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Interested in interacting with digital signage? Analysing the relevance of smartphone psychological ownership through an integrated qualitative comparative analysis

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Abstract

Objective: This study analyses the conditions that explain citizens' interest in interacting with interactive displays. To achieve this, it applies the psychological ownership theory within the framework of appropriation.

Methodology: A sample of 13,643 consumers aged between 18 and 59 years was analysed using an integrated QCA approach. After obtaining the QCA solutions, a regression analysis was performed based on the terms included in these solutions.

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Results: Interest in interacting with digital signage can be explained either by the perception of advertising digitalisation in out-of-home contexts or by the interaction between this perception and the psychological ownership consumers feel toward their smartphones. Conversely, the lack of interest is consistently explained by the interaction of negative perceptions of digital signage with an absence of psychological ownership.

Limitations: The study is based on a cross-sectional sample, limiting the ability to track the evolution of conditions and results over time. A longitudinal approach would provide valuable insights. Additionally, the use of large-N QCA limits the in-depth analysis of individual cases.

Practical implications: To boost investment in digital signage in certain markets, it is crucial to understand consumer perceptions. This study identifies two customer segments for targeted strategies: those motivated by the perception of out-of-home advertising digitalisation and those influenced by the interaction between this perception and smartphone-related psychological ownership. These highlight the opportunities generated by the application of augmented reality.

Keywords: digital signage; interactive displays; appropriation; psychological ownership; QCA

JEL codes: M31; M15; O33

1. Introduction

Technological innovations have transformed consumption patterns, introducing new products, services and markets (Benamar et al., 2020; Morewedge et al., 2021) and redefining how urban environments are perceived and experienced (Abdel-Aziz et al., 2016). Among these innovations are devices that serve as advertising platforms, driving interest in out-of-home advertising due to their ability to capture attention in a fragmented media landscape and their integration with smartphones (Roux et al., 2020; Roux & Maree, 2021; Wilson, 2024). Out-of-home advertising media is highly dynamic, facilitating the incorporation of digital technology through multiple formats (Wilson, 2023; Wilson et al., 2020).

Advertising displays have evolved from traditional formats to interactive platforms featuring touchscreens and smartphone connectivity, providing immersive experiences (Abdel-Aziz et al., 2016; Kirk et al., 2015; Mora et al., 2023). Digital screens in public spaces, often referred to as digital signage, broadcast a variety of content, including advertisements, entertainment and news (Nanni & Ordanni, 2024; Roux et al., 2020; Roux & Maree, 2021).

The potential of out-of-home media to influence audience behaviour is especially valuable given the challenge the advertising industry faces in engaging consumers (Mposi et al., 2025; Roux & Maree, 2021; Wilson et al., 2020). Digital signage enables more engaging advertising displays that effectively capture consumer attention. The persuasive and entertaining nature of out-of-home advertising generates a favourable perception among consumers (Wilson et al., 2020), and greater interest in processing their advertisements (Wilson, 2023). While these displays have the

potential to enhance interactions between individuals and their surroundings (Abdel-Aziz et al., 2016), their adoption faces significant challenges. Interactions with digital signage are often brief and sporadic, hampered by individuals' hesitation to engage with these displays in public spaces (Mora et al., 2023; Wilson, 2023, 2024; Ylipulli et al., 2014). As a result, this study explores the conditions that influence citizens' interest in interacting with digital signage, considering the socio-technical and emotional aspects of public interaction with digital displays, which often occur through smartphones (Mora et al., 2023).

Smartphones face challenges in their integration with digital signage in public spaces to enable meaningful, bidirectional interactions (Mora et al., 2023; Roux et al., 2020; Ylipulli et al., 2014). Psychological ownership theory offers a valuable explanatory framework (Morewedge et al., 2021), emphasising the sense of 'mine-ness' (ownership and appropriation) as a key factor in understanding consumer evaluations (Peck & Luangrath, 2023). Since psychological ownership impacts satisfaction and loyalty toward on-demand and personalised entertainment services (Kisfürjesi et al., 2025), it is recommended to investigate psychological ownership in the context of digital products and service consumption (Gupta & Sharma, 2024). This study addresses the existing gap in examining how consumers' psychological ownership influences their interest in interacting with digital signage. First, it is critical to investigate how technology-driven shifts in consumption affect consumers' sense of ownership (Morewedge et al., 2021). Second, it is necessary to deepen the understanding of theoretical frameworks that explain the use of digital signage (Wilson, 2024). This is all within a context in which out-of-home media has been poorly investigated (Wilson, 2023; Wilson et al., 2020).

This study adopts a technology appropriation model to explore consumers' interactions with digital displays (Abdel-Aziz et al., 2016; Ylipulli et al., 2014). Additionally, stemming from the interplay between technology appropriation and psychological ownership theory, this research incorporates the latter framework. Personalisation and the discovery of new uses for digital displays enable users to reinterpret technology and cultivate a sense of 'mine', a core element of psychological ownership. Psychological ownership plays a critical role in understanding technology adoption. Focusing on Spain, the study analyses a sample of 13,643 Spanish consumers aged 18-59. The sample size enables the application of an integrated Qualitative Comparative Analysis (QCA) approach, combining QCA solutions with regression analysis. It also allows answering the call to integrate different theories to respond to complex phenomena (Park et al., 2020), as well as applying multi-method approaches to achieve a faithful reflection of psychological ownership (Gupta & Sharma, 2024).

The findings reveal that interest in digital signage can be explained by both positive perceptions of digital advertising and the interaction of these perceptions with psychological ownership. Conversely, the lack of interest is consistently tied to the interaction of negative perceptions of out-of-home advertising digitalisation and dimensions of psychological ownership. Notably, while perceptions of digitalisation

are not a necessary condition, they are critical for both fostering and rejecting interest in interacting with digital signage.

The following sections outline the technology appropriation process as a framework for analysing digital signage adoption, introduce the psychological ownership theory and present the proposed model and propositions. The methodology, results, discussion and conclusions, including limitations and future research directions, are subsequently discussed.

2. Literature review

2.1. Technology adoption from the perspective of appropriation

The view of technology as an input that consumers either accept or reject is insufficient for understanding how they exploit its interactivity, flexibility and capacity to create value. The adoption of technology is a dynamic and complex process that requires moving beyond traditional acceptance models and focusing on consumers' usage experiences (Kirk et al., 2015; Ylipulli et al., 2014). This process, known as technological appropriation, describes how users integrate technology into their practices, making it an essential part of their daily lives (Benamar et al., 2020; Gkinko & Elbanna, 2023; Kirk et al., 2015; Ylipulli et al., 2014). Appropriation also highlights the active role of users in the consolidation and evolution of technology, moving beyond the view of consumers as passive subjects.

Furthermore, the appropriation of technology occurs in different phases or levels of evaluation. At the initial level, users make preliminary judgments during their first encounter with the technology, which can lead to rejection or further exploration, continuing the appropriation process. In the second phase, a deeper exploration of the technology may result in its definitive adoption, where users recognise its ability to meet specific needs, or in its disappropriation. Finally, at the third level of integration, users incorporate the technology into their daily practices in the long term. However, changes in user evaluation could lead to disappropriation (Gkinko & Elbanna, 2023). Thus, appropriation is a multifaceted concept that encompasses not only how technology is used but also how it is adopted and reinterpreted by users (Felicetti et al., 2024).

