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Omnichannel safe customer experience: how should it be measured? Does it affect customer well-being and retailers' performance?☆

Syed Mahmudur Rahman [a,*], Jamie Carlson [b], Noman H. Chowdhury [c], Siegfried P. Gudergan [d,e,f], Martin Wetzels [g], Christian M. Ringle [h,d], Dhruv Grewal [i,j,k]

[a] Department of Marketing, Macquarie University, Sydney, NSW 2109, Australia
[b] Newcastle Business School, The University of Newcastle, Australia, Newcastle, NSW 2300, Australia
[c] School of Business and Economics (SBE), North South University, Dhaka 1229, Bangladesh
[d] College of Business, Law and Governance, James Cook University, Townsville, Australia
[e] Aalto University Business School, Aalto University, Finland
[f] Institute for International Business, Vienna University of Economics and Business, Austria
[g] EDHEC Business School, Lille Campus, France
[h] Department of Management Sciences and Technology, Hamburg University of Technology, Hamburg, Germany
[i] Babson College, Babson Park, MA, United States
[j] University of Bath, UK
[k] Honorary Distinguished Visiting Professor of Retailing and Marketing, Tecnológico de Monterrey, Monterrey, Mexico

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ABSTRACT

Customer safety is a fundamental need, so for customer-centric omnichannel retailers operating in competitive and technologically intensive markets, a critical question arises: do customers' perceptions of a safe customer experience determine their sense of well-being, as well as the retailers' performance? To offer insights into these questions, the current research relies on mixed methods across five studies in six phases to develop a multidimensional scale for safe customer experiences (SafeCX). The formative SafeCX scale, which can be adopted as either a full 48-item or a condensed 12-item version, contains 12 critical safety dimensions that constitute essential considerations for managers, as well as key concepts for researchers dedicated to customer safety considerations. Among these dimensions, several directly capture in-store technologies, such as payment systems, surveillance cameras, and technology-mediated order fulfillment processes. Other dimensions reflect online technologies, such as data protection, social media safety, and practices that bridge physical and digital channels, offering a comprehensive perspective on customer safety. Complementing SafeCX, we also develop a two-dimensional, 8-item customer well-being scale: individual well-being, reflecting effects on one's own mental, emotional, social, and physical life; and community well-being, reflecting effects on family, friends, and the broader community. This scale enables researchers and retail managers to assess how safety perceptions translate into personal and societal value in omnichannel contexts. In turn, this research establishes that customers who indicate positive appraisals on the SafeCX scale also exhibit a higher share of wallet and stronger intentions to influence others, effects that are mediated by their well-being appraisal.

1. Introduction

Safety is a fundamental human need (Maslow, 1954). Achieving it requires protection against various risks, such as physical harm, financial instability, social turbulence, and negative emotions. Closely aligned with safety is the valuable personal resource of well-being, and together these factors shape many purchasing behaviors (Schwartz, 1992). In modern marketing thought, which emphasizes the need to create value benefiting organizations, customers, and society at large (AMA, 2023), customer safety and well-being emerge as potential

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* Corresponding author.
E-mail addresses: Syed.Rahman@mq.edu.au (S.M. Rahman), Jamie.Carlson@newcastle.edu.au (J. Carlson), chowdhury_noman@yahoo.com (N.H. Chowdhury), Siggi.Gudergan@jcu.edu.au (S.P. Gudergan), Martin.Wetzels@edhec.edu (M. Wetzels), c.ringle@tuhh.de (C.M. Ringle), dgrewal@babson.edu (D. Grewal).

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sources of competitive advantage (Deloitte, 2025; Mende et al., 2024). Despite this recognition, omnichannel retailers currently lack empirical guidance regarding which specific elements, either in-store or online, most significantly influence customers' safety perceptions and well-being outcomes.

Existing literature presents diverse safety-related elements but rarely tests them in a comprehensive manner or concurrently in omnichannel retail contexts. This holds especially for the impact of in-store technologies designed to enhance customer safety. Consequently, retailers face challenges in effectively monitoring and improving safety and well-being experiences based on customers' actual perceptions. This limitation is particularly critical in today's omnichannel retail environment, where customers increasingly expect technology-enabled and customer-driven safety initiatives. Understanding the critical factors underlying these safety and well-being perceptions is therefore essential to inform retail decisions, guide investment in relevant in-store technologies, enable targeted improvements, and drive enhanced customer engagement and retail performance. Specifically, we identify four gaps that prompt the research questions (RQs) we seek to address with the current research:

RQ1: How do customers perceive safe customer experiences in omnichannel retailing?

RQ2: How do customers perceive their well-being in omnichannel retailing?

RQ3: How do customers' perceptions of safe customer experiences relate to their perceptions of well-being in omnichannel retailing?

RQ4: Which technology-driven safe customer experience dimensions are critical for enhancing customer well-being in-store and online?

Addressing these research questions requires a rigorous empirical approach to explore, refine, and validate the critical dimensions underlying omnichannel customer safety and well-being. An empirical scale development process serves as the appropriate methodology, as it systematically identifies the most relevant factors and captures customers' actual perceptions (Netemeyer et al. 2003). Such empirically validated scales are invaluable for researchers seeking to deeply investigate each identified dimension and for retail managers needing practical tools to audit their safety performance across channels and inform their decisions.

Our literature review highlights that research in various disciplines deals with the concept of customer safety, and multiple scales exist for assessing safety perceptions in specific consumption settings. In marketing literature, most explorations of customer safety perceptions concentrate on websites and e-commerce contexts. We know of no efforts to take a more holistic view of customer safety across omnichannel retail settings. A related stream of research highlights the growing relevance of customer well-being, which depends on people's own mental and physical health, as well as the health of others in their immediate circle (e.g., family, friends) and in broader communities (Noble et al., 2022). Yet here again, a holistic scale designed to measure customer well-being in omnichannel contexts is missing. In response, we propose and test comprehensive multidimensional scales to measure customers' safety and well-being perceptions in omnichannel settings, then demonstrate how customers' safety perceptions affect their perceived well-being, with notable implications for retailer performance.

To derive these scales, we start by defining omnichannel retail customers' perceptions of a *Safe Customer Experience (SafeCX)* as their overall evaluations of safety across 12 dimensions encountered throughout the various stages of the customer journey, such as information search, purchase, delivery, communication, and returns, while interacting with multiple integrated channels, including physical stores, websites, mobile apps, social media, email, call centers, and catalogues. We also define *Customer Well-being* perception in omnichannel retailing as customers' overall perceptions of how interactions with an omnichannel retailer contribute positively to their personal and societal welfare. To complement all these scales, we test a nomological network in which customer engagement (share of wallet and intentions to influence others) serves as an outcome. In addition to deriving an extensive, 48-item version of the proposed SafeCX scale, we also validate a shorter, 12-item condensed version, both of which take comprehensive views on customer perceptions of safety in omnichannel retailing contexts. The full scale can support more granular assessments of each SafeCX dimension across all customer touchpoints (see concluding discussions for details); the condensed scale offers an efficient, practical alternative for researchers who want to gauge SafeCX perceptions in general. This easy-to-administer, 12-item version still offers excellent predictive ability, such that omnichannel retailers can implement it readily to inform their efforts to enhance customers' safety perceptions, well-being, and engagement.

Among the identified SafeCX dimensions, several directly capture in-store technologies that are critical to customer safety. The Security Cameras dimension reflects customer perceptions of safety derived from surveillance systems deployed across physical stores and parking areas. The Personal Data Safety dimension highlights the retailer's responsibility to safeguard customer information across digital touchpoints, extending to in-store payment systems such as credit cards and contactless transactions. Similarly, the Order Fulfilment Safety dimension is particularly salient in technology-mediated processes such as buy-online-pick-up-in-store, where safety depends on integrated physical–digital systems.

Other dimensions represent practices that complement these technologies in creating a safe customer environment. For example, security personnel, store layouts that promote spatial distancing, assistance with heavy items, and clearly marked emergency exits enhance in-store safety. Additional SafeCX dimensions span both online and offline contexts, such as Safe Employees, Social Inclusiveness, and Anxiety Prevention, while others focus primarily on online environments, including social media safety and product recall. Collectively, these dimensions position SafeCX as a multidimensional instrument that encompasses in-store technologies, online technologies, and technologies that bridge physical and digital channels, supported by broader practices that together shape customers' safety perceptions in omnichannel retailing.

Next, Table 1 outlines the multistage, multiphase process we undertook to address the research questions. It begins with literature reviews (Phase 1). Then we derive the measurement models by synthesizing qualitative data collected in Studies 1 and 2 with the results of our literature reviews. We develop initial measurement items in Phase 2; we refine the SafeCX (Study 3) and customer well-being (Study 4) measurement models in Phase 3, then refine them even further by gathering a new data set (Study 5) in Phase 4. The remaining Phases 5 and 6 consist of nomological validity analyses, robustness checks, and illustrations for managers on how the scales can be used as auditing tools to prioritize investments designed to improve customer safety and thereby increase well-being perceptions and engagement.

2. Literature review

Given the cross-contextual nature of perceived safety and well-being, we reviewed scale development studies across multiple domains, including marketing, healthcare, tourism, transportation, and social infrastructure, to inform the conceptualization of SafeCX and customer well-being. Studies were selected based on three criteria: (1) relevance to construct measurement, (2) demonstrated methodological rigor in scale development, and (3) publication in the SCImago Q1-ranked journals. A summary of the selected studies is presented in Tables 2 and 3, with a brief overview of relevant literature is provided in the following sections.

2.1. Customers' perception of a safe experience in omnichannel retailing

Whereas actual safety implies protection from harm, danger, threat,

Table 1
Scale development and model validation process

Phase 1: *Literature review and conceptualization*
Step 1: Literature review
– Measures of safe/secure experiences across disciplines.
– Measures of customer well-being in omnichannel context.
Step 2: Customers' concept of omnichannel SafeCX: Can customers differentiate between highly safe and unsafe (or less safe) experiences?
– Qualitative data collection ($n = 54$) from multiple countries **(Study 1)**
Step 3: Conceptual dimensions of the SafeCX measurement model: 15 first-order dimensions that form the second-order SafeCX construct.
Step 4: Qualitative data collection ($n = 27$) from retail customers **(Study 2)** to understand customers' perceptions of well-being in omnichannel contexts.
Step 5: Conceptual dimensions of customer well-being measurement model: 2 first-order dimensions that form the second-order customer well-being construct.
Step 7: Theoretical foundations of the SafeCX measurement model and hypothesis development.

Phase 2a: *Development of SafeCX measures*
Step 1: Item generation
– Initial item development, involving multiple authors, Study 1 data, and literature: initial pool of 295 items across 15 conceptual dimensions.
– Item review and improvements by native English speakers, a marketing academic, and two university students.
Step 2: Face and content validation of newly developed items
– Item representativeness test: online survey completed by 36 university students with omnichannel shopping experience; quantitative analysis confirmed the initial pool of 295 items.
– Face validation of the items by 6 omnichannel customers (4 U.S. and 2 U.K.-based) to receive and address qualitative feedback.
– Content validation of the items by two marketing academics to receive and address qualitative feedback.
– Item ranking by 15 omnichannel customers (U.S.-based) to select a minimum of 10 highly ranked items in each dimension, leading to a finalized pool of 178 items
– Copyediting by a professional copyeditor.

Phase 2b: *Development of customer well-being measures*
Step 1: Item generation
– Initial item development, involving multiple authors, Study 2 data, and literature: initial pool of 18 items across 2 conceptual dimensions.
– Item review and improvements by native English speakers.
Step 2: Face and content validation of newly developed items
– Face validation of the item pool by 5 omnichannel customers.
– Content validation of the item pool in a roundtable discussion with 11 marketing academics during a research seminar; the pool increased to 20 items. The academics also confirmed the representativeness of the items in the conceptual dimensions.
– Copyediting by a professional copyeditor.

Phase 3a: *Refinement of the SafeCX measurement model*
Step 1: Data collection **(Study 3)** and exploratory factor analysis (EFA) with data from ($n = 365$) U.S. omnichannel customers, gathered with an online survey.
Step 2: EFA with principal component analysis (PCA) for item reduction: item pool refined to 102 items across 15 factors for the main SafeCX scale.
Step 3: EFA with principal axis factoring (PAF) for further refinement
– Refined pool of 81 items across 12 factors for the main SafeCX scale (4 to 8 items per factor).
– Pool of 12 items in subscale (2 factors, 6 items in each) for measuring responses to local/global health emergencies (epidemics/pandemics/flu season).
– Heterotrait–monotrait (HTMT) discriminant validity tests, in addition to construct reliability assessments.
– Two authors independently conducted all EFA steps following the same criteria, and the outcomes were cross-validated.

Phase 3b: *Refinement of the customer well-being measurement model*
Step 1: Data collection **(Study 4)** from ($n = 135$) U.S. omnichannel customers, gathered with an online survey.
Step 2: EFA with the same steps as in Phase 3, which produced a refined 12-item (2 factors, 6 items each) measurement model for customer well-being.
Step 3: HTMT discriminant validity tests, in addition to construct reliability assessments.

Phase 4: *Validation of the newly developed SafeCX and customer well-being measurement models*
Step 1: Data collection **(Study 5)** from ($n = 257$) U.S. omnichannel customers, gathered with an online survey.
Step 2: EFA with maximum likelihood (ML) to confirm the 12-factor structure of the SafeCX and 2-factor structure of the customer well-being models.
Step 3: Model fit assessment and item reduction using a confirmatory factor analysis (CFA).
– Finalized the 48-item SafeCX scale (12 factors, 4 items each).
– Finalized the 8-item subscale (2 factors, 4 items each) for measuring responses to local/global health emergencies (epidemics/pandemics/flu season).
– Finalized the 8-item customer well-being scale (2 factors, 4 items each).
– HTMT discriminant validity tests, in addition to construct reliability assessments.
– Two authors independently conducted all CFA steps following the same criteria, and the outcomes were cross-validated.

