Journal of Namibian Studies, 34(2023): 4575-4609 ISSN: 2197-5523 (online)

Laundry Care Products Consumer Loyalty: A Structural Equation Model Analysis

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Abstract

The global laundry care product market is estimated to increase by $23.85 billion between 2022 and 2027, with consumers focused on searching for hygienic products capable of fighting viruses. Given this industry's size and consumer importance, the authors investigated which factors contributed the greatest to consumer loyalty (ConLoy). Simple random sampling was used to select 520 repeat purchase consumers across all major regions in Thailand. The questionnaire had an expert evaluation rating of 0.60 to 1.00 and a reliability value between 0.89 and 0.95. LISREL 9.10 was used to analyze the data using a latent variable path analysis which determined that all the causal variables in the model had a positive impact on ConLoy, collectively accounting for 67% of the variation in the factors that affect Customer Loyalty (R^2). There were four causal variables influencing consumer loyalty (ConLoy). When ranked from most significant influence to lowest influence, these were product quality (ProQua), product attitude (ProAtt), product innovation (ProInn), and finally, consumer satisfaction (ConSat), with total effect (TE) values of 0.94, 0.93, 0.82 and 0.48, respectively. The study contributes to the literature as it represents one of a very limited of studies in English concerning the laundry care product sector within Asia and its related detergent products.

KEYWORDS: Consumer Loyalty, Laundry Care Products, Laundry Detergents, Product Innovation, Thailand.

INTRODUCTION

Companies must adapt to consumer demands in the rapidly evolving business landscape by implementing innovative strategies to address changes effectively. For example, the COVID-19 pandemic has prompted businesses to expedite the development of innovations. Vaccines, for instance, have benefited from the integration of artificial intelligence (AI) in various research stages. This approach has resulted in reduced experiment durations, lower research costs, and accurate predictions of vaccine efficacy (Jercich, 2021). This signals business units, from marketing departments to product development and production teams, to redesign work systems based on new foundations. Given consumers' evolving needs and opportunities, companies and business units must devise strategies to create innovations that meet these demands and drive efficient and rapid growth (Doshi et al., 2020).

The size of a company directly influences its research and development (R&D) capabilities. Large organizations generally have better resources to allocate budgets for product R&D compared to smaller companies, regardless of the absolute amount of money or expenditure ratio. Conversely, medium-sized and small companies often prioritize managing day-to-day business operations, leading to slower product development and ultimately affecting operational outcomes (Singhal, 2020).

From 2000 to the present, the innovation landscape has seen a particular focus on specialized laundry detergent innovations due to their exceptional stain-removal abilities across different types of water (Ferri et al., 2016). This characteristic is fundamental to laundry detergents across all brands. Consequently, manufacturers must develop innovations such as long-lasting fragrance formulas, formulas that rejuvenate white clothes, formulas that maintain the freshness and durability of colored clothes, and formulas that incorporate fabric softeners. Several products in the market exemplify these innovations.

For example, ’Comfort’ brand laundry detergent emphasizes long-lasting fragrance on clothes throughout the day. In contrast the 'Omo Plus White Fresh’ brand laundry detergent provides

bright and fresh white results, incorporating optical brighteners to enhance cleanliness and radiance. Another popular innovation in laundry detergents includes odor-reducing properties, enabling users to dry their clothes in shaded areas or wash them at night without unpleasant smells (Bogdan & Boerner, 2020).

Furthermore, laundry detergent innovation must also consider new environmental conditions that impact daily life, such as the COVID-19 pandemic. Manufacturers have researched and developed products with unique properties to eliminate germs and inhibit their growth in fabric fibers. An example is the 'Attack 3D Virus Killer' laundry detergent produced by Kao Industrial (Thailand) Limited, which employs 3D Virus Killer technology to eliminate over 99.9% of specific virus groups and prevent bacterial growth.

The laundry detergent innovation process takes shape by considering customer needs, adapting to changing environmental conditions and prioritizing innovations. Since leading companies often have numerous innovative products awaiting a market introduction, stakeholders rely on relevant information from the marketing research team to determine the optimal timing for product distribution. Factors such as whether the product should be introduced before or after specific models can significantly impact business profitability, highlighting the company's strong commitment to product quality (Figure 1).

Figure 1: Thai brand laundry detergent product innovation focused on specific properties

One of the highly popular innovative laundry detergents identified in this research is the combination of laundry detergent with fabric softener. In 2021, liquid laundry

detergents were stated as 33% of the total Thai detergent market, which is an increase from 21% in 2015 ("Neo Corporate achieves no. 1," 2021). Also, in 2021, the Thai liquid detergent sector was valued at approximately $86 million.

This product has experienced consistent annual sales growth of over 6%. The innovation involves incorporating bentonite granules directly into the detergent powder (Weinstein, 1986) at a concentration of 6-8%, eliminating the need for a separate fabric softener during the washing process. This simplifies the laundry routine and reduces the cost of purchasing additional fabric softeners. Furthermore, it provides excellent fabric coating and fiber protection, enhancing the texture of the fabric.

From the perspective of detergent manufacturers, exciting data has emerged regarding the use of fabric softeners in laundry detergent products. Since 2010, several leading manufacturers have increasingly developed products in this category to cater to the consumer trend of using fabric softeners after washing, which has become a habit for many. These manufacturers have introduced softening agents in granule form, derived from bentonite minerals, and directly mixed them with various detergent powder formulas. Major laundry detergent manufacturers like Lion Corporation Limited and Kao Industrial (Thailand) Co., Ltd. have introduced over seven product lines of detergent powders mixed with fabric softeners.

These factors present interesting points for studying consumer behavior related to competition in innovative laundry detergent products across different forms. Based on the reference above data, it is evident that laundry detergents mixed with fabric softeners have increased market value and share.

Furthermore, in Europe, a study of over 4,000 consumers across five countries showed that although the laundry process success is dependent on chemical and physical factors (e.g., temperature, chemistry, mechanical action, time), consumers believed it was the chemistry (detergent and amount) that played the most significant role in effective outcomes (Ferri et al., 2016).

Therefore, it becomes necessary to investigate further variables directly impacting business operations, such as product innovation, customer attitudes toward the product, customer satisfaction, and product quality. These factors significantly influence customers' favorable perception of laundry detergents mixed with fabric softeners and ultimately impact the business performance of the companies involved.

