

JUST WALK OUT STORES—THE FUTURE OF SHOPPING? EXAMINING CONFIGURATIONS OF REASONS FOR AND AGAIINT CONSUMER ADOPTION

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Just walk out stores—the future of shopping?

Examining configurations of reasons for and against consumer adoption

ABSTRACT

Artificial intelligence (AI)-enabled technologies have paved the way for innovative retail formats such as just walk out stores (JWOS). Despite its promise, however, the JWOS format has challenges maturing and being fully embraced by consumers. Taking a configurational behavioral reasoning perspective, this multi-method paper examines consumers' *reasons for* and *against* JWOS adoption. Through qualitative field interviews (n = 60), five reasons for (i.e., access convenience, transaction convenience, search convenience, no need for interaction, and limited social judgment) and seven reasons against (i.e., technology reliability concerns, entry inconvenience, payment unease, customer care inconvenience, privacy, contamination, and assortment-related concerns) JWOS adoption are identified. Building on a subsequent empirical study (n = 546) using fuzzy set Qualitative Comparative Analysis (fsQCA), we show that different configurations (or combinations) of *reasons for* and *against* may lead to favorable and unfavorable JWOS attitude and adoption intention. This research contributes to the emerging literature on AI-enabled retail formats by shedding light on the nuanced drivers of JWOS adoption. With these insights, retailers can tailor their approaches to minimize barriers and accentuate positive factors associated with JWOS adoption.

Keywords: Just walk out stores; Cashierless stores; Autonomous technology; Artificial intelligence; Retail innovation; Behavioral Reasoning Theory; Configuration Theory

1. Introduction

Consumers' desire for frictionless shopping experiences, in combination with an increasingly competitive retail landscape, makes retailers turn toward Artificial Intelligence (AI)-enabled tools that promise automation and shopping convenience (Lu et al. 2023). One recent AI-driven innovation that gained wide attention is the so-called “just walk out” technology, a term coined by Amazon to represent technologies that allow consumers to enter a store by means of their smartphone, take what they want, and exit without any checkout process. The technology leverages AI, cameras, and sensors to charge consumers for their purchases. Amazon Go popularized this concept in 2018, and since then, retailers around the globe have developed and implemented their own versions of just walk out stores (JWOS) (see Web Appendix A for an overview of some of these retailers).

JWOS (also commonly referred to as cashierless, grab-and-go, smart, or unmanned stores) have the potential to enhance the retail shopping experience by eliminating common pain points like waiting lines and checkout (Benoit et al. 2024; van Esch et al. 2021a). However, they also entail a radical shift in the nature and role of consumer-store interactions, as they delegate tasks traditionally performed by consumers and employees to technology (de Bellis and Johar 2020). This may trigger novel mental considerations in consumers' decision-making process and subsequently impact JWOS attitude and shopping intentions.

A recent study by Insider Intelligence (2022) finds that only 26 percent of U.S. adults have used JWOS, and 56 percent show little to no interest in it. Furthermore, in March 2023, Amazon announced to close 8 of its 29 U.S. Go stores due to lower-than-expected sales and the difficult economic climate (Palmer 2023), and it stopped expanding its UK stores for the same reasons (Das 2022). At the same time, retailers such as WHSmith and Żabka are successfully implementing and expanding this new retail format (Pott 2023). Together, this suggests that, despite JWOS' great promise, some consumers may still be hesitant to try out

and adopt this new retail format, while others are highly enthusiastic towards it. Therefore, research to understand what makes consumers willing or reluctant to adopt and use JWOS is critical for retailers (Grewal et al. 2021; Shankar et al. 2021). Such insights may serve as a first steppingstone to support the further expansion of the JWOS format and facilitate it to realize its full potential.

While initial work has provided valuable insights into consumer responses to JWOS, these studies have two key shortcomings. First, building on traditional innovation/technology adoption theories such as the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and the Hedonic Information Systems Acceptance Model (HISAM), these studies investigate the impact of *more generic* antecedents (usually positive/motivating factors; e.g., perceived usefulness, ease of use) on JWOS attitude and/or intentions. Yet, the unique characteristics of a retail innovation like JWOS are likely to trigger more innovation-specific *reasons for* as well as *reasons against* that impact consumer attitude and adoption—a perspective strongly supported by behavioral reasoning theory (Westaby 2005). In the context of this paper, a *reason*—as opposed to more general beliefs—refers to a concrete explanation or rationale that consumers provide to justify their attitude and actions toward JWOS (Westaby 2010).

Second, prior research has focused on understanding the direct impact of antecedents on JWOS outcomes relying on linear, symmetrical modeling and net effects that are typical for regression-based models. This, however, may not fully capture the *complexity* of consumer behavior (Kumar et al. 2022)—a viewpoint rooted in complexity theory (Byrne 1998) and configuration theory (Ragin 2008) arguing that different configurations (or combinations) of antecedents may lead to similar outcomes. Coming to grips with this complexity is crucial for retailers to comprehend how consumers' attitudes and adoption decisions are shaped (de Bellis and Johar 2020). *Reasons for* and *against* do not occur in isolation, they can vary across

consumers and may thus be impactful in different configurations (i.e., What different combinations of *reasons for* and *against* lead to high/low JWOS attitude and high adoption intentions? Can some *reasons for* offset the presence of *reasons against*?).

To address these limitations in current literature, our research has two main objectives. First, we build on behavioral reasoning theory and use an exploratory qualitative study (based on 60 field interviews) to uncover salient contextualized *reasons for* and *against* that drive consumers' JWOS adoption decisions. The JWOS model considered is comparable to the one from Amazon Go (i.e., electronic entry, sensor-tracking of items taken in store, and automated payment when leaving), arguably the most debated JWOS model in popular press and adopted by other retailers like Aldi, Auchan, Sainsbury's, Tesco, and WH Smith. Specifically, this paper seeks to reveal JWOS-specific *reasons* that have not been suggested by common technology-adoption theories, nor have been examined in prior JWOS adoption studies. We uncover five *reasons for* (i.e., access convenience, transaction convenience, search convenience*, no need for interaction*, limited social judgment—two* of these were not yet uncovered in prior literature) and seven *reasons against* (i.e., technology reliability concerns, entry inconvenience, payment unease*, customer care inconvenience, privacy concerns, contamination concerns*, assortment-related concerns*—three* of these were not yet uncovered in prior literature). Doing so, we provide managers with concrete and specific insights into the different factors that drive consumers' attitudes toward JWOS, as well as their adoption decisions.

Second, we build on survey data (n = 546) and investigate what different configurations of JWOS-specific *reasons for* and *reasons against* lead to respectively high and low consumer JWOS attitude and adoption intentions. To this end, we employ fuzzy set Qualitative Comparative Analysis (fsQCA) as it allows to capture the complex and asymmetric relations between high/low JWOS adoption outcomes and the set of *reasons for* and *against* (Pappas

and Woodside 2021). Our findings show all reasons for and against JWOS adoption have some impact, with different configurations leading to high/low attitude and adoption intentions. Reasons in favor of JWOS, especially transaction and access convenience, generally drive a high attitude and adoption intention more than reasons against do. These results show that high attitude and adoption intentions persist even if reasons against are present. Low adoption intentions are marked by lack of perceived transaction convenience and strong reasons against. Altogether, these findings stress the need for retailers to tailor their approaches to minimize barriers and especially accentuate positive factors associated with JWOS adoption to help overcome current limited interest in JWOS and realize their full potential.

2. Just walk out as an innovative consumer-interfacing retail technology

Retail format innovation represents a prevalent growth strategy for retailers. New and innovative retail formats hold promise in meeting diverse consumer needs and shopping situations, increasing diversity and efficiencies, reducing the cost structure, while also serving as a signal of modernization that provides stores with a more contemporary image (Goldman et al. 2002; Shankar et al. 2021; Sorescu et al. 2011). Retailers therefore must keep abreast of new technologies and understand the opportunities and challenges stemming from innovative technological developments for their business models (Sorescu et al. 2011).

The emergence of JWOS technology exemplifies a shift towards the integration of AI in the consumer retail space. Its goal is to allow retailers to enhance consumer-perceived service convenience by removing pain points (e.g., simplifying checkout) (Benoit et al. 2024; van Esch et al. 2021a), but also reduce labor costs, increase earnings per square meter, and gather live consumer behavioral data (Grewal et al. 2020; Schögel and Lienhard 2020). In essence, JWOS allow consumers to pick up grocery items of their choice and to walk out of the store

without requiring any interaction with the staff or need for their assistance—hereby striving to deliver a frictionless shopping experience (Gauri et al. 2021). In their most advanced form (i.e., the focus of this paper), AI-driven technology enables the store to separate individual consumers and their purchases from one another, and to automatically charge the consumer’s account linked to their mobile app when they leave the store (see Figure 1 for a visual representation of the shopping process of JWOS). Thus, JWOS itself must be operational without requiring staff to support shoppers (Benoit et al. 2024).

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3. JWOS adoption vs. rejection: A behavioral reasoning and configurational approach

Understanding consumers’ responses to new retail technologies and innovations like JWOS has been identified as a top research priority (e.g., de Bellis and Johar 2020; Xu et al. 2021). Relying on traditional technology adoption theories and using common variance-based statistical approaches (e.g., regression models), research to date has examined a wide variety of general motivating and—albeit to a lesser extent—inhibiting factors that impact consumers’ attitudes and usage intentions towards JWOS. As examples, Chuawatcharin and Gerd Sri (2019), Pillai et al. (2020), and Chang et al. (2021) demonstrate the importance of perceived usefulness, ease of use and enjoyment in driving consumer adoption of JWOS. Ponte and Bonazzi (2023) and Lin (2022) show that such stores may also trigger perceptions of risks among consumers, which in turn negatively affect their propensity to adopt JWOS. Table 1 provides a comprehensive overview of JWOS literature to date.

