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Golfer Responses to Traditional and Technology-Enabled Equipment Sales: A Comparative Study

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Launch monitors are electronic devices that measure the movement of golf balls and clubs and convert the information into numerical data like ball speed and attack angle. This technology has enabled the use of analytical science in golf club fitting and retail sales, allowing equipment retailers to offer personalized performance analyses based on a kinematic assessment. However, there is a lack of academic research on the effectiveness of launch monitor technology on golf equipment sales. This lack of evidence, along with the high costs of purchasing and using launch monitors, can be a concern for golf equipment retailers. This quasi-experimental study examined the impact of launch monitors on golf consumers in an applied business setting. Our results from a factorial MANCOVA analysis showed that incorporating launch monitors into the sales process significantly increased consumer learning, shopping experience, and expenditure amount. These findings enhanced the understanding of consumer perception toward technology-enabled sales and provided practical implications for golf equipment retailers considering the use of this technology.

Introduction

The golf industry has been impacted by various technologies over the years. In the early 21st century, the design and manufacturing of high-performance equipment, such as titanium drivers, significantly impacted golf performance and equipment sales (Farrally et al., 2003). Since then, measurement technology has been introduced to further enhance players' experience and performance by providing accurate, reliable, and instantaneous feedback (Fisher, 2019). One such measurement technology is the launch monitor, which measures golf ball and club movement and converts the information into interpretable numerical data such as ball speed, club speed, and attack angle (Leach et al., 2017). In addition to enhancing golf performance, launch monitors have allowed golf equipment retailers to offer personalized performance analyses for each consumer. Rather than using the traditional sales approach that solely relies on personal selling and retail atmospherics to drive sales, some retailers like Club Champion (https://clubchampion.com) and True Spec Golf (https://truespecgolf.com) have adopted a technological sales approach that centers around the use of launch monitor technology in nearly every equipment sales transaction. Compared to the traditional approach, this new approach allows salespeople to utilize the data and insights provided by launch monitors to make equipment recommendations to consumers.

The increased use of launch monitors in golf shops has led many to believe that this technology could improve sales and enhance a shop's competitive position in the market. Previous research has shown that in-store technologies

can attract consumers, improve the shopping experience, and boost purchase intention (Demirkan & Spohrer, 2014; Pantano & Viassone, 2015). However, there is a lack of empirical evidence supporting the effectiveness of launch monitor technology on golf equipment sales. This research gap presents a perceived problem for many golf shops, given the substantial costs involved in acquiring, operating, and maintaining launch monitors (Leach et al., 2017). For example, installing a Trackman 4 launch monitor and simulator system, complete with a mat, screen, and software, exceeds $40,000 (Lewinski, 2023). An indoor launch monitor also necessitates a space measuring 14' in width, 18' in depth, and 10' in height, thereby increasing the opportunity cost when allocating valuable retail space (Carl's Place, 2020). Additionally, there are long-term costs associated with hiring salespeople equipped with the requisite knowledge in golf, human kinetics, and data analytics to proficiently operate launch monitors. Therefore, it is important for golf industry professionals to determine whether launch monitor technology is a worthwhile investment that effectively promotes golf equipment sales and creates value for consumers. Unfortunately, academic studies addressing this question are scarce.

The main purpose of this study is to investigate the impact of launch monitor technology on golf consumer purchasing behavior. In light of the growing population of women golfers, which exceeded six million in 2020, this research also aligns with the recommendations made by the PGA to engage and understand this specific demographic (NGF, 2023; PGA, 2013). Typically, women have different physical attributes than men, prompting manufacturers to design specific golf equipment lines for women (Berner, 2020). However, this differentiation may inadvertently lead sales associates to make gender-based assumptions, potentially recommending unsuitable gear for women and diminishing their enjoyment of the game. In contrast, launch monitors provide objective data to guide personalized equipment choices irrespective of gender biases. This advantage underscores the importance of exploring how women view a sales approach anchored by such technology. Notably, past research indicates that gender can shape consumer evaluations and judgments; thus, this study aims to identify any gender-specific variations in perceptions of this tech-centric sales approach (McQuiston & Morris, 2009; J. A. Wood et al., 2014; L. Wood & Danylchuk, 2011). To tackle these research questions, we conducted a 2 (sales approach: technology-enabled vs. traditional) x 2 (gender: women vs. men) quasi-experimental study in a real-world business setting. The ensuing conceptual framework section documents the rationale behind the three hypotheses we tested in this study. An explanation of the quasi-experimental design and results are then provided followed by a discussion of managerial implications.

Conceptual Framework

Enhancing Retail Experience with Launch Monitor Technology

The golf equipment market was estimated to be worth over $13 billion in 2023 (Mordor Intelligence, 2023), yet it has received limited scholarly attention regarding the factors influencing equipment sales. Previous empirical research

has predominantly examined the celebrity endorsement effect from a macro perspective. For example, an endorser like Tiger Woods can persuade consumers to switch brands, leading to a substantial increase in product demand, as evidenced by secondary data analysis (Chung et al., 2013; Derdenger, 2018). Addressing this gap in the literature, this study adopts a micro perspective, exploring the use of in-store technology to enhance equipment sales and consumer experience at an individual level.