Phase 5: *Measurement model robustness checks and finalization*
Step 1: Confirmatory tetrad tests (CTA-PLS) to confirm SafeCX as a formatively measured second-order construct.
Step 2: Permutation analysis to confirm that the SafeCX and customer well-being measurement models do not have statistically significant differences in their group-specific parameter estimates across predefined data groups (e.g., male vs. female).
Step 3: Common method bias (CMB) tests (marker variable technique, variance inflation factors).
Step 4: Validation of a 12-item condensed SafeCX measurement model.

Phase 6: *PLS-SEM nomological validity assessments*
Step 1: Reliability and validity assessment of endogenous constructs, share of wallet, and customers' influence intentions.
Step 2: Nomological validity assessments/hypothesis testing.
Step 3: Predictive relevance tests (e.g., out-of-sample prediction) using $PLS_{Predict}$ and cross-validated predictive ability test (CVPAT) procedures.
Step 4: Endogeneity assessment using the instrumental variable free Gaussian copula approach.
Step 5: Importance–performance map analysis (IPMA) for identifying the most important SafeCX dimensions.
Step 6: Necessary condition analysis (NCA) for identifying must-have dimensions of the SafeCX measurement model.
Step 7: Illustration of cIPMA. i.e., the integration of IPMA and NCA, application in practice for auditing SafeCX.

or loss (Wildavsky, 1988), perceived safety can result from myriad factors (Nordfjærn et al., 2011), some of which might not even relate to actual safety. For example, drivers often perceive roundabouts as unsafe, but empirically, they effectively reduce the chance of accidents (Engstrom, 2011). Understanding how people perceive and evaluate safety in different contexts is therefore critical; in health care settings, assessing patients' perceptions of their safety can inform efforts to avoid harm and help them achieve better health (Lennox et al., 2017). Similarly, if omnichannel retailers can understand the nature of customers' safety concerns, they can better anticipate and facilitate their consumption decisions and attitudes. Particularly in the years since the coronavirus pandemic, customers increasingly focus on and consider safety and security elements in retail settings to inform their purchase decisions (e.g., Bove and Benoit, 2020).

Accordingly, researchers in multiple domains have introduced frameworks designed to understand perceived safety, some of which we

Table 2
Measurement scales of safe experience across disciplines.

Domain	Study	Context/Objective	Method	Insights Related to Safe Experiences
Marketing	Bove and Benoit (2020)	Identifying signals that service providers use to reduce customer perceptions of physical risk in a COVID-19 era.	Systematic search through ProQuest and organic search from Google and other media sources (24 + 108 articles)	Identified safety signals are being used by service providers to reduce customers' perceptions of physical risk of COVID-19 infection. These insights connect to SafeCX dimensions such as personal hygiene, injury prevention, and anxiety prevention.
	Rahman et al. (2022a) [Omnichannel marketing]	Developing a comprehensive framework that directs the implementation of safe customer experience initiatives in omnichannel settings.	Systematic review (25 articles and 9 industry reports) followed by an analysis of qualitative data collected from 62 retail customers in the US, UK, and Australia.	Identified 14 safety factors within omnichannel retailing and integrated them into a framework addressing customer safety in post-pandemic service contexts. It provides direct input into SafeCX dimensions such as social inclusiveness, spatial distancing, role readiness, personal hygiene, policy enforcement, and fraud prevention.
Tourism	Sönmez and Graefe (1998)	Examining the influence of past travel experience and the degree of safety perceived during internal travel on future travel behavior	Survey of 240 travelers (US) having experience with or interest in international travel. Cross- tabulation and logistic regression were used for analysis.	The degree of safety travelers feel during international travel is found to have a strong influence on their intentions and decisions of future travel. These findings parallel SafeCX dimensions such as safety signal and anxiety prevention, which shape customer intentions in retail contexts.
	Lindqvist and Björk (2000)	Analyzing the importance of perceived safety as a quality dimension among senior tourists travelling for pleasure	Interviews with 229 seniors aged 55 and older were conducted in Finland. Respondents were chosen from both sexes and from different age groups. Semi-structured interview guidelines were followed.	Safety was found to be one of the most important quality aspects, along with sanitation, service, food quality, and hospitality. Especially, women in the oldest age group (70+) consider safety as of the highest importance. These insights relate to SafeCX dimensions such as personal hygiene, injury prevention, and social inclusiveness.
	Xie et al. (2021)	Identifying the dimensions of Tourist Perceived Safety at Destinations (TPSD) and developing a scale for its measurement based on safety system theory	A multistage mixed-method study to develop and validate TPSD. A literature review and content analysis of travel blogs were conducted to identify the dimensions and initial items. The preliminary items were refined and validated through explanatory factor analysis (n = 300). Finally, the scale is empirically validated through confirmatory factor analysis (n = 1,830).	Developed a 20-item scale for TPSD with five dimensions: Perceived Safety of Human Elements (PSH), Facility and Equipment (PSFE), Natural Environments (PENE), Social Environments (PSSE), and Management Elements (PSM). These dimensions correspond closely with SafeCX elements such as safe employees, security surveillance, safety policy enforcement, and safety signals.
	Matiza and Slabbert (2021)	Explored the relationship between COVID-19-related perceived risks and tourists' subjective feelings of safety during travel activities.	Survey of 323 potential tourists from all over the world. A respondent-driven snowball sampling approach was followed.	Identified that perceived physical, psychological, and social risks induced by the COVID-19 pandemic negatively influence the overall subjective safety associated with tourism activity. These risks map to SafeCX dimensions such as anxiety prevention, mental health, and social inclusiveness.
	Bertolucci (2022)	Delineating parents' needs and assessing the role of parental safety perceptions for the future of family tourism.	Survey of 241 Italian families with questions related to vacation type, hospitality category, and safety perceptions, as well as hypothetical risks children would incur at the destinations	Identified the factors contributing to parental safety perceptions for family tourism destinations. These perceptions connect with SafeCX dimensions, including delivery safety, role readiness, and personal hygiene.
	Zou and Yu (2022)	Explored how tourists form a sense of destination safety using a social constructivist lens.	Content analysis is conducted on 3,140 reviews/posts (containing detailed travel itineraries and multiple aspects of tourists' safety experiences) collected from Mafengwo.com, between Dec'18 and Jan'20.	Offered a nuanced view of tourists' sense of destination safety, framing it as a dynamic construct that varies across different stages of travel and is influenced by multiple information sources and social interactions. Also provided actionable insights for destination management organizations to create a 'safe experience' through strategies that span pre-trip information, on-site experiences, and post-trip reflections. These findings align with SafeCX dimensions such as safety signals, spatial distancing, and safety policy enforcement across the customer journey.
Health	Ward et al. (2011)	Developing patient safety interventions by involving patients to promote organizational learning about safety.	Phase 1: focus group (4 FG of 4–8 patients) discussions as well as semi-structured interviews (total 35 interviews with patients and professionals). Phase 2: focus group (3 FG of 8–10 patients/carers) discussions, as well as a pilot study in 9 wards. Phase 3: survey with 300 patients.	Developed a framework for a patient incident reporting tool (PIRT). Developed a protocol for involving patients to learn organizational safety. These contributions resonate with SafeCX dimensions such as safety policy enforcement and safety signal.

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Table 2 (*continued*)

Domain	Study	Context/Objective	Method	Insights Related to Safe Experiences
	Giles et al. (2013) [PMOS]	Determining the safety factors that patients identify in a hospital setting and developing a measure to understand safety concerns from the patients' perspective	Conducted 33 qualitative interviews with patients sampled from six units of a teaching hospital in northern England.	Identified 13 contributory factors for safe patient experience and developed a patient measure of safety (PMOS) scale. The contributory factors echo SafeCX dimensions such as role readiness, safety signal, and social inclusiveness.
	Ricci-Cabello et al. (2016) [PREOS-PC]	Constructing and validating a patient-reported measure addressing patient experiences and safety outcomes in primary care.	Used a mixed-methods approach comprising a systematic instrument review, *meta*-synthesis of qualitative research, four patient focus groups, 18 cognitive interviews, and a pilot phase.	Developed and validated a multidimensional Patient Reported Experiences and Outcomes of Safety in Primary Care (PREOS-PC). The PREOS-PC dimensions link to SafeCX elements such as fraud prevention, data usage, and safety policy enforcement.
	Lennox et al. (2017)	Exploring evidence on the links between patient experience and clinical safety and effectiveness outcomes.	Systematic review (55 studies)	Identified strong evidence of links between patient experience and clinical safety and effectiveness. These links align with SafeCX dimensions, including anxiety prevention, safety policy enforcement, and safe employees.
	Elvidge et al. (2020)	Developing a scale to measure cultural safety in hospitals from the Aboriginal patient perspective	Survey of 316 Aboriginal patients attending a New South Wales hospital over 12 months	Developed and validated the Cultural Safety Scale (CSS) to assess five key aspects of cultural safety that shape positive hospital experiences for Aboriginal patients. These characteristics connect with SafeCX dimensions, e.g., social inclusiveness, role readiness, and safety signal.
	Sahlström et al. (2018)	Analyzing the importance of safety incidents reported by patients in promoting safe care	Cross-sectional study of 15 Finnish healthcare organizations spanning specialized hospitals, home care, outpatient services, and inpatient clinics.	Found that patients reported a wide range of safety incidents and proposed systems-based strategies to prevent recurrence, linking these insights to SafeCX dimensions such as policy enforcement, safe employees, and surveillance.
Social life	Doğrusoy and Zeynel (2017)	Exploring the factors explaining perceived safety of parks and the relationship between perceived safety and park use	Literature review followed by a field study (n = 442) conducted with a face-to-face questionnaire in two big parks in Turkey.	Identified three big factors behind perceived park-safety: Perceived safety from crimes, Environmental satisfaction, and Visual access and wayfinding. Further frequency of visiting and park-use in general is found to be significantly influenced by perceived safety. These factors connect with SafeCX dimensions such as spatial distancing, safety signals, and environmental design for injury prevention.
	Jain et al. (2010)	Understanding the urban cyclists' perception of safety and comfort of urban infrastructure	Survey (n = 302) on bicyclists and potential users in eight zones in Pune city, India	Identified factors (e.g., lighting, density, and width of roads) driving bicyclists' perception of safety. These insights correspond to SafeCX dimensions, e.g., spatial distancing, lighting/safety signals, and injury prevention.
Transport	Cao et al. (2021)	Developing and validating a measurement scale for the perceived safety of intelligent connected vehicles	A literature review and an Exploratory factor analysis (n = 372) were conducted to identify items and dimensions of safety perception. Confirmatory factor analysis (n = 352) was conducted to consolidate the items into a model	A six-item (three for cognitive safety and three for emotional safety) measurement scale is developed and validated. The cognitive and emotional safety factors map to SafeCX dimensions, such as anxiety prevention, data usage, and trust in safety policy enforcement.
	Serap et al. (2017)	Identifying the passengers' perceptions of the safety level of ferry transportation service	Survey (n = 690) of passengers who frequently use the ferry services as their transportation to arrive at their destinations	Identified passengers' perceptions and attitudes towards safety, as well as safety practices taken by passengers in different types of ferry services. These findings align with SafeCX dimensions such as role readiness, safety practices, and safe employees.
	Ouali et al. (2020)	Understanding the gender differences in the perception of safety in public transport	Quantitative analysis on data collected annually over the period 2009–2018 via customer satisfaction surveys from users of urban metros (n = 137,513 from 25 cities) and buses (n = 189,890 from 14 cities)	Developed statistical models to test gender differences in the perception of safety and satisfaction on urban metros and buses. These gendered perceptions connect with SafeCX dimensions such as social inclusiveness, anxiety prevention, and safety signals.
	Li et al. (2023)	Exploring user perceptions of safety in self-driving buses by analysing key safety indicators and the psychological processes underlying safety assessments.	Developed a TAM-based structural model to capture influences on self-driving bus adoption, followed by analysis of survey data collected from 215 respondents.	Developed a model that can quantify and analyze user data to filter out the factors that influence the perceived safety of self-driving buses. Results indicated that trust, perceived usefulness, and perceived ease of use are important factors for judging the perceived safety of self-driving buses. These factors align with SafeCX dimensions such as trust building, anxiety prevention, and safe technology usage.

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Table 2 (*continued*)

Domain	Study	Context/Objective	Method	Insights Related to Safe Experiences
Robotics	Bartneck et al. (2009)	Measuring anthropomorphism, animacy, likeability, perceived intelligence, and perceived safety of robots	Review of literature in the domain of human-robot interaction	Proposed a series of questionnaires to measure users/ perception of safety in interacting with robots. These questionnaires correspond to SafeCX dimensions such as anxiety prevention, data usage, and trust in safe employees/technologies.
Construction	Hassan et al. (2007)	Assessing the safety level perception of the construction building workers towards safety, health, and the environment	Survey (n = 100) on workers working in 5 large and 5 small building projects in and around Kuala Lumpur, Malaysia.	Identified factors that influence workers' perception of safety in different sizes of projects. These factors relate to SafeCX dimensions such as role readiness, safety policy enforcement, and safe employees.
	Trillo-Cabello et al. (2021)	Understanding health and safety experts' perception of risks at construction sites	Survey (n = 82) on construction experts using a questionnaire of 30 construction processes. Multilevel linear regression was conducted on quantitative data.	Compared the perception of risk between health and safety experts and proposed measures to increase the consistency of risk assessments. These measures align with SafeCX dimensions such as safety policy enforcement, role readiness, and injury prevention.