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While previous studies provide rich insights into customer adoption decisions, we argue that they suffer from two major shortcomings. The **first** limitation is the generic operationalization of adoption constructs across innovation adoption studies in general (Claudy et al. 2015), and JWOS research in particular. This approach does not allow to account for the innovation-

specific issues that might arise in the context under investigation. As an alternative, behavioral reasoning theory highlights the importance of detecting innovation-specific *reasons* in people's decision-making process (Westaby 2005). These *reasons* help users justify and defend their actions toward innovations, protect their self-concept and make sense of their world (Westaby 2005; Westaby et al. 2010). As opposed to people's generic global motives (e.g., perceived usefulness), which are estimated at a broad level of abstraction (Ajzen 2001), *reasons* refer to a concrete and contextualized explanation or rationale that consumers provide to justify their attitude and actions toward an object (Westaby 2005). For instance, a consumer may consider a robot useful and easy to use. However, when making the decision to interact with this robot, some consumers might decide against it because the robot's appearance looks too much like a human. As this example illustrates, behavioral reasoning theory posits that *reasons* (here, human resemblance) are innovation-specific and represent the most central cause influencing individuals' decisions, whereas general beliefs and motives do not necessarily become reasons in people's explanations (Westaby 2005).

Moreover, much of prior work only accounts for JWOS motivating or inhibiting factors (e.g., Chang et al. 2022; Wu et al. 2022), or else assume these to be logical opposites (e.g., Benoit et al. 2024). Yet, it is not necessarily true that the opposite of a *reason for* or *against* is of relevance to consumers (Talke and Heidenreich 2014). Think about an innovation like virtual reality (VR). While consumers may see possible sickness (e.g., eye strain, headache, nausea) as a reason against VR, it is unlikely that one will want to adopt VR because they want to feel healthy. Similarly, while a person may want to buy an electric car to safeguard the environment (i.e., reason for), it is unlikely anyone will resist an electric car because they want to harm the environment (i.e., reason against). Various psychological models—such as behavioral reasoning theory (Westaby 2005), decisional balance theory (Janis and Mann 1977), and cost-benefit models (Thaler 1999)—propose that consumers weigh the pros and

cons of a behavior before engaging in it. These models together highlight the importance of detecting both *reasons for* and *against* in people's decision-making process—thereby addressing the above limitation and providing a complete view.

In sum, behavioral research theory would serve as a novel valuable theoretical framework to better and comprehensively understand consumers' mental processing of JWOS adoption by including *innovation-specific reasons for* and *against* adoption, which serve as important linkages between attitudes and behavioral intentions (Westaby 2005). More importantly, previous studies have demonstrated that behavioral reasoning theory better explains people's intentions than traditional innovation adoption models like the Theory of Reasoned Action (Claudy et al. 2015; Westaby 2010).

A **second** shortcoming of previous JWOS work (and of [adoption] decision-making literature in general; Kumar et al. 2022) is that it does not account for the complex interplay of *reason for* and *against* leading to high/low attitude and adoption intentions. Relying on conventional variance-based statistical approaches, prior research suggests that attitude/adoption intentions may be explained by a single configuration of adoption antecedents, which is assumed to be the best solution. Complex phenomena, however, are presumed to arise from various combinations of attributes converging to the same outcome (Byrne 1998, Urry 2005). Consequently, linear analysis alone is insufficient for understanding the causes of complex phenomena (Kumar et al. 2022). The concept of various causal attribute combinations resulting in the same outcome is known as equifinality (Woodside 2014). The latter principle is shared by complexity theory and configuration theory (Pappas et al. 2017). Additionally, configuration theory is based on the principle of causal asymmetry, which implies that the variables contributing to the presence of an outcome (e.g., adoption) may differ from those responsible for its absence or negation (Ragin 2008)—further supporting a need to consider both the set of configurations leading to high and low outcomes

separately. Combining a behavioral reasoning with a configurational approach would allow to unveil different *configurations of reasons* that lead to better (or worse) customer adoption outcomes, thereby enhancing researchers' and managers' understanding of customers' decision-making processes (Kumar et al. 2022).

To address the above two shortcomings, we employ a mixed-methods approach in the following sections. In Study 1, we conduct a qualitative field study (n = 60 interviews) to uncover JWOS-specific *reasons for* and *against*—addressing the first limitation of current JWOS work. In Study 2, we build on the identified JWOS-specific *reasons for* and *against* and use a fsQCA approach (n = 546 survey respondents) to investigate how different configurations of reasons lead to high/low JWOS attitude and adoption intentions—thereby overcoming the limitations of a typical variance-based research approach. Study 1 materials (e.g., interview guide) and the raw data analyzed for Study 2 are available on a dedicated OSF page (<https://osf.io/u8cpv>)

4. Study 1: Uncovering consumers' reasons for and against JWOS adoption

This first study uses qualitative, semi-directed in-depth field interviews to uncover the salient reasons used by consumers to explain their decision to adopt or reject JWOS—as opposed to more general beliefs about new (retail) technologies. An exploratory qualitative approach was deemed appropriate for two main reasons. First, JWOS represent a new technology-enabled retail format with rather limited empirical knowledge available on consumers' adoption decisions (Shankar et al. 2021). Second, reasons are context-specific (Westaby 2005), and thus need to be elicited via exploratory qualitative research as the latter typically allows for more context sensitivity (Patton 2014).

4.1. Data collection and sample characteristics

To ensure respondents were familiar with (but not necessarily users of) JWOS, we interviewed people who were studying or working at a major European business school where a new JWOS opened a few weeks prior to the data collection. Respondents were mainly recruited through a purposive, snowball sampling technique, asking selected respondents to provide contact details of other potential participants who shared the characteristics of interest for this study. When recruiting participants, we sought to maximize diversity (e.g., age, gender, culture) to facilitate the emergence of both *reasons for* and *against* adoption and ensure a comprehensive understanding of the phenomenon. As common practice, the sampling process ceased at theoretical saturation (Patton 2014). The resulting sample included 60 participants, ranging in age from 19 to 39 years. Among them, 44 self-identified as women, and 17 are local students or staff members.

4.2. Procedures and analysis

The interview guide (see the OSF page for the full guide) began with general questions about the respondent's grocery shopping behavior, including the types of retail formats they use and the reasons underlying this behavior. Participants were then encouraged to reflect on the JWOS concept in general, and on the JWOS that had just been opened on the university campus. In this part of the interview, informants were specifically asked to explain their decision to adopt or reject the JWOS store that had just opened on campus, and to reflect on the reasons underlying their decision. Given the recentness of the store opening, respondent's mental models used to think about JWOS stores were still very fresh and accessible. The final part contained deeper questions about participants' feelings, likes and dislikes, concerns, and experiences related to the adoption and use of this new JWOS.

With participants' consent, the interviews were audio-recorded and transcribed verbatim, before being coded and analyzed with NVivo v1.6.1. We analyzed the data using an abductive thematic analytic approach. Specifically, we followed recommended procedures

(see Braun and Clarke 2006) and engaged in the recursive process of familiarization with the data, generation of initial codes, searching for, defining, and reviewing themes that organize and describe data in rich detail. When doing so, we compared the emerging findings with existing JWOS research as well as complementary relevant research streams such as frontline service technology (e.g., De Keyser et al. 2019), AI-enabled autonomous retail systems (e.g., de Bellis and Johar 2020), and technology-enabled services (e.g., Walker et al. 2002), to integrate and extend prior knowledge.

To ensure internal consistency and the trustworthiness of our findings, two of the authors discussed the coding and jointly categorized the findings; any disagreements were resolved through discussion with the whole author team. We also asked two independent judges to review the coding plan and use the latter to code selected verbatim data. The intercoder agreement was satisfactory (.75), above the recommended .70 threshold for exploratory research (Rust and Cooil 1994). Moreover, we discussed the results with experts in the innovation adoption research field as well as with the manager of the JWOS opened on the university campus. This last step helped us not only ensure conceptual clarity, but also enhanced the robustness and applicability of our results to practice.

4.3. Results

We established five thematic interpretations as key context-specific *reasons for* consumers' decisions to adopt and use JWOS: access convenience, transaction convenience, search convenience, no need for interaction, and limited social judgment. In relation to the *reasons against* JWOS adoption, we identified seven distinct themes: technology reliability concerns, entry inconvenience, payment unease, consumer care inconvenience, privacy concerns, contamination concerns, and assortment-related concerns. Table 2 lists the definitions and some typical statements describing the reasons for/against JWOS adoption, and identifies exactly which of the reasons for and against were (not) suggested in prior JWOS research.