In the digital age, retail stores are proactively adopting innovative technologies like self-checkout, augmented reality (AR), and virtual reality (VR) to meet the rising expectations of consumers (Grewal et al., 2020). These technologies have the potential to attract more consumers to the store, enrich their shopping experience, and increase their propensity to purchase (Dacko, 2017; Demirkan & Spohrer, 2014; Pantano, 2016). Nevertheless, the mere introduction of technology in a store might be insufficient to impress busy consumers on its own. As proposed by Grewal et al. (2020), the efficacy of in-store technologies in enhancing the consumer experience and stimulating sales largely depends on their ability to perform well on two dimensions: convenience and social presence.

Convenience is an essential aspect of modern technology that streamlines the purchase and usage of products and services (Berry et al., 2002). In-store technologies provide five unique dimensions of convenience: decision, access, transaction, benefit, and post-benefit (Grewal et al., 2020). Golf monitor technology notably impacts two of these: decision and benefit convenience. Decision convenience enhances the ease of making purchase decisions. Technologies like VR, which allow consumers to explore and experience products in various contexts, exemplify this dimension (Heller et al., 2019). Launch monitor technology similarly increases decision convenience by allowing consumers to test and evaluate different equipment inside the store. Benefit convenience, on the other hand, refers to the resources needed to experience the product's core benefits. Using a mobile phone to scan quick response (QR) codes for detailed product information improves benefit convenience. Augmented reality that combines virtual elements with real products also increases benefit convenience by facilitating consumers' visualization of the product output (Dacko, 2017). Similarly, launch monitor technology enhances benefit convenience by providing detailed performance data to help consumers visualize the outcome and benefits of using certain golf equipment.

Apart from convenience, social presence is crucial for enhancing consumer experience and achieving desirable outcomes (Grewal et al., 2020). It is the extent to which technology creates a feeling of being around others, a desirable trait in today's socially connected world (Van Doorn et al., 2017). Social presence can be induced through (i) engagements with the device itself (e.g., robots), (ii) technology-facilitated human connections (e.g., collaborative online shopping), or (iii) technology features that humanize the brand (e.g., handwritten typefaces). We argue that launch monitor technology promotes

social presence through the first two means. First, it allows consumers to interact with the machine itself to view and analyze their performance, creating a sense of interacting with a knowledgeable golf expert (Leach et al., 2017). Second, the in-store use of launch monitor technology necessitates a salesperson to guide the process, provide feedback and suggestions, and even share their own passion for golf. These verbal and body interactions may facilitate human connections and foster a sense of community. Consequently, the combined interaction with both the machine and salespeople can enhance social presence during the use of launch monitors.

Drawing on the preceding discussion, launch monitor technology exemplifies an in-store technology that offers high convenience and social presence. Such technologies have the potential to draw consumers, promote engagement, and ultimately produce more favorable outcomes than scenarios lacking these technologies (Grewal et al., 2020). To test whether the technological sales approach using launch monitors can achieve desirable outcomes for golf shops, this study uses the Foote, Cone, and Belding (FCB) Model as a guiding framework to select measurable outcomes. The FCB model is a significant contribution to advertising and retailing research, suggesting that consumers navigate cognitive, affective, and behavioral stages when making purchase decisions (Vaughn, 1980). These stages often interact with one another and are integral parts of the shopping process. Consequently, we hypothesize that:

> **H1**: Mean vector scores of golf equipment buyers' cognitive, affective, and behavioral measures would be significantly higher for the technological sales group compared to the traditional sales group after controlling for the identified covariates.

Additionally, as women become an increasingly influential demographic in the golf industry, it is essential for researchers to better understand their specific needs and preferences as consumers (NGF, 2023; L. Wood & Danylchuk, 2011). Previous research has suggested that gender can influence consumer judgments and evaluations, as well as the communication and interactions between the salesperson and the consumer (McQuiston & Morris, 2009; J. A. Wood et al., 2014). Furthermore, gender can differentially impact buyers' perceptions of salesperson trustworthiness and perceived conflict with salespeople (J. A. Wood et al., 2014). These potential gender-based differences are important for golf retailers seeking to cater to a diverse consumer base and foster an inclusive environment (L. Wood & Danylchuk, 2011). A deep understanding of how launch monitor technology impacts male and female golf consumers can guide effective marketing strategies. For instance, if responses to this technology vary by gender, additional qualitative research should explore the reasons behind these differences and retailers may need to tailor their sales approaches accordingly. Therefore, it is not just academically

interesting, but also business-critical, to investigate whether men and women perceive the use of launch monitor technology differently in the sales process. Based on these considerations, we hypothesize that:

> **H2**: Mean vector scores of golf equipment buyers' cognitive, affective, and behavior measures would be significantly different between male and female consumers after controlling for the identified covariates.
>
> **H3**: Interaction between gender and sales approach regarding the mean vector scores of golf equipment buyer's cognitive, affective, and behavior measures would be significant after controlling for the identified covariates.

