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Customer Behavior and its Impact on the Supply Chain

EBTM 881 CAPSTONE PROJECT

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1. Introduction & Problem Motivation

In spring of 2019 a Supply Chain Management Alumni administered a survey titled "Multichannel Supply Chains and the Effect on Customer Satisfaction" (to view survey see Appendix A). A research protocol was submitted to the Institutional Review Board before data was collected. The survey was created to gather data on consumer satisfaction with multichannel supply chains. Multichannel supply chains "provide customers with many purchasing options" (Thomas Publishing Company, 2018). Consumers may purchase items in a traditional brick-and-mortar (in-store), online, have items shipped to home/business/store or to a pick-up location (ex. Amazon locker). With online shopping on the rise, supply chains must continually adapt to the evolving needs of its customers. The survey data gives insight into consumer behavior, satisfaction, and perception with the efforts that multichannel supply chains have made in response to the rise in online shopping.

The survey was administered through an online survey platform, Qualtrics. Participants could complete the entire survey through the use of personal computer or mobile device. Participant consent was obtained prior to taking the survey. Any personally identifiable information was used only to give extra credit to Towson University undergraduate business students for participating in the survey. An alternative extra credit assignment was assigned in case participation in the study was undesirable. No identifiable information was used in the analysis of this survey. In addition to recruiting participants from various Towson University business courses through use of extra credit, participants were targeted by direct email, by email listservs (from professional societies), and the survey was promoted on social media.

This 39 question survey collected over 950 responses over in the spring of 2019. The survey consisted of multiple conditional or if/then questions, whereas if a certain option was chosen, the participant was directed to more questions that pertained to their previous answer (for an example of this, view Appendix A, questions 9 and 8). Therefore, each participant did not respond to the same number of questions, nor responded to the entire question set. The number of valid responses was 880 after removing participants due to disqualifiers. The disqualifiers were: the participant did not consent to take the survey; the participant consented but did not answer any survey questions; the participant did not complete the survey; and the participant completed the survey in under 3 minutes (considered straight lining). To view the number of survey responses deleted per disqualifier, see Appendix B.

As a result of this survey, there is a plethora of data on customer behavior with multichannel supply chains. Understanding current customer behavior and satisfaction levels can be used as constructive feedback; whereas, customer behavior and satisfaction with current multichannel supply chain processes are used a continuous source of improvement. Improving ones multichannel supply chain based on feedback or in other words, enhancing supply chain responsiveness can help the supply chain become more efficient and effective thus being more agile to meet consumer demands.

2. Problem Statement

Using the data provided by the survey mentioned above, this study performs various forms of descriptive analytics, such as chi square tests, to gain insight into consumer behavior. Once consumer behaviors have been identified, implications and conclusions are drawn as to how those behaviors impact the multichannel supply chain.

The survey ran on “Multichannel Supply Chains and the Effect on Customer Satisfaction” gathered over 800 responses. The survey consisted of 39 questions, including multiple choice, yes/no, select all that apply, and short answer types. For the purpose of this project the scope of this analysis consists of only 20 questions that are either multiple choice or yes/no. This analyses focus on qualitative data, omitting the descriptive analysis of short answer data. Even after omitting questions from the data set, there was a plethora of data to decipher. Having such substantial data was a great foundation to begin identifying customer behaviors with current multichannel supply chain processes.

The next step was to turn that data into information through descriptive analytics. The analyses used to examine the data were: the chi-square test, the Marascuilo procedure, and Spearman’s rho. For this study the results of the chi-square test tell whether there is a significant relationship between consumer purchase behaviors. If the relationship turned out significant, the Marascuilo procedure was performed to evaluate which proportions are driving the chi-square significance. Spearman’s rho was used to evaluate the strength or weight of significance of the associations between customer behaviors. The results of these analyses were insights into consumer behaviors, perceptions, and satisfaction with multichannel supply chains. The consumer behaviors, perceptions, and satisfaction with multichannel supply chains should be used as feedback. This input from the customer can be used to improve the management and policies within ones multichannel supply chain.

3. Background & Literature Review

This section will review literature that provides increased depth into the use of data on customer satisfaction within the supply chain, the impact of logistics flexibility on the supply chain, and references to two research papers guided the framework of this study.

3.1 Using Customer Satisfaction Data to Benefit the Supply Chain

Fisher (1997) states that poor coordination among supply chains cost on average $30 billion annually. Poor coordination within a supply chains can result in increased costs, a decrease in customer satisfaction, and missed opportunities. The strategies used throughout the supply chain should align with the mission, goals, and objectives set by the organization. There are many strategies organizations can undertake such as cost leadership and differentiation focus. However, it is essential that the strategy and resources to meet objectives are carried throughout the supply chain. This also pertains to the manner or method in which supply chains decide to evaluate customer satisfaction. There are many ways to evaluate data on customer satisfaction. However, the significance drawn from the data should pertain to the mission, goals, and objectives set by the organization. Once the organization has decided on its goals and objectives, it must also decide the metrics that will be used to measure and benchmark its progress to attain those goals. This is when the decision should be made as to what data or indicators regarding customer satisfaction derives the most benefit to the organization. Being able to manipulate supply chain processes one knows will impact certain KPIs can improve a supply chains effectiveness. Therefore, it may be a better utilization of resources for organizations to spend more time evaluating

the customer satisfaction metrics and indicators one knows pertains directly to its processes, than the time spent on evaluating broader market data.

Narrowing down on the indicators used to measure customer satisfaction that align with the goals and strategies selected for the supply chain is imperative for success. Supply chains are at risk of developing an average offering that only satisfies a small customer segment and experiencing increased costs when efforts are made to satisfy all competitive priorities (Naim, 2006). Once a supply chain is able to identify the processes that have an effect on deliberately selected KPI's, it can become more responsive. According to Fisher (1997) Supply chains that are responsive and flexible are profitable.

3.2 The Impact of Logistics Flexibility on the Supply Chain

This study looks at the multichannel supply chain which "provides consumers with many purchasing options" (Thomas Publishing Company, 2018). Logistics flexibility is as "the ability of a firm to respond quickly and efficiently to changing customer needs in inbound and outbound delivery, support, and services" (Naim, 2006; Zhang, 2005). McFarlane (2016) mentions that flexibility includes that within in and outbound delivery which in turn impacts customer satisfaction. Logistics capabilities can be used as a means to create differentiation between ones multichannel supply chain and that of another (Daugherty et al., 1998). Daugherty et al (1998) goes on to say, when service delivery processes are properly leveraged, the value added for customers "is likely to result in improved market share" and profitability. The intent is to keep customers so satisfied with the service that they remain loyal, and will therefore, continue to purchase the product. This loyalty is expected to have a positive effect on financial indicators, such as market share and profitability (Daugherty et al., 1998). There is support that making improvements in outbound logistics capabilities that compromise the multichannel supply chain can be beneficial to the organization/supply chain. Zhang (2005) goes on to state that "there is a strong positive relationship between flexible logistics capability and customer satisfaction." Therefore, efforts made in improving customer satisfaction through flexible logistics capabilities that compromise the multichannel supply chain can be beneficial to the organization/supply chain in measures such as market share and profitability.

According to Zhang (2005), for customer satisfaction to improve "logistics should be organized in the manner that enables customer responsive and cost competitive operations." Not only must supply chain be able to respond quickly and efficiently to changing customer needs, it must also respond in manners that are cost efficient. When a supply chain is able to process and react to customer feedback in the area of logistics, it can focus on providing logistical services that will nurture long-term commitment and repurchase intentions; "these efforts may offer some respite from intense price-based competition" (Daugherty et al., 1998). Repeat customers may be less price sensitive, thus increasing profit margins and decreasing the chances that the customer will choose to shop elsewhere. Finally, repeat customers are more likely to purchase a greater volume and variety of products in any given transaction. These benefits should positively affect such financial indicators as profitability and market share (Daugherty et al., 1998). Heikklia (2002), mentions that to reach supply chain efficiency and high customer satisfaction, supplier need to understand consumer situations and needs. Supply chains need to understand current customer behaviors, perceptions and satisfaction with the multichannel supply chain, and be flexible,

resilient, and responsive to reach optimum supply chain efficiency, effectiveness, and enhance customer satisfaction.

3.3 Framework

The framework of this study was guided by the research structure of two project management research papers. Although the two papers referenced do not pertain to supply chains, the analyses used pertain to the descriptive analysis required to evaluate the data in this paper on customer behavior and its impacts on the supply chain. The research structure of each paper is outlined, followed by how it guided the framework of this paper.

The first paper is "Survey Comparing Critical Path Method, Last Planner System, and Location-Based Techniques" which has been published in the Journal of Construction Engineering and Management (Olivieri et al., 2019). This paper compares and contrasts the use of three of the most relevant systems used for project management (PM) and project production management (PPM) in the construction industry and clarifies industry benefits to eliminate potential misunderstandings about their use. Those three systems are critical path method (CPM), last planner system (LPS), and location-based techniques (LB). Hypotheses regarding the use of each system were created using existing literature. To be able to evaluate these hypotheses, a survey was administered to construction professionals in Brazil, China, Finland, and the United States regarding their use of the three processes. Once the questions of the survey were sorted per method, chi-square non-parametric tests were run in Excel to analyze differences between planning systems related to each question. A chi-square test evaluates the significance between two variables, which in this case is user behavior associated with each method. A hypothesis can consist of multiple chi-square tests. The sum of which determines if the hypothesis is fully, partially, or not supported. If a significant result was found, the Marascuilo procedure was used a post hoc test that further enabled the contrast and comparison between the uses of each process. The Marascuilo procedure was used to detect individual differences between a user's behaviors between systems. After, the paper goes on to use those hypotheses and behaviors to clarify industry benefits in order to eliminate potential misunderstandings about the use of each method.

The above study was used to guide the framework of this paper. Olivieri et al (2019), begins by creating hypotheses that were organized per system based on existing literature. The hypotheses in this analysis were created based on of the patterns and trends seen in the survey data. The hypotheses were organized per topic or aspect of the multichannel supply chain (ex. Tracking delivery time, product research, etc.). Olivieri et al (2019) and this analysis gathered data through use of a survey. The analyses Olivieri et al (2019) selected to evaluate their hypotheses were the chi-square test and Marascuilo procedure. The chi-square tests was used in both cases were used to identify differences between user behaviors in relation to the subject at hand. The Marascuilo procedure was used in both cases as a post hoc analysis to provide additional depth and insight into significant results. The similarities continue since there can be multiple chi-square analyses that evaluate a hypothesis, leading for it to be fully, partially, or not supported. In which, the hypotheses and behaviors identified were then used to identify potential impacts to industry.

The second paper used to guide the framework of this study was “Schedules and Schedulers: A Study in the U.S. Construction Industry”, published in the Engineering Management Journal (Thais et al., 2020). The study proposes recommendations to increase collaboration when developing schedules and to improve the roles of schedulers in the construction industry. Through statistical and qualitative analysis of the survey ran, in addition to other data collection techniques such as the use of a focus group, they discover seven themes in the data and identified industry challenges related to each theme. Spearman’s rho was used to measure the strength and direction of association between respondents’ level of agreement on statements regarding schedules and schedulers. The respondent agreement levels were measured on a 5-point Likert scale. Therefore, the parametric assumption of the Persons correlation are violated and non-parametric methodologies were used. The analyses performed, including Spearman’s rho, “enables participants of the construction industry to benefit from better understanding of how schedules are used and developed in practice as well as the role of schedulers in this process.” Fully understanding current practices within the industry allows one to identify areas of opportunity and identify best practices.

Thais et al (2020), used Spearman’s rho to evaluate the strength and direction of association between participants level of agreements with statements that pertain to the topic at hand. One of the factors that encouraged the use of this non-parametric test was the existence of ordinal survey data. Unlike the research method in Thais et al (2020), in this analysis Spearman’s Rho was used to further evaluate previously created hypotheses. The survey data used in this analysis of customer behavior and its impact of the supply chain consisted of nominal, ordinal, and interval variables. Therefore, Spearman’s rho was used to evaluate the strength or weight of significance of the associations that were previously assessed by the chi-square test. A better understanding of current practices or consumer behaviors within an industry makes it easier to identify areas of improvement and best practices.