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4.3.1. Reasons for JWOS adoption

Individuals decide to adopt and use JWOS because of various reasons, including the convenience benefits associated with such automated stores (Benoit et al. 2024). Echoing Berry et al.'s (2002) and Seiders et al.'s (2007) work on retail convenience, consumers decide to adopt JWOS because of the speed and ease with which they can reach the retail store (*access convenience*). Access convenience in the context of JWOS not only refers to the accessible physical location of stores, but also includes operating store hours. The just walk out technology indeed allows store managers to open 24/7, providing easy access and meeting consumers' urgent needs for necessity goods:

The critical aspect of this store is its convenience, it's open 24/7! [...] Because it's always open, even late at night, there's nothing to worry about—it's not like other stores that are closed in the morning or at certain times of the day—there we can find and buy everything we want, at all times! (ID40)

Next, *transaction convenience*—that is the ease and speed with which consumers can make a transaction—is also particularly salient in JWOS, as this new technology allows shoppers to walk out of the store without stopping to queue, pay or scan merchandise for completing their transaction (van Esch et al. 2021a). The just-walk-out technology allows the transaction to be completed through a more effective process, saving consumers' time and efforts:

“Whenever I'm shopping, my primary concern is: how many people are in the store? And how much time am I going to take in the queue to pay? This usually takes the most time! I take 10 minutes to collect the things that I want, but almost more than five, seven minutes to stand in the queue and pay and put my things in a bag and come out. That is a process that is quite time consuming. I do not really like it. Just walk out stores eliminate that! They eliminate the need to... you know, take out your card and pay. It just simplifies the process altogether” (ID12)

JWOS extend beyond mere access and transactional ease. Consumers also value the speed and ease with which they can identify and select products they wish to buy in JWOS. The compact nature of these stores—typically ranging from 1,500 to 3,800 square feet for an Amazon Go store (Walton 2021)—enhances *search convenience*. With focused merchandising strategies

and intelligent store layouts (Seiders et al. 2000), consumers can swiftly locate desired items, particularly convenient for on-the-go grocery needs. This emphasis on efficient product discovery aligns with the preferences of modern consumers seeking streamlined shopping experiences (Gauri et al. 2021):

“They’re selling things that you would need on a last-minute sort of basis. I found that interesting, you know. Like if I need something, and I’m really desperate, I can go to the JWOS and I will easily find those items. That was my first reason for using it.” (ID29)

In addition to the convenience advantages, consumers’ inclination towards adopting JWOS can be attributed to the absence of social interaction inherent in automated environments like JWOS. This *lack of need for interaction*, whether with fellow shoppers or cashiers, holds significant appeal for various segments of consumers. Particularly, individuals who may not be fluent in the local language, those who identify as introverted, individuals pressed for time, or simply not feeling inclined towards conversation, find this aspect particularly valuable. The autonomy afforded by JWOS resonates with these consumers, allowing them to navigate their shopping experience without the pressures or constraints of social interaction:

“I admit that there are some days where you don’t necessarily want to interact with many people... in such situation, well it [JWOS] is convenient.” (ID44)

Aligned with the diminished social presence characteristic of JWOS (Grewal et al. 2020), consumers experience reduced susceptibility to social pressures within these environments. Consumers enjoy the freedom to select items without the concern of being observed or evaluated by others, fostering an atmosphere of intimacy and privacy. This *limited social judgment* allows shoppers to make choices according to their preferences, uninhibited by external scrutiny. JWOS would thus provide a refuge from the typical social dynamics of traditional shopping settings, empowering consumers to shop with a heightened sense of autonomy and comfort. As one respondent says:

“[In JWOS] there is a kind of respect for consumers’ privacy. Because no one has the eye on the groceries that you buy” (ID9)

4.3.2. Reasons against JWOS adoption

The first *reason against* JWOS adoption links to respondents considering themselves as too dependent on the functioning of the just walk out technology and worrying about its consistent and accurate performance (*technology reliability concerns*). Specifically, they are concerned about being charged for items they did not grab—especially when the store is crowded—or fear being stuck in the store due to technological issues. While physical stores like JWOS are commonly associated with experiential benefits, that is an environment where customers can explore information using their five senses (Breugelmans et al. 2023), some consumers would even refrain from touching and grabbing products when searching for information and comparing alternatives in JWOS to avoid technology-related problems such as being charged incorrectly:

“I’m always afraid that the technology doesn’t work. I’m afraid to take something and when I finally put it back, I still have to pay for it and I don’t realize in the end if I’m not careful” (ID1)

Although JWOS present a multitude of convenience benefits (Benoit et al. 2024), individuals also elucidate their decisions to reject JWOS due to the time and effort expenses entailed. This reluctance can be attributed to the concept of *entry inconvenience*, denoting consumers’ perceptions of the substantial time and effort required to access JWOS and commence the shopping process. To gain entry, consumers are generally obliged to download a dedicated mobile application and integrate it with their personal banking account. This requisite process is perceived by consumers as a significant entry barrier, impeding their willingness to engage with JWOS and utilizing this innovative retail format:

“Oh, I don’t want to download the app! You know, you must download the mobile app to be able to go in. I don’t want to [...] You not only need the app but also must register your payment card in the app... no” (ID19)

Interestingly, the automated checkout system within JWOS is not solely linked with reasons for adoption (Benoit et al. 2024) but also serves as a factor against it. This technology

engenders a sense of diminished control among consumers concerning their purchases, requiring additional time for verification of debited transactions from their accounts. Moreover, the limited scope of payment methods available in JWOS exacerbates *payment unease*, contributing to a perceived loss of control over the payment process. Concerns regarding payment processes and the perceived lack of control therein further explain why certain consumers refrain from embracing JWOS:

“It would be better, if possible, to accept cash payments. I guess it would be... suppose the cloud is blocked or they have some issues going on in their bank account?!” (ID31)

Consumers also anticipate potential time and effort expenditures when initiating or reinitiating contact with the firm during or after experiencing the benefits of the service, a phenomenon referred to as *consumer care inconvenience* in this study. Within the context of JWOS, individuals express concerns about the absence of readily available support channels; uncertainty arises regarding whom to contact and how to address inquiries or issues that may arise during or after using JWOS. This lack of assistance, particularly in situations involving product exchanges or rectifying incorrect automatic payments, exacerbates feelings of helplessness among respondents. Consequently, the apprehension regarding the availability and efficacy of customer support channels within JWOS reinforces perceptions of inconvenience associated with the service and contributes to consumer reluctance:

“The reason why I didn't do it, it's because there's no one there if you ever have a question or don't understand... there's no one to help you!” (ID14)

In line with previous research on the personalization privacy paradox (e.g., Awad and Krishnan 2006), the technologies implemented within JWOS offer notable benefits to consumers, such as enhanced transaction convenience (Benoit et al. 2024). However, they also introduce heightened *privacy concerns*, indicative of consumers' apprehension and discomfort regarding the gathering, utilization and security of their personal data within JWOS. The widespread presence of video cameras within such stores contributes to a

pervasive sense of being under constant surveillance among consumers. This tension between the perceived benefits of technology-enabled convenience and the accompanying privacy considerations further underscores the complexities inherent in consumer adoption of innovative retail formats like JWOS:

“As we are filmed and observed 24 hours a day, it is important for me that the store protects our private life, and make sure that everything that is filmed is not transmitted to anyone else. In fact, my fear with this type of technology is that everything that is filmed will be sold or used without your consent [...] we must make sure that it's not misused and really only used for the benefit of the consumer” (ID14)

In addition to worries about their personal privacy, respondents also expressed *contamination concerns*, that is fear of being contaminated by germs as well as apprehensions about the cleanliness of JWOS. These concerns result from consumers' observations that JWOS are typically small stores (Benoit et al. 2024) where consumers are forced to come near one another, and where there is a limited number of retail employees to clean the store. The latter is also likely to trigger consumers' *concerns related to the assortment*, particularly apprehensions about the slow replenishment of the assortment as well as about the low width and depth of the assortment available in JWOS. These contamination- and assortment-related concerns further explain why some consumers decide not to adopt and use JWOS. As two respondents respectively put it:

“Stores need to be sanitized again and again, but that is not really the case [in JWOS] because there is no one over there... I guess that is another reason why I would avoid visiting this store... because of this obvious reason” (ID30)

“The shelf is empty, always empty! I think it's the main issue, it's always empty, and there's no one you know, to fill out the shelves!” (ID17)

4.4. Discussion of Study 1

Taken together, this exploratory qualitative study uncovers a variety of reasons contextualized to JWOS and used by consumers to explain their attitude and adoption decisions regarding this new retail format (see Table 2). Interestingly, while consumers see the potential benefits of JWOS like access and transaction convenience, they may also have several reasons not to

adopt and use those automated stores, including consumer care inconvenience and technology-related concerns. These findings highlight the need for retailers to examine both *reasons for* and *reasons against* to fully grasp a more comprehensive view of consumers' decision-making process. Moreover, our findings show that the *reasons for* and *against* are not necessarily logical opposites, further emphasizing the importance of considering both in research. In contrast to prior JWOS literature, we also identify two additional *reasons for* (i.e., search convenience and no need for interaction) and three additional *reasons against* (i.e., payment unease, contamination concerns, and assortment-related concerns). This confirms the necessity of uncovering JWOS-specific *reasons for* and *against* to explain consumer outcomes, as posited by behavioral reasoning theory (Westaby 2005). It is noteworthy that some *reasons against* do not relate to the JWOS concept per se but rather to the operations of JWOS (e.g., concerns related to contamination and assortment), which may vary from one store to another. These contextualized concerns nonetheless are likely to explain consumers' decisions to refrain from adopting JWOS, underscoring the significance of addressing both design and operational issues to encourage widespread adoption of JWOS.

5. Study 2: The complex interplay between *reasons for* and *against* JWOS adoption

In Study 2, we use an online survey to investigate what configurations of reasons lead to respectively high and low consumers' attitudes toward JWOS and adoption intentions. As Figure 2 suggests, adoption of JWOS depends on how multiple conditions interact and combine rather than on how specific adoption factors affect it directly. By exploring these configurations, JWOS retailers can enhance their comprehension of the specific combinations of factors that influence consumers' attitudes and adoption intentions, both positively and negatively. This knowledge can help retailers identify the types of consumers who are more

(or less) inclined to visit JWOS and provide insights into what *configurations of reasons* need to be stimulated/diminished to enhance the adoption success of the JWOS retail model.