Research Objectives

To identify and then analyze the factors influencing consumer loyalty towards laundry detergent with fabric softener in the Thai market and propose a structural equation model (SEM) that encompasses the relationships among these factors.

LITERATURE REVIEW

Product Innovation (ProInn)

Product innovation (ProInn) refers to introducing novel and distinctive elements into a product or service to improve its market potential and meet specific consumer needs (Putriana et al., 2019; Zghoul & Al-Haddad, 2021). This concept emphasizes the focus on quality and the endeavor to offer something new and unique, setting the product apart from competitors (Putriana et al., 2019). Seng and Ping (2016) state that product innovation adds value by incorporating innovative attributes that enhance the product's performance and contribute to the tangible brand value experienced by consumers.

Research conducted by Daragahi (2018) explored the impact of innovation on consumer loyalty in the context of cosmetic products. The study identified five ProInn indicators. These were (1) presenting unique features that competitors do not offer, (2) increasing market potential and expanding market share, (3) incorporating consumer input into the ProInn process, (4) designing products that better suit consumer preferences and exhibit improved quality, and (5) developing ProInn that address specific consumer needs.

Similarly, Hwang et al. (2021) examined product innovation in the context of botanical anti-aging cream products. They

identified five observable indicators or variables of product innovation, including presenting unique and novel features, increasing market potential, utilizing consumer input, designing products that better meet consumer preferences and enhance quality, and developing innovations that address specific consumer needs.

Furthermore, Boonnarakorn et al. (2023) investigated the influence of ProInn on various aspects such as innovative processes, packaging design, marketing mix system, product quality, and export performance, and highlighted the interconnectedness between ProInn and these factors, illustrating the importance of innovation in driving overall business performance. Similarly, Witell et al. (2011) have added that the Theory of Attractive Quality (TAQ) use can be effective in helping with ProInn development. The authors also noted that their microwave product innovation experiment provided empirical evidence that attractive ideas are more original and of higher consumer value than other ideas.

In summary, ProInn involves introducing new and distinctive elements to enhance market potential, meet consumer needs, and differentiate a product from competitors. It encompasses quality, consumer input, improved design, and addressing specific consumer needs. These factors contribute to increased market share, customer loyalty, and overall business performance.

Therefore, the authors selected three observed variables as potential, influential factors in laundry detergent product innovation (ProInn). These were product innovation (x1), inventiveness (x2), and advantages (x3). Finally, the authors conceptualized these four hypotheses for ProAtt:

H1: ProInn positively and directly effects ProQua.

H2: ProInn positively and directly effects ConSat.

H3: ProInn positively and directly effects ProAtt.

H4: ProInn positively and directly effects ConLoy.

Product Quality (ProQua)

Product Quality (ProQua) refers to the ability to deliver products that meet consumers' expectations, providing them with reliability, safety, and value. The importance of offering high-quality products that fulfill consumer needs and expectations throughout the lifespan of a product has been emphasized by Daragahi (2018), Shalehah et al. (2019), and Suchánek & Králová (2019).

The Kano (1984) Model presents a strategic approach for sustaining a production business by continuously improving and maintaining product quality, services, and processes. Strategies include reducing costs through organizational downsizing and developing new products, services, and processes. Each strategy should be tailored to the specific business environment, taking into account various factors and priorities. Shen et al. (2000) further highlights that in the face of rapid changes and intense competition, a company's survival depends on the quick design, efficient development, and effective marketing of innovative and creative new products or services.

Adebanjo et al. (2020) examined the relationships between product innovation, product quality, and consumer perspectives. They identify two quality indicators related to product innovation: the ability to offer reliable products that meet consumer needs and the ability to deliver products that meet consumer expectations. Perceived quality, as identified by Sitabutr and Pimdee (2017), encompasses seven components, including best quality, excellent standards, overall quality, meeting consumer goals, durability, and service quality.

Similarly, Chuenban et al. (2021) studied the factors affecting brand loyalty in the canned tuna industry. They found that product availability significantly impacted brand loyalty, followed by product quality and brand value. Consumers perceive canned tuna as a commodity, prioritizing convenience and availability when selecting a brand. The sustainability of global fishing stocks, labor costs/practices, and dolphin-free catches were also important considerations for the international consumer community.

Chidi et al. (2020) found a strong positive relationship between ProQua and the preference of 331 customers for soap/detergent products in Anambra State, Nigeria. They suggest employing a product differentiation strategy and prioritizing ProQua can enhance customer loyalty. In a highly competitive market, companies should focus on quality and quantity to differentiate their products successfully (Gil-Marques & Moreno-Luzon, 2013). In conclusion, product quality is crucial in meeting consumer expectations, ensuring reliability, and building customer loyalty. Businesses should prioritize quality as a critical strategy for differentiation and success in competitive markets.

Therefore, the authors have selected three observed variables, namely meeting consumer needs (y7), functionality (y8), and dependability (y9), as potential, influential factors on laundry detergent product quality (ProQua). Finally, the authors have conceptualized these four hypotheses for ProQua:

H5: ProQua positively and directly effects ConSat.

H6: ProQua positively and directly effects ProAtt.

H7: ProQua positively and directly effects ConLoy.

Product Attitudes (ProAtt)

Product attitudes (ProAtt) refer to consumers' perceptions and evaluations of products. Asgari and Hosseini (2015) highlight that attitudes toward products are influenced by product variety, consistent quality, modernity, consumer suitability, safety, and consumer care. These factors create a positive reputation, establish credibility, and foster consumer trust.

The ABC model of attitude, consisting of Affective, Behavioral, and Cognitive components, provides a framework for understanding consumer attitudes (Milton et al., 2017). The affective component represents the emotional or opinion-based aspect of how consumers feel about a product. The behavioral component reflects consumer responses and actions resulting from these feelings. The cognitive component pertains to individuals' beliefs and knowledge about the product. These three elements work together, creating a hierarchical structure

that influences consumer attitudes and indicating the level of involvement or motivation towards a specific attitude.