The process of appropriation also emphasises the negotiation between users and designers regarding how technology should be employed, revolving around customisation and interpretation. Customisation allows users to adapt technology to their specific needs, while interpretation involves discovering new meanings or applications for it (Felicetti et al., 2024). When technology is in use, individuals can redefine its functional purpose, personalise it and assign symbolic meanings to it to make it their own – or they may reject it altogether (Benamar et al., 2020; Gkinko & Elbanna, 2023; Kirk et al., 2015; Ylipulli et al., 2014). People not only shape technology,

but they are also shaped by these technologies through their interactions with them (Benamar et al., 2020; Ylipulli et al., 2014).

2.2. Psychological ownership

Psychological ownership refers to the meanings and emotions associated with the possession of an object, accompanied by the feeling that it is 'mine' or 'ours' (Kirk et al., 2015; Van Dyne & Pierce, 2004). The more a choice is felt to matter, the greater the psychological ownership attached to that choice (Chan, 2025). This concept arises from individuals' innate need to possess (Delgosha & Hajihezdari, 2021). It reflects an emotional bond between consumers and the goods or services they use, creating such a close connection that they perceive these as extensions of themselves (Delgosha & Hajihezdari, 2021; Kirk et al., 2015; Morewedge et al., 2021; Van Dyne & Pierce, 2004). Psychological ownership plays an instrumental role in adoption and post-adoption processes by (1) motivating users to consider attributes beyond cost-benefit evaluations and (2) strengthening the user-object relationship by satisfying basic needs (Delgosha & Hajihezdari, 2021).

Psychological ownership emerges when individuals identify an object as being relevant to achieving meaningful outcomes, perceiving it as something important in their lives (Delgosha & Hajihezdari, 2021; Pirkkalainen et al., 2018; Ştir & Zaiţ, 2022), and which develops over time (Chan, 2025). More specifically, its origins are linked to four fundamental human needs that act as motivators or roots: (1) efficacy and effectiveness, (2) self-identity, (3) having a place (related to a sense of belonging), and (4) stimulation and activation (Chen et al. 2021; Danckerts & Kenning, 2019; Li et al., 2024). Efficacy and effectiveness relate to an individual's desire to feel competent and capable in their environment. Self-identity involves possession as a symbolic expression of self, allowing people to create and communicate their identity. Having a place reflects an individual's need for a familiar space, a preferred location and a fixed point of reference around which they build their daily activities. Lastly, stimulation and activation represent the extent to which possessions generate excitement or arousal (Danckerts & Kenning, 2019).

Three interrelated routes lead to psychological ownership: (1) having a sense of control or efficacy over the object, (2) gaining in-depth knowledge about it, and (3) investing time and energy in it (Chen et al., 2021; Delgosha & Hajihezdari, 2021; Kirk et al., 2015; Morewedge et al., 2021). Perceived control, defined as the subjective belief that one can influence their environment and freely use objects, establishes a connection that fosters psychological ownership (Kisfürjesi et al., 2025; Paraman et al., 2024). While consumers may experience this type of ownership toward both material and intangible objects (Delgosha & Hajihezdari, 2021; Pirkkalainen et al., 2018; Ştir & Zaiţ, 2022; Van Dyne & Pierce, 2004), digital products present unique challenges due to their reduced tangibility and lower perceived control (Danckerts & Kenning, 2019).

2.3. Proposed model and justification of propositions

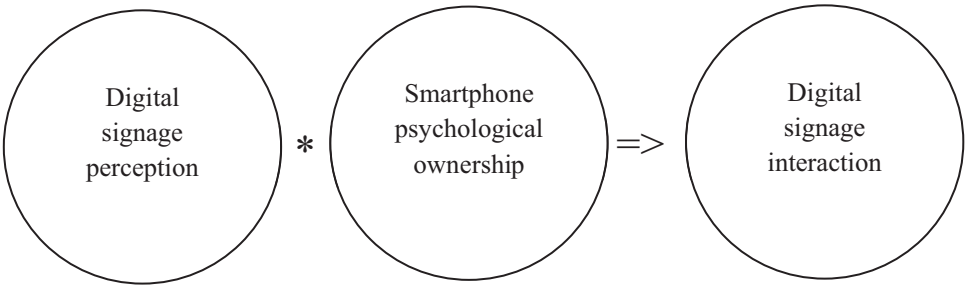
Ylipulli et al. (2014) developed a model for the process of adopting technologies in public spaces across three levels. The first level acts as a filter that may prevent technology adoption. At the second level, users are prepared to actively test the technology, potentially leading to its appropriation or disappropriation. Finally, the third level incorporates sociocultural factors that influence the appropriation process, either facilitating or hindering adoption. The model is adapted to emphasise two key levels: the first, which acts as a filter for technology use, and the second, which integrates the psychological ownership consumers develop toward their smartphones and how this affects their interest in interacting with digital signage (Figure 1).

Out-of-home advertising is an effective and innovative strategy for subtly influencing audience behaviour (Wilson et al., 2020). The interactive and personalised nature of such media captures users' interest and shapes behaviour by mediating motivational factors and user experience. In the context of digital out-of-home advertising, interaction refers to users' expectations regarding the accessibility of content through menus and touchscreens (Mposi et al., 2025). Whether users find digital display content interesting determines the extent of their attention, with interest encompassing dimensions such as engaging and informative. In fact, interest is considered a third critical dimension that drives attention to digital display content (Wilson, 2023). Therefore, this study investigates users' interest, or lack thereof, in interacting with digital signage.

The theory of psychological ownership assumes that the feeling of ownership is shaped by both individual and contextual factors and influences behaviour by reinforcing identification with the owned object, potentially making it an extension of one's identity (Pirkkalainen et al., 2018; Van Dyne & Pierce, 2004). This concept plays a central role in brand content engagement and consumer interaction with digital services (Kisfürjesi et al., 2025). Perceived psychological ownership encourages individuals to explore and exploit possessions more actively, as they become meaningful reference points that guide behaviour (Delgosha & Hajihezdari, 2021).

For firms, psychological ownership is a key intangible asset due to its impact on consumer behaviour (Gupta & Sharma, 2024). It satisfies consumers' emotional and

Figure 1. Proposed model



Source: Own elaboration.

social needs, shaping their perceptions, attitudes and behavioural intentions (Chan, 2025; Danckerts & Kenning, 2019; Delgosha & Hajihezdari, 2021; Li et al., 2024; Morewedge et al., 2021; Paraman et al., 2024; Pirkkalainen et al., 2018; Ştir & Zaiţ, 2022). Beyond increasing perceived value, psychological ownership also mediates emotional attachment through affective reactions, deepening the user-object connection.