INSERT FIGURE 2 AROUND HERE

This configurational approach is investigated by means of the fsQCA technique (Pappas and Woodside 2021). This methodology is rapidly gaining in popularity and has recently been proposed in the business and marketing literature (see Kumar et al. 2022 and Li and Larivière 2023) as a novel way to unveil complexities in data. A key benefit of this technique is that complex relationships among variables (e.g., *n*-way interactions) can be assessed, which is of particular importance for this study since five *reasons for* and seven *reasons against* have been identified as being relevant in the context of JWOS adoption. In contrast with conventional research methodologies (e.g., structural equation modeling, regression models), fsQCA is suitable to tackle the challenge of high-order interaction effects and, in doing so, to unveil which variables are relatively more important in these various configurations (Ragin 2008). Based on Boolean algebra and Boolean algorithms, a qualitative comparative analysis (QCA) can unveil the causal relationship between causal conditions and desired outcomes by transferring variables to a fuzzy-set membership (Ragin 2008).

5.1. Participants and procedure

We used Prolific to recruit a gender-balanced sample of 598 U.K. participants—in line with the required sample size guidelines of Pappas and Woodside (2021). To address concerns calling into question the quality of online subject pool data such as Prolific, we followed Aguinis et al.'s (2021) best-practice recommendations. Specifically, *all* respondents were paid in exchange for their participation, with an hourly rate above the U.K. minimum wage at the time of the data collection. We removed one participant who reported an age below 18 years old. Given that the present study focuses on consumer attitudes and adoption intentions, participants (*n*=51) with prior experience with JWOS were also excluded from the sample. As

the JOWS concept remains in its nascent stage, it becomes imperative to prioritize consumers with no previous experience. This demographic is pivotal, as they form the primary target audience for the concept's expansion. Gaining insights into their responses to the JOWS model and identifying strategies for retailers to encourage adoption are crucial for effective managerial decision-making. No participant failed the two attention checks included in the questionnaire (3 respondents failed one attention check yet were not excluded—in line with Aguinis et al.'s [2021] recommendation), nor completed the questionnaire with an unusually fast response time (i.e., less than one second per item; Wood et al. 2017), providing us with confidence about the quality of the data. Table 3 provides an overview of the final sample (n=546).

INSERT TABLE 3 AROUND HERE

5.2. Measures

The web-survey included a short vignette describing JWOS (similar to Figure 1), and the measures for the variables presented in our theoretical framework (Figure 2). For the outcome and control variables in this paper, we relied on existing scales available from the literature, and adjusted them to the JWOS setting. Specifically, the outcome variable *adoption intentions* as well as the global motive construct *attitude* were assessed using scales adapted from Dabholkar and Bagozzi (2002) and Reinders et al. (2008) respectively. In addition, we measured socio-demographic variables (e.g., age, gender).

In contrast, for the JWOS-specific *reasons factors* that have been identified via the qualitative research in Study 1, we first had to propose and test an appropriate measurement instrument. Specifically, we followed standard procedures (see for instance Westaby et al. 2010) and converted our qualitative study findings into items to frame the unique context for JWOS adoption decisions. While the object under investigation in this study (JWOS) differs from previous research using a similar contextualized approach (e.g., Claudy et al. 2015), we

adapted the wording of the reasons from these previous studies. When deemed possible, we also used and adapted existing scales to measure some of the identified reasons (e.g., Seiders et al.'s [2007] *convenience* measures). More details on where the different items for the various reasons factors are originating from can be found in Table 4.

Finally, we included a marker variable that is theoretically unrelated to the variables under investigation, that is *attitudes towards the blue color*. This marker variable enabled us to assess and cancel out common method bias (Simmering et al. 2014). Specifically, we performed an ad hoc OLS analysis in which this marker variable was included versus removed. This analysis provided evidence of stable parameters (i.e., in terms of both the significance levels and magnitude of the OLS parameter estimates) for all reasons factors, thereby indicating that common method bias is not an issue in this dataset (Lindell and Whitney 2001). All constructs were measured with 7-point Likert scales.

INSERT TABLE 4 AROUND HERE

Since a new measurement tool is proposed with items adapted from past literature and supplemented with items from our qualitative study, factor analyses were performed to assess the measurement properties before relationships among variables are examined. To identify items with cross-loadings and items that poorly correlated with the remaining items in each scale, we first conducted an exploratory factor analysis (EFA) and an initial item and reliability analysis. The EFA revealed problems with six items (see bold factor loadings in Table 4). After deleting these items, we assessed the fourteen-factor structure using confirmatory factor analysis (CFA; R version 4.2.2, Lavaan Package), thereby generating a good fit (CFI = .962; TLI = .956; RMSEA = .043). Together, the survey data provide evidence for the multidimensional nature of the *reasons for* and *reasons against JWOS*—in line with the insights obtained from the qualitative study findings.

5.3 Methodology and findings

*Data calibration*¹. Analyzing data with fsQCA requires a translation of the raw data into set membership scores ranging between 0 (full non-membership) and 1 (full membership). Three anchors to structure the calibration had to be determined: a threshold for full membership, a threshold for full non-membership, and a crossover point. Based on the direct calibration method, we follow the suggestions by Pappas et al. (2017) to select 20%, 50%, and 80%² as thresholds to respectively identify the full non-membership, crossover point, and full membership of respondents in a solution. In addition, because it is difficult to analyze an intermediate set membership, which is exactly 0.5, we further adopted the approach suggested by Fiss (2011) and therefore added a constant 0.001 to all conditions that were below the full membership score of one after the calibration procedure. The results of this calibration step regarding our data are presented in Table 5.

INSERT TABLE 5 AROUND HERE

Solution with configuration. A solution refers to the obtained configurations, in which a configuration denotes the compilation of a selected set of variables that should be either present or absent in that specific configuration to obtain high values for the dependent variables under investigation (here, high attitude and adoption intent towards JWOS). As a result, fsQCA can uncover *different* configurations that all can lead to favorable outcomes instead of just one “population-averaged” finding.

In accordance with Ragin’s (2008) recommendations, this work presents the intermediate solution. The intermediate solution reveals whether a specific variable matters in a configuration, in which a circle (see Table 6) is used in fsQCA terminology to indicate that a particular variable is important in a configuration (i.e., comparable to a significance level

¹ For readers unfamiliar with fsQCA, we added Web Appendix B that draws a parallel between this methodology and the traditional regression method. This may help to better capture how to read fsQCA results.

² As a robustness check, we followed Park and Mithas’s (2020) recommendation and conducted a sensitivity analysis by changing the calibration anchors to 25%, 50% and 75. We found no significant difference in the final fsQCA configurations.

mark in conventional regression analyses such as * significant at .05). In contrast, a blank is used to denote the “does not matter” scenario which means that the presence or absence of that specific variable does not help explain the outcome and thus is not relevant to consider in that configuration (i.e., like a non-significant variable in conventional regression analyses). Next, in case a variable is relevant for a specific configuration, black circles (●) are used in fsQCA terminology to indicate the presence of a condition, whereas crossed-out circles (⊗) are used to indicate the absence of a condition; the presence implies that a high value for a specific variable is needed to obtain favorable outcomes, while the absence implies that a low value for a specific variable is required to obtain favorable outcomes (i.e., comparable to significant positive and significant negative parameter estimates in conventional regression analyses). In addition, when a variable is considered relevant in all configurations of a solution, fsQCA labels this variable as a “necessary condition”, meaning that the presence (●) or absence (⊗) of that variable is necessary to obtain the desired outcome in the dependent variable since it is part of every configuration of the found solution.

In line with Pappas and Woodside (2021), our research examines the parsimonious solution. Specifically, the parsimonious solution presents the most important conditions which cannot be left out from any configuration and are therefore referred to as “core conditions” (Fiss 2011), whereas the intermediate solution contains both core and non-core conditions—the latter being commonly referred to as “peripheral conditions” (Fiss 2011). When a specific variable matters in a configuration (denoted by a black or crossed-out circle), larger circles are used to indicate the core conditions, whereas smaller circles are used to indicate peripheral conditions (Ragin 2008) (i.e., comparable to the higher versus lower magnitude of a significant parameter estimate in conventional regression analyses).

Model performance and robustness test. Two performance metrics (i.e., solution consistency and solution coverage) assess the overall model performance, while three

additional metrics (i.e., consistency, raw coverage, and unique coverage) assess the performance of each specific configuration. First, the solution consistency denotes the degree to which all the causal configurations link to the same outcome condition (Ragin 2006) and is comparable to the significance level in regression models (Schneider and Wagemann 2010); solution consistency values should be higher than 0.74 (Woodside and Baxter 2013). Second, the solution coverage denotes the extent to which the dependent variable(s) can be explained by the different configurations, and is therefore similar to the variance explained (i.e., R^2) in regression analyses (Mendel and Korjani 2012; Woodside and Baxter 2013). There is no specific cutoff value for the solution coverage; however, the higher the value of solution coverage, the better the explanatory power of the fsQCA model. Looking at work in business and management, values range from 0.257 to 0.84 (e.g., Zhu et al. 2020—solution coverage of 0.257; Hsiao et al. 2016—solution coverages of 0.35 and 0.55; Skarmeas et al. 2014—solution coverage of 0.45; Chuah et al. 2021—solution coverage of 0.65; Llopis-Albert et al. 2019—solution coverage of 0.84).

Our findings in Table 6 reveal that all solution consistencies are higher than 0.87, and that solution coverage values equal to 0.515 (high attitude), 0.474 (high adoption intention), 0.549 (low attitude), and 0.364 (low adoption intention). All models thus explain a substantive portion of consumer JWOS attitude and adoption intentions. As for the three additional metrics that assess the performance of each specific configuration, the consistency score has the same meaning and same cutoff value as the solution consistency. The raw coverage represents the percentage of outcome cases that are covered by a specific route, in which also a higher value for the raw coverage indicates a stronger empirical influence (Rihoux and Ragin 2008). The unique coverage denotes the proportion by which an outcome is only covered by one specific configuration but not by others. The value of the unique coverage should be higher than zero (Schneider et al. 2010). Our findings in Table 6 reveal that all

consistency values are higher than 0.88, while the raw and unique coverage range from 0.007 to 0.434, in line with past fsQCA research (e.g., Zhu et al. 2020).