Interestingly, in a study concerning Halal-labeled detergents, Rizkitysha and Hananto (2022) noted that the perceived usefulness and brand label played the greatest role in a consumer's ProAtt and subsequent intention to purchase. Boon et al. (2020) also reported that consistent quality was crucial when shoppers evaluated natural skincare products. Other factors included modern and safe products with a reputation for high standards, which builds consumer credibility. Thus, understanding consumer attitudes about a brand or product is critical because it directly impacts purchase intent and brand loyalty. Moreover, organizational restructuring plays a role in developing new sales markets and influencing consumer attitudes.

Positive attitudes can translate into increased loyalty, word-of-mouth recommendations, and repeat purchases, ultimately boosting a brand's health (Smith, 2020). Consumers hold certain brand attitudes partly because of the brand's utility. If a product has helped us in the past, even in a small way, our attitude towards it tends to be favorable. Several factors shape consumer attitudes, including personal values and beliefs, economic, family, social, political, psychological, personality, and reference group factors. Attitudes are learned, and different approaches exist to how learning works as it is acquired by individuals (Rusdan et al., 2023). Attitudes often help individuals adjust to their work environment.

Moreover, functional benefits refer to a product's tangible and objective outcomes, such as convenience, efficiency, ease of use, time-saving, or improved performance. These benefits directly relate to the product's functionality and ability to fulfill specific needs or tasks. By using 'functional benefits,' consumers can highlight the practical advantages that influence their ProAtt.

Therefore, the authors selected three observed variables as

potential, influential factors on a consumer's product attitudes (ProAtt). These were the cognitive benefits (y1), emotional benefits (y2), and functional benefits (y3). Finally, the authors conceptualized these two hypotheses for ProAtt:

H8: ProAtt positively and directly effects ConSat.

H9: ProAtt positively and directly effects ConLoy.

Consumer Satisfaction (ConSat)

Customer/consumer satisfaction (ConSat) is crucial to consumer loyalty and repeat purchases. When consumer customers are satisfied with a service or product, they are most likely to develop a positive perception of a brand, establish a connection with the company, and exhibit loyalty towards it. Several key factors contribute to customer satisfaction and, in turn, impact their loyalty and propensity for repeat purchases.

Product Quality (ProQua)

The quality of the product is a fundamental driver of ConSat. When a product consistently meets or exceeds customer expectations regarding performance, durability, effectiveness, and other relevant factors, it enhances customer satisfaction. High-quality products give customers a positive experience and instill confidence in their purchase decisions.

Service Quality (SerQua)

According to Hallencreutz and Parmler (2021), recent years have witnessed a paradigm shift in how consumers judge ConSat. The authors suggest that ProQua has overtaken SerQua as the most critical driver in ConSat perceptions.

Apart from the product itself, the level of service provided by the company significantly influences ConSat. Factors such as timely delivery, responsive customer support, effective problem resolution, and personalized assistance contribute to a positive service experience. Customers receiving excellent service enhances their overall satisfaction and strengthens their loyalty to the brand.

In Thailand, several studies have pointed out that critical factors within the public service sector are timely, fair, sufficient, continuous, and progressive services (Changwetchay, 2018; Limoubpratum et al., 2020). In Malaysia, Yee and Daud (2011) investigated ConSat within the courier delivery sector and determined that tangibility, reliability, and assurance played vital roles.

Value for Money (VaLMon)

Consumers seek value for the price they pay for a product or service (Hult et al., 2019). When they perceive that the benefits and features provided by a product justify its cost, it enhances their satisfaction. Brands that offer competitive pricing, promotions, discounts, or added value regarding features, packaging, or customer support can positively impact ConSat and encourage repeat purchases.

This is consistent with Wang (2013), who reported that consumer ProAtt was partially influenced by visual packaging, affecting their perception of quality and brand preference. Calvo-Porral and Lévy-Mangin (2017) stated that a consumer's perceived quality and, to a lesser extent, the price significantly affect their purchase intention.

By focusing on these factors and consistently delivering positive experiences, brands can enhance consumer satisfaction, build strong customer loyalty, and encourage repeat purchases. Consumer satisfaction is a foundation for creating lasting consumer relationships, driving business growth, and maintaining a competitive advantage in the market.

Therefore, the authors selected three observed variables as potential, influential factors on a consumer's product attitudes (ConSat). These were perceived value (y4), promotional activities (y5), and service quality (y6). Finally, the authors conceptualized this final hypothesis for ConSat:

H10: positively and directly effects ConLoy.

Consumer Loyalty (ConLoy)

Consumer loyalty is critical in purchasing home laundry products such as washing detergents and fabric softeners for several reasons. These include:

Repeat Purchases (RepPur)

Loyal customers repeat purchases of the same brand or product (Dick & Basu, 1994). Regarding home laundry products, customers who have had a positive experience with a particular detergent or fabric softener are more likely to continue purchasing the same brand in the future (Chidi et al., 2020). Therefore, consumer loyalty helps to maintain a consistent customer base and drive ongoing sales, with various studies reporting that loyal patrons return to brands and spend 31% more than new customers. Khan (2013) has also stated that a 5% increase in consumer retention increases profits by 25%.

Trust and Familiarity (TruFam)

Consumers develop trust and familiarity with specific brands or products over time. Brands can build customer trust by consistently delivering high-quality and reliable laundry products. This is consistent with Park (2009), who indicated that ConSat and trust were critical in brand loyalty. Agrawal (2017) has added that consumers are starving for product information. As such, vendors who provide product information inspire 56% of their consumers to trust them more. This trust leads to customer loyalty as consumers rely on the brand they know and trust for their laundry needs. Loyal customers are often more resistant to switching to competing brands.

Reduced Decision-Making Effort (RedEff)

When consumers are loyal to a particular brand of laundry products, they do not need to spend significant time and effort evaluating and comparing different options in the market. They already have confidence in the brand they trust, making the purchasing decision easier and less time-consuming.

Perceived Value (PerVal)

Customer loyalty can be driven by the perceived value that a

brand offers. This value may include product performance, effectiveness in cleaning clothes, fragrance, fabric care, environmental considerations, or other features that align with the customer's preferences and priorities. Loyal customers perceive the brand they prefer as providing the best value for their needs, reinforcing their loyalty.

Word-of-Mouth Recommendations (WomRec)

A satisfied and loyal customer is likelier to recommend their preferred laundry products to friends, family, and acquaintances (Gildin, 2022). Positive word-of-mouth recommendations can significantly influence the purchasing decisions of others, leading to increased sales and market growth for the brand (Chuenban et al., 2021).

