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GENDER DIFFERENCES AND THE PERCEPTION OF LOGISTICS EFFECTIVENESS IN LAGOS FMCG FIRMS.

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Abstract

The study evaluated the perceptions of logistical performance and gender disparities in Lagos FMCG companies. This study adopted a positivist methodological approach, utilizing primary and secondary data. The study involved 305 workers from the chosen companies' supply chain, procurement, logistics, and transportation departments. For the investigation, the total enumeration approach was used. The research tool was a structured questionnaire with closed-ended questions. Cronbach's Alpha was used to evaluate the survey instrument's dependability, and the results varied from 0.925 to 0.950. The Independent T-test was used to analyze the data. The independent T-test was employed to find out how gender affected the opinion of logistics performance in a few chosen consumer goods companies in Lagos. The distribution frequency of items between the sexes [t (292) = -1.96, p >.05] and operational expenses [t (292) = -1.83, p >.05] did not differ statistically significantly, according to the findings. However, there is a statistically significant difference in genders in terms of customer satisfaction [t (292) = -2.01, p <.05] and on-time delivery [t (292) = -2.81, p <.05]. The management of Lagos State's consumer products companies was advised to strive for greater gender diversity in logistics positions, and companies leverage each gender's strength. They should develop training programs that promote skills contributing to on-time delivery and customer satisfaction.

Keywords: ***Gender Diversity, Adaptability, Adhocracy, Innovation, On-time Delivery, Logistics Effectiveness***

Introduction

The logistics sector is crucial to the fast-moving consumer goods (FMCG) business, and its efficacy directly affects customer satisfaction and logistical efficiency. The FMCG industry is vital in Lagos, Nigeria, a bustling economic hub that

significantly boosts the national and regional economies. The success of logistical operations in the FMCG sector, which encompasses reliability, cost-effectiveness, punctuality, and service quality, determines the competitive advantage of these businesses. Understanding how different consumer demographics, particularly gender, perceive logistics effectiveness is necessary to customize strategies that enhance service delivery and customer satisfaction (Sánchez-Hernández et al., 2010; Mokhlis, 2012).

In Lagos, Nigeria, the fast-moving consumer goods (FMCG) industry is a significant engine of economic activity, and competitive advantage depends heavily on operational sustainability and logistical effectiveness (Nwaulune, 2024). With data demonstrating a statistically significant influence on sustainability measures in Lagos-based FMCG companies, recent studies highlight the relevance of green logistics practices—such as sustainable packaging, production, and transportation—in improving operational outcomes (Nwaulune, 2024). Though logistics effectiveness has been extensively studied, little is known about how gender dynamics affect views of logistical effectiveness, especially in developing nations like Nigeria. Given the increasing discussion on gender diversity in supply chain management (SCM) and how it affects organizational performance, this disparity is noteworthy (Maersk, 2024; Akbari et al., 2024, Oluwakoya & Ogundipe, 2021).

Women constitute 41% of the supply chain workforce globally, yet their representation in leadership remains disproportionately low (less than one-third of senior positions) (Maersk. 2024). In frontline logistics roles, such as maritime and trucking, women's participation drops further—1.2% of seafarers and 13% of truck drivers are female, underscoring systemic barriers rooted in cultural biases and workplace safety concerns. These disparities are compounded in regions like Sub-Saharan Africa, where gender stereotypes and limited access to mentorship hinder career progression for women in logistics (Maersk. 2024; Akbari et al., 2024). In Lagos, a hub for FMCG activity in Nigeria, these challenges intersect with broader institutional factors, including corruption and infrastructural inefficiencies, which may disproportionately affect women's perceptions of logistical effectiveness (Larson, 2019).

Gender disparities in customer perceptions have been thoroughly examined in several fields (Kwok et al., 2016; Karatepe, 2011). These results suggest that men and women may prioritize logistics and service quality differently due to cultural norms and varying expectations. For instance, men could focus more on a service's speed and efficiency, whereas women might emphasize relational qualities like reliability and customer service (Mokhlis, 2012; Ferrer, 2007). Such insights are essential for FMCG businesses doing business in Lagos, a city known for its diverse clientele and unique logistical challenges. Thanks to several megatrends, including e-commerce and urbanization, logistics innovation has become a central concept in supply chain management research (Amling & Daugherty, 2018). However, gender disparities in decision-making positions, such as supplier selection and logistics planning, run the danger of maintaining uniformity in approaches to problem-solving, which might jeopardize flexibility in dynamic marketplaces (Akbari et al., 2024). Strategies to maximize resource allocation and promote inclusive growth might be informed by knowledge of how gender affects views of logistical effectiveness in

Lagos' FMCG industry, where businesses prioritize sustainability and cost-effectiveness.