Building an emotional and psychological bond with technology can be decisive in overcoming initial resistance to interactive displays in urban environments. In the digital realm, users may feel ownership not only toward the device itself but also toward the digital products accessed through it (Danckerts & Kenning, 2019). Features like touchscreens, for instance, can increase the sense of control and psychological ownership, as well as attachment to electronic devices (Li et al., 2024; Paraman et al., 2024; Peck & Luangrath, 2023). Psychological ownership depends not only on prolonged use or control but also on tangible and perceptual interactions that strengthen the emotional connection to an object. In this sense, tactile feedback during interactions through mobile devices can increase both the sense of psychological ownership and attachment to them (Paraman et al., 2024). Simply touching an image of an object can lead to a positive evaluation if the experience creates a sense of ownership (Ştir & Zaiţ, 2022). Positive perceptions associated with digital signage tend to lead to stronger behavioural responses (Roux et al., 2020).

Moreover, the more individuals rely on a source of information, the more trustworthy they perceive it to be. Consequently, users who are more dependent on their smartphones perceive them as more reliable and may transfer that trust to the advertisements received through them via the halo effect (Stewart & Perren, 2023). According to Lee (2020), smartphone users engaged in multi-screening tend to value the informativeness of mobile advertising more highly, fostering favourable attitudes toward this content. This suggests that users with more intensive technological usage and multitasking habits are more inclined to adopt technologies such as digital signage, further reinforcing their emotional connection and positive perceptions. Given that psychological ownership plays a key role in the adoption and use of digital signage – and mediates behavioural perceptions linked to app-based services –, the following propositions are proposed:

Proposition 1. The perception of digital signage and psychological ownership of smartphones interact to explain interest in engaging with digital signage.
Proposition 2. The perception of digital signage and psychological ownership of smartphones interact to explain the lack of interest in engaging with digital signage.

3. Methodology

3.1. Sample and data collection

The Asociación para la Investigación de los Medios de Comunicación (AIMC, 2024) has been monitoring internet use in Spain since 1996. In its 26th edition, the

fieldwork was conducted between 17 October and 11 December 2023, yielding 18,902 valid responses. From these, 13,643 cases were selected, comprising individuals aged between 18 and 59. Of the sample, 65% were male and 35% female. In terms of age distribution, 13% were aged 18-29, 33% were aged 30-44 and 54% were aged 45-59. All conditions and the outcome were measured on a 5-point scale, as detailed in Table 1.

Table 1. Outcome and conditions included in the model

Outcome/Condition	Description (Acronym)
Interact	To what extent do you find it interesting to interact with these types of digital displays (e.g., touchscreen, using a smartphone)? (INTDISP)
Perception displays	Advertising on billboards, street furniture, urban areas, etc., is undergoing a digitisation process (from paper to screens). How would you rate this process? (DIGDISP)
	I prefer outdoor advertising (on the street, in shopping malls, etc.) when viewed on digital screens (LIKDISP)
Smartphone psychological ownership	I couldn't live without internet on my mobile phone (LIVMOV)
	My mobile phone is sufficient for everything I want to do on the internet (ALLMOV)

Source: Own elaboration.

3.2. Method

QCA is an analytical technique based on set theory that employs Boolean algebra to systematically reduce complexity (Meuer & Rupietta, 2017a). QCA is characterised by its epistemological foundations, addressing causal complexity, which differentiates between necessary and sufficient conditions (López-Cabarcos et al., 2024). Through conjunctural causation, it establishes how different conditions interact, with the effect of one condition often depending on its combination with others. QCA allows the identification of asymmetric causal relationships, requiring distinct explanations for a result and its negation, and accounts for equifinality, wherein different combinations of conditions can explain the same phenomenon. Thus, QCA identifies complex interactions and manages equifinality by focusing on the 'causes of effects' (Meuer & Rupietta, 2017a; Oana et al., 2021).

Systematically combining qualitative and quantitative approaches offers potential for better understanding phenomena (Meuer & Rupietta, 2017a). Mixed methods systematically integrate different research approaches under the premise that they provide contributions exceeding those of individual methods, create stronger inferences and simultaneously test theories within a single study (Meuer & Rupietta, 2017b). Sometimes, QCA is used initially, and its results are incorporated as variables in statistical analyses. This integration is useful for quantifying QCA's qualitative results, assessing the representativeness of QCA's complete solution, and strengthening the predictive power of theories (Meuer & Rupietta, 2017a).

While QCA was developed for use in small-sample studies (small-N QCA), it can also be applied to large-sample studies (large-N QCA) (Thomann et al., 2018). In large-N QCA, a condition-oriented approach is preferred. Although it does not benefit from insights gained through intimacy with individual cases, it offers several advantages (Thomann & Maggetti, 2020). Condition-oriented QCA focuses on cross-case comparisons, conceptual knowledge of case types and the robustness and reliability of QCA solutions; and it is often applied in combination with statistical techniques that demonstrate the validity and robustness of cross-case inferences (Thomann et al., 2022). QCA can handle thousands of cases. In fact, from a theoretical perspective, the sample size is not limited by methodological constraints (Greckhamer et al., 2013). Supporting large-N QCA with complementary statistical techniques establishes the validity and robustness of cross-case inferences while offering opportunities for new contributions by focusing interpretation on configurations (Meuer & Rupietta, 2017a; Meuer & Rupietta, 2017b; Misangyi et al., 2017; Thomann et al., 2022; Thomann & Maggetti, 2020). The application of QCA involves the development of different steps before calibration (theoretical fit, research design, measurement and calibration), during the analysis (need and sufficiency analysis) and after the analysis (robustness and relationship of the cases with the theory) (Oana et al., 2021).

To confirm the suitability of applying QCA, a contrarian case analysis was conducted. As shown in Table 2, numerous cases would remain unexplained by main effects, demonstrating the appropriateness of using QCA.

Subsequently, a descriptive analysis of the conditions and the outcome included in the model was conducted, showing homogeneous behaviour across them (Table 3).

Table 2. Contrarian case analysis

		INTDISP				
		1	2	3	4	5
DIGDISP	1	902 (7%)	358 (3%)	0 (0%)	151 (1%)	81 (1%)
	2	1,323 (10%)	3,417 (25%)	0 (0%)	1,293 (9%)	310 (2%)
	3	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	4	310 (2%)	797 (6%)	0 (0%)	1,701 (12%)	547 (4%)
	5	160 (1%)	303 (2%)	0 (0%)	449 (3%)	1,541 (11%)
LIKDISP	1	1,035 (8%)	721 (5%)	0 (0%)	409 (3%)	258 (2%)
	2	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	3	1,008 (7%)	2,701 (20%)	0 (0%)	1,636 (12%)	779 (6%)
	4	352 (3%)	954 (7%)	0 (0%)	1,121 (8%)	614 (5%)
	5	300 (2%)	499 (4%)	0 (0%)	428 (3%)	828 (6%)

(*continued*)

Table 2. Contrarian case analysis (*continued*)

		INTDISP				
		1	2	3	4	5
LIVMOV	1	740 (5%)	970 (7%)	0 (0%)	545 (4%)	356 (3%)
	2	663 (5%)	1,427 (10%)	0 (0%)	792 (6%)	408 (3%)
	3	631 (5%)	1,273 (9%)	0 (0%)	1,149 (8%)	540 (4%)
	4	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	5	661 (2%)	1,205 (9%)	0 (0%)	1,108 (8%)	1,175 (9%)
ALLMOV	1	1,020 (7%)	1,162 (9%)	0 (0%)	750 (5%)	505 (4%)
	2	675 (5%)	1,511 (11%)	0 (0%)	941 (7%)	532 (4%)
	3	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	4	630 (5%)	1,440 (11%)	0 (0%)	1,286 (9%)	694 (5%)
	5	370 (3%)	762 (6%)	0 (0%)	617 (5%)	748 (5%)
Phi <0.001; Cramer's V<0.001; Gamma <0.001; Kendall's Tau-b<0.001						

Source: Own elaboration.