Covariates

This quasi-experimental study has six consumer background variables that could not be controlled through sample randomization. Instead, we will control for these potential confounding variables through statistical analyses.

Golfer Age. Golf is a sport that appeals to all ages (Sorbie et al., 2020). As of 2022, the 18-34 age group was the largest consumer segment with 6.2 million players, while 5.3 million golfers exceeded 65 years (NGF, 2023). This study identifies the age of golfers as a potential confounding variable, in line with current golf industry research conducted by organizations such as the NGF.

Consumer Expertise. Previous research has shown that consumer expertise gained through previous experiences plays a significant role in the way consumers make purchasing decisions (Alba & Hutchinson, 1987). Johnson and Russo (1984) suggested that familiarity with a product category can lead to three forms of consumer expertise: superior knowledge of available alternatives, superior ability to process new information, and superior ability to distinguish relevant and irrelevant information. In this study, consumers' skill level, previous golfing experience, familiarity with golf equipment, and familiarity with launch monitor technology will be considered as confounding variables that reflect the expertise level of the consumers.

The Salesperson. Salesperson attributes, such as courtesy, knowledge, friendliness, respect for consumer knowledge, and responsiveness, have been shown to affect consumer behavior (Humphreys & Williams, 1996). Gender differencs may also influence consumers' perceptions of these salesperson attributes, potentially affecting behavioral outcomes (Darley et al., 2008).

Method

An ex post facto quasi-experimental study was conducted to assess the impact of sales with launch monitor technology on golf consumers' cognitive, affective, and behavioral responses. A 2x2 multivariate analysis of covariance (MANCOVA) design was employed with technology (technological sales procedures vs. traditional sales procedures) and gender as independent variables, and cognitive, affective, and behavioral responses as dependent variables.

Due to the constraints of the business environment, random assignment of participants to the technological or traditional sales groups was impractical. To address this issue, six covariates were statistically controlled: consumer age, golf experience, golf ability (skill level), perceived salesperson attributes, familiarity with golf equipment, and familiarity with launch monitor technology. This is a common practice in quasi-experimental studies when it is not possible to physically control confounding variables (Shpitser et al., 2012). By controlling for these covariates, we were able to estimate the causal effects of the treatments more accurately and make causal inferences.

Participants

This study was conducted at a retail golf shop in Palm Beach Gardens, Florida, and involved consumers who were at least 18 years old and willing to participate on a voluntary basis. The target population for the study was frequent and avid golfers, as opposed to beginner or novice players. To ensure that the sample accurately reflected this core market segment, only golfers with a USGA handicap of 30 or less were included in the study (Herder & Benoit, 2022). A total of 127 participants were included in the sample, which was collected over a period of seven days.

Survey Instrument

Data for this study was collected via a survey instrument that was adapted from a review of relevant literature. The survey assessed consumers' socio-demographic characteristics, their cognitive, affective, and behavioral responses, along with the six identified covariates. The first section of the questionnaire collected socio-demographic information including gender, ethnicity, household income, USGA golf handicap, golf experience, and age, using multiple-choice format. The questions and answer choices were designed based on the previous research of Braunstein and Zhang (2005), Cianfrone and Zhang (2006), and NGF (2016).

The study utilized ten items adapted from Kent and Allen (1994) to measure covariates like familiarity with golf equipment and launch monitor technology. Perceived salesperson attributes were assessed using a six-item scale adapted from Darley et al. (2008), originally developed for the automotive sales industry. All items used a 7-point Likert scale with anchor adjectives illustrating the concept.

For dependent variables, consumers' (a) cognitive, (b) affective, and (c) behavioral stages in the shopping process were measured by (a) consumer learning, (b) shopping experience and consumer satisfaction, and (c) purchase expenditure amount and intention to buy or recommend, respectively. Consumer learning was gauged using five items adapted from Cianfrone et al. (2006). The shopping experience was measured using five items adapted from Bagdare and Jain (2013) and Pine and Gilmore (1998), while satisfaction was evaluated via five items derived from Angelova and Zekiri (2011) and Hansemark and Albinsson (2004). Behavioral intention was assessed using five questions from Cronin et al. (2000) and Darley et al. (2008). All items utilized

a 7-point Likert scale with anchor adjectives illustrating the concept. The last measure was actual purchasing behavior, with consumers reporting their total purchase amount, if any. Non-purchasing participants were recorded as $0.

In addition to using the literature as the primary guideline to assess the content validity, the formulated questionnaire was submitted to a panel of three experts with expertise in sport marketing research and practice. The panel members reviewed each item in the questionnaire for relevance, representativeness, and clarity in the context of the specified concept. They provided suggestions for minor wording improvements and approved all items with respect to the three aspects of content validity.