Note: To ensure comprehensive coverage, we used multiple databases (e.g., Scopus, Web of Science, ProQuest) and employed structured keyword combinations. Examples of the search terms we used for safety include: "perceived safety scale", "safety experience", "customer safety", "safety perception", "retail safety", "safety outcomes".

outline in Table 2. Health care is notable for its many contributions. For example, Ward et al. (2011) propose a patient incident reporting tool and a protocol for expanding health care patients' learning about organizational safety. Giles et al. (2013) identify which factors contribute to safe experiences (e.g., physical environment, communication, leadership, teamwork), according to patients' perspectives, and thereby propose a patient measure of safety. In their proposed Patient Reported Experience and Outcomes of Safety in Primary Care scale, Ricci-Cabello et al. (2016) instead cover practice activation, patient activation, experiences of patient safety events, harm, and general perceptions of patient safety. Elvidge et al. (2020) seek to measure cultural safety from the perspective of Aboriginal patients in hospital settings, using five key characteristics.

Turning to marketing, our literature review reflects developments in the wider field. Whereas customer transactions were the primary focus of marketing before around 1990, such that key measures involved customer value, share of wallet, recency, frequency, and monetary value, marketers began to shift their focus after this point to relationship marketing and measures of commitment or trust. Many organizations have also evolved to an omnichannel approach and seek to gauge customers' engagement. Throughout these phases, safety and security have remained constant customer concerns, yet they have rarely been included as determinants of the customer experience.

Since the pandemic, this gap seems even more remarkable. Customers' perceptions of safety are central determinants of both their demands and their relationships with the firm. Bove and Benoit (2020) identify some safety signals that service providers used to reduce customers' perceptions of COVID-19 infection, specific to physical risks in physical channels (Mende et al., 2023). Rahman et al. (2022a) also propose a framework that incorporates the safety elements customers consider in omnichannel retailing. However, despite these important insights, the literature still lacks a validated measurement scale that captures how customers themselves perceive a safe customer experience in omnichannel retailing. While healthcare research has developed similar scales (e.g., Elvidge et al., 2020; Ricci-Cabello et al., 2016), no equivalent tool exists for the retail context. Addressing this gap, our study responds to RQ1 by developing and validating the SafeCX scale, which systematically measures customer perceptions of safety in omnichannel service encounters.

2.2. Customer well-being in omnichannel retailing

Marketing scholarship has consistently highlighted customer well-being (or consumer well-being) as a core concept (Sirgy et al., 2007), one that differs from customer satisfaction. Satisfaction shapes outcomes such as loyalty, repeat purchasing, and favorable word-of-mouth (Sirgy & Lee, 2008), which in turn contribute to greater patronage, sales growth, market share, and profits (Fornell, 1992). Well-being instead offers a more macro view, due to its potential for enhancing customers' quality of life, which implies "higher level of life satisfaction, overall happiness with life, absence of ill-being, greater societal welfare, and so on" (Sirgy and Lee, 2008, p. 379).

Existing conceptualizations of customer well-being (see Table 3) include Meadow's (1983) focus on customers' experience and satisfaction with their acquisition of consumer goods. Referring to material possessions, Nakano et al. (1995) conceive of customer well-being as a composite of two items: "How do you feel about your standard of living—the things you have like housing, car, furniture, recreation, and the like?" and "How do you feel about the extent to which your physical needs are met?" Leelanuithanit et al. (1991) combine both acquisition and possession satisfaction in their measure. Other studies propose and test customer well-being measures in relation to specific product categories; Grzeskowiak et al. (2006) capture home buyers' positive and negative affect associated with the purchase, use, maintenance, ownership, and sale of their houses to measure these customers' well-being.

In a broader sense though, Sirgy and Lee (2008) argue that customer well-being is "a state of objective and subjective well-being involved in the various stages of the consumer/product life cycle in relation to a particular consumer good" (p. 381). When customers sense (dis)satisfaction, such as while shopping for or purchasing a product, it can affect their quality of life, which pertains to subjective well-being. An objective form of well-being instead reflects expert assessments by engineers, scientists, or safety officers of the costs and benefits and level of safety (of customers, others, and the environment). Another perspective encompasses experiences too, such as the tasks or range of alternatives that people encounter in shops or shopping centers (e.g., El Hedhli et al., 2016; Ekici et al., 2018). In this view, a successful trip to a shopping center contributes to customers' perceived well-being, and the marketplace experience influences their quality of life (Ekici et al., 2017; Maggioni et al., 2019).

As these various approaches imply, well-being is multifaceted, encompassing *meta*-level concepts such as quality of life, subjective assessments, overall happiness, and various forms (interpersonal, financial, social) (Dittmar et al., 2014; Sirgy et al., 2007). However, most practices pertaining to well-being seek to enhance individual well-being, whether subjective or objective; they rarely address considerations of the well-being of significant others or the wider community (Tenney

Table 3
Marketing studies of customer well-being.

Study	Context/Objective	Theoretical basis [Concept/Construct]	Method	Insights related to well-being
Noble et al. (2022)	Understanding the potential of the Fifth Industrial Revolution (5IR) for well-being, etc., within retail and service domains	Sociotechnical theory[5IR (Fifth Industrial Revolution)]	Conceptual paper	Highlighting the importance of organizations to emphasize their prioritization of the well-being of humanity and society, including both individual well-being (physical, emotional, psychosocial) and community well-being.
Balderjahn et al. (2020)	Understanding the effect of anti-consumption constructs on consumer well-being.	Cognitive prosocial theories [Subjective well-being]	Hypothesis testing using survey-based data.	Investigated the relationship of sustainable anti-consumption (e.g., voluntary simplicity, collaborative consumption, and debt-free living) with consumers' well-being, spanning financial, psychosocial, and subjective aspects of individual well-being.
Maggioni et al. (2019)	Examining shopping well-being by assessing the role of consumer decision-making styles	Bottom-up spill-over theory of life satisfaction[Shopping well-being]	Hypothesis testing based on an online survey	Established the relationship between the dimensions of the shopping center experience (retail offer, center-based activities, and center atmosphere) and well-being, particularly individual well-being through physical, emotional, and psychosocial dimensions.
Ekici et al. (2018)	Understanding the influence of shopping well-being on consumers' quality of life (QOL)	Bottom-up spill-over theory of life satisfaction[Shopping well-being]	Hypothesis testing using an online survey	Consumers' QOL can be strengthened by developing programs to increase the consumer level of engagement in marketplaces, thereby enhancing individual well-being in terms of life satisfaction and emotional balance.
El Hedhli et al. (2013)	Construct, antecedents, and consequences of shopping well-being at the mall	Utilitarian-laden and hedonic-laden perspectives of well-being [Shopping well-being]	Hypothesis testing using a survey conducted on two North American shopping malls	Provides empirical support of high shopping well-being in malls characterized as high in functionality, convenience, safety, leisure, atmospherics, and self-identification, which contribute to individual well-being across physical, emotional, and psychosocial domains.
Sirgy and Lee (2008)	Conceptualizing and refining the concept of consumer well-being	Stakeholder theory[Well-being marketing]	Literature review and conceptual discussion	Suggested that well-being marketing draws on duty-based ethics, particularly the obligations of beneficence and non-maleficence, and demonstrated how this perspective shapes marketing choices in consumer goods firms with consequences for both individual and community well-being.
Grzeskowiak et al. (2006)	Theorizing the interrelationships among the housing well-being constructs and perceived quality-of-life (QOL)	Consumer/Product Life Cycle Model[Housing well-being]	Measurement model development and validation through an online survey (US and Korea)	Conceptualized housing well-being as residents' combined positive and negative feelings linked to house acquisition, usage, upkeep, ownership, and disposal, and tested its influence on financial, psychosocial, and material life satisfaction as dimensions of overall well-being.
Lee et al. (2002)	Developing a subjective measure of consumer well-being	Bottom-up spill-over theory of life satisfaction[Subjective well-being]	Measurement model development and nomological study based on a survey	Proposed and tested the concept of consumer well-being, framing it as satisfaction derived from the acquisition, ownership, use, upkeep, and disposal of goods and services, which together reflect material, financial, and overall life satisfaction.
Nakano et al. (1995)	Examining consumers' overall satisfaction/ well-being with their material possessions and standard of living	Possession Satisfaction Model [Subjective well-being]	Measurement model development and nomological study based on a survey	Operationalized the concept of well-being as a composite of two-question measure: "How do you feel about your standard of living—the things you have like housing, car, furniture, recreation, and the like?" and "How do you feel about the extent to which your physical needs are met?" a direct measure of individual well-being through material and physical satisfaction.
Leelanuithanit et al. (1991)	Investigating the relationship between marketing and overall satisfaction with life/ well-being in a developing country	Acquisition/Possession Satisfaction Model[Marketing well-being in developing countries]	Measurement model development and nomological study based on a survey (in Thailand)	Conceptualizing consumer well-being as satisfaction with the acquisition and possession of consumer goods and services related to those goods, shaping individual well-being through family life, material possessions, and self-development.
Meadow (1983)	Exploring the makeup of Overall Consumer Satisfaction/consumer well-being and its impact on the life satisfaction of elderly customers	Attitudinal hierarchy of life satisfaction, normative perspective of life satisfaction [Shopping Satisfaction Model]	Measurement items development and a nomological study based on a survey	Constructed a measurement model centered on elderly consumers' purchasing experiences with retail institutions in categories such as food, housing, household tasks, furnishings, clothing and accessories, personal care, medical care, leisure, transportation, and education, designed to represent well-being across physical, psychosocial, and material aspects.

Note: Examples of the search terms we used in multiple databases, such as Scopus, Web of Science, ProQuest, for well-being include: "consumer well-being scale", "well-being measurement", "shopping well-being", "well-being in consumer behavior", "scale development well-being".

et al., 2016). We challenge such an approach and argue for the necessity of integrating the societal/community level into operationalizations of well-being. In omnichannel contexts, particularly, customers perceive the experience in innumerable ways, thinking about themselves and others, who become salient across the myriad communication and delivery channels available to them, including but not limited to physical, virtual, social media, and social interactions. Any attempt to measure well-being at an individual level or according to a discrete measure, such as financial well-being (Prawitz et al., 2006), shopping well-being (El Hedhli et al., 2013; Maggioni et al., 2019), or perceived empowerment (Hunter and Garnefeld, 2008; Prentice et al., 2016), cannot encompass the entire concept. In addition to its relevance in omnichannel settings, we argue that the need for a holistic conceptualization has become increasingly pressing at the dawn of the fifth industrial revolution, when any framework of well-being must account for multiple stakeholders (e.g., society, employees, customers) (Noble et al., 2022).

Regarding the community dimension specifically, and its absence from well-being measurement models, we acknowledge that most existing models were developed before the proliferation of social media or mass-level mobile marketing (Table 3). These developments, together with the implications of the global pandemic, have triggered greater concern for the well-being of others in society, as a determinant of people's perceptions of their own well-being (e.g., Cowie and Myers, 2021). In response, today's retailers must exhibit and demonstrate concern for customers, their family, and their communities. However, despite increasing attention to community and societal well-being, there is still no validated scale that captures how customers themselves perceive their well-being when engaging across omnichannel retail settings. Developing such a measure is crucial to extend existing well-being models and directly address RQ2.

We accordingly propose that an effective measure of well-being must capture both societal and individual dimensions. Finally, as we determine in developing our proposed, robust SafeCX model, which spans 12 dimensions, customers and retailers increasingly worry about safety in its various guises, including safety on social media and the safety of vulnerable populations. Therefore, we conceptualize well-being in a comprehensive way to align with and capture the essence of SafeCX.

3. Phase 1: Construct conceptualization

In this section, we detail how we conceptualize the SafeCX dimensions, two dimensions of customer well-being, and the nomological network that links them.

3.1. Omnichannel safe customer experience

How do customers perceive safe customer experiences in omnichannel retailing? Can they differentiate between highly safe and unsafe (or less safe) customer experiences? To address these key research questions, we developed an open-ended online questionnaire and asked omnichannel retail customers in multiple countries to describe both highly safe and highly unsafe (or less safe) customer experiences across all channels maintained by an omnichannel retailer of their choice. The procedure for our qualitative Study 1 mimics that described in Brakus et al.'s (2009) influential concept and scale development study.

We collected qualitative responses from 54 respondents with omnichannel retail purchase experience. They resided in eight countries (the United States, the United Kingdom, Australia, Canada, Germany, Singapore, India, and the Netherlands). Following the procedure described by Rahman et al. (2022b, p. 618), the respondent screening criteria identified customers who use three or more channels (e.g., retailer's social media, mobile apps, physical or online stores) for their retail shopping. They provided open-ended responses and selected different omnichannel retailers; some exemplary responses are available in Web Appendix 1. Respondents reported safe and unsafe customer experiences that occurred when they interacted with omnichannel retailers and other customers across different channels at different stages of their customer journey. The content analysis of these qualitative data indicates that all respondents had a concept of a safe customer experience, and they could differentiate between highly safe and unsafe customer experiences in omnichannel retail settings.

We employed a mix of deductive (where literature listed in Table 2 and Table 3 supports a theme, such as Personal Data Safety) and inductive (where a new theme emerged from Study 1 data, such as safety in retailers' social media) thematic extraction approaches based on qualitative responses to combine these data with safety factors identified in prior literature to initially conceptualize 15 dimensions of omnichannel retail safe customer experience, as perceived by customers:

1. Social media safety: Safety features reduce the spread of harmful materials/activities across the retailer's social media platforms.
2. Social inclusiveness: Communication features safeguard the interests and safety of vulnerable customers across channels.
3. Role readiness: Communication features equip customers with the knowledge to engage in shopping activities safely across channels.
4. Safe employees: Communication features emphasize employee screening and vetting during recruitment.
5. Safety policy enforcement: Communication features reflect compliance with safety and security regulations across channels.
6. Injury prevention: Safety features minimize the risk of physical injuries within retail environments.
7. Personal hygiene: Safety features reduce the transmission of infectious diseases in retail settings.
8. Spatial distancing: Safety features address overcrowding risks in retail environments.
9. Security surveillance: Safety features support monitoring and enforcement of security in retail environments.
10. Safety signal: Ambient features create a perception or feeling of safety across channels.
11. Fraud prevention: Security features protect customer information during purchase transactions across channels.
12. Order fulfilment safety: Safety features reduce risks associated with delivery and pickup services.
13. Safety recall: Service recovery features support effective management of product recalls across channels.
14. Anxiety prevention: Service recovery features reduce customer anxiety during retail interactions.
15. Personal data safety: Security features ensure the protection of transactional data from misuse across channels.