INSERT TABLE 6 AROUND HERE

Findings. Table 6 presents the fsQCA results and provides insights into what combinations of *reasons for* and *against* lead to high consumer JWOS attitude (model 1), high adoption intentions (model 2), low consumer JWOS attitude (model 3), and low adoption intentions (model 4). Models 2 and 4 include attitude as an extra variable next to the *reasons for* and *against* because it is typically considered to be a primary antecedent of consumers' adoption intentions of technology-based innovations (e.g., Blut et al. 2016).

- ***What configurations lead to high attitude and adoption intentions?***

To explain high JWOS attitude (see model 1 in Table 6), four causal configurations are identified by the fsQCA (intermediate solution). Configuration 1 (which has the highest raw coverage) shows that when all *reasons for* are present, JWOS attitude is high. The blank cells of the *reasons against* indicate that their level does not matter. Hence, even when *reasons against* are high, the presence of all *reasons for* still results in a high JWOS attitude. Configuration 2 shows that when customer care inconvenience is absent, only four *reasons for* need to be present—that is access convenience, search convenience, no need for interaction, and limited social judgment. Configurations 3 and 4 reflect combinations in which all *reasons against* are absent. Here, consumers only need to believe strongly in a subset of *reasons for* to hold high JWOS attitude—that is the combination of high transaction convenience and having no need for interaction (configuration 3), or having a high belief in JWOS access, transaction, and search convenience (configuration 4). Moreover, we see that high transaction convenience and access convenience are acting as core *reasons for*; absence of beliefs related to customer care inconvenience is acting as a core *reason against*—indicated by a larger circle in Table 6. When considering the four configurations of the model 1

solution, no single variable acts as a necessary condition since a specific condition is not present or absent in all four configurations.

When looking at model 2 ('high adoption intentions' configurations), the four configurations are largely consistent with those of model 1. Configuration 1 shows that the presence of all *reasons for* in combination with a strong JWOS attitude leads to high adoption intentions, regardless of *reasons against* being high or low. Configurations 2, 3, and 4 are consistent with respectively configurations 3, 4, and 2 of model 1, except for the fact that JWOS attitude is also present. In this model, JWOS attitude is a core driver and necessary for consumers to display high adoption intentions—in line with our theoretical prediction (e.g., Blut et al. 2016)

- ***What configurations lead to low attitude and adoption intentions?***

To explain low JWOS attitude (see model 3 in Table 6), three causal configurations emerge. Interestingly, these configurations are not all the 1-on-1 counterparts of the configurations leading to high JWOS attitude. Configuration 1 shows that when all *reasons for* are absent, JWOS attitudes are low. Configuration 2 finds that when all *reasons against* are and transaction convenience is absent, JWOS attitude is low. Finally, configuration 3 shows that when consumers strongly hold a set of *reasons against* (i.e., technology reliability concerns, payment unease, entry inconvenience, customer care inconvenience, privacy concerns) and do not believe in some *reasons for* (i.e., absence of transaction convenience, search convenience, no need for interaction, limited social judgment), JWOS attitude is low. When considering the importance of the various reasons, low transaction convenience, low limited social judgment, and high customer care inconvenience surface. Moreover, low transaction convenience acts as an insufficient, necessary condition in model 2, meaning that the absence of this condition is needed in each configuration and thus 'necessary' for consumers to have a low attitude, yet

‘insufficient’ since other conditions are required too in combination with the absence of transaction convenience.

When looking at model 4 (‘low adoption intentions’ configurations), four configurations surface. Configuration 1 shows that when all *reasons against* are present and consumers hold low JWOS attitude, adoption intentions are low. Configurations 2, 3, and 4 all represent solutions of consumers holding low JWOS attitude, with a varied selection of *reasons against* being present and several *reasons for* being absent. In this case, a low JWOS attitude is the core driver across the models. Moreover, there are four insufficient, necessary conditions: high technology reliability concerns, high customer care inconvenience, high privacy concerns, and low JWOS attitude are needed for consumers to hold a low JWOS adoption intention.

6. General discussion

JWOS stores are commonly considered as a highly promising new retail format. Yet, consumer interest is low (Insider Intelligence 2022), with many retailers still being in an experimental phase. Thus, it is highly important to understand what reasons impact consumers’ decisions to accept or reject JWOS. While research to date offers initial insights, work focusing on JWOS-specific *reasons for* and *reasons against* is limited. Moreover, the complex joint impact of these reasons on JWOS attitude and adoption intentions has been barely considered. Understanding how different configurations of *reasons for* and *against* impact consumers is of high managerial relevance to further boost consumer adoption.

In a first qualitative field study, our work uncovers five JWOS-specific *reasons for*—access convenience, transaction convenience, search convenience, no need for interaction, limited social judgment—and seven *reasons against*—technology reliability concerns, entry inconvenience, payment unease, customer case inconvenience, privacy concerns,

contamination concerns, assortment-related concerns. By doing so, we gain a deeper understanding of what makes consumers willing or reluctant to adopt and use JWOS, thereby responding to earlier research calls for more research on JWOS (Grewal et al. 2021; Shankar et al. 2021). Moreover, we extend prior work as two *reasons for* (i.e., search convenience, no need for social interaction) and three *reasons against* (i.e., payment unease, contamination concerns, assortment-related concerns) were not exposed in earlier work and are novel findings of the current research. While prior JWOS research did include single measurement items on *customer care inconvenience* (e.g., Lin 2022³) and *technology reliability concerns* (e.g., Lin 2022⁴; Ponte and Bonazzi 2023⁵), these were not identified as separate reasons and were solely incorporated within a broader ‘perceived risk’ factor. In line with behavioral reasoning theory (Westaby 2005), our findings clearly show the importance of considering both *reasons for* and *reasons against* separately in research and practice as these are not necessarily logical opposites.

Building on the insights of the fsQCA analysis, we find that (i) all reasons *for* and *against* are impactful as they appear in one or more configurations, and (ii) that different combinations of *reasons for* and *against* may lead to favorable and unfavorable outcomes toward JWOS. Looking at what leads to high JWOS attitude and adoption intention, we find that the set of *reasons for* is generally more impactful in driving high JWOS attitude and adoption intentions compared to *reasons against*. When all *reasons against* are high, attitude and JWOS adoption intention are high regardless of whether all *reasons against* are high or not. When all *reasons against* are low (i.e., absent), a combination of *reasons for* is still necessary for high JWOS attitude and adoption intentions. Here, transaction and access

³ Item: ‘Compared with traditional convenience stores, I feel that intelligent unmanned convenience store is risky because there is no one to help the customers’

⁴ Item: ‘Compared with traditional convenience stores, I am worried about intelligent unmanned convenience store is more likely to have system failure’

⁵ Item: ‘Thinking about the risks that the purchasing process entails, I think that this technology can make mistakes in registering products and accounting for goods purchased’

convenience prove to be the core *reasons for*. This appears logical as the ease of shopping is a typical JWOS attribute that is highlighted (Grewal et al. 2021), while most JWOS are in highly convenient locations across major cities and airports. Consumers showing low JWOS attitude and adoption intentions are largely marked by an absence of perceived transaction convenience and a strong belief in multiple *reasons against*.

On a more general level, this paper is also among the first to uncover JWOS-specific reasons impacting consumer attitudes and adoption intentions based on qualitative data, rather than relying on typical general drivers/inhibitors (e.g., perceived ease of use, perceived risk) put forth in traditional technology/innovation adoption models like TAM, UTAUT and HISAM. In this way, we broaden the application of behavioral reasoning theory (Westaby 2005) and demonstrate the importance of accounting for innovation-specific reasons in technology/innovation adoption research, thereby responding to the need to adjust technology adoption theoretical models according to the characteristics of the innovation field (Xu et al. 2021). In this context, researchers and practitioners need to employ qualitative techniques such as in-depth interviews to move beyond generic adoption antecedents and uncover salient, contextualized reasons for both technology/innovation adoption and rejection.

Finally, like Acikgoz et al. (2023) and Li and Larivière (2023), we demonstrate the value of fsQCA as an alternative methodology in technology/innovation adoption and marketing research. This methodology is particularly complementary to behavioral reasoning theory (Westaby 2005) to reveal complex interdependencies among a large set of *reasons for* and *against* new technologies whose interplay cannot be uncovered by relying on conventional research methodologies. Typically, few studies examine interactions among adoption drivers (Kumar et al. 2022). Even in those studies, the focus of the studies is limited to specific pairs of drivers. Our work, on the contrary, shows more complex and complementary relationships across a large set of different reasons. Adopting a similar

approach in future research could prove advantageous, wherein thinking in terms of *reasons configurations* enables a more fine-grained understanding of consumers' adoption decision-making process for new technologies and innovations.

7. Managerial implications

From a managerial viewpoint, this research holds several important implications. First, managers can use our results to identify the specific *reasons for* and *reasons against* that their customers may hold regarding their JWOS. Our qualitative findings, grounded in field data, provide insightful examples of such reasons as well as how they influence consumers' decision-making process. JWOS managers may use these findings as a checklist of contextualized factors that affect their consumers. Moreover, our findings underscore that the *reasons for* and *against* JWOS are multifaceted, suggesting that a single factor may not be a reliable predictor of adoption or rejection of JWOS. Rather, it is a combination of various factors that shape outcomes, necessitating comprehensive strategies that take this complexity into account.