Table 3. Descriptive statistics

	Mean	Median	Standard deviation	Skewness	Standard error skewness	Kurtosis	Standard error kurtosis
INTDISP	3.320	3.000	1.184	-0.371	0.021	-0.522	0.042
DIGDISP	3.450	3.000	1.005	-0.200	0.021	-0.040	0.042
LIKDISP	3.260	3.000	1.087	-0.220	0.021	-0.241	0.042
LIVMOV	3.590	4.000	1.254	-0.563	0.021	-0.666	0.042
ALLMOV	3.310	3.000	1.216	-0.332	0.021	-0.793	0.042

Source: Own elaboration.

The conditions and outcome were then calibrated, with thresholds of 5 for full inclusion, 3 for maximum ambiguity and 1 for full exclusion. The aim was therefore to maintain the greatest variability existing in the measurement of conditions and results. Additionally, ambiguous cases were adjusted by subtracting 0.01. This was intended to prevent cases with an intermediate rating on the Likert scale from being calibrated with a membership that would signify belonging to the corresponding set. The skewness check revealed that all conditions and outcomes were within acceptable thresholds (e.g., INTDISP=44.51%; DIGDISP=42.57%; LIVMOV=56.75%; ALLMOV=47.99%; LIKDISP=37.35%).

4. Results

4.1. Identification of necessary conditions

For a condition to be considered necessary, it must have a consistency greater than 0.9 and a relevance of necessity (RoN) value greater than 0.5. There is no strict threshold for coverage (Oana et al., 2021). As shown in Table 4, no single condition met the thresholds required to be considered necessary.

Similarly, the analysis of super-subsets revealed that while some subsets exceeded the required thresholds (Table 5), they lacked theoretical justification and were thus not considered necessary conditions.

Table 4. Analysis of necessity INTDISP/~INTDISP

	Consistency	Coverage	RoN
DIGDISP	0.882/0.743	0.841/0.502	0.798/0.558
LIKDISP	0.781/0.721	0.807/0.527	0.798/0.617
LIVMOV	0.804/0.769	0.729/0.493	0.668/0.519
ALLMOV	0.749/0.719	0.754/0.513	0.746/0.596
~DIGDISP	0.477/0.765	0.724/0.821	0.852/0.899
~LIKDISP	0.542/0.736	0.733/0.704	0.831/0.816
~LIVMOV	0.440/0.577	0.729/0.676	0.871/0.849
~ALLMOV	0.516/0.656	0.722/0.649	0.833/0.798

RoN=Relevance of necessity.
The tilde '~' denotes the logical operator NOT.

Source: Own elaboration.

Table 5. Necessary super-subsets

Outcome	Conditions	Consistency	RoN	Coverage
INTDISP	DIGDISP+~LIVMOV	0.910	0.663	0.772
	DIGDISP+~ALLMOV	0.916	0.639	0.762
	DIGDISP+~LIKDISP	0.912	0.644	0.763
	DIGDISP+LIKDISP	0.935	0.657	0.779
~INTDISP	~DIGDISP+~LIVMOV+~ALLMOV	0.903	0.633	0.619
	~DIGDISP+~LIVMOV+~LIKDISP	0.909	0.647	0.631
	~DIGDISP+~ALLMOV+~LIKDISP	0.923	0.617	0.618

(*continued*)

Table 5. Necessary super-subsets (*continued*)

Outcome	Conditions	Consistency	RoN	Coverage

RoN=Relevance of necessity.
The addition symbol '+' stands for the logical operator OR and the tilde '~' stands for the logical operator NOT.

Source: Own elaboration.

4.2. Identification of sufficient conditions

To identify sufficient conditions, a truth table was created, requiring a consistency of 0.9 and at least 500 cases per configuration. To establish the required consistency level, it was taken into account that, when using large-N QCA, consistency levels higher than 0.8 are recommended. Likewise, the trade-off between the analysis potential and the inclusion of rare configurations, while maintaining a relevant number of cases, was taken into account when considering the number of required cases (Greckhamer et al., 2013). To obtain the intermediate solution, the directional expectation of ALLMOV's presence was included (and its negation for the outcome negation). Following Fiss's (2011) approach, core and peripheral conditions were distinguished based on their presence in parsimonious and intermediate solutions or exclusively in intermediate ones. The concepts of causal core and periphery enable the identification of essential or fundamental conditions as opposed to those of lesser importance or even irrelevant ones, thereby facilitating comparisons between configurations (Fiss, 2011; Meuer & Rupietta, 2017b; Rubinson, 2019).

Three main parameters are used to assess sufficient conditions, or the terms they comprise. Consistency numerically expresses how closely the sufficiency relationship between a condition and the outcome conforms to a set theory pattern. Proportional reduction in inconsistency (PRI) reflects whether a condition explains both an outcome and its negation, with PRI values below 0.5 being considered insufficient. Coverage reflects the empirical relevance of a solution, in terms of how much of the outcome can be explained by a sufficient condition (Oana et al., 2021). The intermediate solution explaining interest in interacting with digital signage achieved high parameters (consistency=0.875; PRI=0.776; coverage=0.800) through two terms. The first term comprised two core conditions (DIGDISP*LIKDISP), while the second combined DIGDISP and ALLMOV as core conditions with LIVMOV as peripheral. Both terms demonstrated high performance metrics (Table 6).

The intermediate solution explaining the negation of interest in interacting with digital signage also demonstrates high parameters (consistency=0.881; PRI=0.657; coverage=0.581) and comprises three terms, formed by the combination of the negation of three conditions. In the first term, the combination of two core conditions (~DIGDISP*~ALLMOV) is joined by ~LIVMOV. In the second and third terms, ~DIGDISP as a core condition is combined with ~LIKDISP as a peripheral condition, along with a core condition that is either ~LIVMOV in the second term or ~ALLMOV in the third term.

Table 6. Intermediate solutions

	INTDIG		~INTDIG		
	Term 1	Term 2	Term 1	Term 2	Term 3
DIGDISP	●	●	◯	◯	◯
LIKDISP	●			○	○
LIVMOV		•	○	◯	
ALLMOV		●	◯		◯
Consistency	0.892	0.898	0.914	0.913	0.902
PRI	0.796	0.799	0.689	0.692	0.679
Raw coverage	0.728	0.607	0.419	0.430	0.476
Unique coverage	0.192	0.072	0.047	0.058	0.104
Solution consistency		0.875			0.881
Solution PRI		0.776			0.657
Solution coverage		0.800			0.581
PRI=Proportional reduction of inconsistency					

Source: Own elaboration.