In summary, ConLoy plays an essential role in purchasing home laundry products by driving repeat purchases, fostering trust and familiarity, reducing decision-making efforts, enhancing perceived value, generating positive word-of-mouth recommendations, and cultivating brand advocacy. Brands building and maintaining ConLoy will likely succeed in competitive marketplaces and enjoy long-term customer relationships.

Therefore, the authors' literature review and theory determined the following latent and observed variables as possible factors in influencing laundry care product consumer loyalty (Table 1).

This is consistent with Wang (2013), who reported that consumer ProAtt was partially influenced by visual packaging, affecting their perception of quality and brand preference. Calvo-Porral and Lévy-Mangin (2017) stated that a consumer's perceived quality and, to a lesser extent, the price significantly affect their purchase intention.

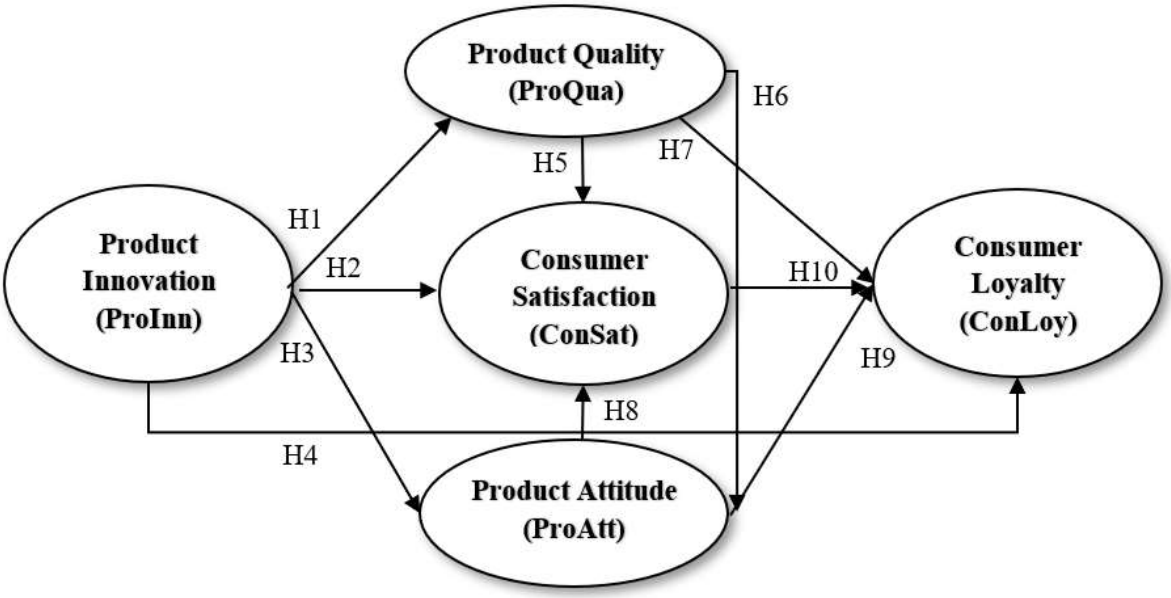
Table 1: Questionnaire Laten and Observed Variables and their Supporting Theory

Latent Variables	Observed variables (26 questionnaire items)	Supporting Theory

Product Innovation (ProInn)	Product innovation (x1) Inventiveness (x2) Advantages (x3)	(Boonnarakorn et al., 2023; Daragahi, 2018; Doshi et al., 2020; Hwang et al., 2021; Seng & Ping, 2016; Putriana et al., 2019; Witell et al., 2011; Zghoul & Al-Haddad, 2021).
Product Quality (ProQua)	Meeting consumer needs (y7) Functionality (y8) Dependability (y9)	(Adebanjo et al., 2020; Chidi et al., 2020; Chuenban et al., 2021Daragahi, 2018; Gil-Marques & Moreno-Luzon, 2013; Kano, 1984; Khan, 2013; Shalehah et al., 2019; Shen et al., 2000; Sitabutr & Pimdee, 2017; Suchánek & Králová, 2019).
Product Attitudes (ProAtt)	Cognitive beliefs (y1) Emotional appeal (y2) Functional benefits (y3)	(Asgari & Hosseini, 2015; Boon et al., 2020; Calvo-Porral & Lévy-Mangin, 2017; Milton et al., 2017; Rizkitysha & Hananto, 2022; Rusdan et al., 2023; Smith, 2020; Wang, 2013).
Consumer Satisfaction (ConSat)	Perceived value (y4) Promotional activities (y5) Service quality (y6)	(Agrawal, 2017; Calvo-Porral & Lévy-Mangin, 2017; Changwetchay, 2018; Hallencreutz & Parmler, 2021; Hult et al., 2019; Limoubpratum et al., 2020; Namini, 2016; Samudro & Susanti, 2021; Yee & Daud, 2011; Wang, 2013).
Consumer Loyalty (ConLoy)	Repeat purchase intention (y10) Information dissemination (y11) Purchase intention (y12)	(Agrawal, 2017; Calvo-Porral & Lévy-Mangin, 2017; Cavero & Cebollada, 1998; Chidi et al., 2020; Chuenban et al., 2021; Dick & Basu, 1994; Gildin, 2022; Khan, 2013; Park, 2009; Siwayanan et al., 2015; Stern & Hammond, 2004; Wang, 2013).

Conceptual Model

Figure 2: Conceptual model of laundry care product ConLoy



METHODS

Population and Sample

The population was the purchasers of detergent products with fabric softeners in Bangkok and four other Thai regions, including eight provinces, who purchased laundry detergent products more than once in 2022. Determination of sample size used concepts from Schumacker and Lomax (2016) and Hair et al. (2021), which have observed that the number of samples that satisfies the principle of structural equation modeling should use 10-20 questionnaires times the number of the model's observed variables. As there were 26 observed variables in this research, 520 (26x20) questionnaires were determined as the target (Table 2) to ensure better reliability.