3.2. Customers' concept of well-being in omnichannel retailing

Do customers believe that omnichannel retailing affects their well-being? If yes, then what is the nature of that perception? We conducted a second qualitative Study 2, with a procedure similar to that for Study 1, and collected data from 27 omnichannel customers from multiple countries. These data affirm that customers pay attention to how retailers address their well-being needs, and they reveal two distinct well-being themes. The first is individual well-being, reflecting customers' desire for self-care, as manifested in physical, emotional, and psychosocial well-being. The second theme is the well-being of important others (e.g., family members, friends) and the broader community. Excerpts from the Study 2 responses are available in Web Appendix 2. By combining these data with our literature review, we conceptualize customer well-being in omnichannel retailing as a multidimensional construct, composed of the two distinct dimensions of individual well-being and community well-being.

3.3. Nomological validity of SafeCX and customer well-being

As with any new measurement instrument, it is essential to

demonstrate that the constructs predict relevant behavioral outcomes (MacKenzie et al., 2011). Accordingly, we examined two nomologically established outcomes with practical importance: share of wallet and intentions to influence others. Share of wallet captures customers' financial commitment, while influence intentions reflect social advocacy and organic customer acquisition (Rahman et al., 2022b). These dual outcomes enable an assessment of whether SafeCX and well-being perceptions translate into both economic and relational value for the retailer.

Consistent with retail literature outlining the relationships among customer experience (CX) constructs, customer beliefs, and favorable financial outcomes for retailers (e.g., Parasuraman et al., 2005; Rahman et al., 2022b; Zeithaml, 1988), we draw on means–end chain theory to formulate the structural framework tested in this research (Fig. 1). This theory (Gutman & Reynolds, 1988) posits that customers associate specific experiences with broader personal values through intermediate evaluations. Accordingly, customers' perceptions of discrete service attributes (e.g., the dimensions of SafeCX) shape their evaluation of the overall higher-order SafeCX construct, which in turn influences value-driven outcomes. Applying this logic, we argue that SafeCX serves as a foundational means, shaping the extent to which customers perceive their broader ends, such as customer well-being, to be supported during the omnichannel journey. Customers aim to maximize psychological and functional benefits and avoid negative consequences (Gutman & Reynolds, 1988), especially in risk-sensitive retail contexts (Mende et al., 2023). Therefore, their well-being evaluations are influenced by the degree of perceived safety across physical and digital channels and touchpoints.

In this framework, well-being plays a central mediating role. Drawing on prior consumer well-being research (e.g., Sirgy & Lee, 2008; Noble et al., 2022), we conceptualize it as a key psychological outcome reflecting the customer's sense of comfort, assurance, and support derived from interactions with the omnichannel retailer. It encompasses both individual-level benefits (e.g., stress reduction, confidence in the retailer) and community-oriented concerns (e.g., safety for vulnerable groups), and thus serves as a critical path through which SafeCX perceptions influence engagement behaviors.

4. Phase 2: Measures

Marketing literature has yet to establish robust measurement models or scales for safe customer experience and well-being perceptions in omnichannel retailing. Therefore, we develop new scales to measure these newly conceptualized constructs, using a comprehensive, step-by-step survey process to identify an appropriate item pool, as we detail next.

4.1. Development of SafeCX measures

Item Generation. Having conceptualized the initial SafeCX dimensions and their operational definitions, we synthesize the qualitative data from Study 1 with extant literature to generate an initial pool of SafeCX measurement items. In so doing, we carefully considered the format of the survey response scale. Consistent with previous research on customers' CX perceptions (Rahman et al., 2022b), we adopted Likert-type, agreement-based response scales that required respondents to indicate their degree of agreement with declarative statements (Netemeyer et al., 2003). We avoided reverse-coded or negatively worded items, which can confuse respondents and produce method bias or poor reliability (Podsakoff et al., 2003).

The initial item pool consisted of 295 items, spanning 15 conceptual dimensions, with no fewer than 16 items per dimension. The author team collaborated to develop these items, and then we subjected them to a series of improvement processes. First, the items were reviewed and edited using Grammarly software. Second, they were reviewed by two native English-speaking postgraduate university students, who are also omnichannel customers. Third, a native English-speaking marketing academic with a strong track record of scale development publications reviewed the items. We addressed their comments, including suggestions to reword four items to improve clarity, shorten five items, and eliminate redundant phrasing in two items.

Quantitative Item Representativeness Test. To assess item representativeness, we invited undergraduate business students to complete a survey in exchange for course credit, following procedures in Brakus et al. (2009). After a verbal briefing on omnichannel retailing and safe customer experience, participants received instructions and rated 295 randomly ordered items on a 7-point Likert scale (1 = "not at all descriptive," 7 = "extremely descriptive"). Five irrelevant items were included to check attentiveness. Participants could pause and resume, with an average completion time of 97 min. Among the 36 valid responses, items with a mean < 4.0 and SD > 2.0 were flagged for removal. Although five items had means < 4.0, their SDs were below 2.0, so they were retained for the next stage. All remaining items fell within acceptable ranges (means: 4.028–6.083; SD: 0.806–1.973).

Face and Content Validation. We presented the item pool, along with a research overview and operational definitions of the dimensions, to six omnichannel customers (four in the United States and two in the United Kingdom) for face validation. We leveraged their qualitative feedback to enhance the clarity of a few items, but did not remove or add any items at this step. Next, we shared the item pool with two native English-speaking marketing academics in Australia in a Microsoft Word document, with the track changes tool enabled. They provided feedback about the wording of some items, which we took into account.

Although these assessments did not conclusively indicate any items for removal, it is ideal to have 8–10 items per conceptual dimension (Netemeyer et al., 2003), so we ran an online survey to determine the most suitable or representative statements for each dimension. Fifteen U.S.-based omnichannel customers provided their input, and their responses were summarized in an Excel file for review by all the authors. This step left us with 178 items, distributed such that there were no fewer than 10 items in each dimension, which we submitted for review to a professional copyeditor.

4.2. Development of customer well-being measures

Item Generation. Informed by both prior literature and our Study 2 data, we generated an initial pool of 18 items to assess customer well-being across the two identified dimensions: 9 for individual well-being and 9 for community well-being. Similar to the SafeCX measure development, we employed Likert-type, agreement-based response scales. This item generation process understandably proved less demanding than that for the 15 SafeCX dimensions. To refine the well-being items, one author presented the concept and initial items to an online MBA class of native English-speaking students. The students provided verbal and written feedback on item clarity, which led to minor rewordings of two items.

Face and Content Validation. Five omnichannel customers evaluated the 18-item pool for face validity, and this step did not result in any modifications. Next, we applied the content validation process outlined by Kumar and Pansari (2016) and presented the initial items, along with their conceptual details, to a panel of 11 marketing academics during a research seminar and roundtable discussion. As they suggested, two new items, one for each dimension, were integrated into the item pool. The academic panel also verified that the items adequately represented the conceptual dimensions. The resulting 20-item pool underwent professional copyediting.

5. Phase 3: Measurement model refinement

We employed statistical procedures to refine the SafeCX and customer well-being measurement models, using data from two new quantitative studies.

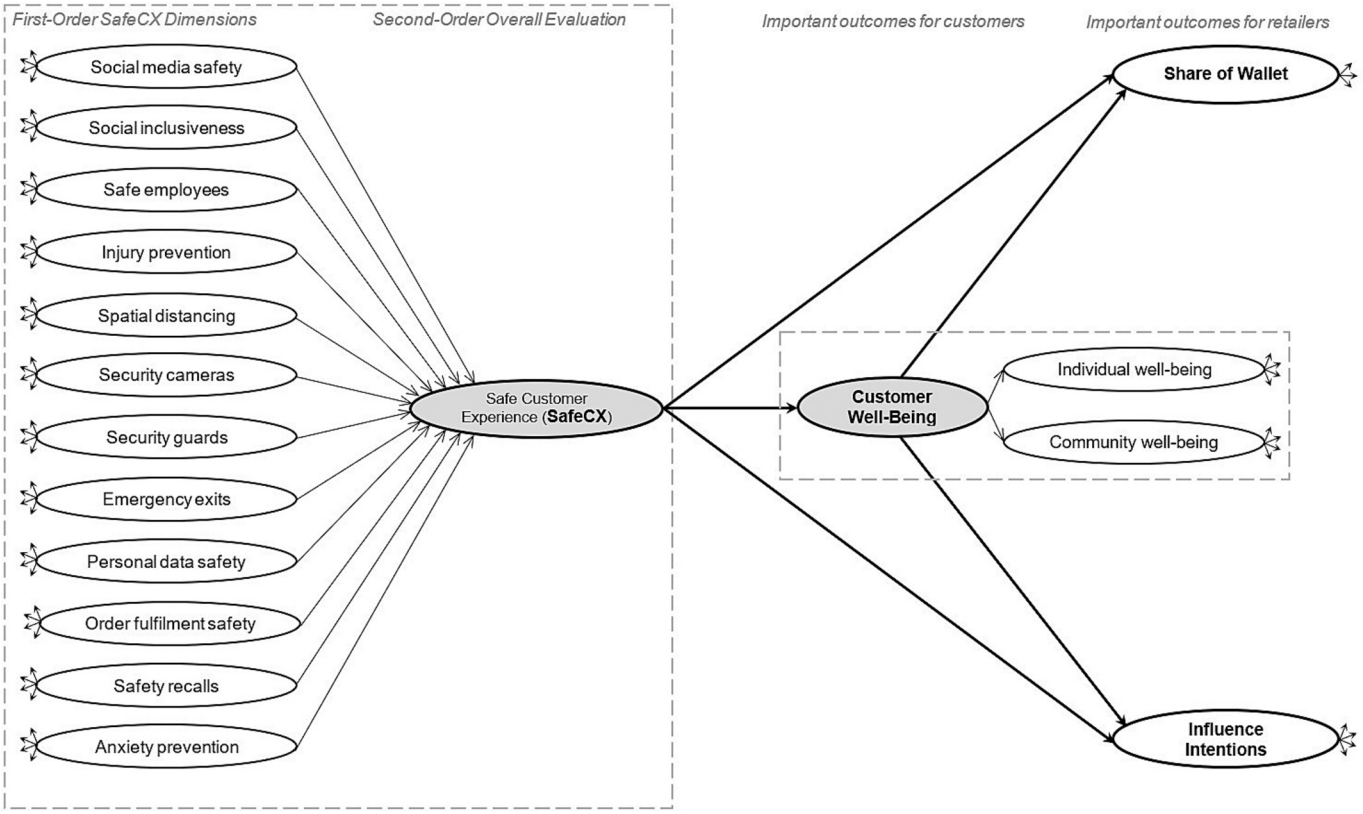

Fig. 1. Omnichannel Safe Customer Experience (SafeCX) Framework.

5.1. Study 3: Refinement of SafeCX measurement model

Data Collection. We developed the online survey in Qualtrics, and respondents were recruited from MTurk online panel over five weeks, following best practices outlined by Rahman et al. (2022b, p. 618). The respondent screening process followed Study 1 procedures. To enhance reliability, items were presented one at a time in random order using the platform's randomizer function. Seven initial pretests ensured the survey's configuration and randomization were effective, followed by a final pretest (n = 5) to verify technical accuracy. Given the survey's length, respondents were allowed to pause and resume, and substantial incentives were offered to support completion. In line with Netemeyer et al.'s (2003) recommendation for large samples when refining complex, multidimensional item pools, we obtained 365 responses.

To ensure that our data were collected from genuine omnichannel customers, we implemented a rigorous two-stage screening procedure across all studies. First, recognizing that the term omnichannel is widely used in research and practice but less familiar to customers, we provided respondents with an explanatory prompt defining omnichannel retailing as the use of multiple integrated channels (e.g., physical stores, websites, mobile apps, social media, email, catalogues, and call centers) across various stages of the customer journey, including information search, purchase, communication, and returns. Respondents were then asked to confirm whether they considered themselves omnichannel customers and to name a retailer they associated with omnichannel shopping. The majority nominated well-known U.S. retailers such as Walmart, Target, and Best Buy, each of which maintains extensive integrated channel operations. Second, we incorporated a behavioral screening check to confirm actual omnichannel usage. In Study 3, respondents were required to select all the channels they had recently used with the named retailer, and only those selecting three or more channels were permitted to proceed with the survey. As a result, all participants had experience using at least three channels, and 18.7 % (n = 84) reported using four or more. The most common combinations included 'Physical store, Online store, Mobile app' and 'Physical store, Online store, Social media,' indicating frequent engagement across the retailers' channel mix.

Exploratory Factor Analysis. With these survey data, we attempt to refine the item pool through the systematic process outlined by Rahman et al. (2022b). Two authors independently conducted exploratory factor analysis (EFA) in SPSS, with a step-by-step, iterative approach, then cross-validated their findings. The initial refinement reduced the item pool to 102 items, distributed across 15 factors, on the basis of the principal component analysis (PCA). Then, according to principal axis factoring with Varimax rotation, we further refined the pool to include 78 items, assigned to 12 reliable factors. All item loadings (λ) were greater than 0.50; the item loadings are available in Table 4.