4. Data

This analysis begins with data from the survey “Multichannel Supply Chains and the Effect on Customer Satisfaction” that had been run in the spring of 2019 by Supply Chain Management Alumni Jenna Turley (Appendix A). The survey received 986 responses. After cleaning the data, there were 880 valid survey responses. Participant responses were removed if: (1) the participant finished the survey in under three minutes; (2) the participant did not complete the survey; (3) participant did not respond to any of the survey questions; and (4) the participant did not consent to take the survey. See Appendix B for a table that breaks down of the number of participants deleted per reason.

The survey consisted of 39 questions that include multiple choice, yes/no, select all that apply, and short answer types. As stated earlier, the survey consisted of multiple conditional or if/then questions, whereas if a certain option was chosen, the participant was directed to more questions that pertained to their previous answer (for an example of this, view Appendix A, questions 9 and 8). Therefore, each participant did not respond to the same number of questions, nor responded to the entire question set. For the purpose of this project the scope of this analysis focuses on qualitative data collected from 20 non-conditional survey questions that require either multiple choice or yes/no answer types. The questions used in this study are marked with an asterisk (*).

To begin organizing or sorting the plethora of data that was gathered from the survey, topics or aspects within the multi-channel supply chain that the survey covered were identified. The survey questions covered certain aspects of the multichannel supply chain such as tracking, delivery time, delivery options, and more. With those topics in mind, individual survey questions were then sorted by assigning each question to at least one topic/aspect of the multichannel supply chain. After sorting the 20 survey questions to topics/aspects of the multichannel supply chain, hypotheses were created based on the trends and patterns in the data. See Figure 1 for hypotheses per multichannel supply chain aspect. To evaluate these hypotheses, questions that pertained to each hypothesis, as seen in Figure 2, were identified and examined. While the data mentioned in Figure 2 were used to evaluate hypotheses, other data was analyzed as well but are not associated with a hypothesis (see Appendix C for other questions used in the analysis). Notice: a survey question can be assigned to more than one aspect of the multichannel supply chain; and data related to demographics (questions 1, 2, and 4 of the survey) was used in the evaluation of each aspect of the multichannel supply chain. Using demographics in the analyses further develops the analysis on consumer behavior.

Tracking	Delivery Times	Order Frequency	Delivery Options	Shipping Costs	B&M vs Online	Product Research
H1. Order frequency impacts closeness of tracking	**H4.** The number of purchases made influences satisfaction with delivery time	**H7.** Order frequency is impacted by demographics	**H9.** Consumers are satisfied with multiple delivery options	**H10**. Regardless of demographics, consumers expect free shipping	**H12.** Perceived total value received will determine where consumers place an order (in-store or online)	**H14.** Product research (price checking, comparing, reading reviews) is a factor in consumer purchase behavior
H2. Where one typically shops (in-store or online) impacts closeness of tracking	**H5.** Delivery time impacts customer satisfaction	**H8.** External circumstances impact order frequency		**H11.** Shipping charges impact consumer purchase behavior	**H13.** The rise in online shopping impacts demographics differently	**H15.** Regardless of demographics, consumers engage in product research
H3. The ability to track improves customer satisfaction	**H6.** Delivery time is not influenced by gender					**H16.** Consumers require up-to-date information when researching product

Figure 1: Table of Hypotheses per Multichannel Supply Chain Aspect

Topics/ Aspects	Hypotheses	Analyzed Data
Tracking	H1. Order frequency impacts closeness of tracking	Questions 5, 6, and 12
	H2. Where one typically shops (in-store or online) impacts closeness of tracking	Questions 12 and 31
	H3. The ability to track improves customer satisfaction	Questions 12 and 43
Delivery Times	H4. The number of purchases made influences satisfaction with delivery time	Questions 6,7, 43, and 44
	H5. Delivery time impacts customer satisfaction	Questions 43, 44
	H6. Delivery time is not influenced by gender	Questions 1, 7, 43, 44
Order Frequency	H7. Order frequency is impacted by demographics	Questions 1, 2, 4, 6
	H8. External circumstances impact order frequency	Questions 2, 4, 5, 26
Delivery Options	H9. Consumers are satisfied with multiple delivery options	Questions 29, 43
Shipping Costs	H10. Regardless of demographics, consumers expect free shipping	Questions 1, 2, 4, 17, 21, and 28
	H11. Shipping charges impact consumer purchase behavior	Questions 1, 5, 6, 17, 21, 25, 28, 31, and 32
B&M vs. Online Shopping	H12. Perceived total value received will determine where consumers place an order (in-store or online)	Questions 1, 9, 21, 24, 25, 28, and 31
	H13. The rise in online shopping impacts demographics differently	Questions 1, 2, 4, 26, 32
Product Research	H14. Product research (price checking, comparing, reading reviews) is a factor in consumer purchase behavior	Questions 21, 24, 25, 28, and 31
	H15. Regardless of demographics, consumers engage in product research	Questions 1, 24, ,25
	H16. Consumers require up-to-date information when researching product	Questions 5, 6, 24, and 25

Figure 2: Questions Used to Evaluate Each Hypothesis per Multichannel Supply Chain Aspect

5. Model and Analysis

This section will explain the analyses performed in this study, then discuss the results of the analyses. The next section will use the information from this section to draw conclusions as to how consumer behaviors identified impact the supply chain.

The hypotheses were evaluated by non-parametric chi-square tests using the analyzed data listed in Figure 2. Before any analyses were performed, the data was treated and cleaned through the following steps: (1) data was exported from Qualtrics to Excel; (2) SCM Alumni Jenna Turley deleted participants from the data set who met certain “disqualifiers” (as expressed above), survey questions were selected to be used in analysis due to scope (as expressed above); the questions were coded using numerical values.

When the survey responses were downloaded from Qualtrics it came in the form of nominal, ordinal, and interval data. That is the participants answer choices used either nominal, ordinal, or interval data. To prepare the data for analysis, each answer response was coded on a numerical scale. When analyzing the results that used nominal data, the numerical label assigned to the variables needed to be recognized since the number does not provide any quantitative value. When analyzing the results that used ordinal data, such as responses that follow the five point Likert scale, the numerical value assigned matched the value in the Likert scale (ex. The first answer option is the first point on the Likert scale, the second answer option is the second point on the Likert scale and so on). While the intervals between the points are not well defined, for the demands of this analysis they were assigned numerical values. When coding responses that were interval data, the value that falls in the middle of the interval was used (ex. The value 21 was coded for the age range 18-24 since it is the mid-point of the interval).

Once the data was properly coded, the analyses to identify consumer behaviors were performed. Since the survey consisted of multiple conditional or if/then questions, each participant did not respond to the same number of questions, nor responded to the entire question set. Due to the fact that the data does not fit a normal distribution and the presence of nominal, ordinal, and interval data, non-parametric analyses were used throughout this analysis.

In this study of consumer behavior and its impact on the supply chain, chi-square test, Marascuilo procedure, and Spearman correlation coefficient were used to identify consumer behaviors with the current multichannel supply chain processes. The chi-square tests were used to evaluate the hypotheses created, just as in Olivieri (2019). The chi-square result will help define whether a hypothesis is fully, partially, or not supported. The chi-square test assess if there is a significant relationship between two variables. The survey questions represent the variables in the context of this study. The variables represent the untold consumer behavior, satisfaction, or perceptions with the respective aspect of the multichannel supply chain. Using the analyzed data or questions from Figure 2, chi-square tests were performed in Excel to identify significant differences between participant behaviors as they pertain to certain aspects of the multi-channel supply chain. In some cases, multiple chi-square tests were run to evaluate the hypotheses (see Appendix C for list of chi-square tests run per hypothesis). If the chi-square test was significant, meaning the p-value was less than or equal to 0.05, the same variables were used in the Marascuilo procedure.

The Marascuilo procedure gives the chi-square analysis more depth by identifying what variable or consumer behavior is driving the significant relationship between variables. Being able to tell which variable or consumer behavior drives significance enhances the knowledge gathered on consumer behavior, satisfaction, and perceptions with current multichannel supply chain processes. The Marascuilo procedure was performed on excel using the same variables that were used in the previous significant chi-square analysis. The results of this analysis with values less than or equal to 0.05 are significant.

This study also uses Spearman's correlation coefficient or Spearman's rho to measure the strength of association between two variables. In the context of this research, to identify the relationship between consumer behaviors that have the most impact on the multichannel supply chain. Spearman's rho was performed on MiniTab. The results of this analysis with values +/- 0.07 or greater are significant. This analysis was performed on all question pairs, regardless if other analyses were significant or not.

The discussion of the analysis results per hypotheses will be explained below. See Appendix D for a summary of chi-square test results; Appendix E for Marascuilo results; and Appendix F to view each chi-square analysis per topic and hypothesis.

5.1 Chi-square and Marascuilo Analysis

Hypothesis 1: Order frequency impacts closeness of tracking.

To evaluate this hypotheses two separate chi-square tests were performed. The first chi-square analysis was between questions 5 and 12, then 6 and 12. Variable 1 or question 5 is "Have you made an online purchase in the last month?" Variable 2 or question 12 is "Did you track your shipment closely?" The chi-square results were not significant. Since there is no significant difference between placing an order within the past month and tracking a shipment closely. The variables for the second chi-square test are question 6, "How many purchases do you typically make online in a month?" and question 12. The chi-square value is not significant with a p-value of 0.632. There is not a significant difference between tracking shipment closely and number of purchases made in a month. Therefore, the recency of an online purchase and the number of purchases a consumer typically makes in a month does not impact whether a purchase is tracked closely. Since both chi-square tests are not significant, the hypothesis was not supported (Figure 3).

Hypothesis 2: Where one typically shops (in-store or online) impacts closeness of tracking.

The relationship between estimated ratio of in-store purchasing versus online shopping (question 31) and whether one track their shipment closely (question 12) are used to evaluate this hypothesis. The relationship is significant with a chi-square p-value of 0.008. Since the chi-square test is significant the Marascuilo procedure was performed to identify the cause of significance. The chi-square test significance means the ratio of in-store vs online shopping impacts tracking behavior. The Marascuilo analysis goes on to say there is statistical significance that all consumers, regardless of their ratio of in-store to online purchasing, tend to track their orders closely. Hypotheses 2 is fully supported (Figure 3).

Hypothesis 3: The ability to track improves customer satisfaction.

The two variables used to evaluate this hypothesis through the use of the chi-square tests are: questions 12 "Did you track your shipment closely?" and question 43 "How satisfied were you with the time it took to receive your order?" The significant chi-square analysis means there is a significant difference between tracking a shipment closely and satisfaction with delivery time. While it is now stated that tracking delivery time satisfaction and the ability to track may be linked. The post hoc analysis adds in that it is statistically significant that consumers who are extremely satisfied with delivery time track their order closely. Hypotheses 3 is fully supported (Figure 3).

View Appendix F to see other relationships analyzed within the "Tracking" topic.

Hypothesis 4: The number of purchases made influences delivery time.

The three chi-square tests performed to evaluate this hypothesis were significant. Variable 6 "How many purchases do you typically make online in a month?" is significantly different with questions 43 satisfaction with delivery time of most recent purchase. The number of purchases typically made impacts consumer satisfaction with delivery time. Consumers who typically makes 4 or more purchases a month is statistically significant with consumers being extremely satisfied with delivery time. The

relationship between question 6 with question 44 and 7, the delivery time of ones most recent order and the delivery time of ones most recent online purchase, respectively, are significant. Delivery time impacts the number of purchases typically made in a month. Consumers that typically make two or more purchases a month is statistically significant with receiving two day shipping. There may be more significant insight concerning two day delivery due to this customer behaviors. Hypothesis 4 is fully supported (Figure 3).