Pilot Study

A pilot study involving 30 golfers at a local driving range was conducted to evaluate our questionnaire and familiarize ourselves with the quasi-experimental procedures. Participants were eligible if they had purchased golf equipment in the past two years. After consenting, they were asked to reflect on their recent golf retail experience and complete the questionnaire.

To examine the content validity of the measures, open-ended questions were included after each concept (e.g., familiarity with golf equipment) to solicit comments on item relevance, clarity, and adequacy. Using SPSS Version 26, item-total correlation coefficients were calculated for each item within a concept, all exceeding the .707 threshold suggested by Hair et al. (2006), supporting our measures' preliminary construct validity. Cronbach's alpha coefficients were calculated for all dependent and covariate variables, which ranged from .775 to .957. This exceeded the recommended cut-off criterion of .70 (Nunnally & Bernstein, 1994), indicating internal consistency in our measures. Based on these results, minor improvements were made to the wording of a few items to enhance their clarity. Overall, the pilot study demonstrated that our questionnaire and procedures were appropriate for the proposed quasi-experimental study.

Quasi-Experimental Study Protocol

This study was approved by the institution's review board for the use of human subjects and had the written approval from the owner and manager of a golf shop in Palm Beach Gardens, FL. The study was conducted at this shop, which has approximately 13,000 square feet of retail space and two Trackman 4 equipped hitting bays. Customers were invited to participate in a brief questionnaire upon entry, with data collected over a span of seven days from most of the customers. Participants were presented with a consent letter and were informed of the study's affiliation with the retail store, but the specific objectives of the study and the experimental conditions were not disclosed to them.

Participants were requested to complete a two-part questionnaire; the first part prior to their shopping experience and the second part afterwards. The first half contained 16 questions related to socio-demographic information and familiarity with golf equipment and launch monitor technology. The

familiarity constructs were measured before entering the store because participants' shopping experience would likely affect their responses. The second half, completed post-shopping, consisted of 27 questions across six constructs: consumer learning, shopping experience, salesperson attributes, consumer satisfaction, intention to buy or recommend, and actual purchase amount. A total of 127 participants completed the 44-item questionnaire covering nine factors.

As the study was conducted during the COVID-19 pandemic, measures were taken to follow social distance regulations and ensure participant safety. All data was collected outside the entrance to the store at a table set up in an open location. No more than two participants were allowed to complete the questionnaire simultaneously, and each questionnaire was presented on a clipboard with a new, single-use pencil. Clipboards were disinfected after each use.

Data Analyses

Descriptive statistics were calculated for all socio-demographic, covariant, and dependent variables across both quasi-experimental groups (i.e., technological and traditional) and genders (i.e., male and female consumers). Despite preliminary construct validity checks during the pilot study, we further examined the unidimensionality of each concept. To do so, we conducted a factor analysis with principal component extraction and varimax rotation for items within each concept (Williams et al., 2010). We followed the guideline of using an eigenvalue equal to or greater than 1.0 (Nunnally & Bernstein, 1994) and examined the scree plot (Cattell, 1966) to determine the number of factors. Items were retained if they had a factor loading of .707 or higher without double loading (Hair et al., 2006). Finally, using the factor scores, we conducted a 2x2 factorial MANCOVA to examine differences in mean vector scores of consumer learning, shopping experience, consumer satisfaction, purchase intention, and actual expenditure amount between the technological and traditional sales group and between genders, while controlling for the identified covariates.

Results

Descriptive Statistics

A total of 127 shoppers voluntarily participated in the study, with 74.8% (n = 95) being male and 25.2% (n = 32) being female. Most of the participants (64.6%, n = 82) were golfers over the age of 50, and the majority (72.4%, n = 92) had an annual income of over $100,000, with 37.8% ($n$ = 48) reporting an annual income of over $250,000. The sample was predominantly composed of avid golfers, as 89.7% (n = 114) had played eight or more rounds of golf per year for at least 3-5 years, and 74% (n = 94) had a handicap index of 20 or less (NGF, 2016; Tiger et al., 2006). Most of the dependent variables (e.g., shopping experience) had a mean score of 4.0 or higher on a 7-point Likert scale. Tables 1 and 2 present descriptive statistics for the participants' background variables, and their covariate and dependent variables, respectively.