Despite the expanding body of research on gender differences in service perceptions, there is a glaring paucity of studies addressing logistical efficacy in Lagos' FMCG sector. Previous studies have avoided a closer examination of the local dynamics that influence consumer perceptions in areas like Lagos in favor of concentrating on global or generalized contexts (Valaei et al., 2016; Kovács & Tatham, 2010). This study attempts to reduce this gap by examining how Lagos's men and women perceive the effectiveness of logistics in FMCG firms and how these perceptions impact their brand loyalty and satisfaction. The research gap is made worse by gender concerns.

Understanding the differences between men and women in logistics is essential, given that women are under-represented in the field and frequently lack the same access to resources as men (McCrea, 2018; Nix & Stiffler, 2018). Despite the management literature's claim that men and women require relatively distinct organizational contexts and traits for innovation, there is a dearth of research on gender disparities in supply chain management (Perrenoud et al., 2020; Wille et al., 2018). Therefore, addressing these differences may have significant management implications, offering guidance to companies on how to manage their gender-diverse workforce to promote logistics innovation successfully.

Focusing on the FMCG industry in Lagos, this study contributes to the global discussion on gender and logistics while offering localized insights that may result in strategic improvements in consumer satisfaction and service quality. It is anticipated that the findings would assist FMCG firms in Lagos in creating logistics strategies that consider the needs and preferences of all genders, ultimately leading to increased customer satisfaction and competitiveness. Furthermore, by highlighting Lagos' unique consumer characteristics, the study's localization approach would assist companies in better understanding the nuances of their target markets and increasing the effectiveness of their logistical processes.

Although gender equality in operations and supply chain management is receiving more attention, comprehensive evaluations show that little research concentrates on FMCG companies in emerging markets. Previous studies on the FMCG industry in Lagos have primarily focused on green logistics, ignoring the social aspects of gender (Akbari, 2024).

This study fills this gap by examining the following important question:

1. How do employees of FMCG companies in Lagos perceive logistics effectiveness in gender difference?

This study intends to improve operational resilience in Lagos' FMCG industry while providing practical suggestions for coordinating logistics strategies with the UN Sustainable Development Goal 5 (gender equality) by incorporating knowledge from gender studies and sustainability literature.

The study uses theoretical frameworks such as the Gender Schema Theory and the Expectancy-Dis confirmation Paradigm to investigate the causes of these gender differences and how they affect logistical efficacy (Karatepe, 2011). While the Gender Schema Theory argues that internalized gender roles and societal norms influence how people assess the quality of services, the Expectancy-Dis confirmation

Paradigm provides a lens for understanding how expectations versus actual service delivery shape consumer satisfaction (Karatepe, 2011; Mokhlis, 2012).

Literature Review

Introduction to Gender Differences in Logistics Perception

The impression of logistics effectiveness is an important factor in the fast-moving consumer goods (FMCG) industry, where customer happiness and loyalty are closely linked to the effectiveness and caliber of logistical services. In recent years, there has been increased interest in examining how gender influences these ideas, particularly in diverse consumer markets such as Lagos and Nigeria. To understand the nuances of gender differences in how logistics success is seen, theoretical frameworks such as the Gender Schema Theory and the Expectancy-Dis confirmation Paradigm are helpful.

With women under-represented in leadership and frontline operational roles, disparities by gender in logistics and supply chain roles continue to be a significant problem worldwide (Larson, 2019). For example, research shows that women comprise just 13% of truck drivers and 1.2% of mariners worldwide, reflecting structural obstacles, including occupational safety concerns and cultural biases (Larson, 2019). These obstacles are made worse in Nigeria by institutional.

Elements such as corruption and inefficient infrastructure, which disproportionately prevent women from advancing in logistics-related careers. For instance, male-dominated logistics planning decision-making in Lagos frequently maintains uniformity in approaches to problem-solving, which may jeopardize flexibility in FMCG companies (Nwaulune, et al., 2023).

Gender Schema Theory

The gender schema theory, initially proposed by Bem (1981), maintains that people internalize gender norms and customs from society, which then influences their behavior and worldview. This theory suggests that men and women may assess logistical performance and service quality differently due to ingrained gender conventions. For instance, women may be more likely to prioritize relational service elements like customer involvement and reliability under traditional gender roles that place emphasis on communication and relationship-building (Bem, 1981; Ferrer, 2007). However, because speed and efficiency are typically associated with performance and masculinity, men could place more value on them (Mokhlis, 2012).