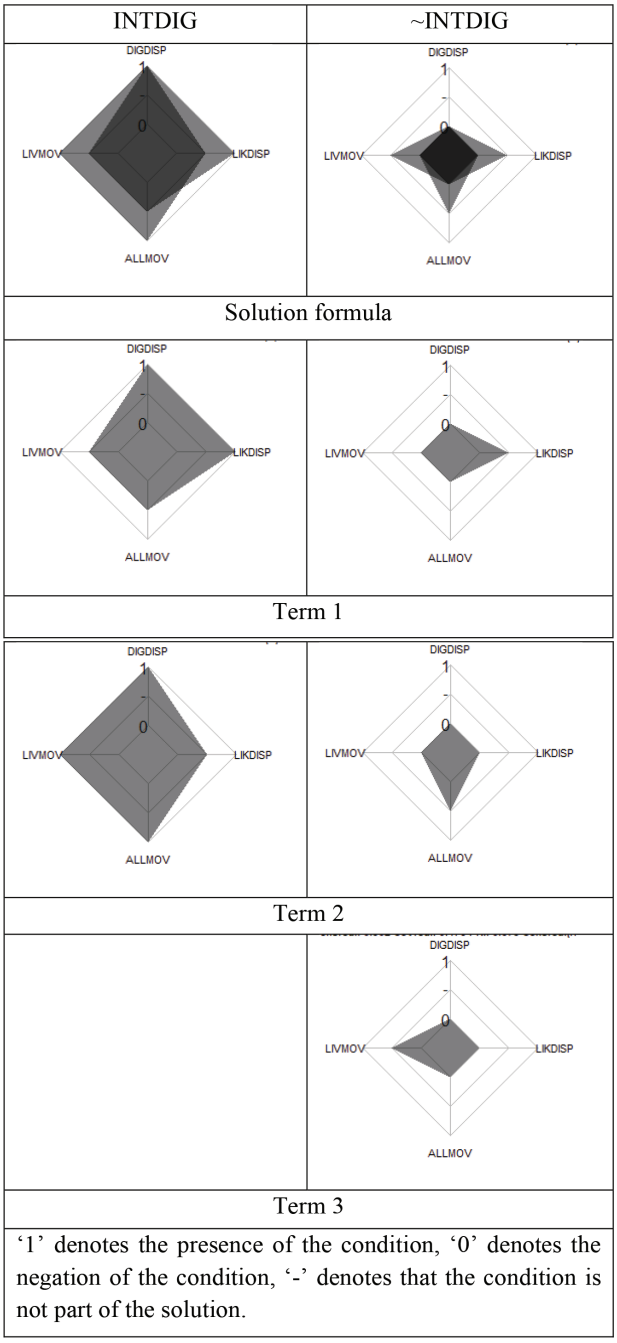
To facilitate the interpretation of intermediate solutions, they are also presented in the form of a radar chart, a method developed by Meuer et al. (2015) to visualise QCA configurations (Rubinson, 2019). This presentation (Figure 2) highlights the different sufficient conjunctions through their size and shape, making it a particularly interesting approach for evaluating diverse profiles (Oana et al., 2021).

4.3. Robustness of results

Given the importance of error management in applying large-N QCA, traditional fit parameters were complemented with robustness analysis of the results (Thomann et al., 2018). First, the Braumoeller (2015) test was conducted to detect the presence of false positives. Since none of the terms' consistency fell within the generated confidence interval, the existence of false positives can be ruled out (Table 7).

To further assess the robustness of intermediate solutions, the robustness test suggested by Oana and Schneider (2024) was used, which is more suitable for larger sample sizes and less familiarity with the cases. Three alternative models were generated by modifying the requirements of consistency for sufficiency to 0.85 and the minimum number of cases to 250. The robustness fit results are very high both

Figure 2. Radar chart of intermediate solutions



Source: Own elaboration.

Table 7. Robustness of the parsimonious solution

Outcome	Term	Consistency	PRI	Coverage	Unique coverage	Confidence interval	p-val-adj
INTDISP	DIGDISP* ALLMOV	0.884	0.783	0.687	0.091	[0.771, 0.782]	0.013
	DIGDISP* LIKDISP	0.892	0.796	0.728	0.132	[0.775, 0.786]	0.017
	Model	0.869	0.769	0.819	-	-	-
~INTDISP	~DIGDISP* ~ALLMOV	0.874	0.636	0.547	0.128	[0.702, 0.720]	0.013
	~DIGDISP* ~LIVMOV	0.884	0.646	0.500	0.081	[0.709, 0.727]	0.017
	Model	0.856	0.618	0.628	-	-	-

PRI=Proportional reduction of inconsistency; p-val-adj=p value adjusted.
The multiplication symbol '*' denotes the logical operator AND.

Source: Own elaboration.

for explaining interest in interacting with digital signage (RF_cov=1; RF_cons=1; RF_SC_minTS=0.946; RF_SC_maxTS=0.685) and for its negation (RF_cov=1; RF_cons=1; RF_SC_minTS=1; RF_SC_maxTS=0.75). In terms of the robustness case, values are acceptable for explaining interest in interaction (RCR_typ=0.704; RCR_dev=0.524; RCC_Rank=2) and slightly lower for the negation of interaction interest, especially for deviant cases (RCR_typ=0.561; RCR_dev=0.185; RCC_Rank=2).

Additionally, to determine the applicability of results to all sample cases, a cluster analysis was conducted, using prior interaction with digital signage as a criterion for cluster establishment. The observed distance values (Oana et al., 2021) ruled out significant discrepancies in the behaviour of solutions based on whether consumers had previously interacted with digital screens for both INTDISP (Term1=0.036; Term2=0.036) and ~INTDISP (Term1=0.027; Term2=0.027; Term3=0.032).

4.4. Theory testing

Large-N QCA studies are suitable for evaluating theoretical propositions, offering insights into the components of a theory that are supported by empirical findings, areas requiring theoretical expansion and aspects that may need to be excluded (Schneider & Wageman, 2012). QCA is increasingly used to evaluate expectations derived from theory; thus, theory-evaluating QCA formulates concrete set-theoretic expectations in propositions (Thomann et al., 2022). A study grounded in a large-N approach facilitates the development of new hypotheses or theories for future exploration. This study applied theory evaluation based on Thomann et al. (2018).

The intersection between theory and empirical solutions represents the overlap where the theory is supported by evidence. This intersection demonstrates optimal parameters (consistency=0.926; PRI=0.839; coverage=0.536) (Table 8), indicating strong alignment between theory and results. A second area highlights overlaps between empirical findings and cases not anticipated by theory, suggesting an expansion of existing theory. This area comprises configurations where some conditions in the solution are negated (consistency=0.885; PRI=0.746; coverage=0.626). This space includes terms in which one of the conditions is denied, a situation not contemplated in the initial version of the theory used. No cases explained by theory are excluded from the solution, eliminating the need for theory delimitation. Situations not explained by either theory or findings indicate configurations that are insufficient for results (consistency=0.724; PRI=0.438; coverage=0.575). Lastly, the interaction between situations not explained by either theory or findings indicates configurations that are insufficient for the results.