Table 2: Sampling Regions, Populations, and Questionnaires Obtained

Regions	**Provinces**	**Population**	No.
Bangkok	Bangkok	5,588,222	152

Central	Chonburi	1,566,885	43
	Samut Prakan	1,351,479	37
Northern	Chiang Mai	1,784,370	49
	Chiang Rai	1,295,026	35
Northeastern	Nakhon Ratchasima	2,633,207	72
	Ubon Ratchathani	1,866,697	51
Southern	Nakhon Si Thammarat	1,550,721	42
	Songkhla	1,428,609	39
Totals		**19,065,216**	**520**

Note: No. = questionnaires obtained

Research Instrument

The questionnaire consisted of six parts. These were:

Part 1: Personal Information

This section gathered information about the respondents, including gender, age range, education level, marital status, occupation, income, frequency of purchases of detergent and fabric softener products, and purchase value per transaction.

Part 2: Product Innovation (ProInn)

A 5-level estimation scale with a reliability value of 0.90 was used to assess respondents' perceptions of product innovation. It included questions about product design changes that enhance efficiency, adapt to changing consumer needs, and increase competitiveness.

Part 3: Product Attitude (ProAtt)

Using a 5-level estimation scale with a reliability value of 0.93, this section measured respondents' attitudes by considering knowledge, perception, belief, and emotional aspects.

Part 4: Consumer Satisfaction (ConSat)

This section utilized a 5-level estimation scale with a reliability value of 0.95 to gauge respondents' satisfaction and happiness with the product and the company's service quality.

Part 5: Product Quality (ProQua)

A 5-level scale with a reliability value of 0.89 assessed respondents' perception of product quality, which included aspects such as suitability, design, durability, condition, compliance with standards, and efficient production processes.

Part 6: Consumer Loyalty (ConLoy)

This section used a 5-level estimation scale with a reliability value 0.90 to measure respondents' loyalty. It explored their likelihood of future repeat purchases, preference for detergent mixed with fabric softener, referrals to others, and willingness to continue using these products.

The questionnaire served as a comprehensive tool to gather data on various aspects related to consumer attitudes, satisfaction, loyalty, and perceptions of product innovation and quality.

Data Collection

The researcher utilized an engaging approach to collect data by employing a questionnaire administered to purchasers of detergent mixed with fabric softener. A team of research assistants was dispatched to various regions of Thailand, including Bangkok and eight provinces from four different regions. The data collection spanned from January to February 2022, targeting individuals who made multiple purchases of detergent-mixed products. The collection took place between 4:00 p.m. and 8:00 p.m., primarily in department stores or convenience stores like TOP Department Stores, Supermarket, Good Made Market Home, Fresh Mart, Max Value, Tesco Lotus, Big C Supercenter, Mini Big C, 7-Eleven, Family Mart, CJ Supermarket, and 108 Shops. The researcher successfully obtained and analyzed 520 completed questionnaires (Table 1).

Data Analysis

A path analysis method with latent variables was employed to analyze the validity of the causal model and the variables influencing ConLoy. The researchers utilized the LISREL 9.10 program to conduct the analysis and interpret the validity of the causal model. The goodness-of-fit (GOF) index criterion was used to assess the influence between the variables in the model.

RESULTS

Consumer Characteristics

Of the 520 consumers surveyed (Table 3), 87.12% identified themselves as women. Interestingly, 47.12% were between 31 and 40 years of age, while another 41.35% were between 20 and 30. An almost equal number had finished high school (42.31%) or university (41.54%). Although it might be expected that most would be married (53.85%), a surprising number were single (41.73%). When asked about their employment, the vast majority indicated they worked in private companies (36.15%) or were an entrepreneur (35%). The monthly incomes of the respondents were in line with similar Thai consumer studies (Chuenban et al., 2021). 48.46% indicated a monthly income of $284-$568, with another large group of 36.73% indicating a monthly income of $568-$852. Finally, the vast majority only purchased detergent products once a week (80.77%), with 32.31% indicating detergent product purchases between $2.85-$4.26.

Table 3: Thai Consumer Characteristics (n=520)

Gender	Number	%
Male	67	12.88
Female	453	87.12
Age Ranges		
19 years old or younger	9	1.73
20-30 years old	215	41.35
31-40 years old	245	47.12
41 years old or older	51	9.81
School Levels		
High school/vocational certificate/or equivalent	84	16.15
Diploma/Diploma	220	42.31
Bachelor's degree or higher	216	41.54
Relationships		
Single	217	41.73
Married	280	53.85
Divorced/Widowed	23	4.42

Gender	Number	%
Jobs		
Government Service	73	14.04
State Enterprise	77	14.81
Private Company	188	36.15
Personal Business	182	35.00
Income per Month		
Less than $284/month	40	7.69
$284-$568/month	252	48.46
$568-$852/month	191	36.73
$852-$1,137/month	17	3.27
$1,138/month or more	20	3.85
Product Purchase Frequency		
Weekly.	420	80.77
Twice a week.	67	12.88
Three times a week.	23	4.42
Four times a week.	10	1.92
Detergent Purchase Value		
Less than $1.42	46	8.85
$1.42-$2.84	138	26.54
$2.85-$4.26	168	32.31
$4.27-$568	103	19.81
More than $5.68	65	12.50

CFA Results

The research involved a CFA, which examined external and internal latent variables derived from the conceptual framework based on relevant literature and previous studies. The LISREL 9.10 program was utilized to perform the CFA (Table 4) and goodness of fit statistics (GOF) analysis (Table 5).

Table 4: CFA results of the latent external variables and internal latent variables

Latent Variables	**α**	**AVE**	**CR**	**Observed Variables**	**Loading**	**R^2**
Product Innovation (ProInn)	0.90	0.82	0.93	Product innovation (x1)	0.85	.72
				Inventiveness (x2)	0.93	.87
				Advantages (x3)	0.94	.87

Latent Variables	α	AVE	CR	Observed Variables	Loading	R^2
Product Attitudes (ProAtt)	0.93	0.84	0.94	Cognitive beliefs (y1)	0.93	.86
				Emotional appeal (y2)	0.90	.82
				Functional benefits (y3)	0.92	.85
Consumer Satisfaction (ConSat)	0.95	0.76	0.91	Perceived value (y4)	0.89	.80
				Promotional activities (y5)	0.89	.79
				Service quality (y6)	0.84	.70
Product Quality (ProQua)	0.89	0.75	0.90	Meeting consumer needs (y7)	0.89	.80
				Functionality (y8)	0.86	.73
				Dependability (y9)	0.84	.70
Consumer Loyalty (ConLoy)	0.90	0.80	0.92	Repeat purchase intention (y10)	0.92	.84
				Information dissemination (y11)	0.90	.81
				Purchase intention (y12)	0.86	.75

Moreover, Hooper et al. (2008) have reported that R^2 values should not be lower than ≤ 0.20, while factor loadings should also be ≥ 0.5, and composite/construct reliability (CR) should also be ≥ 0.7. After that, it is suggested that the model's fit validity should also be tested using an AVE ≥ 0.5 (Prapatsaranon et al., 2022). Based on these criteria, the model was determined to fit well.