Hypothesis 5: Delivery time impacts customer satisfaction.

The chi-square analysis used to analyze the relationship between questions 43, satisfaction with delivery time of recent order, and 44, delivery time of most recent order, is significant. Delivery time impacts customer satisfaction. It is statistically significant that consumers are extremely satisfied when delivery time is within 5-6 business days. Consumer satisfaction remains extremely satisfied when delivery time is less than 5-6 business days, since it is statistically significant that consumers are extremely satisfied with delivery time when it is between 2-4 business days. Hypothesis 5 is fully supported (Figure 3).

Hypothesis 6: Delivery time is not influenced by gender**.**

To evaluate this hypothesis, the relationship between gender and the following variables were assessed: question 44, delivery time of most recent order; question 7, delivery time of most recent online purchase; and question 43, satisfaction with delivery time of most recent order. Non-significant chi-square results for question pair 6 and 44, and pair 6 and 7 tell us that delivery time is independent of gender. However, there is a significant difference between gender and delivery time satisfaction. It is statistically significant that females are more frequently extremely satisfied with delivery time. While delivery time is independent of gender, genders have different purchase behaviors. Hypothesis 6 is partially supported (Figure 3).

Other relationships within the topic of Delivery Times were evaluated. While they do not pertain to any particular hypothesis, they provide more insight into consumer behavior. To view the discussion of the other analyses, see Appendix F.

Hypothesis 7: Order frequency is impacted by demographics.

The three chi-square tests to evaluate this hypothesis were significant. There is a significant difference between gender (question 1) and the average number of purchases made in a month (question 6). There is a significant difference between age (question 2) and the average number of purchases made online in a month (question 6). There is a significant difference between the average number of purchases made online in a month (question 6) and the location in which a consumer resides (question 4). The information presented by the chi-square and post hoc analysis are: the average number of purchases made is influenced by gender, as it is statistically significant that females typically make more than 5 purchases a month; order frequency differs per age group, as it is statistically significant that consumers within the age range of 25-64 typically make more than 5 purchases a month. Consumers 18-24 typically make between 0-1 purchases a month, and the average number of purchases made in a month is influenced by if a consumer lives in an urban, rural, or suburban location. It is statistically significant that consumers that live in urban and rural areas typically make more than five purchases. Hypothesis 7 is fully supported (Figure 3).

Hypothesis 8: External circumstances impact order frequency.

This hypothesis is partially supported (Figure 3). There is not a significant relationship between age (question 2) and the location type of consumer (question 4) with question 26, the frequency that external circumstances impact a consumers shopping behavior. Although, external circumstances occur across age all groups, and location does not impact the frequency that external circumstances impact a consumers shopping behavior, external circumstances impact the average number of online purchase made in a month. There is a significant difference between question 5 "Have you made an online purchase in the last month?" and question 26 "How often do external circumstances impact your shopping behavior? (Weather, illness, etc.)." There is statistical significance that consumers who have made an online purchase in the last month are frequently/sometimes impacted by external circumstances. Therefore, external circumstances push consumers to shop online.

Hypothesis 9: Consumers are satisfied with multiple shipping options.

Through chi-square analysis of questions 29 and 43, there is a significant difference between delivery time satisfaction and consumer satisfaction with multiple delivery methods. Delivery options impact consumer satisfaction. Consumers that are extremely satisfied with delivery time tend to be highly satisfied with retailers that offer multiple delivery options. Delivery options and delivery time are components of overall customer satisfaction with the multichannel supply chain. Hypothesis 9 is fully supported (Figure 3).

See Appendix F for other chi-square analysis that pertains to the topic of Delivery options.

Hypothesis 10: Regardless of demographics, consumers expect free shipping.

Generally, free shipping is expected regardless of location, gender, and age. There is not a significant difference between gender, location nor age and whether or not one received free shipping. However, free shipping has a different level of significance per age group. There is a statistical significance that consumers between ages of 18-24 receive free shipping more than older age groups. Consumers between the ages of 25-34 receive free shipping statistically significantly more than consumers 65 and older. Free shipping tends to be of importance to younger age groups. Through analysis for questions 4 and 21, deciding whether to abandon a purchase or wait to buy due to shipping costs is influenced by where one lives. There is statistical significance that consumers that reside in urban locations are more likely to abandon an online purchase to buy in-store or wait to buy due to shipping costs. Through chi-square and post hoc analysis of questions 1 and 21, shipping charges impact a genders purchase decision differently. It is statistically significant that females decide to abandon an online purchase to wait to buy or to buy in store due to shipping charges more so than males. Due to this mix significant and non-significant chi-square analyses, hypothesis 10 is partially supported (Figure 3).

Hypothesis 11: Shipping charges impact consumer purchase behavior.

Various chi-square analyses used to evaluate this hypothesis. Through analysis of the relationship between questions 21 and 28, consumers do not prefer shipping costs. There is no significant difference between the willingness to pay more to have goods delivered and abandoning an online purchase to buy in-store or wait to buy due to shipping costs. Shipping costs are only a factor in changing consumer purchase behavior since there is no significant difference between the willingness to pay more to have goods delivered and abandoning an online purchase to buy in-store or wait to buy due to shipping costs. The analysis goes on to identify that shipping costs may interrupt purchase behavior. Consumers that

have made a purchase in the last month (question 5) is statistically significant with those that decide to abandon an online purchase to buy in-store or wait to buy due to shipping costs (question 21). To support the claim that shipping costs are only a factor in consumer purchase behavior, through analysis of question 5 and 17, it is recognized that free shipping is independent of whether a purchase has been paid in the last month. However, there is statistical significance that consumers who typically make more than 0-1 purchases and having received free shipping for their most recent online order. Consumers tend to receive free shipping when they typically make more than 1 purchase online a month.

Shipping costs impact whether a purchase is made in-store or online. It is statistically significant that consumers that shop equally online and in store (question 31) tend to abandon an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar due to shipping charges (question 21). The more consumers shop in store, the more likely they are to abandon an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar due to shipping charges. Shipping costs and the point in which consumers choose to research an item prior to online purchase are components of consumer purchase behavior. Regardless of how much a consumer is willing to pay for convenience (question 28), the point in which they choose to research an item prior to online purchase does not change (question 25). While the price point in which consumers decide to research an item does not change regardless of how much they are willing to pay for shipping, shipping costs impacts purchase behavior in genders differently. It is statistically significant that female consumers (question 1) tend to abandon an online purchase to buy in-store or wait to buy due to shipping costs (question 21) more so than males. Through these analyses hypothesis 11 is partially supported (Figure 3).

<u>Hypothesis 12: Perceived total value received will determine where consumers place an order (in-store or online).</u>

Analysis of questions that pertain to the consumer purchase decision on whether to buy online or at a traditional brick and mortar has identified the following behaviors. Please refer to Appendix # to view the chi-square tests used to identify the following behaviors.

Shipping charges and perception of better value impact whether a purchase in made in store or online. Consumers that have abandoned an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar due to shipping charges, is statistically significant with the ability to price check / compare and read online reviews sometimes impacting consumer shopping behavior. Price checking is a factor in deciding where to purchase from (in store or online). Those who make between 25 and 50% of their purchases in store (or 75 to 50% online) tend to frequently make purchases online while standing in a store. Shipping costs impact whether a purchase is made in-store or online or at all. It is statistically significant that consumers that shop equally online and in store tend to abandon an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar due to shipping charges. The more consumers shop in store, the more likely they are to abandon an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar due to shipping charges. The ability to price check/compare prices/read online reviews impacts shopping behavior, both in store and online. Consumers whose shopping behavior sometimes or always involves product research while shopping in-store, tend to have a higher price point in which they typically choose to research an item online prior to making a purchase. Consumers are willing to pay more for an online purchase when performing product research in store. Consumers may prefer online shopping although delivery costs are incurred. Consumers who

purchase approximately 75% in store (25% online), tend to be willing to pay 0-<10% more for delivery. Hypothesis 12 is fully supported (Figure 3).

Hypothesis 13: The rise in online shopping impacts demographics differently.

The rise in online shopping impacts genders differently. It is statistically significant that females have been affected by the effect of the rise in online shopping more so than men. While age does not impact whether or not one has been affected by the effect of the rise in online shopping, location does. Consumers that reside in Rural locations have been affected by the effect of the rise in online shopping more so than consumers in Suburban and Urban locations. Hypothesis 13 is partially supported (Figure 3).

Hypothesis 14: Product research (price checking, comparing, reading reviews) is a factor in consumer purchase behavior.

The ability to price check/compare/read online reviews and shipping costs are factors in making a purchase. It is statistically significant that consumers who decide to abandon an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar store instead, typically choose to research an item(s) that are between $51 and $100 prior to making a purchase. The ability to price check/compare prices/read online reviews and shipping costs are factors in making a purchase. Consumers that frequently make purchases online while standing in a store are willing to pay 0-5% more for delivery. The ability to price check/compare prices/read online reviews impacts shopping behavior, both in store and online. Consumers that sometimes/frequently make online purchases while standing in a store tend to research all or most items before making a purchase regardless of price. Price checking impacts consumers' ratio of in-store purchasing vs online shopping. Those who make between 25 and 50% of their purchases in store (or 75 to 50% online) tend to frequently make purchases online while standing in a store. Consumers who typically shop 75% online frequently conduct product research while standing in store. Shipping charges and perception of better value impact a purchase decision. Consumers that have abandoned an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar store instead due to shipping charges, sometimes tend to look online and read reviews/check pricing while shopping in a store. Consumers search for value both in store and online. Hypothesis 14 is fully supported (Figure 3).

Hypothesis 15: Regardless of demographics, consumers engage in product research.

Price checking behaviors in store are independent of gender. There is not a significant difference between gender and the ability to price check / compare and read online reviews impacting ones shopping behavior while shopping in a brick-and-mortar store. The price point in which one typically chooses to research an online item prior to purchase is not impacted by gender. There is not a significant difference between gender and a price point where one typically chooses to research an item online prior to making a purchase. Hypothesis 15 is supported (Figure 3).

Hypothesis 16: Consumers require up-to-date information when researching product.

Product research is only one factor in consumer purchase behavior. Having made an online purchase within the last month is not impacted by the ability to price check/compare price/read reviews impacting ones behavior in-store. Whether one has made an online purchase in the last month does not impact the price point one typically chooses to research an online item prior to purchase. The ability to

conduct product research prior to making an online purchase does not impact the shopping behavior of consumers that typically make between 0-3 purchases a month. The ability to price check becomes of more importance as the number of purchases made increases. Hypothesis 16 is partially supported (Figure 3).

Tracking	Delivery Times	Order Frequency	Delivery Options	Shipping Costs	B&M vs Online	Product Research
H1. Order frequency impacts closeness of tracking **Not Supported**	H4. The number of purchases made influences satisfaction with delivery time **Fully Supported**	H7. Order frequency is impacted by demographics **Fully Supported**	H9. Consumers are satisfied with multiple shipping options **Fully Supported**	H10. Regardless of demographics, consumers expect free shipping **Partially Supported**	H12. Perceived total value received will determine where consumers place an order (in-store or online) **Fully Supported**	H14. Product research (price checking, comparing, reading reviews) is a factor in consumer purchase behavior **Fully Supported**
H2. Where one typically shops (in-store or online) impacts closeness of tracking **Fully Supported**	H5. Delivery time impacts customer satisfaction **Fully Supported**	H8. External circumstances impact order frequency **Partially Supported**		H11. Shipping charges impact consumer purchase behavior **Partially Supported**	H13. The rise in online shopping impacts demographics differently **Partially Supported**	H15. Regardless of demographics, consumers engage in product research **Fully Supported**
H3. The ability to track improves customer satisfaction **Fully Supported**	H6. Delivery time is not influenced by gender **Fully Supported**					H16. Consumers require up-to-date information when researching product **Fully Supported**

Figure 3: Hypothesis Status after Chi-square Analyses

5.2 Spearman's Rho

Refer to Appendix E to view results of the Spearman correlation coefficient or Spearman's rho. The r value of this analysis will fall between +/- 1. The farther r is away from 0, the stronger the relationship. If the correlation is negative, this implies a negative relationship (as one variable increases, the other decreases). A positive correlation implies that both variables move in the same direction. While many of the results may have been significant with a p-vale of 0.05 or less. Only three correlation values were worth mentioning.