Nine factors align with the previously identified conceptual dimensions (Table 4). The items initially linked to the Security Surveillance dimension loaded on two distinct factors: Security Cameras and Security Guards. Therefore, we separately labeled and defined these dimensions (Table 4). The items associated with Emergency Exits, within the conceptualized Safety Signal dimension, aggregated into a single factor, so we renamed this dimension accordingly (Table 4). We aimed for four–six items per dimension, in preparation for the subsequent data collection and item refinement stages, but the Injury Prevention factor only includes three items, all focused on lifting heavy items. To address this issue, we reviewed the initial item pool and incorporated some items relevant to preventing injuries due to lifting heavy items to ensure a well-rounded representation. The refined item pool thus consisted of 81 items, and each of the 12 dimensions contained no fewer than 4 items.

Two conceptual factors, Personal Hygiene and Safety Policy Enforcement, did not load well on the 12-factor scale. When we conducted a separate EFA, after removing these items from the 12-factor scale, they formed a distinct, two-factor subscale. On closer examination, we realized that the measurement items assigned to these factors pertained to safety features of great concern to customers during the recent pandemic. This interpretation, guided by the data, suggests that

Table 4
EFA, CFA, and PLS-SEM results for SafeCX measurement model.

Item ID	Dimension Name, Definition, and Measurement Items *Study:*	EFA Loading *3*	EFA Loading *5*	CFA Loading *3*	CFA Loading *5*	PLS Loading *3*	PLS Loading *5*	95% CI Dimensions→SafeCX *3*	95% CI Dimensions→SafeCX *5*
	Social media safety (SMS): *The extent to which customers perceive the social media channels of an omnichannel retailer are safe.*							0.54; 0.69	0.46; 0.68
SMS1[c]	I believe XYZ promptly removes any hate speech from their social media platforms.	0.84	0.87	0.89	0.93	0.91	0.92		
SMS2	I believe XYZ keeps their social media platforms safe by promptly removing any harmful material.	0.77	0.86	0.87	0.92	0.90	0.93		
SMS3	I believe XYZ promptly removes any harmful material from their social media platforms.	0.78	0.83	0.89	0.90	0.92	0.92		
SMS4	I believe XYZ is always watchful regarding any hate speech on their social media platforms.	0.79	0.79	0.86	0.84	0.90	0.88		
	Social inclusiveness (SIC): *The extent to which customers perceive an omnichannel retailer is safe for vulnerable people (*e.g.*, elderly, disabled).*							0.71; 0.80	0.72; 0.82
SIC1[c]	XYZ always communicates with vulnerable customers (e.g., the elderly, disabled people) about safety concerns.	0.69	0.57	0.88	0.88	0.91	0.89		
SIC2	XYZ communicates across all channels that they cater to the safety needs of vulnerable customers (e.g., the elderly, disabled people).	0.74	0.69	0.92	0.88	0.93	0.90		
SIC3	XYZ communicates across all channels that they have special services for vulnerable customers (e.g., the elderly, disabled people).	0.76	0.61	0.88	0.83	0.91	0.87		
SIC4	XYZ's communication of special shopping hours helps elderly and other vulnerable people (e.g., disabled people).	0.61	0.74	0.68	0.71	0.77	0.83		
	Safeemployees (SEM): *The extent to which customers perceive an omnichannel retailer hire employees who prioritize customers safety.*							0.73; 0.81	0.68; 0.80
SEM1[c]	XYZ communicates across all channels that they are committed to recruiting employees who are highly conscious of the safety of others.	0.65	0.78	0.88	0.94	0.91	0.95		
SEM2	XYZ communicates across all channels that they assess an employee's level of safety consciousness during recruitment.	0.71	0.80	0.88	0.92	0.91	0.93		
SEM3	XYZ communicates across all channels that they are committed to hiring employees who have safety knowledge.	0.68	0.73	0.87	0.86	0.91	0.89		
SEM4	XYZ communicates across all channels that they assess all potential employees' levels of safety consciousness during recruitment.	0.71	0.77	0.91	0.87	0.93	0.91		
	Injury prevention (IPV): *The extent to which customers perceive an omnichannel retailer assists with injury prevention.*							0.54; 0.71	0.56; 0.76
IPV1[c]	XYZ provides support in physical stores for lifting heavy items to avoid injuries.	0.52	0.84	0.71	0.95	0.87	0.96		
IPV2	XYZ provides support for lifting heavy items to prevent injuries.	–	0.84	–	0.95	–	0.96		
IPV3	Physical XYZ stores always have employees who assist with lifting heavy items to prevent injuries.	0.92	0.80	0.89	0.92	0.90	0.94		
IPV4	Physical XYZ stores always have support services to assist with lifting heavy items.	0.60	0.80	0.80	0.92	0.81	0.94		
	Spatial distancing (SPD): *The extent to which customers perceive an omnichannel retailer mitigate overcrowding at stores.*							0.57; 0.71	0.54; 0.72
SPD1[c]	XYZ's layout allows customers to maintain physical distancing across all stores.	0.80	0.89	0.90	0.95	0.93	0.96		
SPD2	Physical stores of XYZ always have well-spaced aisles to maintain physical distancing.	0.80	0.86	0.90	0.94	0.92	0.96		
SPD3	XYZ's stores are spacious enough to maintain physical distancing.	0.84	0.86	0.91	0.93	0.93	0.95		
SPD4	It is easy to maintain physical distancing across XYZ's stores.	0.85	0.85	0.92	0.92	0.93	0.94		
	Security cameras (SCM): *The extent to which customers perceive an omnichannel retailer utilizes technology (e.g., cameras) to monitor store safety.*							0.65; 0.78	0.66; 0.79
SCM1[c]	The high presence of security cameras across XYZ's stores makes me feel safe.	0.82	0.85	0.94	0.96	0.94	0.96		
SCM2	The high presence of surveillance cameras across XYZ's stores makes me feel safe.	0.81	0.85	0.93	0.95	0.94	0.94		
SCM3	The high presence of security cameras across XYZ's pickup locations makes me feel safe.	0.77	0.77	0.91	0.90	0.93	0.94		
SCM4	The high presence of security cameras across XYZ's parking lots makes me feel safe.	0.67	0.69	0.83	0.86	0.89	0.92		
	Security guards (SGD): *The extent to which customers perceive an omnichannel retailer utilizes security personnel to monitor store safety.*							0.51; 0.67	0.63; 0.76
SGD1[c]	The high presence of security personnel across XYZ's stores makes me feel safe.	0.62	0.56	0.76	0.75	0.84	0.86		
SGD2	XYZ always has security guards at the entries/exits across all stores.	0.82	0.78	0.84	0.85	0.88	0.86		
SGD3	XYZ always has security guards at the pickup locations across all stores.	0.84	0.85	0.89	0.88	0.90	0.86		
SGD4	XYZ always has security guards in the parking lots across all stores.	0.73	0.70	0.83	0.81	0.87	0.86		
	Emergency exits (EMX): *The extent to which customers perceive an omnichannel retailer assists with store emergency exits.*							0.54; 0.70	0.51; 0.71
EMX1[c]	Emergency exits are highly visible across XYZ's stores.	0.87	0.84	0.94	0.94	0.93	0.93		
EMX2	Emergency exit signs are highly visible across XYZ's stores.	0.87	0.86	0.93	0.94	0.93	0.93		
EMX3	Emergency exits are clearly marked across XYZ's stores.	0.84	0.82	0.91	0.89	0.93	0.90		
EMX4	Floor plans displaying emergency exits are highly visible across XYZ stores.	0.67	0.69	0.79	0.78	0.88	0.88		
	Personal data safety (PDS): *The extent to which customers perceive an omnichannel retailer safeguards personal data.*							0.67; 0.77	0.54; 0.74
PDS1[c]	I am confident that XYZ will not misuse my personal information across all channels.	0.77	0.84	0.92	0.93	0.94	0.95		
PDS2	I am confident that XYZ will not share my personal information with others.	0.78	0.83	0.89	0.92	0.92	0.94		
PDS3	I trust XYZ to keep my personal information safe across all channels.	0.78	0.84	0.92	0.93	0.93	0.95		
PDS4	I trust XYZ will protect my privacy across all channels.	0.84	0.79	0.92	0.91	0.94	0.94		
	Order fulfillment safety (OFS): *The extent to which customers perceive an omnichannel retailer's delivery and pickup services are safe.*							0.53; 0.68	0.54; 0.72
OFS1[c]	XYZ's pickup services are always safe.	0.74	0.68	0.87	0.87	0.89	0.91		
OFS2	I always feel safe with XYZ's curbside delivery.	0.73	0.77	0.74	0.85	0.81	0.88		
OFS3	I always feel safe when picking up orders from XYZ.	0.67	0.65	0.80	0.84	0.84	0.88		
OFS4	I always feel safe with XYZ's delivery service.	0.66	0.66	0.82	0.79	0.90	0.84		

(*continued on next page*)

Table 4 (*continued*)

Item ID	Dimension Name, Definition, and Measurement Items *Study:*	EFA Loading 3	EFA Loading 5	CFA Loading 3	CFA Loading 5	PLS Loading 3	PLS Loading 5	95% CI Dimensions→SafeCX 3	95% CI Dimensions→SafeCX 5
	Safety recalls (SRC): *The extent to which customers perceive an omnichannel retailer has an effective safety recall process.*							0.69; 0.80	0.56; 0.75
SRC1[c]	XYZ handles product safety recalls effectively across all channels.	0.67	0.81	0.86	0.93	0.90	0.93		
SRC2	XYZ's safety recalls across all channels are effective.	0.72	0.75	0.86	0.89	0.90	0.91		
SRC3	XYZ handles product safety recalls well across all channels.	0.73	0.71	0.89	0.88	0.92	0.91		
SRC4	XYZ has a well-planned product safety recall procedure.	0.71	0.77	0.87	0.85	0.90	0.90		
	Anxiety prevention (APV): *The extent to which customers perceive an omnichannel retailer prevents anxiety related to shopping.*							0.62; 0.75	0.62; 0.78
APV1[c]	I am confident that XYZ will always meet their obligations when processing refunds for orders.	0.66	0.64	0.82	0.81	0.85	0.86		
APV2	I am confident that XYZ will always meet their obligations when providing product replacements.	0.67	0.64	0.86	0.85	0.89	0.91		
APV3	I do not feel anxious about my orders with XYZ because of the guarantees they give.	0.59	0.60	0.80	0.82	0.84	0.83		
APV4	I do not worry about getting faulty products replaced by XYZ.	0.58	0.66	0.77	0.80	0.87	0.84		

Notes: All values are significant at $p = 0.00$. Model fit (Study 3; Study 5): $x^2/df = 1.71;1.46$; CFI = 0.96;.96; SRMR = 0.05;.05; RMSEA = 0.05;.04. Model fit thresholds: x^2/df = between 1 and 3; SRMR < 0.08; RMSEA < 0.06; CFI > 0.95. Item IPV2 was developed during the content and face validation stage but was not included in the Study 3 survey, because it was not one of the top ten ranked items. After reviewing the EFA outcome of Study 3 (reliable factor, lifting heavy items), IPV2 was added to the Study 5 survey, to ensure a minimum four content valid items for each factor. "XYZ" was replaced with the name of the omnichannel retailer that respondents mentioned at the start of the online survey.

[C] Items included in the 12-item $SafeCX_{Condensed}$ model.

CI = bias-corrected and accelerated (BCa) bootstrap confidence interval. The results represent the CIs for study 3 and study 5 of each dimension.

such factors gain particular significance during local or global health emergencies such as epidemics, pandemics, or flu seasons, but they might not be integral to a parsimonious SafeCX measurement model in normal circumstances. We discuss these interesting findings and the two-factor subscale in more detail in Web Appendix W3.

Construct Reliability and Discriminant Validity Tests. The checks for the reliability and validity of the 12 refined dimensions of the SafeCX model rely on the Study 3 data set. As the results in Table 5 reveal, the Cronbach's alpha coefficient and composite reliabilities of the dimensions all exceed 0.70, offering evidence of their reliability and internal consistency (Hair et al., 2018). The average variance extracted (AVE) for each dimension is greater than 0.50, which confirms convergent validity. The variance inflation factors (VIF) fall well below the cut-off value of 3, which implies multicollinearity is not a concern. Finally, in support of discriminant validity, the HTMT ratios are less than 0.9 across all dimensions (Henseler et al., 2015).

5.2. Study 4: Refinement of customer well-being measurement model

With the same procedures applied in Study 3, we collected fresh data for Study 4 from a sample of 135 MTurk online panel members, with the aim of refining our customer well-being measures. This sample size is suitable for conducting EFA, due to the modest size (20 items, distributed across two well-defined dimensions) of the conceptual model (MacCallum et al., 1999). The respondent-to-item ratio is nearly 7 to 1, well in excess of the recommended minimum ratio of 3 responses to 1 item (MacKenzie et al., 2011). We applied the same EFA protocol, such that two authors independently conducted the EFAs and then cross-validated their analyses. Two distinct factors emerged, in close alignment with the conceptual dimensions. To streamline and refine the measurement model, we reduced the initial 20-item pool to a more concise 12-item pool by selecting 6 items with the highest factor-to-item loadings for each dimension, though notably, all the item loadings exceeded the 0.50 threshold (Table 6). The Cronbach's alpha coefficient and composite reliabilities of both dimensions exceeded 0.70, and AVE were above 0.50. The HTMT ratio of 0.77 between the individual well-being (IWB) and community well-being (CWB) dimensions indicates discriminant validity. The correlation between dimensions equals 0.73.

