susceptibility to Partisan Fake News is Better Explained by Lack of Reasoning Than by Motivated Reasoning." *Cognition* 188 (June): 39–50. https://doi.org/10.1016/j.cognition.2018.06.011.

Perdue, C.W., Dovidio, J.F., Gurtman, M.B. and Tyler, R.B. (1990). Us and Them: Social Categorization and the Process of Intergroup Bias. *Journal of Personality and Social Psychology*, *59*(3), 475–486. https://doi.org/10.1037/0022-3514.59.3.475 http://web.a.ebscohost.com.ezproxy.royalroads.ca/ehost/pdfviewer/pdfviewer?sid=02c5c4b5-cf7b-4eee-8865-6d353d67be6e%40sessionmgr4008&vid=1&hid=4107

Petty, E. R., and T. J. Cacioppo. 1986. "The Elaboration Likelihood Model of Persuasion." *Advances in Experimental Social Psychology* 19:163–205.

Postigo, H. 2016. "The Socio-Technical Architecture of Digital Labor: Converting Play Into YouTube Money." *New Media and Society* 18 (2): 332–349. https://doi.org/10.1177/1461444814541527.

Powell, T. E., H. G. Boomgaarden, K. DeSwert, and C. H. deVreese. 2019. "Framing Fast and Slow: A Dual Processing Account of Multimodal Framing Effects." *Media Psychology* 22 (4): 572–600. https://doi.org/10.1080/15213269.2018.1476891.

Revelle, W. 2020. psych: Procedures for Psychological, Psychometric, and Personality Research (Version 2.0.12) [R package]. Northwestern University. Retrieved from https://personality-project.org/r/psych/

Shin, J., L. Jian, K. Driscoll, and F. Bar. 2017. "Political Rumoring on Twitter During the 2012 US Presidential Election: Rumor Diffusion and Correction." *New Media and Society* 19 (8): 1214–1235. https://doi.org/10.1177/1461444816634054.

Shin, J., L. Jian, K. Driscoll, and F. F. Bar. 2018. "The Diffusion of Misinformation on Social Media: Temporal Pattern, Message, and Source." *Computers in Human Behavior* 83:278–287. https://doi.org/10.1016/j.chb.2018.02.008.

Shin, J., and K. Thorson. 2017. "Partisan Selective Sharing: The Biased Diffusion of Fact-Checking Messages on Social Media." *Journal of Communication* 67 (2): 233–255. https://doi.org/10.1111/jcom.12284.

Shmargad, Y., and S. Klar. 2019. "How Partisan Online Environments Shape Communication with Political Outgroups." *International Journal of Communication* 13:2287–2313. https://doi.org/10.1080/10584609.2012.762075.

Simon, H. A. 1955. "A Behavioral Model of Rational Choice." *The Quarterly Journal of Economics* 69 (1): 99–118. https://doi.org/10.2307/1884852

Tajfel, H. 1982. "Social Psychology of Intergroup Relations." *Annual Review of Psychology* 22 (1): 1–39. https://doi.org/10.1146/annurev.ps.33.020182.000245

Tandoc, E. C., Z. W. Lim, and R. Ling. 2017. "Defining "Fake News":A Typology of Scholarly Definitions." *Digital Journalism*, 1–17. https://doi.org/10.1080/21670811.2017.1360143.

Tandoc, E. C., R. Ling, O. Westlund, A. Duffy, D. Goh, and L. Z. Wei. 2018. "Audiences' Acts of Authentication in the age of Fake News: A Conceptual Framework." *New Media & Society* 20 (8): 2745–2763. https://doi.org/10.1177/1461444817731756.

Vargo, C. J., L. Guo, and M. A. Amazeen. 2018. "The Agenda-Setting Power of Fake News: A big Data Analysis of the Online Media Landscape from 2014 to 2016." *New Media and Society* 20 (5): 2028–2049. https://doi.org/10.1177/1461444817712086.

Waddell, T. F. 2020. "The Authentic (and Angry) Audience: How Comment Authenticity and Sentiment Impact News Evaluation." *Digital Journalism* 8 (2): 249–266. https://doi.org/10.1080/21670811.2018.1490656.

Walter, N., J. Cohen, R. L. Holbert, and Y. Morag. 2020. "Fact-Checking: A Meta-Analysis of What Works and for Whom." *Political Communication* 37 (3): 350–375. https://doi.org/10.1080/10584609.2019.1668894.

Wang, C. C., and C. Y. Chiang. 2019. "Analyzing Online Fake Business News Communication and the Influence on Stock Price : A Real Case in Taiwan." *Journal of Information Technology Applications and Management* 26 (December): 1–12.

Waruwu, B. K., E. C. Tandoc, A. Duffy, N. Kim, and R. Ling. 2020. "Telling Lies Together? Sharing News as a Form of Social Authentication." *New Media and Society*, 1–18. https://doi.org/10.1177/1461444820931017.

Williams, H. T. P., J. R. McMurray, T. Kurz, and F. H. Lambert. 2015. "Network Analysis Reveals Open Forums and Echo Chambers in Social Media Discussions of Climate Change." *Global Environmental Change-Human and Policy Dimensions* 32:126–138. https://doi.org/10.1016/j.gloenvcha.2015.03.006.

Woolley, S. C., and P. N. Howard. 2018. *Computational Propaganda: Political Parties, Politicians, and Political Manipulation on Social Media*. New York: Oxford University Press.

Wu, H. D., and L. Guo. 2017. "Beyond Salience Transmission: Linking Agenda Networks Between Media and Voters." *Communication Research*, 1–24. https://doi.org/10.1177/0093650217697765.

Zhang, L., J. Zhao, and K. Xu. 2016. "Who Creates Trends in Online Social Media: The Crowd or Opinion Leaders?" *Journal of Computer-Mediated Communication* 21 (1): 1–16. https://doi.org/10.1111/jcc4.12145.