Question 6 and 31 have a moderately positive correlation with a correlation value of 0.438. As the number of purchases one makes in a month changes, the ratio of in store versus online purchasing moves in the same direction. Question 7 and 43 have a moderately negative correlation with a correlation value of -0.534. The longer delivery time is, the less satisfied consumers are with delivery time. Question 7 and 44 have a strong positive correlation with a correlation value of 0.808. The participants who took the survey responded similarly to two separate questions regarding the delivery time of their most recent order, and most recent online order.

6. Results and Recommendations

By performing descriptive analyses that comprised of the chi-square test, the Marascuilo procedure, and Spearman's rho on the data gathered from the survey "Multichannel Supply Chains and the Effect on Customer Satisfaction," provides much of information on consumer behaviors, satisfaction, and perceptions with current multichannel supply chain processes. Now that there is a better understanding of customer behavior, satisfaction, and perceptions, that information can be used to identify their impacts on the supply chain. Improving ones multichannel supply chain based on feedback or in other words, enhancing supply chain responsiveness can help the supply chain become more efficient and effective thus being more agile to meet consumer demands.

The impacts to the supply chain based off of the consumers behaviors identified through the analyses above are: (1) there are aspects of the multichannel supply chain that consumers expect; (2) supply chains need to be flexible and responsive, by way of adequate management of relationships with multiple logistics providers, having multiple strategically placed fulfilment facilities, and having adequate management of ERP and front-end systems, and (3) attention should be paid to the gender orientation of the market.

The supply chain impacts will be discussed further using the customer behavior, satisfaction, and perceptions identified and the hypotheses evaluated in this study.

Tracking: Hypotheses 1-3

Consumers expect the ability to track their orders. Regardless of the recency of an online order and the number of purchases a consumer typically makes, consumers track their orders (Hypothesis 1). Regardless of their ratio of in-store to online purchasing, tend to track their orders closely (Hypothesis 2). Consumers that track their order closely tend to be extremely satisfied with delivery time (Hypothesis 3). Since consumers expect the ability to track regardless of their customer lifetime value and whether they are in store or online, supply chains need to have the resources and processes to support that ability.

If tracking is outsourced through the use of a logistics provider (such as FedEx, UPS, USPS etc.), adequate management of relationships with multiple logistics providers is needed to meet consumer expectations. From this analysis it is known that generally, no one gender can recall the specific Logistic Provider who serviced them (see appendix # other info that didn't fall under a hypothesis 'delivery times'). Therefore, customer satisfaction with delivery time reflects on the organization and its supply chain, not the logistics provider. Supply chains must ensure that logistics providers meet internal objectives set by the organization. Adequate management of relationships with logistics providers includes building strategic relationships. Leveraging ones relationship can lead to enhanced efficiencies, which can improve a supply chains ability to meet customer expectations and improve customer satisfaction.

If tracking is sourced internally, supply chain processes and resources will be required to meet consumer expectations. In addition to ensuring that delivery aspects meet organizational expectations, through

the use of scorecards or another management process, systems such as RFID and ERP systems will be necessary for proper management.

Delivery Times: Hypotheses 4-6

Delivery time impacts a customer's satisfaction with the organization/supply chain. Regardless of a customer location (urban, rural, or suburban) it is statistically significant that consumers are extremely satisfied when delivery time is within 5-6 business days (see appendix # "Delivery time", and Hypothesis 5). Consumer satisfaction remains extremely satisfied when delivery time is less than 5-6 business days. To meet consumer expectation, supply chain processes and systems, including front and back end, need to be efficient to meet delivery time expectations set by the consumer. Adequate management of ERP systems will be essential in meeting consumer delivery time expectations. Whether the logistics process is in or outsourced, it will be necessary for information to be shared to ensure customer expectations will be met. The ERP system also aids in the development of mitigation plan, if the original delivery plan is unable to be executed, an ERP system provides management with the information needed to redesign the delivery plan in a matter that still meets customer expectations.

Alongside using an ERP system to aid in mitigation development, having multiple fulfilment facilities adds to the flexibility and responsiveness of a supply chain. Multiple fulfilment facilities provide an organization with multiple solutions to meet consumer expectations. This in combination with the use of an ERP system will permit supply chains to be resilient and to continuously provide consistent service, which will result in high delivery time satisfaction.

A consumer's satisfaction with delivery time is influenced by the average number of purchases made in a month (Hypothesis 4), and a consumer's ratio of in-store vs online shopping (see appendix # "Delivery time"). Consumer satisfaction with delivery time is made up of more than one delivery experience. This enforces the statement that logistics processes undertaken by the supply chain need to be consistent. Each individual delivery time experience is taken into account when measuring a consumers overall satisfaction with an organization. Hypothesis 4 supports that proper management of logistic processes is required to meet customer expectations and improve customer satisfaction. Whether logistic processes are internal or external, adequate management is needed.

While delivery time is independent of gender, there is a significant difference between gender and delivery time satisfaction (Hypothesis 6). It is statistically significant that females tend to be extremely satisfied with delivery time more frequently than males. While delivery time is independent of gender, genders have different purchase experiences (Hypothesis 6). This idea is supported, since females tend to receive free shipping more so than men. For these reasons, supply chain may need to respond differently to meet consumer expectation in markets that are dominated by one gender. Acknowledging the gender orientation and being sure to incorporate those gender-specific values within a supply chains processes attributes to a supply chain responsiveness and may give ideas as to how processes can be improved to result in increased customer satisfaction.

Order Frequency: Hypotheses 7 and 8

Order frequency differs per gender, age group, and location (Hypothesis 7). Females tend to make more purchases than men. Consumers within the age range of 25-64 typically make more purchases than other age ranges. Consumers that live in urban and rural areas typically make more purchases than

suburban locations. Supply chain implications include paying attention to the gender orientation of the market, and improving supply chain flexibility through utilization of multiple strategically placed fulfillment facilities.

It has already been established that genders have difference purchase experiences, therefore consumer expectations may differ per gender and the supply chain efforts to meet consumer expectations may differ per gender. A supply chain is at an advantage if it is able to identify consumers' needs and meet them. This is especially important when a market is dominated by a certain gender. Giving some importance to the gender orientation of a market can uncover areas of opportunities or identify competencies that an organization can use to divert uncertainty.

The strategic placement of multiple fulfillment facilities will enable a supply chain to service consumers and meet consumer delivery expectations regardless of their location. In this study, fulfilment facilities should be primary located in urban and rural locations since that it where most consumers reside. It may be the best use of resources to have fewer fulfilment facilities in suburban areas, where there is less demand. Looking at the distribution of where consumers reside can improve supply chain efficiency, resiliency, and responsiveness.

External circumstances impact the average number of online purchases made in a month (Hypothesis 8). External circumstances affect all age groups, and consumers in urban, suburban, and rural location types. External circumstances such as …, push consumers to shop online. External circumstances that impact shopping behavior can be unprecedented. A multichannel supply chain needs to ensure that the consumer has all the resources and accurate information they need to make a purchase decision. Adequate management of ERP and front-end systems are needed so consumers can shop online when something unexpected arises or they are unable to visit a brick and mortar. The ERP system will ensure that the consumer will have updated product information, which attributes to supply chain efficiency.

Delivery Options: Hypothesis 9

Delivery options impact consumer satisfaction. Consumers that are extremely satisfied with delivery time tend to be highly satisfied with retailers that offer multiple delivery options (Hypothesis 9). Therefore, delivery options and delivery time are components of overall customer satisfaction with the multichannel supply chain. The supply chain implication directly connects with the need for the management of relationships with multiple logistics providers and/or proper management of the resources and processes necessary for delivery, and the need for adequate management of ERP systems.

The management of multiple delivery options puts emphasis on relationship management and adequate use of ERP and front-end systems. If delivery is outsourced, the management of multiple delivery options and delivery time may not be totally under the supply chains control. Whether a supply chain decides its delivery options and delivery times or not, sufficient resources and management of relationships is essential to ensure internal goals and expectations are being met. Providing multiple delivery options requires will require that information be shared with the up- and downstream supply chain. To continue, the information provided to consumers, such as up to date information on product availability, estimated delivery times, shipping charges and more, and is imperative for the consumer to make the most educated purchase decision and improves supply chain effectiveness.

Shipping Costs: Hypotheses 10 and 11

Generally, free shipping is expected regardless of location, gender, and age (Hypothesis 10). While consumers do not prefer shipping costs, it are only a factor in consumer purchase behavior and does not definitively decide whether a consumer makes a purchase or not. Shipping costs and the point in which consumers choose to research an item prior to online purchase are components of consumer purchase behavior**.** While shipping costs may cause a consumer to hesitate when making a purchase, shipping costs do not mean a consumer will not make an order/purchase. There is statistical significance that consumers tend to receive free shipping when they typically make more than one purchase online a month.

Shipping costs impact whether a purchase in made in-store or online (Hypothesis 11). The more consumers shop in store, the more likely they are to abandon an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar due to shipping charges. Whether a consumer shops online or in-store is not influenced by age (Hypothesis 10). Hypothesis 10 also supports that consumers between ages of 18-24 receive free shipping more than older age groups. Consumers between the ages of 25-34 receive free shipping statistically significantly more than consumers 65 and older. Free shipping tends to be of importance to younger age groups that typically make more than one purchase a month.

By leveraging an organizations relationship with a logistics provider, shipping costs may be able to be decreased, removed, or absorbed. If a supply chain can eliminate the hesitation felt by consumers once they encounter shipping/delivery charges, it is an opportunity that should be taken into consideration. If delivery is in-house, improving the efficiencies throughout the supply chain, thus utilizing resources better and at a lower cost, may allow an organization to decrease or remove front-facing delivery/shipping charges.

Shipping costs impact purchase behavior of genders differently (Hypothesis 10, 11). It is statistically significant that female consumers (question 1) tend to abandon an online purchase to buy in-store or wait to buy due to shipping costs (question 21) more so than males. This information may be of more use to online/in-store organizations in markets that are more female oriented. Generally to meet customer expectations, consumers do not prefer shipping costs. However, shipping costs have more of an effect on the female purchase decision. Supply chains in these markets may make additional effort to absorb, decrease, or eliminate shipping costs.

Brick and Mortar versus Online Shopping: Hypotheses 12 and 13

Shipping charges and perception of better value impact whether a purchase in made in store or online (Hypothesis 12). Consumers that have abandoned an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar due to shipping charges, is statistically significant with the ability to price check / compare and read online reviews sometimes impacting consumer shopping behavior. Price checking is a factor in deciding whether to purchase in-store or online. The ability for consumers to engage in product research requires that the supply chain adequately manage ERP and front-end systems. Information needs to be shared with supply chain parties both up- and downstream. Not only to ensure the customer has the up to date information to make an informed purchase decision, but for a supply chain to manage their inventories and processes accordingly.

Frequency in which external circumstances impacts ones shopping behavior has not changed since the rise of online shopping. However, the rise in online shopping impacts genders differently. It is statistically significant that females have been affected by the effect of the rise in online shopping more so than men. Ratio of in-store versus online shopping and where one chooses to ship an online order is not influenced by gender. There are certain aspects of the multichannel supply chain that impact a female's purchase behavior more than males, such as increased sensitivity to shipping costs and the rise in online shopping. Due to the differences in expectations and purchase behaviors that genders have within multiple aspects of the supply chain, gender orientation of a supply chain can help develop supply chain processes to ensure that customer expectations can be met.