4.5. Integrated analysis

QCA terms were integrated into the regression analysis to assess the relative importance of each term and include control variables (Fiss et al., 2013; Meuer et al., 2015; Meuer & Rupietta, 2017b). In the analysis, the terms that make up each of the explanations are taken as independent variables (2 in the case of INT and 3 for ~INT), taking the membership score of each case as a value in said terms. Since in none of the developed models the condition index is above 30, the possibility of the existence of collinearity (INT) or multicollinearity (~INT) was ruled out; in fact, only one term in each model reaches a proportion higher than 0.9 (0.97 Term 2 INT for dimension 2 and 0.96 Term 3 ~INT in dimension 3).

The regression analysis for terms explaining INT showed both terms as significant, with a greater weight for Term 1 (Table 9). Including prior interaction with the screens improved the model's fit, as indicated by an increase in adjusted R^2, though the terms' impact remained largely unchanged.

Table 8. Theory-testing analysis

	Theory	~Theory
Model	DIGDISP*LIVMOV* ALLMOV*LIKDISP	DIGDISP*~LIVMOV*LIKDISP + DIGDISP*~ALLMOV*LIKDISP + DIGDISP*LIVMOV*ALLMOV*~LIKDISP
~Model	-	~DIGDISP + ~LIVMOV*~LIKDISP + ~ALLMOV*~LIKDISP

Model: DIGDISP*LIKDISP + DIGDISP*LIVMOV*ALLMOV (consistency=0.875; PRI=0.776; coverage=0.800).
Theory: DIGDISP*LIKDISP*LIVMOV*ALLMOV (consistency=0.926; PRI=0.839; coverage=0.536).

Source: Own elaboration.

Table 9. Regression analysis for INT terms

	Model[1]	Model[2]
Term 1	0.366**	0.343**
Term 2	0.196**	0.175**

[1] Adjusted R^2=0.225
[2] Adjusted R^2=0.275

Source: Own elaboration.

Table 10. Regression analysis for ~INT terms

	Model[1]	Model[2]
Term 1	0.084**	0.089**
Term 2	0.133**	0.117**
Term 3	0.229**	0.201**

[1] Adjusted R^2=0.181
[2] Adjusted R^2=0.234

Source: Own elaboration.

The regression analysis for terms explaining ~INT showed all three terms as significant, with improved model fit when the control variable was included (Table 10). The highest weight corresponded to Term 3, followed by Term 2, with Term 1 having the smallest impact.

5. Discussion

The findings reveal that there are no necessary conditions for citizens to express interest – or lack thereof – in interacting with digital displays. This result contrasts with Ylipulli et al. (2014), who suggest that specific conditions act as filters in the process of technological appropriation. However, if such conditions exist in the case of digital displays, they are not reflected in the conditions included in this model.

When the analysis focuses on the conditions that explain interest in interacting with digital signage, a positive perception of the digitalisation process in advertising emerges as a core condition, considered an essential causal factor (Fiss, 2011; Meuer & Rupietta, 2017b; Rubinson, 2019). This perception is complemented, in the first term, with a preference for out-of-home advertising viewed on digital screens, reflecting a favourable attitude toward interactive visual media. In the second term, this is joined by the perception that smartphones allow users to accomplish everything they need online and their emotional dependence on these devices, as evidenced by statements like 'I couldn't live without my smartphone'. Consequently, in

this second term, the interaction between psychological ownership and perceptions of digital displays is a determinant of interest in interacting with these technologies.

However, integrated QCA analysis indicates that the first term, which does not include dimensions linked to psychological ownership, has a greater impact on the interest in interacting with digital displays. This finding suggests that, in the context of digital products, fostering digital ownership may be more complex due to specific characteristics of such products, such as their lower tangibility and perceived difficulty of personalisation (Paraman et al., 2021).

On the other hand, the lack of interest in interacting with digital displays is explained through three terms, all of which share the negation of a positive perception of the digitalisation process in out-of-home advertising as a core condition. In these terms, this condition is combined with the negation of two conditions (at least one related to psychological ownership). This underscores the instrumental role of psychological ownership in technological adoption and post-adoption processes (Delgosha & Hajihezdari, 2021).

In the first term, the negation of a positive perception of digital displays is accompanied by the negation of both dimensions through which psychological ownership is assessed. In the second and third terms, this is combined with the negation of a liking for the digitalisation process as a peripheral condition. Additionally, the second term includes the negation of emotional dependence on smartphones, while the third term includes the negation of the perception that smartphones allow users to accomplish everything they want through the Internet. Thus, the lack of interest in interactive displays involves a combination of negative perceptions of the displays and the negation of dimensions related to psychological ownership. These findings confirm that psychological ownership influences attitudes and behaviours by shaping perceptions of the factors that determine behavioural intention (Pirkkalainen et al., 2018; Van Dyne & Pierce, 2004).

From the perspective of technological appropriation theory, these results reinforce the notion that adopting digital technologies is not a passive process but a dynamic one (Kirk et al., 2015; Ylipulli et al., 2014) influenced by multiple individual, social and contextual factors (Benamar et al., 2020). The model proposed by Benamar et al. (2020), which identifies phases such as exploration and use construction, can help explain why positive perceptions of digital displays and favourable attitudes toward smartphones are crucial in fostering interaction interest. Likewise, rejection of these technologies could be interpreted as a form of disappropriation, where users fail to establish an emotional or functional connection with the device (Gkinko & Elbanna, 2023).

In conclusion, these findings support Proposition 2, which posits that the negation of digital signage perceptions and psychological ownership toward smartphones interact to explain the lack of interest in digital signage. However, the results do not support Proposition 1, which may reflect inherent difficulties in creating ownership bonds with digital products like interactive displays. These findings also highlight the importance of designing technologies that facilitate symbolic and functional appropriation, enabling users to meaningfully integrate these technologies into their daily routines and practices.

6. Conclusions, contributions, limitations and future directions

6.1. Conclusions

This study was conducted to identify the conditions that explain interest in interacting with digital signage. Addressing a gap in the literature, it drew upon the theoretical framework of psychological ownership. The findings confirm that perceptions of digital signage can interact with psychological ownership to encourage its use. In contrast, the absence of interest in digital signage is consistently explained by the interaction between its perception and psychological ownership. In this sense, the technological appropriation approach demonstrates that it is possible to model digital signage use through meaningful interactions between users and the technology via their smartphones.

6.2. Contributions

The theoretical contributions of this work include identifying instances where consumers may feel interested in digital signage regardless of psychological ownership of their smartphones. Additionally, the results show that the explanatory factors for interaction interest do not necessarily depend on prior user experience with digital signage, suggesting that this interest could develop in early exposure stages.