Table 5: Criteria, Theory, and Goodness-of-Fit Assessment Values

Criteria Index	Criteria	Supporting Theory	Values	Results
Chi-square: χ2	p ≥ 0.05	(Jöreskog et al., 2016)	0.39	passed
Relative Chi-square: χ2/df	≤ 2.00 (LISREL 9.10)	(Sahoo, 2019)	1.04	passed
RMSEA	≤ 0.05	(Jöreskog et al., 2016)	0.01	passed
NFI	≥ 0.90	(Schumacker & Lomax, 2016)	1.00	passed
CFI	≥ 0.95	(Jöreskog et al.,	1.00	passed

		2016)		
RMR	≤ 0.05	(Schumacker & Lomax, 2016)	0.01	passed
SRMR	≤ 0.05	(Schumacker & Lomax, 2016)	0.01	passed
GFI	≥ 0.90	(Jöreskog et al., 2016)	0.99	passed
AGFI	≥ 0.90	(Schumacker & Lomax, 2016).	0.97	passed
Cronbach's Alpha	≥ 0.70	(Tavakol & Dennick, 2011)	0.89-0.95	passed

Table 6 presents the correlation coefficients between different latent variables. The table provides information about each latent variable's mean and standard deviation (SD). It also displays the correlation coefficients between the latent variables. The correlation coefficients represent the direction and strength the variable relationships.

For example, it shows that Product Innovation (ProInn) has a positive and significant correlation with Product Quality (ProQua), Product Attitude (ProAtt), Consumer Satisfaction (ConSat), and Consumer Loyalty (ConLoy). Similarly, other latent variables also exhibit significant positive correlations with each other.

Table 6 also reports the Skewness and Kurtosis values, which describe the distribution characteristics of the latent variables, indicating the degree of departure from a normal distribution. Various studies have reported acceptable values for these tests, with Kim (2015) stating that the p-values of the skewness and kurtosis are used to assess data normality. Curran et al. (1996) have added that an acceptable Skewness value is ≤ 2.00, and for kurtosis, it is ≤ 7.0.

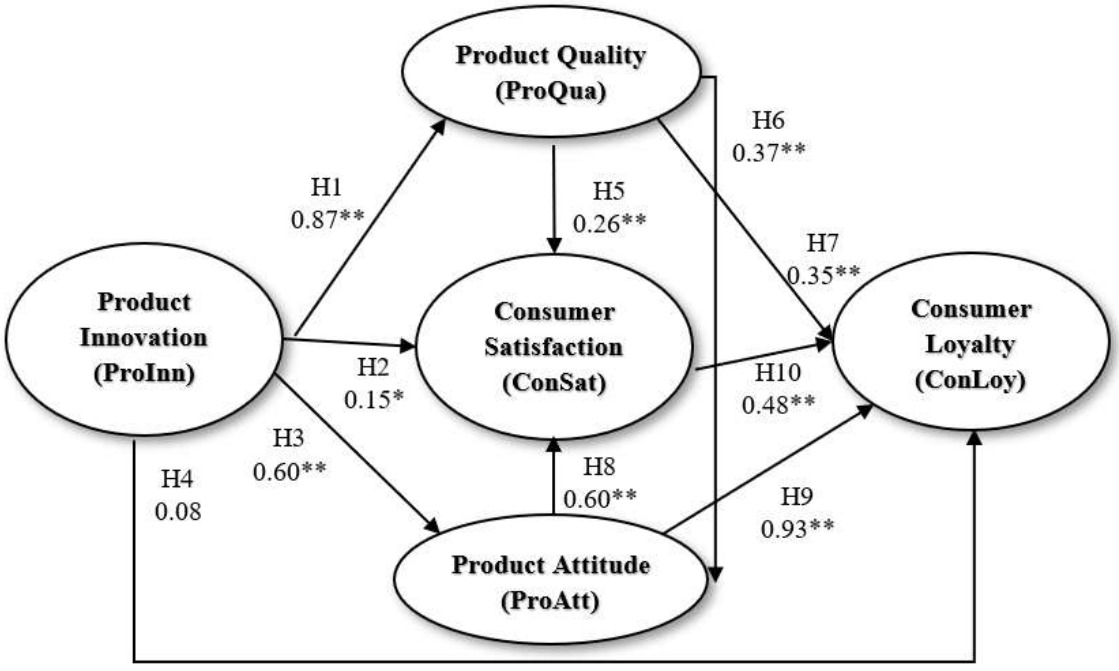
Overall, Table 6 helps to understand the relationships and associations between the latent variables included in the study, providing insights into their interdependencies and potential impact on consumer loyalty.

Table 6: Correlation coefficients between latent variables

Latent Variables	Mean	SD	ProInn	ProQua	ProAtt	ConSat	Conroy
Product Innovation (ProInn)	3.67	.96	1	.80**	.87**	.85**	.77**
Product Quality (ProQua)	3.75	.87		1	.82**	.88**	.89**
Product Attitude (ProAtt)	3.77	.97			1	.89**	.79**
Consumer Satisfaction (ConSat)	3.75	.91				1	.82**
Consumer Loyalty (ConLoy)	3.80	.87					1
Skewness			-.84	-.81	-.88	-.91	-.78
Kurtosis			.02	.25	.12	.32	.22

Notes: **Sig. ≤ .01, SD = standard deviation

Figure 3: Final SEM of factors influencing consumer loyalty to detergent mixed with fabric softener



The results depicted in Figure 3 and Table 6 determined that the SEM influencing consumer loyalty (ConLoy) was accurate and consistent with the empirical data. Table 8 reports results from the hypotheses testing.