Service quality studies from different companies corroborate this theoretical perspective. For example, sánchez-Hernández et al. (2010) found that relational components of service quality were more predictive of satisfaction for women, whereas functional aspects were more significant for men. This finding highlights how gender schemas influence different demographic groups' opinions of service quality.

Expectancy-Disconfirmation Paradigm

The Expectancy-Disconfirmation Paradigm, developed by Oliver in 1980, is widely used in customer satisfaction studies. It claims customer happiness is determined by disconfirmation, or the discrepancy between expected and actual service performance (Oliver, 1980). This paradigm may aid in explaining gender differences in logistical perceptions by highlighting how men and women may form different service expectations depending on cultural norms and past experiences.

For instance, in the FMCG sector, disconfirmation occurs when women's expectations for improved customer service and increased dependability from logistics are unmet (Karatepe, 2011). However, deficiencies in these areas might lead to increased dissatisfaction and disconfirmation if men emphasize pricing and rapid delivery (Kwok et al., 2016). Studies in comparable service contexts, such as retail banking and hotel services, have shown that gender significantly moderates the relationship between service expectations, performance, and subsequent satisfaction (Karatepe, 2011; Sánchez-Hernández et al., 2010).

Empirical Evidence and Applications in FMCG Firms

For example, disconfirmation emerges in the FMCG industry when women's expectations of better customer service and more reliability from logistics are not fulfilled (Karatepe, 2011). However, if males value price and speedy delivery more, any shortcomings in these areas might result in more significant discontent and disconfirmation (Kwok et al., 2016). Gender strongly moderates the link between service expectations, performance, and subsequent satisfaction, according to studies conducted in similar service contexts, such as retail banking and hotel services (Karatepe, 2011; Sánchez-Hernández et al., 2010).

While these studies provide useful information, there is still a lack of research focusing only on FMCG firms, particularly in Nigerian cities like Lagos. The necessity for more gender diversity and understanding within logistics frameworks has been emphasized by Kovács and Tatham (2010). However, they usually focus on broader humanitarian logistics rather than consumer-focused enterprises.

There is a solid theoretical basis for gender disparities in logistics perceptions, according to research from various service businesses. There are opportunities for more study when these findings are applied to FMCG firms, especially in developing nations. To validate and expand upon these frameworks within the context of FMCG logistics in Lagos, future research should employ robust empirical methodologies to capture the complex relationships among gender, service expectations, and logistic efficiency. Gender-sensitive logistics management strategies will be informed by the theoretical understanding and practical insights this approach will provide.

Research Methodology

For this study, both primary and secondary data were employed. A comprehensive questionnaire and interviews with each company's distributors, mid-level staff, and senior management provided the core data. PZ Cussons and Nestle Nigeria, two well-known consumer products firms in Oshodi/Isolo Local Government in Lagos State, Nigeria, provided the data. The companies were chosen because they are the only two international corporations in the Local Government Area listed on the Nigerian Stock Exchange (NSE).

The companies were contacted over the phone to confirm availability and arrange visits. According to a preliminary poll, 305 respondents were employed in these businesses' supply chain distributors, logistics, transportation, and procurement divisions. Because of the small sampling frame, which included employees from the logistics, warehousing, transportation, sales, and procurement departments of the chosen consumer goods companies, the study used the total enumeration technique to determine the sample size. The use of complete enumeration has been supported by prior supply chain and distribution channel

studies (Oko, 2013). As a result, the study's sample size, which included the total population, was established at 305.

Table 1: Sample Size for Study

Companies	Total number of questionnaires distributed to employees	The total number of Questionnaires retrieved
PZ Cussons	143	141
Nestle	162	153
Total	305	294

Source: Researcher's Survey (2023)

Data on the distribution and retrieval of questionnaires among PZ Cussons and Nestle employees is shown in Table 1. Employees in Nestle were distributed 162 questionnaires, 153 were collected, whereas employees in PZ Cussons were distributed 143, and 141 were collected. 294 of the 305 questionnaires that were distributed were recovered. These numbers show high response rates: around 98.6% for PZ Cussons and 94.4% for Nestle, for a total response rate of roughly 96.4%. Given that average survey response rates can vary greatly, sometimes ranging from 10% to 90% depending on several factors, such high response rates are noteworthy.