Methodologically, this research showcases the potential of the integrated QCA approach for analysing complex phenomena. QCA benefits from its epistemological foundations. First, asymmetry reveals that interest in interaction and its negation require differentiated explanations beyond merely inverting the valence of explanatory conditions. For instance, while interest in digital signage is explained by two terms, its negation comprises three (reflecting equifinality). Second, conjunctural causation illustrates how the effects of conditions depend on their interaction with others. Finally, QCA allows differentiation between necessary and sufficient conditions. However, the presence of a positive perception of advertising digitalisation in explaining interest (and its negation in explaining disinterest) cannot be considered a necessary condition since it represents a 'false necessity'. Complementing QCA with regression analysis, enabled by applying the analyses to a large-N sample, allowed for deeper insights into which terms have the greatest impact on the analysed outcome.

From a management standpoint, the study identifies two pathways with distinct consumer profiles that can inform targeted digital signage strategies. The first group shows interest in digital signage due to a positive perception of digitalisation processes. These consumers are receptive to technology and represent an ideal audience for both commercial and informational campaigns. For this segment, companies should prioritise content-focused digital signage, focusing on informative, engaging and visually appealing displays that leverage the consumer's openness to digital experience to foster

engagement and brand affinity. The second group demonstrates high psychological ownership of their smartphones, making them more likely to engage in interactive and personalised experiences with digital signage. For this profile, managers should consider strategies that integrate digital signage with mobile technologies, enabling two-way interactions. In particular, the integration of augmented reality features presents an interesting opportunity. Incorporating augmented reality through dedicated apps or mobile-linked signage can enhance the sense of control and personalisation. This can strengthen consumer attachment and increase the effectiveness of the campaign.

6.3. Limitations and future directions of research

The primary limitations of this study include its reliance on a cross-sectional sample, which limits the ability to assess the temporal evolution of the conditions being investigated. Additionally, the use of a large-N QCA approach reduces the depth of insight into individual cases. Another limitation is the exclusion of variables related to user satisfaction, a key construct in technology acceptance and adoption. Including this variable in future research could provide valuable insights into how satisfaction with digital signage influences users' interest in interacting with it. Finally, it would be valuable to explore how cultural or broader demographic contexts influence these relationships.

References

Abdel-Aziz, A. A., Abdel-Salam, H., & El-Sayad, Z. (2016). The role of ICTs in creating the new social public place of the digital era. *Alexandra Engineering Journal*, *55*, 487-493. https://doi.org/10.1016/j.aej.2015.12.019

Asociación para la Investigación de los Medios de Comunicación (AIMC). (2024). *26ª Encuesta AIMC a Usuarios de Internet - Navegantes en la Red*. https://www.aimc.es/a1mc-c0nt3nt/uploads/2024/03/Navegantes2023.pdf

Benamar, L., Balagué, C., & Zhong, Z. (2020). Internet of Things devices appropriation process: The Dynamic Interactions Value Appropriation (DIVA) framework. *Technovation*, *89*, 102082. https://doi.org/10.1016/j.technovation.2019.06.001

Braumoeller, B. F. (2015). Guarding Against False Positives in Qualitative Comparative Analysis. *Political Analysis*, *23*, 471-487. https://doi.org/10.1093/pan/mpv017

Chan, E. Y. (2025). Choice, Psychological Ownership, and Option Valuation. *Psychology & Marketing*, *42*, 767-779. https://doi.org/10.1002/mar.22150

Chen, T., Dodds, S., Finsterwalder, J., Witell, L., Cheung, L., Falter, M., Garry, T., Sneyder, H., & McColl-Kennedy, J. R. (2021). Dynamics of wellbeing co-creation: A psychological ownership perspective. *Journal of Service Management*, *32*(3), 383-406. https://doi.org/10.1108/JOSM-09-2019-0297

Danckerts, S., & Kenning, P. (2019). "It's MY Service, it's MY Music": The role of psychological ownership in music streaming consumption. *Psychology & Marketing*, *36*, 801-816. https://doi.org/10.1002/mar.21213

Delgosha, M. S., & Hajihezdari, N. (2021). How human users engage with consumer robots? A dual model of psychological ownership and trust to explain post-adoption behaviours. *Computers in Human Behavior*, *117*, 10660. https://doi.org/10.1016/j.chb.2020.106660

Felicetti, A. M., Cimino, A., Mazzoleni, A., & Ammirato, S. (2024). Artificial intelligence and project management: An empirical investigation on the appropriation of generative Chatbots by project managers. *Journal of Innovation & Knowledge*, *9*, 100545. https://doi.org/10.1016/j.jik.2024.100545

Fiss, P. C. (2011). Building better causal theories: A fuzzy set approach to typologies in organization research. *Academy of Management Journal*, *54*(2), 393-420. https://doi.org/10.5465/amj.2011.60263120

Fiss, P. C., Sharapov, D., & Cronqvist, L., (2013). Opposites Attract? Opportunities and Challenges for Integrating Large-N QCA and Econometric Analysis. *Political Research Quarterly*, *66*(1), 191-235. https://www.jstor.org/stable/23563602

Gkinko, L., & Elbanna, A. (2023). The appropriation of conversational AI in the workplace: A taxonomy of AI chatbot users. *International Journal of Information Management*, *69*, 102586. https://doi.org/10.1016/j.ijinfomgt.2022.102568

Greckhamer, T., Misangyi, V. F., & Fiss, P. C. (2013). The Two QCAs: From a Small-N to a Large-N Set Theoretic Approach. In P. C. Fiss, B. Cambré & A. Marx (Eds.), *Configurational Theory and Methods in Organizational Research* (49-75). Emerald Group Publishing Limited.

Gupta, S., & Sharma, B. (2024). A bibliometric study on marketing perspective of psychological ownership. *Management Research Review*, *47*(11), 1750-1776. https://doi.org/10.1108/MRR-08-2023-0603

Kirk, C. P., Swain, S. D., & Gaskin, J. E. (2015). I'm proud of it: Consumer technology appropriation and psychological ownership. *Journal of Marketing Theory and Practice*, *23*(2), 166-184. https://doi.org/10.1080/10696679.2015.1002335

Kisfürjesi, N., Mitev, A. Z., & Hofmeister-Tóth, Á. (2025). Monogamy in the Harem of Hedonic Digital Services – The Role of Psychological Ownership in Loyalty. *Journal of Promotion Management*, *31*(1), 1-30. https://doi.org/10.1080/10496491.2025.2462121

Lee, K. Y. (2020). Untangling the Way Smartphone-based Multiscreening Influences Attitude toward Mobile Video Advertising. *The Journal of the Korea Contents Association*, *20*(8), 176-185. https://doi.org/10.5392/JKCA.2020.20.08.176

Li, Y., Chang, Y., Li, Z., & Geng, L. (2024). The value of psychological ownership: how buy-online-and-pick-up-in-store enhances consumer loyalty. *European Journal of Marketing*, *58*(1), 119-142. https://doi.org/10.1108/EJM-05-2022-0378

López-Cabarcos, M. Á., Piñeiro-Chousa, J., Quiñoá-Piñeiro, L., & López-Pérez, M. L. (2024). Water and waste management strategies as drivers of the financial

performance of food companies. *Technological Forecasting and Social Change*, *200*, 123138. https://doi.org/10.1016/j.techfore.2023.123138