Mediation Effects

Determination was made that all the SEM's causal variables had a positive effect on ConLoy, which, when combined, had an R^2 value of 67% on ConLoy. Furthermore, the total effect (TE) values of each construct, when ranked in importance, were product quality (ProQua), product attitude (ProAtt), product innovation (ProInn), and finally, consumer satisfaction (ConSat), with total effect (TE) values of 0.94, 0.93, 0.82 and 0.48, respectively.

Table 7: Mediation Effects Affecting ConLoy

dependent variables	R^2	Effect	ProInn	ProQua	ProAtt	ConSat
Product Quality (ProQua)	0.75	DE	0.87**			
		IE	-			
		TE	0.87**			
Product Attitude (ProAtt)	0.86	DE	0.60**	0.37**		
		IE	0.33**	-		
		TE	0.93**	0.37**		
Consumer Satisfaction (ConSat)	0.87	DE	0.15*	0.26**	0.60**	
		IE	0.78**	0.22**	-	
		TE	0.93**	0.48**	0.60**	
Consumer Loyalty (ConLoy)	0.67	DE	0.08	0.35**	0.93*	0.48**
		IE	0.73**	0.59**	-	-
		TE	0.82**	0.94**	0.93**	0.48**

Note: *Sig. < .05, **Sig. < .01

Table 8: Results of the Hypothesis Testing

Hypotheses	Coef.	t-test	Supp
H1: ProInn positively and directly effects ProQua.	0.87	20.92**	Sup.
H2: ProInn positively and directly effects ConSat.	0.15	2.21*	Sup.

H3: ProInn positively and directly effects ProAtt.	0.60	9.45**	Sup.
H4: ProInn positively and directly effects ConLoy.	0.08	0.66	Not Supp.
H5: ProQua positively and directly effects ConSat.	0.26	3.88**	Sup.
H6: ProQua positively and directly effects ProAtt.	0.37	5.93**	Sup.
H7: ProQua positively and directly effects ConLoy.	0.35	5.17**	Sup.
H8: ProAtt positively and directly effects ConSat.	0.60	6.55**	Sup.
H9: ProAtt positively and directly effects ConLoy.	0.93	2.32*	Sup.
H10: ConSat positively and directly effects ConLoy.	0.54	5.33**	Sup.

Note: *Sig. < .05, **Sig. < .01, Sup./Not Supp. = Supported / Not Supported

DISCUSSION

The structural equation modeling (SEM) analysis conducted to examine the factors influencing laundry care detergent-related products revealed that the model exhibited a strong fit with the data. Furthermore, out of the initial hypotheses proposed, nine were consistent with the data and support.

In the following five tables, the authors present the data and its interpretation obtained from the descriptive statistics analysis for each of the five latent variables.

To assess the responses obtained from the Likert-type opinion scale used in the questionnaire, the authors employed a five-value scale ranging from 1 to 5. The scale values were categorized as follows: 1.00-1.50 represented '1' denoting no agreement, 1.51-2.50 represented '2' indicating minimal agreement, 2.51-3.50 represented '3' reflecting moderate agreement, 3.51-4.50 represented '4' signifying agreement, and 4.51-5.00 represented as '5' representing total agreement.

Additionally, each hypothesis was evaluated using a correlation coefficient value and a t-test score. According to several authors, correlation values (Pearson's r) ranging from 0.10 to 0.29 are considered weak, values from 0.30 to 0.49 are classified as

moderate, and values from 0.50 to 1 are regarded as strong (Ditsuwan & Sukkamart, 2022). Hair et al. (2016) recommended that construct validity is achieved when t-values are ≥ 1.96. Sharma (1996) further suggested that a standardized factor loading of ≥ 0.60 provides additional validity evidence.

Moreover, as previously mentioned, Kim (2015) stated that p-values of skewness and kurtosis are utilized to assess data normality. Curran et al. (1996) added that an acceptable skewness value is ≤ 2.00; for kurtosis, it should be ≤ 7.0.

In summary, the discussion highlights the strong fit of the SEM model with the data and the support for nine out of the initial hypotheses. The hypotheses test results are summarized in Figure 4 and Table 8. Therefore, of the ten conceptualized hypotheses, nine were validated. When relationships were ranked from strongest to weakest, results showed the following: H9 (r = 0.93), H1 (r = 0.87), H3 (r =0.60), H8 (r =0.60), H10 (r =0.54), H6 (r =0.37), H7 (r =0.35), H5 (r =0.26), and H2 (r =0.15). H4 was determined to be unsupported.

The authors present the data interpretation for each latent variable in five tables. Additionally, guidelines regarding correlation coefficients, t-values, factor loadings, skewness, and kurtosis are referenced by various authors to ensure a comprehensive analysis of the findings.

Descriptive Analysis

ProInn

Results for the four hypotheses tests for ProInn relationships determined that three of the four hypotheses were supported. H1 showed a very strong relationship between ProInn and ProQua with r = 0.87, the t-value = 20.92, and p ≤ 0.01. Also, H3 was determined to be strong as the relationship between ProInn and ProAtt was r = 0.60, the t-value = 9.45, and p ≤ 0.01. However, the relationship between ProInn and ConSat (H2) was weak as r = 0.15, the t-value = 2.21, and p ≤ 0.05, while the ProInn to ConLoy (H4) was determined to be inconsistent and unsupported.

Further descriptive statistics testing of ProInn's observed variables (Table 9) showed inventiveness (x2) (mean = 3.72, SD = 1.07) and advantages (x3) (mean = 3.72, SD = .98) were judged by the consumers as the most important to laundry detergent product innovation.

Table 9: Descriptive Statistics Results for ProInn

Items	Mean	SD	Skewness	Kurtosis
Product Innovation (ProInn)	**3.67**	**.96**	**-.84**	**.02**
Product innovation (x1)	3.53	1.05	-.51	-.36
Inventiveness (x2)	3.72	1.07	-.78	-.11
Advantages (x3)	3.72	.98	-.80	-.04

ProQua

Results for the three hypotheses tests for ProQua relationships determined that all hypotheses were supported. H6 showed a moderate and direct relationship between ProQua and ProAtt with r = 0.37, the t-value = 5.93, and p ≤ 0.01. Also, H7 was determined to be moderate and direct as the relationship between ProQua and ConLoy was r = 0.35, the t-value = 5.17, and p ≤ 0.01. However, the relationship between ProQua and ConSat (H5) was weak as r = 0.26, the t-value = 3.88, and p ≤ 0.01.