While age does not impact whether or not one has been affected by the effect of the rise in online shopping, location does. Consumers that reside in rural locations have been affected by the effect of the rise in online shopping more so than consumers in suburban and urban locations. Due to an increase in online demand in rural areas due to the rise of online shopping, it would be strategic for organizations to consider placing fulfilment facilities in rural locations. Decreasing the proximity between a fulfilment center and a consumer's home/business/ship-to-store/ship-to-pick-up point, increases the probability of meeting consumer expectations. Having multiple fulfilment centers improves a supply chains effectiveness and resiliency.

Product Research: Hypotheses 14-16

The ability to price check/compare/read online reviews and shipping costs are factors in making a purchase (Hypothesis 14, 16). The willingness to pay for shipping is independent of a price point typically chosen to research an item online prior to purchase. Consumers who typically shop 75% online, frequently conduct product research while standing in store (Hypothesis 14). Product research is only one factor in consumer purchase behavior. The ability to conduct product research becomes of more importance as the number of purchases made increases (Hypothesis 16).

The ability to price check/compare prices/read online reviews impacts shopping behavior, both in store and online. Consumers that sometimes/frequently make online purchases while standing in a store tend to research all or most items before making a purchase regardless of price. Finally, price checking behaviors in store and the price point in which one typically chooses to research an online item prior to purchase is not impacted by gender.

Adequate management of ERP and front-end systems is needed to provide consumers with the ability to conduct product research. The consumer purchase decision includes product price and shipping cost comparison, reading or watching reviews, and reading product descriptions/ingredients. If a supply chain fails to provide consumers with the resources necessary for accurate product research, the product or item sales may seem to differ extremely from forecasts. If a supply chain decides to alter forecasts based on those faulty sales, supply chain efficiency and effectiveness decreases.

7. Conclusions

Through descriptive analysis of the survey "Multichannel Supply Chains and the Effect on Customer Satisfaction," consumer behaviors, satisfaction, and perceptions with current multichannel processes were identified. The descriptive analyses performed consisted of the chi-square test, the Marascuilo

procedure, and Spearman's rho. After consumer behaviors were identified, their impacts to the supply chain and areas of opportunity were discussed.

Multichannel supply chains must focus on improving its flexibility, responsiveness, effectiveness and resiliency to meet customer expectations. There are processes that consumers come to expect, such as tracking; without these processes an organizations supply chain is at a disadvantage. Through the development of strategic relationships with multiple logistics providers, strategic placement of multiple fulfilment facilities, and adequate management of ERP and front-end systems a supply chain is more prepared to meet consumer expectations within the multichannel supply chain. Attention should also be paid to the gender orientation of the market the supply chain serves; as genders have different consumer purchasing behaviors.

The next steps for this study are to align the information found with what is in the literature and to analyze the remaining survey data, including descriptive analysis.

8. Acknowledgements

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Appendix A

Multichannel Supply Chains Survey

Start of Block: Default Question Block

Q45 Dear Participant: Researchers at Towson University (namely, Jenna Turley and Dr. Natalie Scala) are conducting a study to assess consumer satisfaction with multichannel supply chains, where customers are given multiple options of shopping in store, having items shipped to their homes, shipped to store, or shipped to "pickup points" like Amazon locker. The goal of this research is to better understand how customer satisfaction may be affecting the supply chain. We would like to ask for your participation in this study by completing a short survey. It is not necessary to answer every question, and you may discontinue your participation at any time. Your participation is voluntary, and your decision whether or not to participate will in no way affect your employment status. Your responses will be kept confidential, and any identifying information will be removed from the dataset. Neither anyone reading the results of the survey nor the researchers will be able to identify you. If you have any questions about the study, you may contact Dr. Natalie Scala at 410.704.2773 or nscala@towson.edu. You may also contact the Chairperson of the Towson University Institutional Review Board, Dr. Elizabeth Katz, at 410.704.3207. Sincerely, Jenna Turley and Dr. Natalie Scala
This research was reviewed by the Towson University Institutional Review Board.

- ○ Yes, I consent to taking the survey (1)
- ○ No, I decline the opportunity to take the survey (2)

Skip To: End of Survey If Dear Participant: Researchers at Towson University (namely, Jenna Turley and Dr. Natalie Scala)... = No, I decline the opportunity to take the survey

*Q1 With which gender do you identify?

- ○ Male (1)
- ○ Female (2)
- ○ Transgender (3)
- ○ Other (4)
- ○ Choose not to disclose (5)

---

*Q2 What is your age?

- ○ 18-24 (1)
- ○ 25-34 (2)
- ○ 35-44 (3)
- ○ 45-54 (4)
- ○ 55-64 (5)
- ○ 65+ (6)

---

*Q4 Do you live in an urban, suburban, or rural location?

- ○ Urban (city) (1)
- ○ Suburban (2)
- ○ Rural (3)

---

*Q5
Have you made an online purchase (purchased online and had goods delivered or picked up from store / pickup location) in the last month?

- ○ Yes (1)
- ○ No (2)
- ○ I don't recall (3)

Page Break

*Q6 How many purchases do you typically make online in a month?

- ○ 0-1 purchases (1)
- ○ 2-3 purchases (2)
- ○ 4-5 purchases (3)
- ○ More than 5 purchases (4)

---

*Q44 How long did it take you to receive your most recent order?

- ○ Same Day (1)
- ○ One Business Day (2)
- ○ Two Business Days (3)
- ○ Three or four Business Days (4)
- ○ Five or six Business Days (5)
- ○ Seven or more business days (6)

Page Break

*Q7
For the next set of questions, please consider the most recent purchase that you made online.

How long did it take you to receive your most recent order?

- ○ Same day (1)
- ○ One business day (2)
- ○ Two business days (3)
- ○ Three or four business days (4)
- ○ Five or six business days (5)
- ○ Seven or more business days (6)

---

*Q9 Did you choose a ship-to-home, ship-to-store, or a ship to pick-up-point (ex. Amazon locker) option?

- ○ Ship to Home/Business (1)
- ○ Ship to Store (2)
- ○ Ship to a Pick-up Point (ex. Amazon Locker) (3)

Page Break

Display This Question:

If Did you choose a ship-to-home, ship-to-store, or a ship to pick-up-point (ex. Amazon locker) option? = Ship to Store

Q8 Why did you choose to ship-to-store? (select all that apply)

- ☐ To avoid paying shipping costs (1)
- ☐ I received an additional discount (2)
- ☐ Convenience - I needed the item or items sooner (3)
- ☐ I wanted to pick up something additional at the store (4)
- ☐ Other, please specify (5) _____

Display This Question:

If Did you choose a ship-to-home, ship-to-store, or a ship to pick-up-point (ex. Amazon locker) option? = Ship to a Pick-up Point (ex. Amazon Locker)

Q9 Why did you choose to ship to a pick-up point? (select all that apply)

- ☐ Proximity to home or business (1)
- ☐ Security/Safety - I was worried an item may not be as secure if delivered to my home or business (2)
- ☐ I would not be home to sign for a delivery (3)
- ☐ Other, please specify (4) _____

Display This Question:

If Did you choose a ship-to-home, ship-to-store, or a ship to pick-up-point (ex. Amazon locker) option? = Ship to Home/Business

*Q10 Do you recall which logistics provider delivered your shipment?

- ○ USPS (1)
- ○ UPS (2)
- ○ FedEx (3)
- ○ Amazon (4)
- ○ DHL (5)
- ○ Other (6)
- ○ I do not recall (7)

Display This Question:

If Did you choose a ship-to-home, ship-to-store, or a ship to pick-up-point (ex. Amazon locker) option? = Ship to Home/Business

Q11 Were you overall satisfied with the logistics provider that delivered your shipment?

- ○ Extremely satisfied (1)
- ○ Somewhat satisfied (2)
- ○ Neither satisfied nor dissatisfied (3)
- ○ Somewhat dissatisfied (4)
- ○ Extremely dissatisfied (5)

Page Break

*Q12 Did you track your shipment closely?

- ○ Yes (1)
- ○ No (2)

Page Break

Display This Question:

If Did you track your shipment closely? = Yes

Q42 Did you notice any detours that seemed out of the norm? (For example: shipped from NY, went to a distribution California, then back across the country to be delivered in Maryland.)

- ○ Yes - I noticed this, but it did not impact the expected delivery date (1)
- ○ Yes - I noticed this, and delivery was delayed (2)
- ○ No - The path of my shipment made sense (3)

Page Break

Display This Question:

If Did you track your shipment closely? = Yes

Q14 How satisfied were you with the ability to track your shipment status?

- Extremely satisfied (1)
- Somewhat satisfied (2)
- Neither satisfied nor dissatisfied (3)
- Somewhat dissatisfied (4)
- Extremely dissatisfied (5)

Display This Question:

If Did you track your shipment closely? = Yes

Q15 Why were you satisfied or dissatisfied with the ability to track your shipment?

_____

Page Break

*Q43 How satisfied were you with the time it took to receive your order?

- ○ Extremely satisfied (1)
- ○ Somewhat satisfied (2)
- ○ Neither satisfied nor dissatisfied (3)
- ○ Somewhat dissatisfied (4)
- ○ Extremely dissatisfied (5)

Q44 Why were you satisfied or dissatisfied with the time it took to receive your order?

_____

Page Break

Q16 Were there any delays in receiving your order? (Select all that apply.)

- [ ] Yes, and these delays were due to a product being out of stock (1)
- [ ] Yes, and these delays were due to weather (2)
- [ ] Yes, and the reason for the delay was unknown (3)
- [ ] Yes, and these delays were due to other reasons specified here: (4) _____
- [ ] No (5)

*Q17 Did you receive free shipping (not incur an additional fee for this purchase)?

- ○ Yes (1)
- ○ No (2)

Page Break

Display This Question:

If Did you receive free shipping (not incur an additional fee for this purchase)? = Yes

Q18 Would you have purchased this item online even if you had to pay for shipping?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Did you receive free shipping (not incur an additional fee for this purchase)? = Yes

Q19 Was the free shipping the result of a paid membership plan? (For example, Amazon Prime)

- ○ Yes, Amazon Prime (1)
- ○ Yes, another membership plan (ex. Sam's Club, Costco, or other). Please specify plan (2) _____
- ○ No (3)

Display This Question:

If Did you receive free shipping (not incur an additional fee for this purchase)? = Yes

Q20 Was the free shipping a result of meeting a minimum order requirement? (For example, spend $50 and receive free shipping)

- ○ Yes (1)
- ○ No (2)

Page Break

*Q21
The next set of questions are about general shopping behaviors.

Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?

- ○ Yes, I have done this (1)
- ○ No, I have never done this (2)

Q22
Why would you choose to order online rather than shop at a brick-and-mortar (traditional) store? (Select all that apply)

- ☐ Convenience - I don't have to leave my home (1)
- ☐ Pricing - Price was lower online (2)
- ☐ I did not need the item immediately and could wait for it to be shipped (3)
- ☐ Item was not available in store/only available online (4)
- ☐ Other, please specify (5) _____
- ☐ I don't shop online / I prefer to shop in traditional brick-and-mortar stores (6)

Page Break

Q23
As online shopping has become more prevalent in consumer culture, have you noticed if your shopping behavior has changed? For example, choosing to have groceries delivered instead of shopping in store; choosing to set up “subscribe and save” options for common household items instead of going to a brick-and-mortar store on a routine basis, etc?

Please specify if and how your shopping behaviors have changed.
(Select all that apply.)

- [ ] My shopping behaviors have not changed (1)
- [ ] I have groceries delivered using services like PeaPod, Instacart, PrimeNow, etc. (2)
- [ ] I set up "subscribe and save" options for common household items (examples: cleaning supplies, diapers, etc.) (3)
- [ ] I use food delivery services like DoorDash, GrubHub, etc. to avoid going to brick-and-mortar restaurant locations (4)
- [ ] I use food prep services like Blue Apron, HelloFresh, etc. to avoid going to brick-and-mortar locations (5)
- [ ] Other (please specify) (6) _____

*Q24
Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?