Table 1. Descriptive statistics for the background variables ($N = 127$)

Variable	Category	N	%
Gender	Male	95	74.8
	Female	32	25.2
Race	Native American	3	2.4
	African American	0	0.0
	Asian	3	2.4
	Hispanic or Latino	1	0.8
	Pacific Islander	0	0.0
	Mixed	3	2.4
	White or Caucasian	117	92.1
	Other	0	0.0
Age	18-29	25	19.7
	30-39	9	7.1
	40-49	7	5.5
	50-59	18	14.2
	60-69	24	18.9
	70+	40	31.5
Household Income	< $30,000	6	4.7
	$30,000 - $49,999	5	3.9
	$50,000 - $74,999	10	7.9
	$75,000 - $99,999	9	7.1
	$100,000 - $149,999	21	16.5
	$150,000 - $250,000	23	18.1
	$250,000 +	48	37.8
Golf Experience	Never	4	3.1
	1-2	9	7.1
	3-5	6	4.7
	6-10	16	12.6
	11-15	18	14.2
	16-20	9	7.1
	20 +	65	51.2
Golf Handicap Level	< 5	20	15.7
	6-10	24	18.9
	11-15	24	18.9
	16-20	26	20.5
	21-25	9	7.1
	26-30	20	15.7

Measurement Properties

Before the factor analysis, we applied the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser, 1974) and the Bartlett Test of Sphericity (BTS) to ensure data suitability (Williams et al., 2010). Every covariate and dependent variable had KMO values above the recommended threshold of .70 (Williams et al., 2010; Yong & Pearce, 2013). All BTS results were statistically significant ($p < .05$), indicating that it was appropriate to proceed with conducting a factor analysis (Tinsley & Tinsley, 1987) (Table 3).

Table 2. Constructs and items

Constructs	Items	M	SD	Factor Loading
Familiarity with golf equipment	How familiar are you with golf equipment in general?	5.38	1.53	.847
(7-point Likert Scale)	How familiar are you with the current products from golf's major equipment manufacturers? (i.e., TaylorMade, Callaway, Ping)	4.98	1.78	.869
	How familiar are you with this golf retail store?	4.80	1.97	.762
	How familiar are you with new golf clubs available in 2020?	4.34	2.01	.881
	How familiar are you with golf club custom fitting?	4.94	1.80	.843
Familiarity with monitor technology	How familiar are you with launch monitor technology?	4.17	2.21	.972
(7-point Likert Scale)	How familiar are you with launch monitor club measurements? (i.e., club head speed, attack angle, or club path)	4.24	2.19	.980
	How familiar are you with launch monitor ball measurements? (i.e., ball speed, spin rate, or launch angle)	4.15	2.17	.984
	How familiar are you with brands like Trackman, FlightScope, and Foresight?	3.75	2.23	.919
	How familiar are you with using launch monitor technology to help determine which golf equipment you should use?	4.11	2.23	.949
Salesperson attributes	Sincerity of the salesperson	6.30	1.24	.970
(7-point Likert Scale)	Honesty of the salesperson	6.38	1.19	.951
	Attitude of the salesperson	6.43	1.14	.929
	Ease of doing business with the salesperson	6.47	1.06	.912
	The salesperson's knowledge of the products	6.13	1.49	.891
	The salesperson showed concern for my needs	6.27	1.35	.957
Consumer learning	I learned a lot about my golf equipment needs	4.56	2.02	.887
(7-point Likert Scale)	I learned a lot about my golf swing	3.66	2.08	.925
	I feel I will be a better golfer after what I learned today	3.85	2.08	.954
	The knowledge I gained today will help me to make good equipment purchasing decisions	4.22	2.13	.935
	What I learned today will help me to lower my golf score	3.75	2.06	.940
Shopping experience	Enjoyable	6.43	0.93	.721
(7-point Likert Scale)	Unique	5.10	1.67	.902
	Memorable	4.93	1.70	.897
	Engaging	5.70	1.44	.884
	Educational	4.99	1.89	.851
Consumer satisfaction	What is your overall satisfaction with your experience today?	6.43	1.08	.966
(7-point Likert Scale)	To what extent did the service meet your expectations?	6.34	1.21	.970
	How well did the service experience compare with an ideal one?	6.28	1.23	.956
	How satisfied were you with the recommendations of the salesperson?	6.07	1.57	.793
	How satisfied are you with this store's ability to meet your golf equipment needs?	6.32	1.22	.915
Intention to buy or recommend	Likelihood of your recommending this golf shop to a friend	6.48	1.02	.928
(7-point Likert Scale)	Likelihood of you recommending the salesperson to a friend or relative	6.11	1.55	.738
	Likelihood of you purchasing golf equipment from this store today	5.84	2.00	.781
	Likelihood of your returning to this store to purchase golf equipment	6.27	1.45	.825
	I intend to use this facility's services again	6.45	1.45	.918
Purchase Amount	What was the total amount of purchase?	375.14	695.24	

Using an eigenvalue threshold of 1.0 or higher (Kaiser, 1960), a single factor was extracted for each covariate and dependent variable in the principal component analysis, accounting for 70.76% to 92.39% of variance within each concept. As a single factor was extracted, a rotation was not needed, and the