Meuer, J., & Rupietta, C. (2017a). A review of integrated QCA and statistical analyses. *Quality & Quantity*, *51*, 2063-2083. https://doi.org/10.1007/s11135-016-0397-z

Meuer, J., & Rupietta, C. (2017b). Integrating QCA and HLM for Multilevel Research on Organizational Configurations. *Organizational Research Methods*, *20*(2), 324-342. https://doi.org/10.1177/1094428116665465

Meuer, J., Rupietta, C., & Backes-Gellner, U. (2015). Layers of co-existing innovation systems. *Research Policy*, *44*(4), 888-910. https://doi.org/10.1016/j.respol.2015.01.013

Misangyi, V. F., Greckhamer, T., Furnari, S., Fiss, P. C., Crilly, D., & Aguilera, R. (2017). Embracing causal complexity: The emergence of a neo-configurational perspective. *Journal of Management*, *43*(1), 255-282. https://doi.org/10.1177/0149206316679252

Mora, L., Gerli, P., Ardito, L., & Petruzzelli, A. M. (2023). Smart city governance from an innovation management perspective: Theoretical framing, review of current practices, and future research agenda. *Technovation*, *123*, 102717. https://doi.org/10.1016/j.technovation.2023.102717

Morewedge, C. K., Monga, A., Palmatier, R. W., Shu, S. B., & Small, D. A. (2021). Evolution of Consumption: A Psychological Ownership Framework. *Journal of Marketing*, *85*(1), 196-218. https://doi.org/10.1177/0022242920957007

Mposi, Z. S., Roux, T., & van Zyl, D. (2025). Content and Process as Motivational Factors in Digital Out-of-Home Media: The Mediating Role of Interaction in User Experience. *Human Behavior and Emerging Technologies*, *Volume 2025*, 8820265. https://doi.org/10.1155/hbe2/8820265

Nanni, A., & Ordanni, A. (2024). Digital signage for promoting price discounts: First insights into customer spending on distant and nearby discounted products. *Journal of Retailing*, *100*, 186-198. https://doi.org/10.1016/j.jretai.2024.05.004

Oana, I-E., & Schneider, C. Q. (2024). A Robustness Test Protocol for Applied QCA: Theory and R Software Application. *Sociological Methods & Research*, *53*(1), 57-88. https://doi.org/10.1177/00491241211036158

Oana, I-E., Schneider, C. Q., & Thomann, E. (2021). *Qualitative Comparative Analysis Using R. A Beginner's Guide*. Cambridge University Press.

Paraman, P., Annamalah, S., Ahmed, S., & Baharein, K. (2024). Unveiling the Nexus: Disentangling the Impact of Touch Screen Frequency in Electronic Media on Amplifying Control Perception, Elevating Psychological Ownership, and Igniting Intentions to Reuse Payment Systems. *International Journal of Human-Computer Interaction*, *40*(22), 7145-7161. https://doi.org/10.1080/10447318.2023.2261733

Park, Y. K., Fiss, P. C., & El Sawy, O. A. (2020). Theorizing the Multiplicity of digital Phenomena: The Ecology of Configurations, Causal Recipes, and Guidelines for Applying QCA. *MIS Quarterly*, *44*(4), 1493-1520.

Peck, J., & Luangrath, A. W. (2023). A review and future avenues for psychological ownership in consumer research. *Consum Psychol Rev*, *6*, 52-74. https://doi.org/10.1002/arcp.1084

Pirkkalainen, H., Pawlowski, J. M., Bick, M., & Tamhäuser, A-C. (2018). Engaging in knowledge exchange: The instrumental psychological ownership in open innovation communities. *International Journal of Information Management*, *38*, 277-287. https://doi.org/10.1016/j.ijinfomgt.2017.09.006

Roux, T., Mahlangu, S., & Manetze, T. (2020). Digital signage as an opportunity to enhance the mall environment: a moderated mediation model. *International Journal of Retail & Distribution Management*, *48*(10), 1099-1119. https://doi.org/10.1108/IJRDM-10-2018-0220

Roux, A. T., & Maree, T. (2021). Joy to the (Shopper) World: An S-O-R View of Digital Pace-Media in Upmarket Shopping Malls. *Journal of Promotion Management*, *27*(7), 1031-1060. https://doi.org/10.1080/10496491.2021.1888177

Rubinson, C. (2019). Presenting qualitative comparative analysis: Notation, tabular layout, and visualization. *Methodological Innovations*, *12*(2), 2059799119862110. https://doi.org/10.1177/2059799119862110

Schneider, C. S., & Wageman, C. (2012). *Set-Theoretic Methods for the Social Sciences. A Guide to Qualitative Comparative Analysis*. Cambridge University Press.

Stewart, K., & Perren, R. (2023). Under the Spell of Your Smartphone: How Dependence Evokes a Halo of Trust in Advertising. *Journal of Promotion Management*, *29*(1), 106-124. https://doi.org/10.1080/10496491.2022.2108188

Ştir, M., & Zaiț, A. (2022). Impact of Direct Interaction with Virtual Objects through Touchscreens on Enhancing Psychological Ownership and Endowment Effect. *International Journal of Human-Computer Interaction*, *40*(5), 1049-1070. https://doi.org/10.1080/10447318.2022.2131263

Thomann, E., & Maggetti, M. (2020). Designing Research With Qualitative Comparative Analysis (QCA): Approaches, Challenges, and Tools. *Sociological Methods & Research*, *49*(2), 356-386. https://doi.org/10.1177/0049124117729700

Thomann, E., Jörn, E., & Paustyan, E. (2022). Approaches to Qualitative Comparative Analysis and good practices: A systematic review. *Swiss Political Science Review*, *28*(3), 557-580. https://doi.org/10.1111/spsr.12503

Thomann, E., van Engen, N., & Tummers, L. (2018). The Necessity of Discretion: A Behavioral Evaluation of Bottom-Up Implementation Theory. *Journal of Public Administration Research and Theory*, *28*(4), 583-601. https://doi.org/10.1093/jopart/muy024

Van Dyne, L., & Pierce, J. L. (2004). Psychological ownership and feelings of possession: Three field studies predicting employee attitudes and organizational citizenship behavior. *Journal of Organizational Behavior*, *25*(4), 439-459. https://doi.org/10.1002/job.249

Wilson, R. T. (2023). Out-of-Home Advertising: A Systematic Review and Research Agenda. *Journal of Advertising*, *52*(2), 279-299. https://doi.org/10.1080/00913367.2022.2064378

Wilson, R. T. (2024). Out-of-home advertising: a bibliometric review. *International Journal of Advertising*, *43*(2), 286-320. https://doi.org/10.1080/02650487.2023.2186013

Wilson, R. T., Lohmeier, J. H., Lustick, D. S., & Chen, R. F. (2020). sch. *International Journal of Advertising*, *40*(5), 783-809. https://doi.org/10.1080/02650487.2020.1807230

Ylipulli, J., Suopajärvi, T., Ojala, T., Kostakos, V., & Kukka, H. (2014). Municipal WiFi and interactive displays: Appropriation of new technologies in public urban spaces. *Technological Forecasting & Social Change*, *89*, 145-160. https://doi.org/10.1016/j.techfore.2013.08.037