Several factors might cause these high response rates. Since prompt completion lowers the possibility of non-response, distributing surveys during meetings when staff members are present might increase participation. A sense of importance may also be created, and participation may be encouraged by tailoring questionnaire invites and making it obvious how important respondents' opinions are. Questionnaires with customized distribution strategies have received more responses than generic ones.

Measures

Questionnaire

The questionnaire, an instrument for primary data collection, is well-structured. The questionnaire was divided into two parts. The first part contains questions related to adhocracy culture. Part two includes inquiries about logistics effectiveness.

Logistics Effectiveness

Three dimensions of logistics effectiveness—quality, logistics costs, productivity, timeliness, and capacity—were assessed using the essential performance indicators that Paddeu (2016) used. The questionnaire created by Cai et al. (2009) serves as the basis for the inquiries about costs associated with logistics effectiveness between the distributors and the focal organization. Every performance scale, including Strongly Agreed (SA), Agreed (A), Disagreed (D), Strongly Disagreed (SD), and Undecided (UD), was scored using a 5-point Likert scale.

Pilot Study

Ten percent of the 294 produced samples were used in pilot research. The transportation, warehousing, supply chain, procurement, and sales departments of consumer products companies in Osun State, Nigeria (Abebi Foods Limited) that were not included in the study's target group were given thirty (30) questionnaires. This allowed for a smaller group to pre-test the survey instrument, which served as

the foundation for evaluating it for the idea, readability, instruction clarity, and apparent areas of ambiguity.

Reliability of Research Instrument

The reliability of the survey instrument was assessed using the data collected from the questionnaires administered for the pilot study. For this study, Cronbach's alpha was employed to verify the internal consistency of each variable to achieve reliability.

Table 2: Reliability Test

Variables	Number of Items	Cronbach's Alpha
Innovation	5	0.950
Adaptability	5	0.927
Flexibility	5	0.925
Cost	5	0.931
Lead Time	5	0.932
Customer Satisfaction	5	0.926
Distribution Frequency	5	0.938

Source: Researcher's Computation (2023)

All variables in Table 2 (the Cronbach Alpha reliability test) have alpha values greater than 0.9, indicating exceptional internal consistency. This implies that the items that gauge the three constructs—innovativeness, adaptability, and flexibility—strongly correlate and accurately evaluate each.

However, high Cronbach's alpha values do not ensure that the scale represents the desired construct (validity), even though they show consistency among items. Items may be consistent, yet taken as a whole, they may evaluate a different characteristic than intended. Validity evaluations must be used with reliability analysis to guarantee that the scale appropriately measures the intended construct.

Validity of Research Instrument

Table 3: Kaiser-Meyer-Olkin and Bartlett's Test

Variables	Number of Items	KMO	Bartlett's Test	Sig.
Innovation	5	0.757	1369.796	0.000
Adaptability	5	0.533	475.727	0.000
Flexibility	5	0.802	1247.49	0.000
Cost	5	0.548	14.46	0.050
Lead Time	5	0.624	315.19	0.000
Customer Satisfaction	5	0.716	42.705	0.000
Distribution Frequency	5	0.689	865.67	0.000

Source: Researcher's Computation (2023)

The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity are shown in Table 3 for five variables, each of which is evaluated using a predetermined number of items. These statistical tests are essential to

determine if data is appropriate for component analysis—which seeks to uncover underlying correlations between variables.

The results indicate that "Flexibility" has meritorious sampling adequacy, "Innovation" and "Customer Satisfaction" are middling, "Lead Time" and "Distribution Frequency" are mediocre, and "Adaptability" and "Cost" are miserable, according to the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy. Before factor analysis, variables with KMO values less than 0.60 would need more research or re-examination.

The result is significant (p-value < 0.05) for Bartlett's Test of Sphericity, meaning sufficient correlation exists between the variables to support component analysis. The significance (Sig.) value of 0.000 for all variables except "Cost" in the table shows strong correlations between the items. With a Sig—value of 0.050, the "Cost" variable is on the significance level.