Second, the results underscore the importance of all *reasons for* driving JWOS attitude and adoption intentions. Even when consumers display strong *reasons against* adoption, the existence of all five *reasons for* adoption counterbalances these concerns and sustains a high level of JWOS attitude and intention to adopt. Therefore, managers may aim to emphasize these multiple *reasons for* to consumers in their communication campaigns, while obviously ensuring that their JWOS delivers on these expectations. Currently, most JWOS communications focus on a limited set of *reasons for*. For example, Amazon Go communications emphasize transaction convenience (i.e., 'get in and out quickly', 'without scanning or waiting in a checkout line'), while Žabka-Nano emphasizes the access and transaction convenience of its stores (i.e., 'open 24/7', 'purchasing process can take less than

a single minute). In case budget would be limited, however, transaction convenience emerges as the core *reason* impacting attitude toward and adoption of JWOS most, yet this reason is “insufficient” as revealed in our empirical findings such that addressing all *reasons for* remains the preferred managerial recommendation. Nevertheless, transaction convenience warrants special managerial attention. Therefore, it is incumbent upon retailers to demonstrate how JWOS streamline the shopping process, reduce checkout times, and provide a hassle-free experience through methods such as in-store demonstrations, informational pamphlets, or digital campaigns.

Third, solely communicating about the relative advantages of JWOS may hold a myopic viewpoint (Claudy et al. 2015). To adopt JWOS, consumers need to change their shopping habits and routines. Doing so requires them to not only embrace JWOS *reasons for*, but also to overcome any *reasons against* they might be feeling—as evidenced by the research findings of our work. Our results indeed show that when *reasons against* are absent, consumers need to have fewer *reasons for* to show high JWOS attitudes and adoption intentions. Hence, efforts that help reduce consumers’ concerns with JWOS might be highly beneficial. From our findings, customer care inconvenience would be a prime candidate to focus on. Amazon Go, for instance, makes use of store employees called ‘Go Associates’ to, among other things, help answer questions and solve problems, thereby taking away worries related to a lack of in-store customer care.

8. Limitations and future research

Several research limitations should be acknowledged. First, the qualitative field study was conducted in a European setting and mostly included people of a younger age. While younger consumers may be better fitting with the typical target audience of JWOS as these stores are typically located in city-areas with much footfall, future work should replicate this study with

older consumers to ensure a broader representation of consumer perspectives and behaviors. Second, despite respondents stemming from different cultures, new work may conduct studies in different countries across the globe to see whether all *reasons for* and *against* surface, and/or whether novel reasons are mentioned. This would provide insights for global retailers seeking to expand JWOS to different markets by considering the interaction between cultural factors and the identified reasons. Third, follow-up work should consider setting up field experiments to test our findings and check whether different reasons-related communication campaigns impact consumers' actual usage of JWOS. This would provide a deeper understanding of the relative importance of these factors and their influence on consumers' JWOS usage. Additionally, future longitudinal studies could apply behavioral reasoning theory and track changes in customers' reasons, attitudes, intentions, and actual behaviors over time to enhance our understanding of the temporal dynamics of JWOS adoption. By addressing these research limitations and pursuing the suggested future research avenues, scholars and practitioners can advance our understanding of JWOS adoption, contribute to the broader literature on technology/innovation adoption, and develop effective strategies to enhance consumer acceptance and utilization of this promising new retail format.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used ChatGPT-GPT4.0 to check the spelling and writing of some of the included sentences. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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Figure 1: JWOS functioning

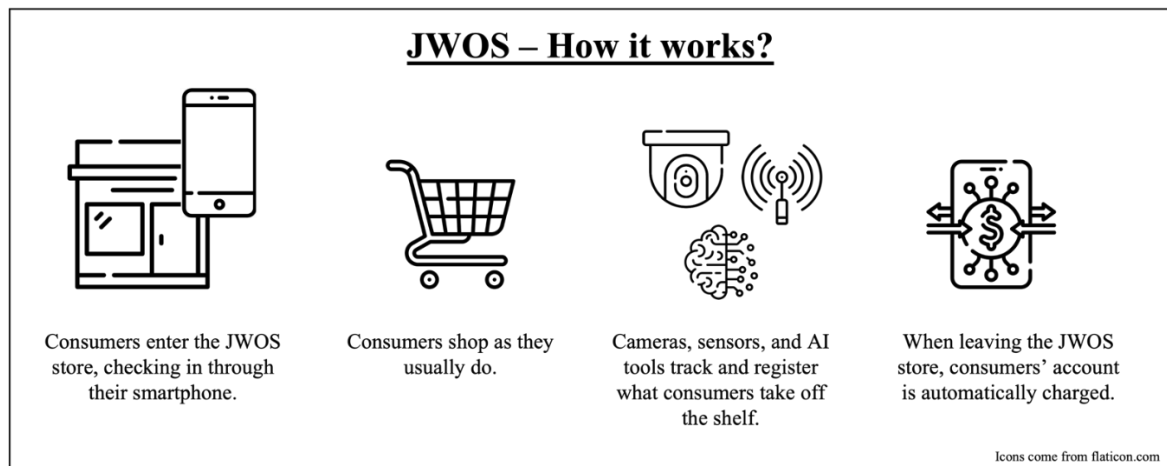
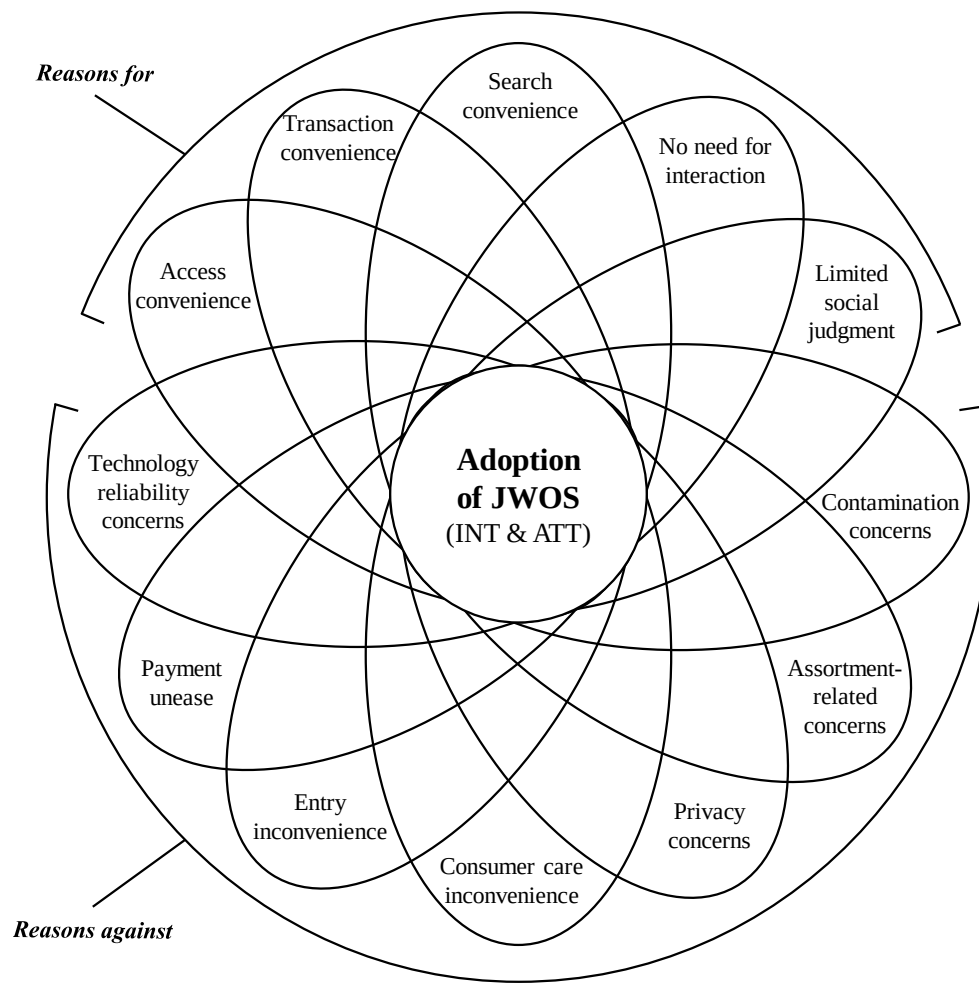


Figure 2: Conceptual model



Notes. INT = intentions to adopt JWOS. ATT = Attitudes towards JWOS

Table 1: Prior JWOS research setup and core findings

Study	Base model/theory	Antecedents		Outcome variable(s)	Method	Key finding(s)
		Drivers	Inhibitors			
Chuawatcharin and Gerdri (2019)	Technology acceptance model	Perceived usefulness, perceived ease of use, perceived entertainment, trust		Attitude, intention to use	Quantitative (survey)	Consumer perceptions of JWOS' usefulness and ease of use positively impact attitude toward JWOS, which leads to higher intentions to use JWOS.
Wu et al. (2019)	Experiential marketing model	Experiential quality		Satisfaction, loyalty, switching intention	Quantitative (survey)	Experiential quality contributes to consumers' confidence in, desire and motivation to visit JWOS. In turn, these factors positively impact satisfaction and loyalty, while diminishing switching intentions
Pillai et al. (2020)	Technology acceptance model, Technology readiness model	Perceived usefulness, perceived ease of use, perceived enjoyment, customization, interactivity		Intention to shop	Quantitative (survey)	Consumers' perceived usefulness, ease of use, enjoyment, customization, and interactivity have a positive impact on intentions to shop at JWOS.
Chang et al. (2021)	Hedonic information systems acceptance model	Perceived ease of use, perceived usefulness, perceived enjoyment		Intention to shop	Quantitative (survey)	Consumers' perceived ease of use, usefulness and enjoyment positively impact intentions to shop at JWOS.
van Esch et al. (2021a)	N.A.	Perceived shopping convenience		Attitude, intention to purchase	Quantitative (experiment)	Compared to self-service checkouts, AI-enabled checkout temporarily activates shopping convenience. This leads to more favorable attitudes, as well as higher purchase intentions.
van Esch et al. (2021b)	Technology threat avoidance theory	In-store communication stimulation	Perceived AI threat	Store atmosphere evaluation, intention to purchase	Quantitative (experiment)	Compared to self-service checkouts, AI-enabled checkouts lead to higher consumers' purchase likelihood. This effect is mediated by in-store communication sensory stimulation. The extent to which consumers perceive AI as threatening acts as a negative boundary condition.
Chang et al. (2022)	Cognitive appraisal theory	Time saving, hedonic seeking experience, trendiness, experiential quality		Satisfaction, loyalty	Quantitative (survey)	Experiential quality (driven by time saving, hedonic seeking experience, and trendiness), confidence, and motivation positively impact consumer satisfaction and loyalty