6. Phase 4: Validation of newly developed measurement models

To further refine and validate the newly developed measurement models, we conducted a new study (Study 5) and multiple analysis, as detailed in this section.

6.1. Data collection

For this study, we collected responses from online panel members consistent with the preceding phases. In addition to the refined items for the newly developed measurement models, the survey incorporated items related to supplementary constructs, such as share of wallet and customers' influence intentions, as well as a marker variable that supported tests for discriminant validity and nomological validity. To ensure the questionnaire's effectiveness, we conducted four pretests to check the survey flow, question randomization, and any design glitches, such as making sure all questions were presented and answered. The respondents had the option to provide feedback at the end of the survey. Five additional pretests offered validation prior to the main data collection phase. The main data collection involved 257 omnichannel U. S. customers (49.8 % men), who reflected on their recent experiences with a consumer goods omnichannel retailer. Because the sample size exceeds 250, it meets the adequacy criterion for factor analysis (MacCallum et al., 1999). For the largest measurement model in the survey, SafeCX with its 81 items, the respondent-to-item ratio also meets the recommended minimum.

6.2. Confirmatory factor analysis

We conducted EFA using maximum likelihood estimation to validate the 12-factor SafeCX and 2-factor customer well-being structures. This was followed by CFA to finalize parsimonious models with consistent item counts. For dimensions with more than four items, lower-loading items were iteratively removed if thematically similar, higher-loading items remained, while monitoring AVE improvements. Two authors independently conducted the CFA and arrived at a 48-item SafeCX model (4 items per dimension), with all loadings above 0.70 and AVE values above 0.50. Model fit was excellent ($\chi^2/df = 1.46$, CFI = 0.96, RMSEA = 0.04; see Table 4). The final customer well-being model included 8 items (4 per dimension), with strong loadings and AVE values, and excellent fit ($\chi^2/df = 2.07$, CFI = 0.99, RMSEA = 0.06; see

Table 5
Cronbach's alpha values (α), composite reliability (CR), average variance extracted (AVE), collinearity (VIF), and discriminant validity (HTMT) of SafeCX dimensions in Study 3.

Constructs:	α	CR	AVE	VIF	Heterotrait-Monotrait (HTMT) Ratios:									
					Social media safety	Social inclusiveness	Safe employees	Injury prevention	Spatial distancing	Security cameras	Security guards	Emergency exits	Personal data safety	Order fulfillment safety	Safety recalls
Social media safety	0.93	0.95	0.83	1.54											
Social inclusiveness	0.91	0.93	0.78	2.36	0.41										
Safe employees	0.94	0.95	0.84	2.72	0.38	0.76									
Injury prevention	0.83	0.90	0.74	1.58	0.35	0.52	0.48								
Spatial distancing	0.95	0.96	0.86	1.60	0.44	0.45	0.44	0.41							
Security cameras	0.94	0.96	0.86	1.96	0.40	0.48	0.52	0.50	0.38						
Security guards	0.90	0.93	0.76	1.71	0.27	0.53	0.61	0.39	0.36	0.52					
Emergency exits	0.94	0.96	0.84	1.63	0.35	0.49	0.51	0.46	0.41	0.50	0.44				
Personal data safety	0.95	0.96	0.87	1.96	0.47	0.49	0.48	0.41	0.46	0.50	0.28	0.35			
Order fulfillment safety	0.88	0.92	0.74	2.01	0.48	0.32	0.27	0.51	0.37	0.50	0.16	0.31	0.51		
Safety recalls	0.93	0.95	0.82	2.30	0.51	0.49	0.56	0.51	0.41	0.53	0.33	0.40	0.55	0.62	
Anxiety prevention	0.89	0.92	0.74	2.44	0.52	0.39	0.34	0.50	0.52	0.53	0.20	0.35	0.62	0.69	0.69

Table 6).

6.3. Construct reliability and discriminant validity tests

Construct reliability and validity results (Table 7, Table 8) confirm that all constructs demonstrate strong internal consistency (Cronbach's alpha and composite reliabilities > 0.70; Hair et al., 2018), convergent validity (AVE ≥ 0.50), and discriminant validity (HTMT < 0.90; Henseler et al., 2015). The formative second-order SafeCX construct showed no multicollinearity (indicators → SafeCX VIFs: 1.53–2.32), and all 12 first-order dimensions significantly contributed to SafeCX (BCa 95 % CI excludes zero; Table 4). The CTA-PLS (Gudergan et al. 2008; Web Appendix W4) based on 10,000 bootstrap subsamples rejected a reflective measurement of SafeCX. When focusing on the reflectively measured outcome variables (IWB, CWB, share of wallet, and influence intentions), we obtain strong loadings (> 0.70), significant BCa estimates, and satisfactory reliability and AVE.

7. Phase 5: Measurement model robustness checks and finalization

Using the Study 5 data, we conducted a series of partial least squares structural equation modeling (PLS-SEM; Hair et al., 2022; Hair et al., 2024; Lohmöller, 1989; Wold, 1982) based analyses using the software SmartPLS (Ringle et al., 2022; see also Cheah et al., 2024) to check the robustness of the measurement models (Vaithilingam et al., 2024). In general, we follow the recent recommendations by Guenther et al. (2025), Guenther et al. (2023), Gudergan et al. (2025), Sarstedt et al. (2025), Sarstedt et al. (2022), Sarstedt et al. (2023), and Sharma et al. (2024) for the evaluation of the measurement model outcomes and structural model results in PLS-SEM.

First, we conceptualize the SafeCX construct with 12 first-order dimensions as a formative measurement model, and we need to validate this specification empirically (Moghddam et al., 2024; Rahman et al., 2022b). To this end, we undertook a CTA-PLS analysis (Cefis et al., 2025; Gudergan et al., 2008; Sarstedt et al., 2024), in which the latent variable scores of the reflectively measured first-order dimensions provide the formative indicators of the second-order SafeCX construct. The results (see Table W4.1 in Web Appendix W4) indicate that the 90 % bias-corrected and Bonferroni-adjusted bootstrap confidence interval (CI) does not include 0, across multiple rows (tetrads). For example, the CI of SafeCX's tetrad 31 indicates a lower boundary of -0.59 and an upper boundary of -0.07 ($p = 0.000$). Thus, the SafeCX measurement model is not reflective.

Second, newly developed measurement models should be tested for compositional invariance (Henseler et al., 2016; Rahman et al., 2022b). With a permutation algorithm, we can determine if predefined data groups (e.g., male and female) exhibit statistically significant differences in their group-specific parameter estimates (e.g., outer weights, outer loadings, and path coefficients). Therefore, we generated two groups, male and female, and conducted the permutation multigroup analysis. The permutation p-values (e.g., MICOM Step 2 estimates) were not significant (SafeCX = 0.91, customer well-being = 0.18), indicating that the composite scores of multi-item-dimensional constructs SafeCX and consumer well-being are indifferent across gender groups. This outcome also offers empirical evidence that observable heterogeneity (e.g., gender) does not condition the estimates.

Third, we conducted tests to assess the potential for common method bias (CMB). With a marker variable technique, we examine the relationship between our theoretical constructs and an unrelated, four-item, social desirability marker (Rahman et al., 2022b). The results do not reveal any meaningful associations. Because VIFs offer a measure of collinearity, we include them in the assessment of our PLS-based model too. As reported previously (see also Table 5), all inner VIF values are below 3, so the study is unlikely to be influenced by CMB (Hair et al., 2018). The combined evidence gathered from these tests suggests that

Table 6
EFA, CFA, and PLS-SEM results for customer well-being (CUWB) measurement model.

Item ID	Dimension Name, Definition, and Measurement Items *Study*	EFA Loading *4*	EFA Loading *5*	CFA Loading *4*	CFA Loading *5*	PLS Loading *4*	PLS Loading *5*
	Individual well-being (IWB): *The extent to which customers perceive that an omnichannel retailer affects their personal life.*						
IWB1	XYZ affects my mental well-being.	0.85	0.90	0.90	0.93	0.93	0.93
IWB2	XYZ affects my emotional well-being.	0.85	0.83	0.92	0.90	0.93	0.92
IWB3	XYZ affects my social well-being.	0.74	0.90	0.84	0.86	0.88	0.90
IWB4	XYZ affects my physical well-being.	0.76	0.68	0.87	0.84	0.90	0.88
	Community well-being (CWB): *The extent to which customers perceive that an omnichannel retailer affects the lives of others within their community.*						
CWB1	XYZ affects the well-being of my family members.	0.83	0.78	0.95	0.93	0.94	0.94
CWB2	XYZ affects the quality of life of others who are important to me.	0.86	0.87	0.94	0.94	0.93	0.95
CWB3	XYZ affects the quality of life of my friends.	0.81	0.77	0.90	0.93	0.89	0.94
CWB4	XYZ affects the well-being of others within my community.	0.69	0.90	0.74	0.80	0.84	0.86

Notes: Model fit (Study 4; Study 5): $x^2/df = 2.08$; 2.07, CFI = 0.98; 0.99, SRMR = 0.03; 0.03, RMSEA = 0.08; 0.06. HTMT = 0.79; 0.85. All values are significant at $p = 0.00$. "XYZ" was replaced with the name of the omnichannel retailer that respondents mentioned at the start of the online survey.

CMB is unlikely to be a significant concern for our study.

The robustness tests thus substantiate the validity of the 48-item SafeCX measurement model, which effectively captures 12 significant dimensions. Following the approach proposed by Sample et al. (2023) and Rahman et al. (2022b), we also derive a 12-item, condensed SafeCX model that features one item for each of the first-order dimensions of SafeCX. This more concise version may be particularly useful for managers and researchers seeking a streamlined approach to measuring safe customer experiences. The 12 items in the $SafeCX_{Condensed}$ model are indicated by the letter "C" in Table 4. We also confirmed its formative nature (Table W4.2, Web Appendix 4). For example, for $SafeCX_{Condensed}$ tetrad 268, the CI does not include 0; its lower boundary is 0.11, and upper boundary is 0.77 ($p = 0.000$). We also identify a strong correlation of 0.99 between the $SafeCX_{Full}$ and $SafeCX_{Condensed}$. The consistent support obtained from all these analyses prompts us to finalize the 48-item SafeCX model to measure customers' overall perceptions of their safe customer experience in consumer goods omnichannel retailing, the 12-item customer well-being measurement model, and the 12-item $SafeCX_{Condensed}$ model.

8. Phase 6: PLS-SEM–based nomological validity assessments

The structural model in Fig. 1 consists of a mix of reflective and formative higher-order measurement models (Crocetta et al., 2021; Hair et al., 2024; Wetzels et al., 2009). For such complex models, PLS-SEM–based estimations generally are suitable (Sarstedt et al., 2016). Accordingly, we conducted a path analysis of the structural model, using the Study 5 data, with which we seek to test the nomological validity. A power analysis indicates that to obtain a large (d = 0.8) effect size, with a statistical power level of 0.8, and a significance level of 0.05, for the four latent variables with 16 indicators (12 items for SafeCX, 2 items for customer well-being, 2 items for the outcome variables), we need a minimum sample of 91. Our Study 5 sample size of 257 thus exceeds the minimum to ensure sufficient statistical power for the path estimates.

Based on the lower-order measurement model validation in Phase 4, we adopted disjoint two-stage approach to analyze higher-order models in PLS-SEM (Becker et al., 2023; Hair et al., 2024; Sarstedt et al., 2019) for Phase 6. That is, in the first stage, we estimate and assess the measurement model for the lower-order components on the basis of the direct relationships of the 12 dimensions of SafeCX with IWB, CWB, share of wallet, and individual well-being; of share of wallet with customers' influence intentions; and of CWB with share of wallet and customers' influence intentions. No higher-order components are included in this Stage 1 model. To estimate the latent variable scores, we set the PLS-SEM weighting scheme to factor. Then in the second stage, we leveraged the unstandardized latent variable scores from the Stage 1 results to create the model: 12 formative indicators of the second-order SafeCX construct (Weighting Mode = A), 2 reflective indicators of customer well-being, a single-item share of wallet indicator, and a single-item influence intentions indicator.

Finally, we evaluated the PLS-SEM path coefficients for the Stage 2 model using a 95 % bias-corrected and accelerated (BCa) bootstrap confidence interval (based on 10,000 subsamples) for significance testing. The estimates obtained with the PLS-SEM path weighting scheme are displayed in Table 9. In addition to the direct effects in Fig. 1, we find significant indirect effects of SafeCX on share of wallet ($\beta = 0.08$; 95 % $BCa = 0.02$; 0.15) and customers' influence intentions ($\beta = 0.21$; 95 % $BCa = 0.15$; 0.28), mediated by customer well-being. The direct and mediated path estimates for the $SafeCX_{Condensed}$ model also are consistent with the results for the full model (Table 9). With regard to the model's explanatory power, we note the R^2 values for the dependent variables: customer well-being (0.21), share of wallet (0.08), and customers' influence intentions (0.43). To assess potential endogeneity issues that could bias the coefficients, we employed Gaussian copula analysis (Hult et al., 2018; Liengaard et al., 2025; Park & Gupta, 2012). For this purpose, we consider a Gaussian copula distribution and non-normality of the potentially endogenous regressors. None of the Gaussian copulas included in the model were statistically significant. The results support the assumption that endogeneity issues are not of critical concern in this study.