Table 3. Measurement properties of affective covariates and criterion variables

Constructs	KMO	Bartlett's Test	Eigenvalue	Variance Explained	Alpha
Familiarity with golf equipment	.842	375.085 ($p < .001$)	3.541	70.827%	.893
Familiarity with monitor technology	.889	1148.484 ($p < .001$)	4.619	92.389%	.979
Salesperson attributes	.860	1157.173 ($p < .001$)	5.250	87.506%	.968
Consumer learning	.863	627.397 ($p < .001$)	4.310	86.190%	.961
Shopping experience	.846	434.655 ($p < .001$)	3.645	72.894%	.914
Consumer satisfaction	.888	821.027 ($p < .001$)	4.253	85.058%	.947
Intention to buy or recommend	.834	423.729 ($p < .001$)	3.538	70.758%	.866

scree plot (Cattell, 1966) confirmed unidimensionality. All items within each concept were retained based on a factor loading of .707 or more without double loading (Hair et al., 2006). Alpha reliability coefficients ranged from .866 to .979 for the concepts, all exceeding the recommended cut-off threshold of .70 (Nunnally & Bernstein, 1994), indicating strong internal consistency for the covariate and dependent variable concepts. In conclusion, all concepts demonstrated acceptable factor validity and internal consistency reliability, making the data suitable for hypothesis testing. Factor scores were then calculated for each variable and used in further analyses. The original data were later used for the three other covariate variables (golf experience, golf skill level, and age) and one other dependent variable (actual purchase expenditure amount), which were observed variables.

Mean Comparisons

Table 4 outlines descriptive statistics for both covariate and dependent variables across experimental groups and genders. Unadjusted comparisons between the technological and traditional sales groups reveal significant increases in all dependent variables, with the most marked changes in consumer learning and expenditure amount. After controlling for covariates, the mean vector scores of dependent variables (consumer learning, shopping experience, consumer satisfaction, purchasing or recommendation intention, and expenditure amount) differed significantly between the technological and traditional groups ($p < 0.001$), supporting Hypothesis 1 (Table 5). This implied that implementing launch monitor technology in the sales process significantly impacted overall consumer behavior. Using the Bonferroni approach with an adjusted level of significance ($\alpha = .01$) to conduct post-hoc univariate analyses of covariance, we found that the technological sales group's mean scores in consumer learning, shopping experience, and actual purchase expenditure were significantly higher ($p < 0.01$), accounting for 33.2%, 9.9%, and 23.6% variance in these dependent variables, respectively (Table 6).

Table 4. Mean and standard deviation values of the dependent variables among experimental conditions

	Variable usage	Construct	Male	Female
Technology approach	Covariate variable	Familiarity equipment	0.073 (0.993)	-1.08 (1.002)
		Familiarity technology	0.247 (0.718)	-1.012 (0.826)
		Salesperson attributes	0.374 (0.376)	0.576 (0)
		Golf experience	5.94 (1.474)	4.9 (1.595)
		Golf handicap	3.46 (1.615)	4.5 (1.841)
		Age	4.09 (2.063)	4.3 (1.567)
	Dependent variable	Consumer learning	.719 (.686)	1.037 (.606)
		Shopping experience	.444 (.767)	.984 (.355)
		Consumer satisfaction	.232 (.726)	.598 (.058)
		Purchasing intention	.421 (.454)	.481 (.457)
		Expenditure amount	852.14 (873.78)	1047.90 (1267.59)
Traditional approach	Covariate variable	Familiarity equipment	0.341 (0.823)	-0.555 (0.922)
		Familiarity technology	0.207 (1.032)	-0.495 (1.449)
		Salesperson attributes	-0.133 (1.029)	-0.495 (1.449)
		Golf experience	5.78 (1.795)	4.5 (2.11)
		Golf handicap	2.8 (1.527)	4.68 (1.673)
		Age	4.1 (2.048)	4.18 (1.842)
	Dependent variable	Consumer learning	-3.88 (.730)	-.556 (.677)
		Shopping experience	-.318 (.938)	-.285 (1.166)
		Consumer satisfaction	-.085 (1.012)	-.410 (1.347)
		Purchasing intention	-.211 (1.032)	-.314 (1.396)
		Expenditure amount	86.81 (100.05)	87.18 (97.92)

Table 5. Factorial (2x2) MANCOVA analyzing the effect of technology sales approach and gender on golf equipment purchase behaviors

Effect	Wilks' Lambda *(Λ)*	*F*	Hypothesis *df*	Error *df*	*p*	$_{\eta}^2$	*1-β*
Intercept	.926	1.794	5	112	.120	.074	.597
Familiarity equipment	.975	.567	5	112	.725	.025	.202
Familiarity technology	.964	.847	5	112	.519	.036	.294
Salesperson attributes	.289	.847	5	112	<.001	.711	1.000
Golf experience	.979	55.229	5	112	.797	.021	.173
Golf handicap	.992	.187	5	112	.967	.008	.093
Age	.997	.077	5	112	.996	.003	.067
Technology Approach (A)	.548	18.466	5	112	<.001	.452	1.000
Gender (B)	.944	1.318	5	112	.262	.056	.452
A x B	.962	.873	5	112	.502	.038	.303

However, the study failed to support Hypotheses 2 and 3. No significant differences ($p > .05$) were found in the dependent variables between male and female groups when controlling for covariates. Similarly, no significant interactions were detected between the experimental and gender groups ($p > .05$) in the multivariate and univariate analyses. Despite females scoring higher in consumer learning and shopping experience, these variations were not significant in the multivariate analyses ($p > .05$). In the univariate analysis, we found that only the mean shopping experience score for female consumers was significantly higher than that of male consumers ($p < .05$).