- ○ Yes - I frequently make purchases online while standing in a store (1)
- ○ Sometimes - I will look online and read reviews/check pricing while shopping in a store (2)
- ○ Does not impact my shopping behavior in a store (3)

Page Break

*Q25 Is there a price point where you typically choose to research (price check, read reviews, etc.) of an item online prior to making a purchase?

- ○ More than $100 (1)
- ○ $51-$100 (2)
- ○ $0-$50 (3)
- ○ I research all or most items online before making a purchase regardless of price (4)
- ○ I never or very rarely research items online prior to making a purchase (5)

---

*Q26 How often do external circumstances impact your shopping behavior? (weather, illness, etc.)

- ○ Never (1)
- ○ Sometimes (2)
- ○ Frequently (3)

Page Break

Display This Question:

If How often do external circumstances impact your shopping behavior? (weather, illness, etc.) = Sometimes

Or How often do external circumstances impact your shopping behavior? (weather, illness, etc.) = Frequently

Q27 What are the external circumstances that impact your shopping behavior? (select all that apply)

- [ ] Bad weather (1)
- [ ] Illness (2)
- [ ] Having young children (3)
- [ ] Impaired mobility (4)
- [ ] Something else (please specify) (5)

_____

Page Break

*Q28 Are you willing to pay more for the convenience of having goods delivered? (for example, groceries) If so, how much?

- ○ Not willing to pay more for convenience (1)
- ○ 0-5% more (2)
- ○ more than 5% but less than 10% more (3)
- ○ 10% or greater more (4)

*Q29 On a scale of 1-5 (1-low satisfaction to 5 - high satisfaction), how satisfied are you with retailers that offer multiple methods to receive orders? (in-store, online & ship, online & pickup, etc.)

- ○ 1 (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4 (4)
- ○ 5 (5)

Q30 Please explain your satisfaction with retailers that offer multiple methods to receive your orders (in store, online & ship, online & pick up in store, etc.):

_____

Page Break

*Q31 What is your estimated ratio of in-store purchasing vs. online shopping?

- ○ I do all of my purchasing in store (1)
- ○ approximately 75% in store (2)
- ○ approximately 50% in store (3)
- ○ approximately 25% in store (4)
- ○ I do all of my purchasing online (5)

---

*Q32
As online shopping continues to grow in popularity and in store sales decline, retailers will continue to have to make changes to their operations, which may include closure of expensive traditional brick-and-mortar locations. Have you been affected by this effect of the rise in online shopping?

- ○ Yes (1)
- ○ No (2)
- ○ Unsure (3)

Page Break

Display This Question:

If As online shopping continues to grow in popularity and in store sales decline, retailers will con... = Yes

Or As online shopping continues to grow in popularity and in store sales decline, retailers will con... = Unsure

Q33 Please describe why and how the closure of brick and mortar store locations has affected you:

_____

Page Break

Display This Question:

If As online shopping continues to grow in popularity and in store sales decline, retailers will con... = Yes

Or As online shopping continues to grow in popularity and in store sales decline, retailers will con... = Unsure

Q34 On a scale of 1-5 (1 = low satisfaction to 5 = high satisfaction) how has this impacted your customer satisfaction with the retailers that have made this change?

- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)

Display This Question:

If As online shopping continues to grow in popularity and in store sales decline, retailers will con... = Yes

Or As online shopping continues to grow in popularity and in store sales decline, retailers will con... = Unsure

Q35 Please describe the impact on your satisfaction as a customer:

_____

_____

_____

_____

_____

Page Break

Q36 Do you have any additional comments?

_____

Page Break

Q37 Are you an undergraduate student who was offered course credit upon survey completion?

- ○ Yes (1)
- ○ No (2)

Page Break

Display This Question:

If Are you an undergraduate student who was offered course credit upon survey completion? = Yes

Q38 Please provide your name to earn credit in your class.

_____

Display This Question:

If Are you an undergraduate student who was offered course credit upon survey completion? = Yes

Q39 Please provide your student e-mail address to verify your class enrollment.

_____

Display This Question:

If Are you an undergraduate student who was offered course credit upon survey completion? = Yes

Q40 Please indicate your course.

_____

End of Block: Default Question Block

Appendix B

Cleansing Survey Data: Number of Respondents Deleted per Disqualifier

Total Survey Respondents	**986**
Disqualifiers	**Number of Survey Respondents Deleted**
Survey taken in 3 minutes or less	43
Survey not completed	60
No survey questions answered	2
No participant consent	1
Total number of Respondents Deleted	106
Total Valid Survey Respondents	**880**

Appendix C

Additional Questions Used in Statistical Analysis of Data

Topics	Analyzed Data
Tracking	Question 1
Delivery Times	Questions 4, 5, 10, 17, and 31
Delivery Options	Questions 5 and 26

These questions from the survey were used in statistical analysis. However, these questions do not help evaluate the hypotheses created

Appendix D Chi Square Test Results

		1	2	4	5	6	7	9	10	12	17	21	24	25	26	28	29	31	32	43	44
With which gender do you identify?	1	P-Value *N*																			
What is your age?	2																				
Do you live in an urban, suburban, or rural location?	4																				
	N																				
Have you made an online purchase (purchased online and had goods delivered or picked up from store / pickup location) in the last month?	5																				
	N																				
How many purchases do you typically make online in a month?	6	0.000	0.000	0.002	0.000																
	N	*877*	*878*	*878*	*879*																
For the next set of questions, please consider the most recent purchase that you made online. How long did it take you to receive your most recent order?	7	0.479				0.000															
	N	*876*				*877*															
Did you choose a ship-to-home, ship-to-store, or a ship to pick-up-point (ex. Amazon locker) option?	9	0.529																			
	N	*872*																			
Do you recall which logistics provider delivered your shipment?	10	0.227																			
	N	*833*																			
Did you track your shipment closely?	12	0.236			0.752	0.632															
	N	*875*			*877*	*876*															
Did you receive free shipping (not incur an additional fee for this purchase)?	17	0.007	0.004	0.700	0.063	0.000															
	N	*875*	*876*	*876*	*877*	*876*															
Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	21	0.000	0.306	0.024	0.042																
	N	*876*	*877*	*877*	*878*																
Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?	24	0.100			0.358	0.001						0.000									
	N	*874*			*876*	*875*						*875*									
Is there a price point where you typically choose to research (price check, read reviews, etc.) of an item online prior to making a purchase?	25	0.279			0.009							0.000	0.000								
	N	*870*			*872*							*832*	*774*								

How often do external circumstances impact your shopping behavior? (weather, illness, etc.)	26	0.004	0.072	0.151	0.001																	
N		*877*	*824*	*878*	*879*																	
Are you willing to pay more for the convenience of having goods delivered? (for example, groceries) If so, how much?	28	0.232										0.281	0.007	0.909								
N		*876*										*876*	*865*	*770*								
On a scale of 1-5 (1-low satisfaction to 5 - high satisfaction), how satisfied are you with retailers that offer multiple methods to receive orders? (in-store, online & ship, online & pickup, etc.)	29		0.096	0.816																		
N			*860*	*860*																		
What is your estimated ratio of in-store purchasing vs. online shopping?	31	0.227								0.008		0.000	0.000			0.000						
N		*876*								*866*		*876*	*875*			*867*						
As online shopping continues to grow in popularity and in store sales decline, retailers will continue to have to make changes to their operations, which may include closure of expensive traditional brick-and-mortar locations. Have you been affected by this effect of the rise in online shopping?	32	0.001	0.409	0.008									0.078		0.154	0.011						
N		*875*	*876*	*876*									*874*		877	859						
How satisfied were you with the time it took to receive your order?	43	0.004		0.632	0.209	0.000	0.000			0.025							0.000	0.027				
N		*825*		*876*	*877*	*834*	*779*			*875*							*858*	876				
How long did it take you to receive your most recent order?	44	0.564				0.000														0.000		
N		*877*				*878*														*806*		

Appendix E

Marascuilo Procedure Results

Hypothesis 2: Where one typically shops (in-store or online) impacts closeness of tracking.

Q 12 v. 31

Observed Frequencies			
	Q12: Did you track your shipment closely?		
Q31: What is your estimated ratio of in-store purchasing vs. online shopping?	Yes	No	Total
approximately 25% in store	90	106	196
approximately 50% in store	154	156	310
approximately 75% in store	133	199	332
I do all of my purchasing in store	10	18	28
Total	387	479	866

Hypothesis 3: The ability to track improves customer satisfaction.

Q12 v. 43

Observed Frequencies

	Q 12: Did you track your shipment closely?		
Q43: How satisfied were you with the time it took to receive your order?	Yes	No	Total
Extremely satisfied	233*	330	563
Neither satisfied nor dissatisfied	23	27	50
Somewhat dissatisfied	23	19	42
Somewhat satisfied	115	105	220
Total	394	481	875

Hypothesis 4: The number of purchases made influences delivery time.

Q6 v. Q43

Observed Frequencies	
	Q6: How many purchases do you typically make online in a month?

Q43: How satisfied were you with the time it took to receive your order?	0-1 purchases	2-3 purchases	4-5 purchases	More than 5 purchases	Total
Extremely satisfied	94	201*	131*	137*	563
Neither satisfied nor dissatisfied	18	17	5	10	50
Somewhat satisfied	60	106	26	29	221
Total	172	324	162	176	834

Q6 v. Q44

Observed Frequencies					
	Q6: How many purchases do you typically make online in a month?				
Q44: How long did it take you to receive your most recent order?	0-1 purchases	2-3 purchases	4-5 purchases	More than 5 purchases	Total
Five or six Business Days	49	43	17	9	118
One Business Day	14	16	25	16	71
Three or four Business Days	66	101	40	28	235
Two Business Days	55	183*	90*	126*	454
Total	184	343	172	179	878

Q6 v. 7

Observed Frequencies					
	Q6: How many purchases do you typically make online in a month?				
Q7: Please consider the most recent purchase that you made online. How long did it take you to receive your most recent order?	0-1 purchases	2-3 purchases	4-5 purchases	More than 5 purchases	Total
Five or six business days	55	45	17	9	126
One business day	16	22	32	27	97
Three or four business days	58	89	36	22	205
Two business days	55	187*	87*	120*	449
Total	184	343	172	178	877

Hypothesis 5: Delivery time impacts customer satisfaction.

Q44 V. 43

Observed Frequencies					
	Q44: How long did it take you to receive your most recent order?				
Q43: How satisfied were you with the time it took to receive your order?	Five or six Business Days	Seven or more business days	Three or four Business Days	Two Business Days	Total
Extremely satisfied	20*	6	108*	365*	499
Neither satisfied nor dissatisfied	18	8	16	7	49
Somewhat dissatisfied	11	12	13	6	42
Somewhat satisfied	35	7	97	77	216
Total	84	33	234	455	806

Hypothesis 6: Delivery time is not influenced by gender.

Q1 v. 43

Observed Frequencies			
	Q1: With which gender do you identify?		
Q43: How satisfied were you with the time it took to receive your order?	Female	Male	Total
Extremely satisfied	483*	79	562
Somewhat dissatisfied	35	7	42
Somewhat satisfied	168	53	221
Total	686	139	825

Q1 v. 17

Observed Frequencies			
	Q1: With which gender do you identify?		
Q17: Did you track your shipment closely?	Female	Male	Total
No	128*	39	167
Yes	604	104	708
Total	732	143	875

Q5 v. 6

Observed Frequencies			
	Q5: Have you made an online purchase in the last month?		
Q6: How many purchases do you typically make online in a month?	No	Yes	Total
0-1 purchases	45	140	185
2-3 purchases	19	324	343
4-5 purchases	6	166	172
More than 5 purchases	9	170*	179
Total	79	800	879

Q31 v 43

Observed Frequencies				
	Q43: How satisfied were you with the time it took to receive your order?			
Q31: What is your estimated ratio of in-store purchasing vs. online shopping?	Extremely satisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Total
approximately 25% in store	153*	9	39	201
approximately 50% in store	197	14	78	289
approximately 75% in store	214	26	103	343
Total	564	49	220	833

Q7 v. 43

Observed Frequencies					
	Q7: Please consider the most recent purchase that you made online. How long did it take you to receive your most recent order?				
Q43: How satisfied were you with the time it took to receive your order?	Five or six business days	Seven or more business days	Three or four business days	Two business days	Total
Neither satisfied nor dissatisfied	16	9	15	9	49
Somewhat	14	14	7	7	42

dissatisfied					
Somewhat satisfied	59	13	182	434	688
Total	89	36	204	450	779

Hypothesis 7: Order frequency is impacted by demographics.