We also undertook the $PLS_{Predict}$ assessment (Shmueli et al., 2016, 2019) and cross-validated predictive ability test (CVPAT; Liengaard et al., 2021; Sharma et al., 2023), both of which involve out-of-sample predictions. We chose 10-folds and 10 repetitions as the settings. The $Q^2_{Predict}$ values using the linear regression model equal 0.21 (using full SafeCX model) and 0.19 (using $SafeCX_{Condensed}$) for customer well-being, 0.05 for share of wallet (using both full and condensed SafeCX), and 0.26 in both models for customers' influence intentions, such that they affirm the predictive relevance of the constructs in the path model. The average loss difference estimates in CVPAT also confirm that the PLS-SEM predictions significantly outperform naïve indicator-average prediction benchmarks for customer well-being (−0.39 using full SafeCX and −0.36 using $SafeCX_{Condensed}$, $p = 0.00$), share of wallet (−0.03 using full SafeCX and −0.04 using $SafeCX_{Condensed}$, $p = 0.10$), and customers' influence intentions (−0.58 in both models, $p = 0.00$), as well as overall (−0.33, $p = 0.00$). For the linear model (LM) benchmark, the CVPAT loss results are comparable to those obtained with PLS-SEM for both the full SafeCX and $SafeCX_{Condensed}$ models, with PLS-SEM showing a slight but not statistically significant advantage for share of wallet, customers' influence intentions, and overall performance, except in the case of customer well-being. This empirical evidence offers support for a moderate predictive ability of both the full and the condensed SafeCX models.

Table 7
Cronbach's alpha values (α), composite reliability (CR), average variance extracted (AVE), and discriminant validity (HTMT) in Study 5.

Constructs:	α	CR	AVE	Social media safety	Social inclusiveness	Safe employees	Injury prevention	Spatial distancing	Security cameras	Security guards	Emergency exits	Personal data safety	Order fulfillment safety	Safety recalls	Anxiety prevention	Individual well-being	Community well-being	Share of wallet
Social media safety	0.94	0.95	0.84															
Social inclusiveness	0.90	0.90	0.76	0.42														
Safe employees	0.94	0.95	0.85	0.30	0.72													
Injury prevention	0.96	0.96	0.90	0.40	0.44	0.48												
Spatial distancing	0.97	0.97	0.91	0.33	0.49	0.47	0.42											
Security cameras	0.96	0.96	0.88	0.36	0.53	0.52	0.44	0.35										
Security guards	0.89	0.93	0.74	0.28	0.59	0.60	0.43	0.37	0.58									
Emergency exits	0.93	0.97	0.83	0.37	0.45	0.47	0.48	0.37	0.39	0.35								
Personal data safety	0.96	0.97	0.90	0.45	0.47	0.38	0.41	0.37	0.53	0.30	0.32							
Order fulfillment safety	0.90	0.93	0.77	0.49	0.39	0.28	0.51	0.42	0.56	0.33	0.47	0.51						
Safety recalls	0.93	0.93	0.83	0.46	0.46	0.42	0.42	0.44	0.41	0.46	0.47	0.38	0.51					
Anxiety prevention	0.89	0.97	0.74	0.49	0.49	0.36	0.54	0.47	0.48	0.38	0.45	0.58	0.71	0.60				
Individual well-being	0.93	0.93	0.82	0.23	0.48	0.46	0.23	0.31	0.39	0.45	0.23	0.34	0.18	0.23	0.32			
Community well-being	0.94	0.95	0.85	0.25	0.41	0.38	0.18	0.28	0.33	0.33	0.22	0.22	0.13	0.24	0.30	0.84		
Share-of-wallet	0.85	0.86	0.77	0.13	0.27	0.22	0.13	0.04	0.30	0.14	0.03	0.24	0.16	0.18	0.19	0.29	0.23	
Customers' influence intentions	0.93	0.93	0.82	0.29	0.48	0.49	0.27	0.35	0.45	0.39	0.23	0.46	0.22	0.28	0.30	0.64	0.56	0.37

Notes: All values are significant at $p = 0.00$.

9. Discussion

Through a six-phase, five-study process, this research provides a robust SafeCX measurement instrument, a customer well-being measurement instrument, resource allocation guidance for retail managers, and avenues for further research. The following sections discuss how this scale contributes to theory and practice in retail and customer experience research.

9.1. Research implications

Some prior research has investigated retail safety narrowly, particularly as it pertains to e-commerce, but the current study offers a more granular analysis of safety constructs overall and fills key gaps by enabling assessment of both in-store and cross-channel perceptions, as well as the link between safety and customer well-being. It helps establish how customers evaluate their overall safety in inherently complex omnichannel environments, in which they transition across multiple channels during their purchase journey and form perceptions of retailers over time. To capture this process, we introduce a parsimonious SafeCX measurement model with 12 necessary dimensions that reflect the critical factors influencing customers' safety perceptions in omnichannel retailing.

Second, our empirical assessments support a formative configuration of SafeCX, meaning that each first-order dimension is essential and the construct cannot be meaningfully measured if any are excluded. This underscores that customer safety in omnichannel retailing is inherently multidimensional and inseparable across its facets. Third, rather than limiting analysis to one aspect of well-being, we operationalize customer well-being to capture both individual and communal forms. This dual focus enables scholars to examine how safety translates into personal and societal value, aligning with evolving social norms and consumers' growing preference for firms that prioritize community welfare alongside individual welfare.

Fourth, addressing RQ4, the findings of this study contribute to retail literature by clarifying how technology-enabled safety mechanisms, distributed across physical and digital touchpoints, shape customer well-being outcomes in omnichannel environments. We employed advanced PLS-SEM based analysis to identify specific dimensions of SafeCX that are both statistically necessary as indicated by necessary condition analysis (NCA; Dul et al., 2023; Richter and Hauff, 2022; Richter et al., 2023) and substantively influential based on total effects from importance-performance map Analysis (IPMA; Hair et al., 2024; Ringle and Sarstedt, 2016).

The estimates based on Study 5 data (see details in Web Appendix W6) suggest that in-store safety remains central to the SafeCX–well-being relationship. Security Cameras dimension is both statistically necessary ($p = 0.01$; see Table W6.1 and W6.2) and demonstrates above-average importance (0.07; see Table W6.3). It reflects customer expectations that physical environments are monitored and controlled using visible surveillance technology and personnel presence, especially across store interiors, pickup zones, and parking areas, influencing their psychological sense of protection. Personal Data Safety (importance = 0.07; $p = 0.00$) represents a high-priority area, with customers expecting consistent safeguards across in-store, websites, and apps payment systems. This points to the relevance of backend infrastructure and cybersecurity measures in shaping perceptions of trust and personal security. The Safe Employees dimension, which holds the highest importance score (0.08) and is also necessary ($p = 0.00$), reflects expectations that staff are knowledgeable, trained, and safety-conscious. This dimension is increasingly supported through advanced technology-based HR systems, onboarding platforms, and omnichannel safety messaging, all of which help ensure customers perceive the workforce as part of the retailer's broader safety commitment. Security Guards dimension is statistically necessary ($p = 0.00$) with above-average importance (0.07). Spatial Distancing, also statistically necessary ($p = 0.00$), indicates

Table 8
PLS-SEM results for endogenous constructs in Study 5.

Item ID	Construct name, definition, and measurement items	PLS Loading
	Share of wallet (SoW) (Rahman et al., 2025b) Based on your purchases from XYZ across all channels, relative to other retailers, please indicate to what extent you buy from XYZ:	
SoW1	Of the last five times you selected a retailer to buy from, how many times did you select XYZ? *Responses: 5, 4, 3, 2, 1*	0.88
SoW2	Based on your total expenditure with all retailers in the past 3 months, what percentage of purchase was made from XYZ? *Responses: (a) 81 %–100 % (b) 61 %–80 % (c) 41 %–60 % (d) 21 %–40 % (e) 0 %–20 %*	0.84
SoW3	How frequently do you buy from XYZ compared to other retailers that you use? *Responses: (a) Always (b) Often (c) Sometimes (d) Rarely (e) Never*	0.91
	Customers' influence intentions (CIN) (Kumar & Pansari, 2016; Rahman et al., 2025a) A customer's intention to influence existing and potential customers of the omnichannel retailer. *[All survey items were based on a seven-point, fully labeled Agree-Disagree Likert scale]*	
CIN1	I actively discuss XYZ on various channels	0.90
CIN2	I love talking to others about my experience with XYZ	0.91
CIN3	I discuss the benefits that I get from XYZ with others	0.90
CIN4	I feel I am a part of XYZ and mention it in my conversations	0.92

Note: "XYZ" was replaced with the name of the omnichannel retailer that respondents mentioned at the start of the online survey.

Table 9
Nomological validity testing results, Study 5.

Effects	Direct Effect		Indirect Effect (mediator: Customer well-being)	
	β	95% BCa CI	β	95% CI
SafeCX → Customer well-being	0.46	0.36; 0.55		
Customer well-being → Share of wallet	0.18	0.04; 0.31		
Customer well-being → Customers' influence intention	0.46	0.35; 0.56		
SafeCX → Share of wallet	0.16	0.03; 0.28	0.08	0.02; 0.15
SafeCX → Customers' influence intention	0.30	0.20; 0.41	0.21	0.15; 0.28
$SafeCX_{Condensed}$ → Customer well-being	0.49	0.36; 0.57		
$SafeCX_{Condensed}$ → Share of wallet	0.21	0.04; 0.34	0.07	0.01; 0.15
$SafeCX_{Condensed}$ → Customers' influence intention	0.35	0.22; 0.45	0.21	0.14; 0.28

Notes: β = path coefficient, CI = bias-corrected and accelerated (BCa) bootstrap confidence interval.

customers' expectations for spacious store layouts and the avoidance of overcrowding, conditions often shaped by AI-based traffic analytics and store planning tools. This dimension underscores how technology can be used to influence movement patterns and perceptions of physical comfort. Emergency Exits ($p = 0.01$), while lower in importance (0.04), still form part of customers' safety expectations, particularly when visibility and signage are enhanced by in-store displays and guided wayfinding systems.

Social Inclusiveness, a high-importance and necessary dimension (importance = 0.08; $p = 0.00$), spans all channels and reinforces expectations that retailers accommodate vulnerable groups. The delivery of inclusive messaging and services via websites, mobile apps, or in-store communications often relies on sophisticated content design and delivery systems, highlighting how technology enables consistency and accessibility in safety-related communication. In the post-purchase and service fulfillment stages, dimensions such as Order Fulfillment Safety and Anxiety Prevention also carry theoretical relevance. Order Fulfillment Safety ($p = 0.00$) is linked to safe pickup and delivery procedures, supported by contactless technology, tracking systems, and secure handoff protocols. Anxiety Prevention ($p = 0.00$) reflects confidence in guarantees, refunds, and issue resolution, which are frequently managed through automated and integrated service platforms. Social Media Safety ($p = 0.00$), though lower in importance (0.04), contributes to emotional well-being by reducing the likelihood of encountering harmful or offensive content. Customers expect retailers to maintain safe online brand environments, often supported by automated moderation tools and platform governance. Collectively, these findings advance retail literature by specifying how technology functions as a channel-level enabler of customer-perceived safety across the omnichannel journey. Rather than treating safety and well-being as diffuse constructs, the current study isolates the specific SafeCX dimensions that are both critical (necessary) and impactful (important) for driving well-being, and it shows how retail technologies, both visible and behind-the-scenes, shape these effects.

9.2. Implications for practitioners

In practice, it might not always be feasible to allocate resources to all 12 dimensions of SafeCX simultaneously, suggesting the need for contingency plans that prioritize poorly performing SafeCX dimensions. Importantly for the managers, this study introduces a practically applicable diagnostic framework that enables the assessment and planning of the improvement of safety-related customer experiences in omnichannel retail settings. SafeCX is specified as a formatively measured second-order construct, meaning each dimension contributes uniquely and indispensably to the higher-order perception of customer safety. This makes the scale highly appropriate for granular performance benchmarking, where underperformance in one specific area (e.g., surveillance coverage, data protection, or staff safety communication) can be flagged for targeted intervention. Specifically, the combined use of IPMA and NCA, e.g., cIPMA (Sarstedt et al., 2024; Hauff et al., 2024; Aldhamiri et al., 2024), allows managers to identify dimensions that are highly influential and represent non-compensatory bottlenecks, meaning that without them customers are unlikely to reach desired levels of well-being, loyalty, or advocacy. cIPMA enables outcome-specific prioritization, distinguishes between high-impact gaps that should be addressed versus dimensions that are already performing well and can be maintained or deprioritized, and supports evidence-based resource allocation in operations.

As an illustration of this application, we used Study 5 data to generate cIPMA[1] tables for three key outcomes: customer well-being, share of wallet, and customers' influence intentions. The results, summarised in Web Appendix 7, demonstrate how SafeCX dimensions vary in terms of importance and necessity across behavioural outcomes. For instance, Safe Employees, Social Inclusiveness, and Security Guards were identified as consistently necessary (i.e., relatively larger bubbles in Fig. 2) and important (i.e., further to the right on the x-axis), but underperforming dimensions (i.e., relatively lower scores on the y-axis) for the customer well-being outcome, suggesting they should be prioritised for improvement. Meanwhile, dimensions such as Order

[1] An Excel template used for generating the SafeCX cIPMA graphs presented in this section is available as a supplementary file. A general template for generating the cIPMA graph is also available here https://www.pls-sem.net/app/download/19698644925/Excel+-+IPMA+qual+indicators.xlsx?t=1705336384.

