Scale Development of Consumer-Focused Technology Features Important to Shopping Experiences in Small Retail Businesses

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Introduction. Readily available technology applicable within small retail stores, such as smart phones and tablets, provides consumers the power to co-create their retail experience, compare offerings, and make purchase decisions in rapid time (Vannucci & Pantano, 2020). Use of in-store technologies influence consumer satisfaction, patronage intention, and positive word-of-mouth (WOM) (Fuentes-Blasco et al., 2017; Kowatsch & Maass, 2010), but research generally focuses on large retailers' applications. Thus, the purpose of the present study was to develop a valid and reliable scale capturing consumer-focused technology features applicable to shopping experiences in small retail businesses. This scale will enable empirical study of preferences for and effectiveness of consumer-focused technology within small retailers, which may offer small retailers useful tools in this highly competitive retail landscape.

Literature Review. Consumers visit brick-and-mortar stores in search of a unique shopping experience (Pantano & Gandini, 2018). Innovative technologies, such as self-service technologies (SSTs) (Weijters et al., 2007) and mobile recommendation agents (MRAs) (Kowatsch & Maass, 2010), allow consumers to co-create their shopping experience to obtain faster check-out speeds, price check items, and product descriptions. In-store technologies should produce both utilitarian and hedonic experiences through enhanced product information search, augmented brand stories, transactional operations, and social connectedness (Grewal et al., 2020; Pantano & Gandini, 2018). Smaller retailers have a limited digital footprint in comparison to larger retailers due to constrained resources, including technology applications. They need realistic, consumer-focused technology solutions to attract and retain customers, and be competitive, in today's dynamic retail environment (Ritz, Wolf, & McQuitty, 2019).

Methods. The scale-development process described below followed steps outlined by Churchill (1979), DeVellis (2011) and Furr (2011). The first step of scale development, content validity, begins with identifying the potential content to be captured by scale items. Literature regarding retailer use of consumer-focused technology directly aided in scale item generation, and indirectly informed question development for five focus groups in the initial stage of the study. The purposive sample included students recruited from two merchandising classes and faculty from a range of academic programs. A total of 32 students (three male and 29 female) and seven female faculty members participated over a two-day period. The qualitative data were analyzed in MAXQDA using thematic analysis (Kuckart, 2014). Eight researchers developed the initial pool of 32 survey items using a thematic summary approach. Two researchers and five graduate students familiar with retailing then checked the generated items for content face validity and

clarity resulting in 23 items for the main survey in stage two. The 23 items were included in an IRB approved survey containing 117 items concerning consumer preferences for technology use, hours of operation, merchandise categories, and events offered in a new program-related small retail store. Over a two-week period, the survey instrument was administered through Qualtrics to students and employees at a large Midwestern university (N= 36,260). Respondents had a chance to win a gift card. Of the 36,260 surveys (29,345 students and 6,915 employees), 3,476 were collected. A total of 3,093 surveys were deemed suitable for analysis, resulting in a final response rate of 8.53%.

Scale Development Procedure and Results. Construct validity began with a purification of the 25 items through Exploratory Factor Analysis (EFA) using principal axis factoring and varimax rotation due to the assumption on correlation among factors (.278~.723). The 3,093 respondents were randomly assigned to either the developmental sample used for initial tests of construct validity and reliability or the validation sample used to replicate tests of validity and perform a measure of nomological validity. The number of factors and items retained for EFA were based on eigenvalues greater than 1, scree tests, and item loadings above .50 on one factor and below .40 on other factors (Hair et al., 2010). Cronbach's alpha coefficients above .70 confirmed the initial assessment of reliability for each factor. Four factors emerged related to technologies and the advantages they offered the consumer. These were: (1) smartphone—social media interactions and enriched store experience (25.27% of variance, $\alpha = .91$), (2) iPad—facilitated product information search (19.13% of variance, $\alpha = .89$), (3) smartphone—facilitated product purchase/transaction (13.14% of variance, $\alpha = .88$), and (4) video—enriched product use and brand knowledge (12.44% of variance, $\alpha = .83$). Sample items were: (1) Smartphone: Participate in games and contests during in-store events on a smartphone, (2) iPads: Browse the entire line of a product found in the store, (3) Smartphone: Easy Checkout through mobile payments, and (4) Video: Watching "how to" clips on using or wearing new products.

The factors and items retained following EFA were assessed through Confirmatory Factor Analysis (CFA), Cronbach's alpha coefficient, and convergent and discriminant validity. The goodness-of-fit indices for CFA included the Chi-square to degrees of freedom ratio (less than three indicated good model fit; Hair et al., 2010) and the following measures and cutoff values: CFI > .95, TLI > .95, RMSEA < .06, SRMR < .08 (Hu & Bentler, 1999). SEM's CFA results revealed adequate goodness-of-fit values for the measurement model. Average variance extracted (AVE) exceeding the suggested cutoff criteria of 0.50 (Hair et al., 2010) established convergent validity, and discriminant validity was established as the square root of the AVE was greater than the intercorrelations with other constructs.

For further validation of the scale, as suggested by Furr (2011), the same tests and cut-offs were used with the second sample. In addition, nomological validity was established by testing a SEM structural model based on relationships among variables found in past studies (Fuentes-Blasco et al., 2017; Inman & Nikolova, 2017). The model consisted of the four new retail technology/advantage factors as exogenous variables and a technology behavioral intentions scale (4 items $\alpha = .953$), which captured patronage and WOM intentions as the

endogenous variable. AVEs were higher than .50, establishing convergent validity, and discriminant validity was established as the square root of the AVE was greater than the intercorrelations with other constructs. SEM's structural model results indicated significant relationships between (a) smartphone—social media interactions/enriched store experience and technology behavioral intentions ($\beta = .56$, $p < .001$) and (b) video—enriched product use/brand background knowledge and technology behavioral intentions ($\beta = .0.11$, $p = .002$).

Conclusions, Implications, and Future Research. A valid and reliable scale, capturing consumer-focused technology features applicable to shopping experiences in small retail businesses, was developed. Of the four emergent factors, two were significantly related to technology behavioral intentions: *smartphone* (social media interactions/enriched store experience) and *video* (enriched product use/brand background knowledge). To enhance competitive capabilities through use of common technology, small retailers should focus on engaging customers via social media on their smartphones and the effective use of in-store video screens. Together, these applications can provide a brand story, relay product knowledge, and create a unique shopping experience. Future research may include exploration of consumers' preferences for and experiences with technology in small retail settings.

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