Table 6. ANCOVA results with Bonferroni alpha level adjustment

Effect Source	*Dependent Variable*	*ss*	*df*	*ms*	*F*	*Sig.*	$_{\eta}^{2}$	*1-β*
Technology Approach (A)	Consumer learning	26.900	1	26.900	57.608	.000	.332	1.000
	Shopping experience	5.700	1	5.700	12.812	.001	.099	.944
	Consumer satisfaction	.041	1	.041	.144	.705	.001	.066
	Purchasing intention	1.088	1	1.088	2.371	.126	.020	.333
	Expenditure amount	12,679,882.9	1	12,679,882.9	35.890	.000	.236	1.000
Gender (B)	Consumer learning	.787	1	.787	1.685	.197	.014	.251
	Shopping experience	2.576	1	2.576	5.792	.018	.048	.665
	Consumer satisfaction	.409	1	.409	1.459	.230	.012	.224
	Purchasing intention	.721	1	.721	1.572	.212	.013	.238
	Expenditure amount	254,747.235	1	254,747.235	.721	.398	.006	.134
A x B	Consumer learning	.941	1	.941	2.016	.158	.017	.291
	Shopping experience	.262	1	.262	.590	.444	.005	.119
	Consumer satisfaction	.330	1	.330	1.178	.280	.010	.190
	Purchasing intention	.059	1	.059	.128	.721	.001	.065
	Expenditure amount	131,501.254	1	131,501.254	.372	.543	.003	.093
Salesperson attributes	Consumer learning	3.483	1	3.483	7.458	.007	.060	.773
	Shopping experience	41.244	1	41.244	92.716	.000	.444	1.000
	Consumer satisfaction	75.123	1	75.123	267.758	.000	.698	1.000
	Purchasing intention	49.259	1	49.259	107.402	.000	.481	1.000
	Expenditure amount	39,804.942	1	39,804.942	.113	.738	.001	.063

Discussion

Some golf equipment retailers have recently adopted a technological sales approach that uses launch monitor technology as the focal point for nearly every equipment sales transaction. Scholars have argued that in-store technologies such as augmented reality and virtual mirrors can increase consumer visits and purchase intention (Demirkan & Spohrer, 2014; Pantano & Viassone, 2015). However, no academic studies have been conducted to quantify the effect of launch monitors on golf consumers. This quasi-experimental study sought to bridge this gap, comparing sales procedures using launch monitors with those that do not and investigating potential differences in buyer behavior between genders. To make the comparisons, we developed an instrument to measure consumers' cognitive, affective, and behavioral stages during the purchasing process. Our findings suggest that launch monitor technology can impact consumers at every purchasing stage.

In this study, we statistically controlled for six covariates because consumer background and past experiences can influence their decision-making (Alba & Hutchinson, 1987). We found that these covariates did influence the model, but their effects were minimal outside of salesperson attributes. In the MANCOVA, salesperson attributes were the only covariate significantly influencing the dependent variables, accounting for 71.1% of the variance. This finding aligns with previous research emphasizing the impact of perceived salesperson attributes on consumer behavior (Darley et al., 2008; Humphreys & Williams, 1996). This result highlights the importance of hiring and training salespeople who demonstrate attributes such as honesty, sincerity, and a

positive consumer-focused attitude. In the context of golf equipment sales, it also suggests that golf retailers should employ trained salespeople with advanced knowledge in golf, human kinetics, and data analytics to increase short-term and long-term profits.

One of the most important findings of this study was the conclusive empirical evidence that using launch monitor technology significantly increases golf equipment purchasing behaviors among consumers. Our results showed that the use of launch monitor technology in the sales process resulted in a 45.2% increase in overall consumer behavior measurements. This finding supports the idea that in-store technology can positively influence consumers (Dacko, 2017; Pantano & Viassone, 2015). Furthermore, this enhancement was observed across all three stages of the purchasing process.

Cognitive Stage

This study used the construct of consumer learning to measure the cognitive stage in the purchasing process. We found that the use of launch monitor technology in the sales process improves consumer learning (i.e., +33.2%). This finding is consistent with previous research showing that in-store technologies such as augmented reality (AR) and virtual reality (VR) can create an interactive shopping environment and positively impact product learning (Jung et al., 2015). We posit that, like AR and VR, launch monitors offer an interactive environment that enhances consumer learning experiences by providing instant feedback on ball flight and club movement parameters after each swing. A closer examination of the survey completion rate suggests that the increase in consumer learning may be even more significant than our model results indicate. Of the 127 participants, 22 did not respond to the five items in the consumer learning scale, all of whom did not use launch monitor technology during their shopping experience. This suggests that the analytical data produced by launch monitors enables retailers to add a valuable educational element to the sales process, which is unlikely without a launch monitor.