Q1 v. 6

Observed Frequencies			
	Q1: With which gender do you identify?		
Q6: How many purchases do you typically make online in a month?	Female	Male	Total
0-1 purchases	134	49	183
2-3 purchases	283	60	343
4-5 purchases	154	18	172
More than 5 purchases	163*	16	179
Total	734	143	877

Q2 v 6

Observed Frequencies							
	Q2: What is your age?						
Q6: How many purchases do you typically make online in a month?	18-24	25-34	35-44	45-54	55-64	65+	Total
0-1 purchases	66*	30	19	21	27	22	185
2-3 purchases	90	93	68	41	30	20	342
4-5 purchases	28	41	41	28	25	9	172
More than 5 purchases	15	66*	64*	19*	9*	6	179
Total	199	230	192	109	91	57	878

Q4 v. 6

Observed Frequencies	
	Q4: Do you live in an urban, suburban, or rural location?

Q26: How often do external circumstances impact your shopping behavior? (weather, illness, etc.)	Rural	Suburban	Urban (city)	Total
0-1 purchases	26	107	52	185
2-3 purchases	48	236	58	342
4-5 purchases	20	126	26	172
More than 5 purchases	20*	137	22*	179
Total	114	606	158	878

Hypothesis 8: External circumstances impact order frequency.

Q5 v. 26

Observed Frequencies			
	Q5: Have you made an online purchase (purchased online and had goods delivered or picked up from store / pickup location) in the last month?		
Q26: How often do external circumstances impact your shopping behavior? (Weather, illness, etc.)	Yes	No	Total
Frequently	100*	5	105
Never	161	30	191
Sometimes	539*	44	583
Total	800	79	879

Hypothesis 9: Consumers are satisfied with multiple shipping options.

Q29 v. 43

Observed Frequencies	
	Q43: How satisfied were you with the time it took to receive your order?

Q29: On a scale of 1-5 (1-low satisfaction to 5 - high satisfaction), how satisfied are you with retailers that offer multiple methods to receive orders? (In-store, online & ship, online & pickup, etc.)	Extremely satisfied	Neither satisfied nor dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Total
3	68	12	5	49	134
4	143	15	18	71	247
5	342*	21	18	96	477
Total	553	48	41	216	858

Q5 v. 26

Observed Frequencies			
	Q5: Have you made an online purchase (purchased online and had goods delivered or picked up from store / pickup location) in the last month?		
Q26: How often do external circumstances impact your shopping behavior? (Weather, illness, etc.)	Yes	No	Total
Frequently	100*	5	105
Never	161	30	191
Sometimes	539*	44	583
Total	800	79	879

Hypothesis 10: Regardless of demographics, consumers expect free shipping.

Q2 v. 17

Observed Frequencies	
	Q2: What is your age?

Q17: Did you receive free shipping (not incur an additional fee for this purchase)?	18-24	25-34	35-44	45-54	55-64	65+	Total
No	55	33	33	19	12	15	167
Yes	144*	196	160	90	78*	41	709
Total	199	229	193	109	90	56	876

Q4 v. 21

Observed Frequencies				
	Q4: Do you live in an urban, suburban, or rural location?			
Q21: Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	Rural	Suburban	Urban (city)	Total
No, I have never done this	11	66	29	106
Yes, I have done this	103	540	128*	771
Total	114	606	157	877

Q1 v. 21

Observed Frequencies			
	Q1: With which gender do you identify?		
Q21: Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	Female	Male	Total
No, I have never done this	73	32	105
Yes, I have done this	661*	110	771
Total	734	142	876

Hypothesis 11: Shipping charges impact consumer purchase behavior.

Q5 v. 21

Observed Frequencies

	Q5: Have you made an online purchase in the last month?		
Q21: Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	**No**	**Yes**	Total
No, I have never done this	15	91	106
Yes, I have done this	63	709*	772
Total	78	800	878

Q6 v. 17

Observed Frequencies					
	Q6: How many purchases do you typically make online in a month?				
Q17: Did you receive free shipping (not incur an additional fee for this purchase)?	0-1 purchases	2-3 purchases	4-5 purchases	More than 5 purchases	Total
No	58	65	22	22	167
Yes	126	277*	149*	157*	709
Total	184	342	171	179	876

Q1 v. 21

Observed Frequencies			
	Q1: With which gender do you identify?		
Q21: Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	Female	Male	Total
No, I have never done this	73	32	105
Yes, I have done this	661*	110	771
Total	734	142	876

Q21 v. 31

Observed Frequencies

	Q21: Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?		
Q31: What is your estimated ratio of in-store purchasing vs. online shopping?	No, I have never done this	Yes, I have done this	Total
approximately 25% in store	31	174	205
approximately 50% in store	21	288*	309
approximately 75% in store	45	289	334
I do all of my purchasing in store	9	20	29
Total	106	771	877

Hypothesis 12: Perceived total value received will determine where consumers place an order (in-store or online).

Q21 v. 24

Observed Frequencies			
	Q21: Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?		
Q24: Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?	No, I have never done this	Yes, I have done this	Total
Does not impact my shopping behavior in a store	49	193	242
Sometimes - I will look online and read reviews/check pricing while shopping in a store	43	466*	509
Yes - I frequently make purchases online while standing in a store	13	111	124
Total	105	770	875

Q21 v. 31

Observed Frequencies	
	Q21: Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur

	shipping charges?		
Q31: What is your estimated ratio of in-store purchasing vs. online shopping?	No, I have never done this	Yes, I have done this	Total
approximately 25% in store	31	174	205
approximately 50% in store	21	288*	309
approximately 75% in store	45	289	334
I do all of my purchasing in store	9	20	29
Total	106	771	877

Q24 v. 25

Observed Frequencies				
	Q24: Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?			
Q25: Is there a price point where you typically choose to research (price check, read reviews, etc.) of an item online prior to making a purchase?	Does not impact my shopping behavior in a store	Sometimes - I will look online and read reviews/check pricing while shopping in a store	Yes - I frequently make purchases online while standing in a store	Total
$51-$100	37	93	28	158
I research all or most items online before making a purchase regardless of price	83	289	81	453
More than $100	71	79*	13*	163
Total	191	461	122	774

Q24 v. 31

Observed Frequencies	
	Q24: Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?

Q31: What is your estimated ratio of in-store purchasing vs. online shopping?	Does not impact my shopping behavior in a store	Sometimes - I will look online and read reviews/check pricing while shopping in a store	Yes - I frequently make purchases online while standing in a store	Total
approximately 25% in store	52	108	45*	205
approximately 50% in store	74	183	51*	308
approximately 75% in store	115	219	28	362
Total	241	510	124	875

Q28 v. 31

Observed Frequencies				
	Q28: Are you willing to pay more for the convenience of having goods delivered? (for example, groceries) If so, how much?			
Q31: What is your estimated ratio of in-store purchasing vs. online shopping?	0-5% more	More than 5% but less than 10% more	Not willing to pay more for convenience	Total
approximately 25% in store	122	28	52	202
approximately 50% in store	175	28	102	305
approximately 75% in store	154*	24*	182	360
Total	451	80	336	867

Hypothesis 13: The rise in online shopping impacts demographics differently.

Q1 v. 32

Observed Frequencies	
	Q1: With which gender do you identify?

Q32: As online shopping continues to grow in popularity and in store sales decline, retailers will continue to have to make changes to their operations, which may include closure of expensive traditional brick-and-mortar locations. Have you been affected by this effect of the rise in online shopping?	Female	Male	Total
No	232	67	299
Unsure	167	33	200
Yes	333*	43	376
Total	732	143	875

Q4 .v 32

Observed Frequencies				
	Q4: Do you live in an urban, suburban, or rural location?			
Q32: As online shopping continues to grow in popularity and in store sales decline, retailers will continue to have to make changes to their operations, which may include closure of expensive traditional brick-and-mortar locations. Have you been affected by this effect of the rise in online shopping?	Rural	Suburban	Urban (city)	Total
No	26	218	55	299
Unsure	23	133	44	200
Yes	65*	253	59	377
Total	114	604	158	876

Hypothesis 14: Product research (price checking, comparing, reading reviews) is a factor in consumer purchase behavior

Q21 v. 25

Observed Frequencies

	Q21: Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?		
Q25: Is there a price point where you typically choose to research (price check, read reviews, etc.) of an item online prior to making a purchase?	Yes, I have done this	No, I have never done this	Total
$51-$100	142*	17	17
I never or very rarely research items online prior to making a purchase	38	18	18
I research all or most items online before making a purchase regardless of price	413	40	40
More than $100	137	27	27
Total	730	102	102

Q24 v. 25

Observed Frequencies				
	Q24: Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?			
Q25: Is there a price point where you typically choose to research (price check, read reviews, etc.) of an item online prior to making a purchase?	Does not impact my shopping behavior in a store	Sometimes - I will look online and read reviews/check pricing while shopping in a store	Yes - I frequently make purchases online while standing in a store	Total
$51-$100	37	93	28	158
I research all or most items online before making a purchase regardless of price	83	289	81	453
More than $100	71	79*	13*	163
Total	191	461	122	774

Q24 v. 31

Observed Frequencies	
	Q24: Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?

Q31: What is your estimated ratio of in-store purchasing vs. online shopping?	Does not impact my shopping behavior in a store	Sometimes - I will look online and read reviews/check pricing while shopping in a store	Yes - I frequently make purchases online while standing in a store	Total
approximately 25% in store	52	108	45*	205
approximately 50% in store	74	183	51*	308
approximately 75% in store	115	219	28	362
Total	241	510	124	875

Q24 v. 28

Observed Frequencies				
	Q24: Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?			
Q28: Are you willing to pay more for the convenience of having goods delivered? (for example, groceries) If so, how much?	Does not impact my shopping behavior in a store	Sometimes - I will look online and read reviews/check pricing while shopping in a store	Yes - I frequently make purchases online while standing in a store	Total
0-5% more	108	270	73*	451
more than 5% but less than 10% more	21	45	14	80
Not willing to pay more for convenience	108	190	36	334
Total	237	505	123	865

Q21 v. 24

Observed Frequencies	
	Q21: Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?

Q24: Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?	No, I have never done this	Yes, I have done this	Total
Does not impact my shopping behavior in a store	49	193	242
Sometimes - I will look online and read reviews/check pricing while shopping in a store	43	466*	509
Yes - I frequently make purchases online while standing in a store	13	111	124
Total	105	770	875

Hypothesis 16: Consumers require up-to-date information when researching product.