Table 1 (continued)

Study	Base model/theory	Antecedents		Outcome variable(s)	Method	Key finding(s)
		Drivers	Inhibitors			
Cui and van Esch (2022)	Approach-avoidance theory	<i>* comparison with self-checkout</i>		Store atmosphere evaluation, intention to purchase	Quantitative (experiment)	Consumers with higher political identity salience evaluate JWOS more favorably compared with self-service kiosks. Among them, liberals prefer AI-enabled over self-service checkouts, whereas conservatives are indifferent. Liberal consumers' greater preference for AI-enabled checkouts is driven by experiences of autonomy.
Cui et al. (2022)	Theory of arousal and attraction misattribution	<i>* comparison with self-checkout</i>		Store atmosphere evaluation, intention to purchase	Quantitative (experiment)	AI-enabled checkouts lead to a higher level of arousal (compared to regular self-service checkouts). This, in turn, yields more favorable store atmosphere evaluations and a higher purchase intent. These effects are diminished when consumers place low importance on innovativeness
Ghazwani et al. (2022)	Roy adaptation model	Convenience		Intention to purchase	Quantitative (experiment)	High-convenience consumers prefer JWOS over their traditional counterpart; low-convenience consumers are indifferent.
Lin (2022)	Unified theory of acceptance and use of technology	Performance expectancy, effort expectancy, perceived convenience value, perceived novelty value	Perceived risk	Attitude, patronage intentions	Quantitative (survey)	Performance expectancy, effort expectancy, social influence, perceived convenience value and perceived novelty value positively impact consumer attitudes towards JWOS, which in turns impacts consumer patronage intentions. Perceived risk has a direct negative impact on consumer patronage intentions.
Park and Zhang (2022)	Technology paradox theory	Technology satisfiers (second order: efficiency, control, private)	Technology dissatisfiers (second order: inefficiency, chaos, public)	Attitude, continuous intention to use	Quantitative (survey)	Technology satisfiers enhance consumer attitude toward JWOS, while the dissatisfiers (except for inefficiency) have adverse effects on attitude, thereby negatively impacting continuous usage intentions
Philips et al. (2022)	Experiential marketing, Job-demand and resource model	Customer effort		Experience memorability	Qualitative (interviews)	A just walk out frictionless experience consists of transferable positive and negative effort with physical, cognitive, and interpersonal components. The reduction of customer effort is facilitated by removing high interpersonal effort
Wu et al. (2022)	N.A.	Product innovation Process innovation, marketing innovation, organizational innovation, experiential value		Satisfaction, commitment, trust, PWOM, patronage intentions	Quantitative (survey)	Perceived innovation (product, process, marketing, organizational) through JWOS drive consumer experiential satisfaction. This, in turn, positively impacts experiential commitment and trust to ultimately enhance word-of-mouth and patronage intentions

Table 1 (continued)

Study	Base model/theory	Antecedents		Outcome variable(s)	Method	Key finding(s)
		<i>Drivers</i>	<i>Inhibitors</i>			
Chang et al. (2023)	Hedonic information systems acceptance model	Perceived ease of use, utilitarian motivation (second order: merchandise quality, merchandise price, location convenience, speed of shopping, product recommendation), hedonic motivation (second order: control, curiosity, joy, focused immersion, temporal)		Intention to purchase	Quantitative (survey)	Perceived ease of use directly and indirectly influences consumer purchase intentions in JWOS through utilitarian and hedonic motivation
Ponte and Bonazzi (2023)	Unified theory of acceptance and use of technology	Performance expectancy	Perceived risk	Intention to use	Quantitative (survey)	Consumers' performance expectancy has a positive impact on intentions to use JWOS, while perceived risk has a negative impact.
Benoit et al. (2024)	Convenience theory	Access convenience, assistance convenience, transaction convenience, verification convenience	Access inconvenience, assistance inconvenience, transaction inconvenience, verification inconvenience	Patronage intentions	Qualitative and quantitative (conjoint experiment)	Except for check-out, consumers prefer staffed JWOS; having to check in, limited access to (remote) staff, and an inability to verify the basket before payment represent significant barriers. Store features that increase convenience and autonomy undermine safety perceptions. Community-based and rural locations are better suited for JWOS than anonymous traffic hubs.

Table 2: Consumers' reasons for/against JWOS adoption, definitions, and illustrative statements

Reason	Definition	Dimension	JWOS literature support ^a	Illustrative statements
<i>Reasons for</i>				
Access convenience	Consumers' perceived low time and effort expenditures to initiate the shopping journey at JWOS	- JWOS operating hours (24/7) - JWOS convenient location - Easy access	Yes	"It's open 24/7! That is a very big plus for students, because we mostly stay up nights and we have not a very good sleep schedule. So you can go there at anytime. I think that is a thing which is very convenient and which almost no other store offers. So that is a very big plus point I feel." (ID36) "The location! Since I live on campus, it is the most convenient place for me to get things in a short notice." (ID45)
Transaction convenience	Consumers' perceived low time and effort expenditures to effect a transaction in JWOS	- No waiting lines - No need to take out, scan and manually pay for grocery items	Yes	"Everyone is living in a busy life, and if we can reduce the time for waiting in the cashier line, or like just reducing the time that we can pay... I think it's also quite some time saving. And then it is so easy for us to like just like pick something and then like, easily pay it and go. So I think it's really convenient!" (ID21)
Search convenience	Consumers' perceived low time and effort expenditures to experience the JWOS' core benefits	- Easy to locate items in JWOS - Appropriate for on-the-go purchases	<u>No</u>	"I found it very practical for emergency purchases or hygienic purchases or purchases on the go before going home." (ID13) "It's a good thing that the store is not very big. So I don't feel overwhelmed." (ID45)
No need for interaction	Consumers' perceptions that shopping at JWOS involves little to no social interaction	Little to no interaction with other shoppers or employees is required	<u>No</u>	"For me it is a good thing. I don't really speak French, so I don't really communicate with the staff at all. So, for me, I don't need that, um that characteristic of the store gives me comfort." (ID26)
Limited social judgment	Consumers' feelings of being less judged in JWOS	- Little to no social pressure from other shoppers waiting behind - No social judgment by the cashier	Yes	"Sometimes there are problems with your payment card, I don't know why, and you have this feeling that... there are like 10 people behind me waiting and I am having a problem with my card and I can't pay. You feel bad. I run into that a lot. So, with JWOS, you never experience that, of course! So yeah, that's kind of like reducing the risk of feeling bad." (ID26)

Note. ^a Reasons for and reasons against identified in prior JWOS research

Table 2 (continued)

Reason	Definition	Dimension	JWOS literature support	Illustrative statements
<i>Reasons against</i>				
Technology reliability concerns	Consumers' perceived uncertainty related to the consistent and accurate performance of the just walk out technology	• Fear of being incorrectly charged • Fear of being stuck in the JWOS • Fear of high dependence on technology	Yes	"I'm always afraid that the technology doesn't work. I'm afraid to take something and when I finally put it back, I still have to pay for it and I don't realize in the end if I'm not careful." (ID1) "Imagine like... one day you go into the JWOS, and then there's some unknown problem and you cannot go out. But then you don't know what to do?!" (ID19)
Entry inconvenience	Consumers' perceived high time and effort expenditures to initiate the shopping journey at JWOS	• Smartphone (with appropriate app installed) required	Yes	"You must download the app to go in. I don't want to download the app [...] you must also register your card in the app, but sometimes you have problem... I don't know. The banking system doesn't work." (ID19)
Payment unease	Consumers' perceived loss of control over the payment in JWOS	• Limited payment methods • Loss of control over payment • Required payment check	<u>No</u>	"I don't want anyone to have access to my bank account like that!" (ID5) "Once I come out, and once I get the bill and I'll need to check what has happened." (ID12)
Consumer care inconvenience	Consumers' perceived high time and effort expenditure to seek consumer support	• Lack of assistance in case of issues • Burdensome remote service recovery process	Yes	"The reason why I didn't do it, it's because there's no one there if you ever have a question or don't understand... there's no one to help you!" (ID14) "People have had, like, money cut from their account, and then they must go through the whole process of contacting the consumer service and then getting the money back. So that's why I haven't... I didn't like this idea." (ID5)
Privacy concerns	Consumers' apprehension and uneasiness over the collection and use of their personal data in JWOS	• Concerns about data privacy/protection • Feelings of being surveilled	Yes	"As we are filmed and observed 24 hours a day, it is important for me that the JWOS managers protect our private life, and make sure that everything that is filmed is not transmitted to anyone else. In fact, my fear with this type of technology is that everything that is filmed will be sold or used without your consent" (ID14) "Because you feel like... like somebody's watching you and yeah, you will feel uncomfortable." (ID52)
Contamination concerns	Consumers' perceived contamination and concerns about the cleanliness of JWOS	• Fear of being contaminated by germs • Cleanliness concerns	<u>No</u>	"It is really small and when everybody is in the store, you know, I'm worried about my health and the risk of... being infected" (ID18)
Assortment-related concerns	Consumers' concerns about the variety and replenishment of the assortment in JWOS	• Low width and depth of the assortment in JWOS • High risks of stockout	<u>No</u>	"They don't have much variety. For instance, they only have white bread, and I prefer to eat brown bread. Plus, they have only one type of milk, cow milk. And I don't like the taste of that. That's the main reasons I haven't visited the store" (ID5)