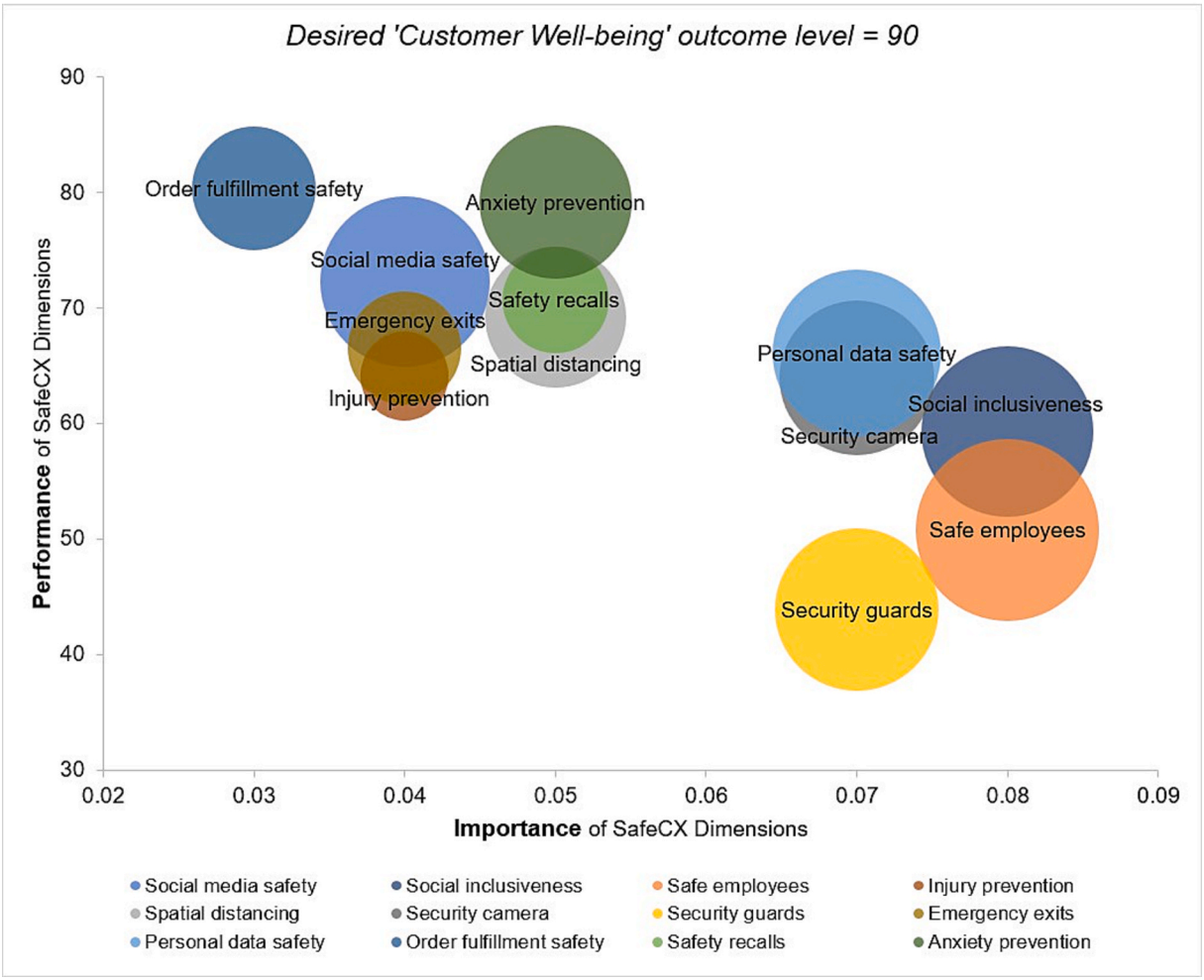

Fig. 2.C. IPMA map of SafeCX for Customer Well-being as the outcome.

Fulfillment Safety and Anxiety Prevention were found to be both necessary and high performing, indicating areas that should be sustained rather than allocated additional resources. In addition, two technology-oriented dimensions, Security Cameras and Personal Data Safety, emerged as highly important to customers yet only moderately performing, underscoring the need for retailers to strengthen investments in surveillance systems and secure payment processes as critical in-store technologies. A specific omnichannel retailer or market research agency can implement this diagnostic tool within their own customer base, model their data using PLS-SEM, and apply the step-by-step cIPMA procedure detailed in Web Appendix 7. This enables the generation of firm-specific diagnostic tables that support prioritisation of safety investments aligned to actual customer experience and their well-being.

Additionally, the 12-item, condensed SafeCX scale accounts for practical constraints that retail managers face and thus offers a reliable, efficient tool that they can use. While it is concise, it also offers strong reliability, demonstrated by its high composite reliability and internal consistency scores, which indicate that it effectively captures core safety dimensions critical to well-being and engagement. Retailers might apply the condensed scale periodically to assess and adjust their safety strategies, to align with evolving customer expectations, and safety standards in omnichannel settings. This approach supports cost-effective monitoring while still maintaining the scale's predictive strength and operational relevance.

Finally, the findings have notable implications for policy and enforcement efforts. Keeping citizens safe is a primary goal of any government, and virtually every citizen experiences some risk of being affected by safety incidents in retail environments. Therefore, it is part of the government's duty to ensure shopping environments are safe. The empirically validated SafeCX model identifies 12 dimensions that are imperative for a safe omnichannel customer journey, which policy-makers can leverage to mandate and enforce the presence of specific safety features in retail environments. Notably, our framework denotes the particular relevance of Social Media Safety, and governments around the world already are considering policies to moderate or limit social media content that has the potential to cause harm (Paul, 2024). Similarly, the Safe Employees dimension offers support for policy imperatives to require background checks to help avoid the possibility that customers confront unsafe service providers.

9.3. *Directions for further research*

Despite the presented robustness of the scale and nomological tests, some limitations remain that continued research could address. First, we test the newly proposed scales using responses from omnichannel customers, mostly located in the United States. This raises an important research question: How does the importance of SafeCX dimensions vary across cultural and regional contexts, and what does this mean for understanding customer behavior and preferences in global marketplaces? Such efforts would clarify cross-cultural differences in the importance of SafeCX dimensions, establish the generalizability of the scales, and indicate whether country-specific measures are needed to capture customer behavior and preferences.

Second, customers' perceptions invariably evolve over time, so the measures we propose need to be checked periodically for necessary updates, especially as the omnichannel retailing context changes. For example, what are the safety implications of increased use of AI in retailing? Can the Personal Data Safety dimension in SafeCX capture AI-linked implications, or are additional measures necessary? Because we develop the SafeCX measurement model as a second-order formative measure, it allows for the inclusion of new dimensions, in line with the schema accommodation process supported by categorization theory (see Rahman et al., 2022b). Therefore, ongoing research should explore any changes in customers' safety perceptions, conceptualize new and important dimensions, and empirically test if any of these emergent dimensions are integral to the SafeCX construct.

Third, we measure the first-order dimensions of SafeCX at the attribute level to capture customers' broad assessments. Attribute-level assessments generally remain stable over time, which means the scale promises long-term validity. However, it does not prescribe which exact features omnichannel retailers should apply. For example, measures of the Social Media Safety dimensions indicate customers' expectation that omnichannel retailers control the spread of hate speech on their social media pages, but we lack specifics related to this expectation. What do these customers consider hate speech, and are their perceptions consistent across genders, age groups, and cultures? How can and should retailers detect and control hate speech on their social media pages? Should efforts to manage hate speech reflect the specific content and engagement provided by different social media formats? By addressing these and other questions that resonate with the 12 dimensions of SafeCX, researchers could establish a more in-depth understanding and advance scholarly knowledge about the fundamental human need for safety.

Fourth, rapidly advancing retail technology suggests the need for research into the effects of emerging technologies, e.g., AI, virtual reality, metaverse (Rahman et al., 2025c), on SafeCX and the resulting impacts on customer well-being, share of wallet, and influence intentions. For example, the SafeCX model empirically demonstrates the importance of anxiety prevention measures by retailers. When they integrate AI applications into customer service efforts, managers should thus address the potential for greater anxiety and consider, for example, options for improving AI's ability to perceive customers' emotional states and cater to their needs. This raises an important research question: How can emerging technologies be designed to reduce customer anxiety and enhance well-being across channels? A more compassionate AI agent, deployed across channels, arguably might enhance customer well-being. Addressing such technological questions could advance knowledge related to both customer safety and well-being.

Fifth, to the best of our knowledge, this study offers the first robust, empirical evidence of the constituent dimensions of customers' safety perceptions in omnichannel retailing. A key question is: How can the SafeCX scale development process be adapted to derive domain-specific safety measures in contexts such as tourism, where customers' omnichannel experiences matter, and in government services, where citizen interactions span multiple channels? The step-by-step process we detail also offers guidelines for similar studies in other domains.

Sixth and finally, safety initiatives represent long-term, strategic investments. Examining the effects of prioritizing certain SafeCX dimensions on long-term outcomes such as customer loyalty, brand perceptions, and financial performance would help quantify or specify the benefits of different resource allocation strategies. In such efforts, we recommend NCA to help managers identify critical SafeCX dimensions ("must-haves") for attaining such outcomes, and IPMA to determine the importance of different factors in producing the outcomes. A key question is how do these necessary conditions and the relevance of different dimensions vary across domains (e.g., retailing vs. tourism), and how should advanced analytics be applied uniquely in different settings to support safety performance monitoring and improvements?

CRediT authorship contribution statement

Syed Mahmudur Rahman: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Jamie Carlson:** Writing – review & editing, Writing – original draft, Supervision, Resources, Conceptualization. **Noman H. Chowdhury:** Writing – review & editing, Writing – original draft, Validation, Investigation, Formal analysis, Data curation, Conceptualization. **Siegfried P. Gudergan:** Writing – review & editing, Supervision, Methodology, Formal analysis. **Martin Wetzels:** Writing – review & editing, Supervision, Methodology. **Christian M. Ringle:** Writing – review & editing, Validation, Supervision, Software, Methodology, Formal analysis. **Dhruv Grewal:** Writing – review & editing, Writing – original draft, Supervision, Resources, Project administration.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jbusres.2025.115760.

Data availability

Data will be made available on request.

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Syed Mahmudur Rahman is a faculty member in the Department of Marketing at the Macquarie Business School, Macquarie University, Australia. He holds a PhD in Marketing Management and an MBA with Distinction from the University of Newcastle, Australia. His research interests include customer experience, customer engagement, measurement model/scale development, omnichannel retailing, and social media. His publications appear in journals including the *Journal of Retailing, Journal of Business Research, Journal of Consumer Behaviour, Journal of Retailing and Consumer Service, Journal of Services Marketing, Journal of Travel Research,* and numerous other internationally recognized journals. He is the recipient of the Jay Lindquist Best Conference Paper Award 2025, Academy of Marketing Science (AMS) World Marketing Congress. ORCiD: https://orcid.org/0000-0002-7351-6775

Jamie Carlson is a full professor in Marketing at Newcastle Business School at the College of Human and Social Futures, University of Newcastle, Australia. He holds a PhD in Marketing. His research interests include consumer behavior, service performance, and customer experience management issues. His publications appear in journals including the *Journal of Retailing, Journal of Business Research, European Journal of Marketing, Journal of Retailing & Consumer Services, Industrial Marketing Management, Journal of Services Marketing, International Journal of Information Management,* and numerous other internationally recognized publication outlets. ORCiD: https://orcid.org/0000-0002-1622-5939

Noman H. Chowdhury completed his PhD in Information Systems at the University of Newcastle, Australia. He is currently serving as Associate Professor, Management, School of Business and Economics (SBE), North South University, Bangladesh. He received his bachelor's in Computer Science and Engineering from Bangladesh University of Engineering and Technology (BUET), and pursued an MBA from the Institute of Business Administration (IBA), Dhaka University. Mr. Noman also has long corporate experience working in companies like Grameen Phone Ltd., Nokia Siemens Networks (NSN), etc. His research interest includes organizational cybersecurity, safe experience, and application of emerging technologies in the organizational context. His research has appeared in top international outlets such as *Behaviour and Information Technology, Computers and Security,* and *Journal of Services Marketing.* ORCiD: https://orcid.org/0000-0003-4209-8950

Siegfried P. Gudergan is Professor of Strategy at James Cook University in Australia. He is also a Visiting Distinguished Professor at Aalto University in Finland, a Visiting Professor at Vienna University of Economics and Business (WU Wien) in Austria, and an Emeritus Professor at the University of Waikato in New Zealand. His research interests concern business innovation, transformation and performance, as well as customer experience management. He has published in leading management, strategy, and marketing journals. ORCiD: https://orcid.org/0000-0002-5493-4664

Martin Wetzels is a Full Professor of Marketing at EDHEC Business School, Lille campus, France. His research interests focus on service marketing and management, marketing research and analytics, digital marketing, B2B marketing, innovation management, relationship management, and supply chain management. His research has been published in leading journals, such as *MIS Quarterly, Journal of Marketing, Management Science, Journal of Operations Management, Journal of Consumer Research, Accounting, Organizations and Society, Journal of the Academy of Marketing Science, Journal of Retailing,* and *Journal of Service Research.* He is currently serving as Area Editor, for the *Journal of the Academy of Marketing Science*, Associate Editor for the *Journal of Product Innovation Management,* and as Co-Editor for the *Journal of Service Research*. Finally, he is the 2023 recipient of the AMA SERVSIG Christopher Lovelock Career Contributions Award. ORCiD: https://orcid.org/0000-0001-8569-5320

Christian M. Ringle is a Chaired Professor of Management and Decision Sciences at the Hamburg University of Technology (Germany), an Adjunct Research Professor at James Cook University (Australia), and a Visiting Scholar at the University of California, Berkeley (USA). His research interests are in the areas of management and marketing, method development, business analytics, artificial intelligence, machine learning, and the application of business research methods to management decision-making. Since 2018, Christian has been included in the list of Highly Cited Researchers by Clarivate Analytics. He is a co-founder and codeveloper of the statistical software SmartPLS (https://www.smartpls.com). ORCiD: https://orcid.org/0000-0002-7027-8804

Dhruv Grewal (Ph.D., Virginia Tech) is the Toyota Chair in Commerce and Electronic Business and a Professor of Marketing at Babson College. He currently serves on numerous editorial review boards, including JSR, JPP&M (AE), JAMS (AE), and was co-editor of JR (2001–2007). ORCiD: https://orcid.org/0000-0002-7046-6063