Results

Data Analysis

Demographic Data of Respondents

Table 4: Background Characteristics of Respondents

Characteristics	Categories	Frequency	Percentage (%)
Gender	Male	226	76.9%
	Female	68	23.1%
Age	16-25yrs	23	7.8%
	26-45 yrs	212	72.1%
	46-55 yrs	59	20.1%
Highest Academic Qualification	SSCE	15	5.1%
	B.Sc/BA/HND	117	39.8%
	PGD/MBA/MSc/MA	158	53.74%
	PhD	4	1.4%
Career Sector	Logistics/ Supply chain	190	64.6%
	Procurement	32	10.9%
	Transport	44	15.1%
	Others	28	9.5%
Working Experience	≤ 5 years	93	31.6%
	5 – 10 years	107	36.4%
	11 -15 years	46	15.6%
	16-20 years	36	12.2%
	≥ 20 years	12	4.1%
Position	Director	12	4.1%
	Manager	135	45.9%
	Officers	127	43.2%
	Others	18	6.1%

Source: Field Survey (2023)

Results presented in Table 4 show that most percentage of the respondents, 76.9%, were males, while 23.1% were females. This result enabled the researcher to

obtain information from both genders, hence more appropriate and reliable information. The findings show that the majority of the respondents who participated in this study, 53.7%, were aged between 26-45 years, followed by 20.1% aged between 46-55 years, and 7.8% were aged 61-65 years. This indicates that respondents were well distributed in terms of their age. In addition, the result of Academic Qualification revealed that most respondents (53.74) were PGD/MBA/MSc/MA holders, while 39.8% were B. Sc/BA/HND, 15% were SSCE holders, while 1.4% were PhD holders. The career sector showed that most of the respondents (64.6%) were in the logistics/supply chain sector,15.1% in the transport sector, 10.9% in the procurement sector, and 9.5% were categorized as in the other segment.

The findings further revealed that many of the respondents, 36.4%, have worked at their organizations for a period between 5-10 years, while 31.6% have worked between periods lesser than or equal to 5 years, 15.6% have worked for the period 11-15 years, 12.2% have worked between 16-20, years and 4.1% have worked for 20 years and above. The study showed that 0.7% of the respondents worked as Directors of a particular department, 4.4% as Managers, 35.7% as Officers in various departments, and 59.2% occupied other positions not listed in the questionnaire. The result showed that all the respondents were qualified to respond to this survey.
Succinctly, the background characteristics of respondents are as follows:

In gender distribution, the sector exhibits a notable gender disparity, with male professionals constituting a significant majority. In the age range, professionals in Nigeria's FMCG firms predominantly fall within the 26 to 45-year age bracket. This age group represents a dynamic segment, combining youthful energy with substantial industry experience, crucial for driving innovation and efficiency in the sector.

The educational qualifications consist of a significant portion of professionals in this field with advanced academic qualifications. Notably, 53.74% possess postgraduate degrees such as PGD, MBA, MSc, or MA, while 39.8% have a bachelor's degree (B.Sc/BA/HND). This high educational attainment reflects the industry's emphasis on specialized knowledge and skills to navigate complex supply chain challenges.

The Career Sectors within the industry, professionals are distributed across various sectors:

- Logistics/Supply Chain: 64.6%
- Procurement: 10.9%
- Transport: 15.1%
- Others: 9.5%

Table 5: Independent T-test showing the Gender perception in logistics effectiveness.

Distribution Logistics Performance	Gender	N	Mean	SD	df	T	p
Distribution Frequency	Male	221	6.07	1.09	292	-1.96	> .05

Distribution Logistics Performance	Gender	N	Mean	SD	df	T	p
Distribution Frequency	Male	221	6.07	1.09	292	-1.96	> .05
	Female	73	6.36	1.05			
Operating Cost	Male	221	4.43	.65	292	-1.83	> .05
	Female	73	4.59	.62			
Lead Time	Male	221	5.72	.73	292	-2.81	< .01
	Female	73	6.01	.89			
Customers' Satisfaction	Male	221	16.01	2.02	292	-2.01	< .05
	Female	73	16.56	2.10			

Researcher's Survey, 2023

Key Findings

Males (Mean = 6.07, SD = 1.09) and females (Mean = 6.36, SD = 1.05) differ in their perceptions of the Firm's Frequency of Distribution of Goods. However, the difference is not statistically significant (t (292) = -1.96, p > .05). This result suggests no compelling evidence of a gender-based discrepancy in how frequently firms distribute goods.

Studies, such as those by Ruel and Fritz (2021), highlight that gender diversity may bring different operational perspectives; however, specific differences in perceptions of distribution frequency are not consistently evident (Ruel & Fritz, 2021).

Males (Mean = 4.43, SD = 0.65) and females (Mean = 4.59, SD = 0.62) exhibit a mild perception difference in Operating Cost. However, this difference is also not statistically significant (t (292) = -1.83, p > .05). These findings imply that both genders perceive operating costs similarly in organizational contexts.