Table 3: Survey sample description

Criterion	Characteristics	Study 2 (n = 546)
Age (year)	Mean	41.13
	Min / max	18 / 87
	Standard deviation	13.32
Gender	Female	50.92%
	Male	48.35%
	Non-binary	0.55%
	Prefer not to say	0.18%
Education	Primary school	0.00%
	Secondary school	3.69%
	Higher or secondary (A-levels, BTEC)	13.15%
	College or university	46.89%
	Post-graduate degree	35.99%
	Prefer not to say	0.28%
Employment	No	20.33%
	Yes	79.67%

Table 4: Constructs and factor analyses

		First-order factor loadings		Second-order factor loadings
Construct	Items	EFA	CFA	CFA
Outcome variables				
Intentions to adopt JWOS (adapted from Dabholkar and Bagozzi 2002)	In the future, would you intend to use just walk out stores?			
	1. unlikely-likely	.758	.947	
	2. impossible-possible	.905	.845	
Attitudes towards JWOS (adapted from Reinders et al. 2008)	How would you describe your feelings toward using just walk out stores?			
	1. bad-good	.833	.959	
	2. unpleasant-pleasant	.839	.921	
	3. unfavorable-favorable	.816	.951	
	4. harmful-beneficial	.877	.876	
My reasons for using JWOS				
Access convenience ^C	1. Because just walk out stores are open 24/7	.665	.739	.887
	2. Because just walk out stores are located in convenient places	.672	.774	
	3. Because I can quickly get access to just walk out stores	.552 ^A		
Transaction convenience ^C	1. Because I can save the hassle of taking out my grocery items for scanning at the checkout	.813	.896	.887
	2. Because just walk out stores eliminate queue waiting times	.809	.924	
	3. Because just walk out stores allow me to complete my purchase quickly	.784	.859	
Search convenience ^C	1. Because I can easily locate items in small stores like just walk out stores	.747	.834	.820
	2. Because I can easily buy items on-the-go in just walk out stores	.697	.890	
	3. Because it is easy to find staple items I am looking for in just walk out stores	.385 ^B		
No need for social interaction	1. Because I can save the hassle of talking to the cashier	.715	.904	.786
	2. Because I do not need to interact with anyone in just walk out stores	.739	.912	
	3. Because personal contact with an employee is not needed in just walk out stores	.732	.911	
	4. Because I would not feel pressured to interact with other people in this kind of store	.421 ^B		
Limited social judgment	1. Because just walk out stores reduce social pressure resulting from other shoppers waiting for you to complete your transaction	.785	.825	.685
	2. Because I can buy things without any person at the check-out seeing what I buy	.871	.899	
	3. Because, in just walk out stores, I can buy things without being judged by others	.896	.874	

^A removed because of high cross-loading on other factor: .567 on transaction convenience

^B removed because. of low (< .50) factor loading

^C Some items were adapted from Seiders et al. (2007)

Table 4 (continued)

<i>My reasons against using JWOS</i>				
Technology reliability concerns	1. Because I worry about being automatically charged for grocery items I did not grab	.816	.763	.760
	2. Because I worry about how reliable the technology is when the store is crowded	.762	.860	
	3. Because I fear being stuck in the store due to technological issues	.377^B		
	4. Because I fear being too dependent on the functioning of the technology behind the store	.571	.721	
Payment unease	1. Because I would need to take the time to check what has been debited to my account	.273^B		.786
	2. Because I would not be able to make cash payments in just walk out stores	.634	.778	
	3. Because the range of payment methods is limited in just walk out stores	.414^B		
	4. Because I would feel less in control at the time of purchase	.644	.858	
Entry inconvenience	1. Because I need to download a mobile application to be able to enter the store	.753	.880	.764
	2. Because installing a mobile application and linking it to my banking account is too much of a hassle	.748	.846	
	3. Because I must have a smartphone with the right app installed to be able to go into the store	.780	.778	
Customer care inconvenience	1. Because I am concerned about the lack of assistance in case of issues	.743	.858	.800
	2. Because I would not know whom to ask and make inquiries when using just walk out stores	.773	.859	
	3. Because returning or exchanging grocery items would not be hassle-free in just walk out stores	.753	.765	
	4. Because after-purchase problems would need to be resolved remotely	.722	.836	
Privacy concerns	1. Because I would worry about being observed by the video cameras in just walk out stores	.780	.756	.812
	2. Because I am worried about the security of my personal data	.712	.893	
	3. Because I would feel under constant surveillance in just walk out stores	.789	.785	
	4. Because I would worry about what would happen to my personal data	.759	.913	
Contamination concerns	1. Because I worry about the cleanliness of just walk out stores	.869	.905	.613
	2. Because I fear that just walk out stores are not cleaned regularly	.845	.866	
	3. Because I would be concerned about germs in just walk out stores	.836	.909	
Assortment-related concerns	1. Because I anticipate slow replenishment of the shelves in just walk out stores	.619	.882	.655
	2. Because grocery items are not frequently restocked in just walk out stores	.733	.863	
	3. Because the product assortment is limited in just walk out stores	.787	.721	

^B removed because. of low (< .50) factor loading

Table 5: Calibration thresholds and descriptives

Conditions		Calibration thresholds			Descriptives
		Threshold for full membership	Crossover point	Threshold for full non-membership	Mean (SD)
Causal conditions	Reasons for (RF) factors				
	1. RF - Access convenience	6	5	4	4.95 (1.35)
	2. RF - Transaction convenience	6.67	6	4.67	5.45 (1.43)
	3. RF - Search convenience	5.5	4.5	3.5	4.42 (1.36)
	4. RF - No need for interaction	6	4.33	2.67	4.29 (1.78)
	5. RF - Limited social judgment	5.67	4.33	2.33	4.03 (1.68)
	Reasons against (RA) factors				
	1. RA - Technology reliability concerns	6.33	5	4	5.01 (1.45)
	2. RA - Payment unease	5.33	3.67	2	3.87 (1.75)
	3. RA - Entry inconvenience	5.5	4	2	3.80 (1.71)
	4. RA - Customer care inconvenience	6.25	5.5	4	5.18 (1.39)
	5. RA - Privacy concerns	6	4.75	3	4.50 (1.69)
	6. RA - Contamination concerns	4.33	2.67	1.67	2.98 (1.52)
	7. RA - Assortment-related concerns	5	4	2.67	3.89 (1.40)
Outcomes	Attitude	6	4.5	2.75	4.33 (1.77)
	Intention	6.9	5.5	3	4.83 (1.79)

Table 6: fsQCA findings

	HIGH								LOW							
Causal Conditions	Configurations for High Attitude (Model 1)				Configurations for High Intention (Model 2)				Configurations for Low Attitude (Model 3)				Configurations for Low Intention (Model 4)			
	1	2	3	4	1	2	3	4	1	2	3	1	2	3	4	
Reasons For (RF) Factors																
1. RF - Access convenience	●	●		●	●		●	●	⊗					⊗	⊗	
2. RF - Transaction convenience	●		●	●	●	●	●		⊗	⊗	⊗		⊗	⊗	⊗	
3. RF - Search convenience	●	●		●	●		●	●	⊗		⊗		⊗	⊗	⊗	
4. RF - No need for interaction	●	●	●		●	●		●	⊗		⊗		⊗	⊗	⊗	
5. RF - Limited social judgment	●	●			●			●	⊗		⊗		⊗	⊗	⊗	
Reasons Against (RA) Factors																
1. RA - Technology reliability concerns			⊗	⊗		⊗	⊗	⊗		●	●	●	●	●	●	
2. RA - Payment unease			⊗	⊗		⊗	⊗	⊗		●	●	●	●	●	●	
3. RA - Entry inconvenience			⊗	⊗		⊗	⊗	⊗		●	●	●	●	●	●	
4. RA - Customer care inconvenience		⊗	⊗	⊗		⊗	⊗	⊗		●	●	●	●	●	●	
5. RA - Privacy concerns			⊗	⊗		⊗	⊗	⊗		●	●	●	●	●	●	
6. RA - Contamination concerns			⊗	⊗		⊗	⊗	⊗		●		●	●	●	●	
7. RA - Assortment-related concerns			⊗	⊗		⊗	⊗	⊗		●		●	●	●	●	
Attitude (high) towards JWOS					●	●	●	●				⊗	⊗	⊗	⊗	
Model Performance Metrics																
Consistency	0.880	0.923	0.973	0.981	0.922	0.966	0.967	0.954	0.958	0.941	0.983	0.976	0.995	0.996	0.996	
Raw Coverage	0.389	0.354	0.229	0.190	0.382	0.236	0.195	0.172	0.434	0.288	0.261	0.291	0.245	0.184	0.181	
Unique Coverage	0.078	0.043	0.051	0.012	0.218	0.053	0.012	0.008	0.200	0.088	0.012	0.103	0.057	0.009	0.007	
Solution Consistency	0.874				0.919				0.939			0.980				
Solution Coverage	0.515				0.474				0.549			0.364				
Necessary Conditions [†]	none				the presence of high attitude towards JWOS				the absence of transaction convenience				the presence of technology reliability concerns, customer care inconvenience and privacy concerns, and the absence of high attitude towards JWOS			
Summary per Model																

Notes. ¹ Necessary conditions are conditions that always need to be met in order to have high or low values for the outcome variables (i.e., the condition is present or absent in all configurations of a Model/Solution); n.a. = not applicable. The ● black circles indicate the presence of a condition, the ⊗ crossed-out circles indicate the absence of a condition, and the “blank space” indicates “do not care”. Large circles indicate core conditions and smaller circles indicate peripheral conditions.