Affective Stage

The study used the constructs of shopping experience and consumer satisfaction to measure the affective stage of consumers in the golf shop. The results indicated that using launch monitors in the sales process significantly improved the shopping experience (i.e., +9.9%). Participants who used the technology rated their experience as more enjoyable, unique, memorable, engaging, and educational than those who did not. However, the use of technology did not significantly impact consumer satisfaction, which the study defined as consumers' "experience with the salespeople in the store." This suggests that while launch monitors can enhance the shopping experience, they may not be a pivotal factor in determining overall consumer satisfaction with the salespeople. This conclusion is reinforced by the high ratings both

traditional and technological sales groups gave to salespeople attributes in the questionnaire, indicating that consumers can be satisfied with salespeople irrespective of the use of launch monitors.

Behavioral Stage

This study used two constructs, purchase expenditure amount and purchase or recommendation intention, to measure consumers' behavior stage. It was found that the use of launch monitor technology in the sales process led to an increase in purchase expenditure amount (i.e., +23.6%). The rise might be attributed to the enhanced consumer learning facilitated by launch monitors, enabling more informed purchasing decisions. Building on findings from Chung et al. (2013) and Derdenger (2018), this study suggests that in addition to selling equipment endorsed by celebrities, incorporating launch monitors provides golf shops with another strategy to enhance golf equipment sales. However, no significant influence was observed on consumer purchase or recommendation intention due to technology use. This finding contrasts with previous studies showing that incorporating new technologies in physical stores can positively affect purchase intention (Mosquera et al., 2018). The difference may be due to some consumers having pre-existing purchasing intentions upon entering the store. For instance, some consumers didn't engage with the launch monitors as they already knew which golf club they wanted to buy, or they intended to purchase accessories like club brushes that don't necessitate the use of launch monitors. Thus, these consumers' purchase or recommendation intentions remained relatively unaltered compared to those who used launch monitors. To further explore this explanation, future research could measure consumers' purchase intentions both before and after store vists. By examining the change in consumers' responses, researchers can better understand how launch monitor usage affects purchase intention.

Gender Differences

In this study, we included men and women as separate consumer groups, given previous research indicating gender's influence on buyers' evaluations and the interactions between the salesperson and buyer (McQuiston & Morris, 2009; J. A. Wood et al., 2014). However, our study did not find gender to be a statistically significant variable. Nonetheless, the disparities observed between male and female consumer groups in descriptive statistics were still noteworthy. Female consumers using launch monitor technology had the highest mean scores acorss consumer learning, shopping experience, consumer satisfaction, purchase intention, and expenditure. While male consumers using the technology also rated these constructs higher than men who did not use technology, the increments were more pronounced for females. Female golfers are an increasingly influential consumer group, accounting for a growing percentage of the overall golfing population (NGF, 2020). Our findings suggest that this growing demographic can display a positive response toward technological applications in golf equipment retail shops and derive high satisfaction from such experiences.

Managerial Implications

The findings of this research have several important managerial implications. First and foremost, the research underscores the significant impact of launch monitor technology on golf equipment retailers. Its use gives a competitive edge by differentiating sales processes and enhancing consumer learning and satisfaction, while its absence risks diminishing competitiveness. Second, our study validates the importance of knowledgeable staff in the sport retail industry (Mao, 2020), highlighting the potential of such staff to increase consumer expenditure. By leveraging launch monitor data, expert sales staff can offer personalized equipment recommendations based on unique needs and preferences, leading to higher sales and consumer satisfaction. Third, the findings support Grewal's (2020) proposed model that in-store technologies providing high convenience and social presence are more likely to achieve desirable outcomes. Therefore, retailers, particularly those with limited resources, should prioritize these types of technologies to enhance consumer learning and shopping experience and ultimately drive sales.

Limitations and Suggestions for Future Studies

Like all studies, this study is limited in several ways. First, its location in Palm Beach Gardens, which may have a higher average income compared to other areas, limits the generalizability of the findings to other regions. Future research should diversify study locations and use other research methods, such as analyzing archival data and conducting online surveys, for greater generalizability.

Second, covariates included in the study may not be exhaustive, and there may be other factors that moderate the effect of technological sales on consumer behavior. For instance, the present study only considered the gender of the consumer but not the salesperson, which could have an impact on consumers' individual experience and satisfaction evaluations (Prendergast et al., 2014). Future research should consider such potential covariates on the effect of technological sales on golf consumer behavior.

Third, future studies should explore the psychological mechanism underlying the observed effects, as this could lead to a more complete understanding of the impact of in-store technologies on consumers. For example, Grewal et al. (2020) proposed that in-store technologies can drive sales through the vividness of the consumer experience. While our study provides a good starting point for this line of inquiry, further research is needed to determine if vividness, or other variables, mediates the positive cognitive, affective, and behavioral outcomes of launch monitor technology use.

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