Literature on gender perceptions in operational contexts, such as Johnson et al. (1999), has identified general similarities in such metrics but notes that subjective cost-related insights may vary depending on hierarchical gender representation (Johnson et al., 1999).

In the Firm's On-time Delivery, this variable, a statistically significant difference was observed (t (292) = -2.81, p < .01), with females (Mean = 6.01, SD = 0.89) rating on-time delivery more positively than males (Mean = 5.72, SD = 0.73). This could imply that females have a more optimistic view of logistics efficiency or hold firms to higher standards for meeting deadlines.

A study by Olowookere et al. (2020) noted that differing perceptions of organizational justice and effectiveness among men and women in Lagos could stem from underlying cultural expectations and role expectations in professional environments (Olowookere et al., 2020). Similarly, Sukri et al. (2023) emphasized

how cultural and gender expectations shape female perspectives on operational performance in male-dominated industries, such as logistics (Sukri et al., 2023).

In customer satisfaction, another statistically significant difference was observed ($t(292) = -2.01$, $p < .05$), with females (Mean = 16.56, SD = 2.10) perceiving higher customer satisfaction than males (Mean = 16.01, SD = 2.02).

This indicates that female respondents may evaluate customer satisfaction metrics more favorably, potentially linking this to their focus on interpersonal and relational dynamics in customer interactions.

Studies like those by Ruel and Subramanian (2020) and Ruel and Fritz (2021) have noted that gender diversity, particularly female inclusion, in supply chain management can enhance customer satisfaction through better communication and empathy in service delivery (Ruel & Subramanian, 2020; Ruel & Fritz, 2021).

Conclusion

This study contributes to understanding gender perceptions in distribution logistics performance, particularly in Lagos' socio-cultural context. While similarities in distribution frequency and operational cost perceptions exist, significant differences in perceptions of on-time delivery and customer satisfaction suggest gender-specific perspectives influenced by cultural and role-based expectations. These findings align with previous empirical studies that emphasize the positive role gender diversity plays in enhancing logistics and supply chain outcomes.

Conclusions:

The analysis of distribution logistics performance based on gender reveals some notable differences in specific metrics. While no significant differences were observed in the frequency of distribution of goods and operating costs between male and female respondents ($p > .05$), there were substantial discrepancies in two other areas: on-time delivery ($p < .01$) and customer satisfaction ($p < .05$).

In On-time Delivery, females reported a higher mean score (6.01) than males (5.72), indicating that female-led firms are perceived to perform better in delivering goods on time. This implies that female involvement is associated with better on-time delivery performance.

Furthermore, in customer Satisfaction, females showed a higher mean score (16.56) for customer satisfaction than males (16.01), suggesting that customers of female-led firms express higher satisfaction levels. This indicates that female participation correlates with higher customer satisfaction levels.

Thirdly, in the Firm's Frequency of Distribution of Goods, both male and female groups exhibit similar mean scores (Male: 6.07, Female: 6.36) with no statistically significant difference ($t (292) = -1.96$, $p > .05$). This suggests that gender does not significantly influence the frequency of goods distribution.

Lastly, in the firms Operating Cost, the mean scores for operating costs are close (Male: 4.43, Female: 4.59), with no significant difference ($t (292) = -1.83$, $p > .05$). This indicates that operating costs are not significantly affected by the gender of the personnel involved.

Recommendations:

1. Given the positive association between female involvement, improved on-time delivery, and customer satisfaction, organizations should strive for

greater gender diversity in logistics positions. This aligns with findings that gender-diverse teams can enhance organizational performance.

2. Firms, regardless of gender, should prioritize strategies that enhance on-time delivery and customer satisfaction. Since female-led firms perform better in these metrics, studying and implementing their best practices may be beneficial.
3. To leverage the strengths of specific gender participation, companies should develop training programs that promote skills contributing to on-time delivery and customer satisfaction. Such initiatives can help in harnessing the benefits of gender diversity in logistics operations.
4. Adopting recruitment policies encouraging female applicants can help balance gender representation in logistics roles. This approach has been shown to improve overall organizational performance.
5. Organizations may benefit from increasing the representation of women in leadership roles, particularly in logistics and operations. Research suggests that diverse leadership can improve performance metrics and organizational success.
6. Additional studies should explore the factors contributing to gender differences in on-time delivery and customer satisfaction. Understanding these factors can inform strategies to optimize logistics performance across all demographics.

By addressing these areas, firms can improve their distribution logistics performance, ultimately enhancing customer satisfaction and operational efficiency.

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