Further descriptive statistics testing of ProQua's observed variables (Table 10) showed dependability (y9) (mean = 3.80, SD = .95) as the most important. This was followed by functionality (y8) (mean = 3.73, SD = .94) and meeting consumer needs (y7) (mean = 3.71, SD = .97).

Table 10: Descriptive Statistics Results for ProQua

Items	Mean	SD	Skewness	Kurtosis
Product Quality (ProQua)	**3.75**	**.87**	**-.81**	**.25**
Meeting consumer needs (y7)	3.71	.97	-.74	.25
Functionality (y8)	3.73	.94	-.63	-.06
Dependability (y9)	3.80	.95	-.71	-.01

ProAtt

Results for the two hypotheses tests for ProAtt relationships

determined that both hypotheses were supported. H9 showed a very strong and direct relationship between ProAtt and ProConLoy with r = 0.93, the t-value = 2.32, and p ≤ 0.05. Also, H8 was determined to have a strong and direct relationship between ProAtt and ConSat as r = 0.60, the t-value = 6.55, and p ≤ 0.01.

Further descriptive statistics testing of ProAtt's observed variables (Table 11) showed functional benefits (y3) (mean = 3.81, SD = 1.02) as the most important. This was followed by emotional appeal (y2) (mean = 3.80, SD = 1.06) and cognitive beliefs (y1) (mean = 3.71, SD = 1.03).

Table 11: Descriptive Statistics Results for ProAtt

Items	Mean	SD	Skewness	Kurtosis
Product Attitudes (ProAtt)	**3.77**	**.97**	**-.88**	**.12**
Cognitive beliefs (y1)	3.71	1.03	-.73	-.18
Emotional appeal (y2)	3.80	1.06	-.80	-.15
Functional benefits (y3)	3.81	1.02	-.85	.03

ConSat

The single hypothesis test results for H10's ConSat determined a strong and direct relationship between ConSat and ConLoy as r = 0.54, the t-value = 5.33, and p ≤ 0.01.

Further descriptive statistics testing of ConSat's observed variables (Table 12) showed perceived value (y4) (mean = 3.81, SD = 1.00) as the most important. This was followed by promotional activities (y5) (mean = 3.69, SD = .98) and service quality (y6) (mean = 3.75, SD = .97).

Table 12: Descriptive Statistics Results for ConSat

Items	Mean	SD	Skewness	Kurtosis
Consumer Satisfaction (ConSat)	**3.75**	**.91**	**-.91**	**.32**
Perceived value (y4)	3.81	1.00	-.87	.28
Promotional activities (y5)	3.69	.98	-.78	.12
Service quality (y6)	3.75	.97	-.78	.11

Consumer satisfaction (ConSat) encompasses the degree to which products fulfill consumer requirements and meet their expectations, delivering value and advantages. According to Namini (2016), ConSat arises from products that offer excellent value for money, overall satisfaction, and efficient resolution of consumer complaints, leading to loyalty and fostering positive impressions among consumers. Moreover, advertising and promotional efforts contribute to the generation of ConLoy.

Samudra and Susanti (2021) elaborate on the factors influencing ConSat, which include rational, emotional, and value-related aspects, directly impacting consumer loyalty. When products successfully cater to consumer needs, align with expectations, provide utility, and deliver favorable value for money, ConSat experiences an upswing. The study also identifies ProQua as a significant influence on ConLoy, further reinforcing the connection between product quality and consumer loyalty.

Conroy

The descriptive statistics testing of ConLoy's observed variables (Table 13) showed repeat purchase intention (y4) (mean = 3.80, SD = .96) and purchase intention (y12) (mean = 3.80, SD = .92) as the most important. This was followed by Information dissemination (y11) (mean = 3.79, SD = .92).

These findings are consistent with Cavero and Cebollada (1998), whose Spanish study of consumer laundry detergents stated that brand loyalty is a consumer's future repurchase commitment. In the United Kingdom, Stern and Hammond (2004) investigated laundry detergent ConLoy and purchase intention and noted that ConLoy initially decreases sharply as purchases increase. However, after approximately 15 purchases ConLoy stabilizes.

Table 13: Descriptive Statistics Results for ConLoy

Items	Mean	SD	Skewness	Kurtosis
Consumer Loyalty (ConLoy)	**3.80**	**.87**	**-.78**	**.22**
Repeat purchase intention (y10)	3.80	.96	-.70	-.06

Information dissemination (y11)	3.79	.92	-.76	.17
Purchase intention (y12)	3.80	.92	-.69	.09

Finally, Siwayanan et al. (2015) explored Malaysian household consumers' acceptance of eco-friendly laundry detergent powders. The authors determined that most consumers had a high affinity towards green and environmentally friendly detergents, especially those produced with low-density laundry detergent powders mixed with green palm oil-based surfactants.

CONCLUSION

The authors investigated which factors significantly influenced Thai laundry detergent product consumer loyalty (ConLoy). Simple random sampling was used to select 520 repeat purchase consumers across all major regions in Thailand. The questionnaire had an expert evaluation rating of 0.60 to 1.00 and a reliability value between 0.89 and 0.95. LISREL 9.10 was used to analyze the data using a latent variable path analysis which determined that all the causal variables in the model had a positive impact on ConLoy, collectively accounting for 67% of the variation in the factors that affect Customer Loyalty (R^2). There were four causal variables influencing consumer loyalty. When ranked from most significant influence to lowest influence, these were product quality (ProQua), product attitude (ProAtt), product innovation (ProInn), and finally, consumer satisfaction (ConSat), with total effect (TE) values of 0.94, 0.93, 0.82 and 0.48, respectively. The study contributes to the literature as it represents one of a few studies in English concerning the laundry care product sector within Asia and its related detergent products.

FUNDING

This study received no specific financial support.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

AUTHORS' CONTRIBUTIONS

All authors contributed equally to the conception and design of the study.

ACKNOWLEDGEMENTS

We would like to express our sincere gratitude to Ajarn Charlie for his invaluable contribution in editing and proofreading this paper. We are truly grateful for his efforts, suggestions and support throughout the process.

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