Q6 v. 24

Observed Frequencies					
	Q6: How many purchases do you typically make online in a month?				
Q24: Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?	0-1 purchases	2-3 purchases	4-5 purchases	More than 5 purchases	Total
Does not impact my shopping behavior in a store	62*	98*	47	35	242
Sometimes - I will look online and read reviews/check pricing while shopping in a store	108	204	95	102	509
Yes - I frequently make purchases online while standing in a store	15	40	28	41	124
Total	185	342	170	178	875

Appendix F

Chi-square Analysis Results

Please refer to the following:

- Appendix F Tracking
- Appendix F Delivery Times
- Appendix F Order Frequency
- Appendix F Delivery Options
- Appendix F Shipping Costs
- Appendix F B&M versus Online Shopping
- Appendix F Product Research

Appendix F
Tracking

Group	Hypothesis	Q1		Q2		Result	Conclusion	Interpretation	Hypothesis Fully, Partially, or Not supported
TRACKING	Order frequency impacts closeness of tracking	5	Have you made an online purchase (purchased online and had goods delivered or picked up from store / pickup location) in the last month?	12	Did you track your shipment closely?	Not Significant	There is no significant difference between placing an order within the past month and tracking a shipment closely.	Recency of order does not affect tracking behaviors.	Not Supported
		6	How many purchases do you typically make online in a month?	12	Did you track your shipment closely?	Not Significant	There is not a significant difference between tracking shipment closely and number of purchases made in a month.	The number of purchases made does not impact whether a purchase is tracked closely	
	Where one typically shops (in-store or online) impacts closeness of tracking	12	Did you track your shipment closely?	31	What is your estimated ratio of in-store purchasing vs. online shopping?	Significant	There is a significant difference between tracking a shipment closely and ones ratio of in-store vs online purchasing.	The ratio of in-store vs online shopping impacts tracking behavior. In comparison between estimated ratios of in-store vs. online buying, there is statistical significance that consumers who do 75% of their purchasing in-store selected to track their orders more closely.	Fully Supported
	The ability to track improves customer satisfaction	12	Did you track your shipment closely?	43	How satisfied were you with the time it took to receive your order?	Significant	There is a significant difference between tracking a shipment closely and satisfaction with delivery time	Tracking delivery time satisfaction and the ability to track may be linked. It is statistically significant that consumers who are extremely satisfied with delivery time track their order closely.	Fully Supported
	Other	1	With which gender do you identify?	12	Did you track your shipment closely?	Not Significant	There is not a significant difference between gender and how closely a shipment is tracked.	Tracking an order closely is not impacted by gender.	

Appendix F
Delivery Time

Group	Hypothesis	Q1		Q2		Result	Conslusion	Interpretation	Hypothesis Fully, Partially, or Not supported
DELIVERY TIMES	The number of purchases made influences satisfaction with delivery time	6 How many purchases do you typically make online in a month?		43 How satisfied were you with the time it took to receive your order?		Significant	There is a significant difference between the number of purchases typically made in a month and satisfaction with delivery time	The number of purchases typically made impacts consumer satisfaction with delivery time. Consumers who typically makes 4 or more purchases a month is satistically significant with consumers being extremely satisfied with delivery time.	Fully Supported
		6 How many purchases do you typically make online in a month?		44 How long did it take you to receive your most recent order?		Significant	There is a significant difference between the number of purchases typically made in a month and the delivery time experienced.	. Delivery time is impacts the number of purchases typically made in a month. Consumers that typically make 2 or more purchases a month is statistically significant with receiving two day shipping. There may be more significant insight concerning two day delivery and customer behaviors.	
		6 How many purchases do you typically make online in a month?		7 Please consider the most recent purchase that you made online. How long did it take you to receive your most recent order?		Significant	There is a significant difference between average number of purchases made online in a month and delivery time of ones most recent order.		
	Delivery time impacts customer satisfaction	43 How satisfied were you with the time it took to receive your order?		44 How long did it take you to receive your most recent order?		Significant	There is a significant difference between delivery time and consumer satisfaction with delivery time.	Delivery time impacts customer satisfaction. It is statistically significant that consumers are extremely satisfied when delivery time is within 5-6 business days. Consumer satisfaction remains extremely satisfied when delivery time is less than 5-6 business days, since it is statistically significant that consumers are extremely satisfied with delivery time when it is between 2-4 business days.	Fully Supported
	Delivery time is not influenced by gender	1 With which gender do you identify?		44 How long did it take you to receive your most recent order?		Not Significant	There is no significant difference between gender and delivery time.	Delivery time is not influenced by gender.	Partially supported
		1 With which gender do you identify?		7 Please consider the most recent purchase that you made online. How long did it take you to receive your most recent order?		Not Significant	There is not a significant difference between time taken to receive most recent order and gender.	Delivery time is indepedent of gender	
		1 With which gender do you identify?		43 How satisfied were you with the time it took to receive your order?		Significant	There is a significant difference between gender and delivery time satisfaction.	Genders have different purchse behaviors. It is statistically significant that females are more frequently extremely satisfied with delivery time.	
		1 With which gender do you identify?		17 Did you receive free shipping (not incur an additional fee for this purchase)?		Significant	There is a significant difference between gender and receiving free shipping for a purchase.	Genders have different purchse behaviors. Females tend to receive free shipping.	
		1 With which gender do you identify?		10 Do you recall which logistics provider delivered your shipment?		Not Significant	There is not a significant difference between gender and ability to recall a shipments Logistics Provider	Generally, no one gender can recall the specific Logistic Provider who serviced them	

Appendix F
Delivery Time continued

	Other	5	Have you made an online purchase (purchased online and had goods delivered or picked up from store / pickup location) in the last month?	6	How many purchases do you typically make online in a month?	Significant	There is a significant difference between whether one has made an online purchase in the last month and average number of online purchases made in a month	Previous online purchase experience impacts the number of online purchases typically made. It is statistically significant that consumers who typically make more than 5 purchases a month, has made a purchase within the last month.	
		31	What is your estimated ratio of in-store purchasing vs. online shopping?	43	How satisfied were you with the time it took to receive your order?	Significant	There is a significant difference between the satisfaction with delivery time and estimated ratio on in-store purchasing vs online shopping.	Ratio of in-store vs online shopping influences satisfaction with delivery time. Consumers who purchase approximately 25% in-store are statistically significant with those that are extremely satisfied with delivery time. Can say with some confidence that consumers who primarily order online are generally satisfied with delivery time.	
		4	Do you live in an urban, suburban, or rural location?	43	How satisfied were you with the time it took to receive your order?	Not Significant	There is not a significant difference between delivery time satisfaction and the location that consumers reside	Delivery time satisfaction is not impacted by the location in which a consumer resides.	
		5	Have you made an online purchase (purchased online and had goods delivered or picked up from store / pickup location) in the last month?	43	How satisfied were you with the time it took to receive your order?	Not Significant	There is not a significant difference between making a purchase online within the last month and delivery time satisfaction	Satisfaction with delivery time is not impacted by whether one has made a purchase within the last month	
		7	Please consider the most recent purchase that you made online. How long did it take you to receive your most recent order?	43	How satisfied were you with the time it took to receive your order?	Significant	There is a significant difference between delivery time of ones most recent order and itself	Delivery time is important to the consumer. It is statistically significant that consumers are the most satisfied when delivery time of an online purchase is within two business days.	

Appendix F
Order Frequency

Group	Hypothesis	Q1		Q2		Result	Conslusion	Interpretation	Hypothesis Fully, Partially, or Not supported
ORDER FREQUENCY	Order frequency is impacted by demographics	1	With which gender do you identify?	6	How many purchases do you typically make online in a month?	Significant	There is a significant difference between gender and the average number of purchases made in a month	Average number of purchases made is influenced by gender. It is statistically significant that females typically make more than 5 purchases a month.	Fully supported
		2	What is your age?	6	How many purchases do you typically make online in a month?	Significant	There is a signifiacnt difference between age and the average number of purcahses made online in a month	Order frequency differs per age group. It is statistically significant that consmers within the age range of 25-64 typically make more than 5 purchases a month. Consumers 18-24 typically make between 0-1 purchases a month.	
		4	Do you live in an urban, suburban, or rural location?	6	How many purchases do you typically make online in a month?	Significant	There is a significant difference between the average number of purchases made online in a month and the location in which a consumer resides.	Average number of purchases made in a month is influenced by if a consumer lives in an urban, rural, or suburban location. Consumers that live in a urban and rural areas typically make more than five purchases.	
	External circumstances impact order frequency	2	What is your age?	26	How often do external circumstances impact your shopping behavior? (weather, illness, etc.)	Not Significant	There is not a significant difference between age and the frequency that external circumstances impact a consumers shopping behavior	External circumstances occur across age groups	Partially Supported
		4	Do you live in an urban, suburban, or rural location?	26	How often do external circumstances impact your shopping behavior? (weather, illness, etc.)	Not Significant	There is not a significant difference between the location a consumer resides and the frequency that external circumstances impact a consumers shopping behavior	Location does not impact the frequency that external circumstances impact a consumers shopping behavior	
		5	Have you made an online purchase (purchased online and had goods delivered or picked up from store / pickup location) in the last month?	26	How often do external circumstances impact your shopping behavior? (weather, illness, etc.)	Significant	There is a significant difference between whether one has made an online purchase in the past month and the frequency that external circumstances impact a consumers shopping behavior	External circumstances impact the average number of online purchase made in a month. There is statistical significant that consumers who have made an online purchase in the last month are frequently/sometimes impacted by external circumstances. Therefore, external circumstances push consumers to shop online.	

Appendix F
Delivery Options

Group	Hypothesis	Q1		Q2		Result	Conslusion	Interpretation	Hypothesis Fully, Partially, or Not supported
DELIVERY OPTIONS	Consumers are satisfied with multiple shipping options	29	On a scale of 1-5 (1-low satisfaction to 5 - high satisfaction), how satisfied are you with retailers that offer multiple methods to receive orders? (in-store, online & ship, online & pickup, etc.)	43	How satisfied were you with the time it took to receive your order?	Significant	There is a significant difference between delivery time satisfaction and consumer satisfaction with multiple delivery methods.	Delivery options impact consumer satisfaction. Consumers that are extremely satisfied with delivery time tend to be highly satisfied with retailers that offer multiple delivey options. Delivery options and delivery time are components of overall customer satisfaction with the multichannel supply chain.	Fully Supported
	Other	5	Have you made an online purchase (purchased online and had goods delivered or picked up from store / pickup location) in the last month?	26	How often do external circumstances impact your shopping behavior? (weather, illness, etc.)	Significant	There is a significant difference between making a purchase in the last month and external circumstances that impact ones shopping behavior	External circumstances impact purchase frequency. External circumstances impact the average number of online purchase made in a month. There is statistical significance that consumers who have made an online purchase in the last month are frequently/sometimes impacted by external circumstances. Therefore, external circumstances push consumers to shop online.	

Appendix F
Shipping Costs

Group	Hypothesis	Q1		Q2		Result	Conslusion	Interpretation	Hypothesis Fully, Partially, or Not supported
SHIPPING COSTS	Regardless of demographics, consumers expect free shipping	2	What is your age?	17	Did you receive free shipping (not incur an additional fee for this purchase)?	Significant	There is a significant difference between age and receiving free shipping for a purchase.	Free shipping has a different level of significance per age group. There is a statistical significance that consumers between ages of 18-24 recieve free shipping more than older age groups. Consumers between the ages of 25-34 recieve free shipping statistically significantly more than consumers 65 and older. Free shipping tends to be of importance to younger age groups.	Partially Supported
		2	What is your age?	21	Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	Not Significant	There is no significant difference between age and abandoning online purchase to buy in-store or wait to buy due to shipping costs.	There is not a significant change in behavior across age groups when one is deciding whether to abandon an online purcahse to wait to buy, or choose to visit a brick-and-mortar store instead due to shipping charges	
		4	Do you live in an urban, suburban, or rural location?	17	Did you receive free shipping (not incur an additional fee for this purchase)?	Not Significant	There is not a significant difference between the type of location one lives in and receiving free shipping for a purchase	Location does not impact whether one receives free shipping or not	
		4	Do you live in an urban, suburban, or rural location?	21	Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	Significant	There is significant difference between the type of location one resides and abandoning online purchase to buy in-store or wait to buy due to shipping costs.	Deciding whether to abandon a purchase or wait to buy due to shipping costs is influenced by where one lives. There is statistical significance that consumers that reside in urban locations are more likely to abandon n online purchase to buy in-store or wait to buy due to shipping costs.	
		1	With which gender do you identify?	28	Are you willing to pay more for the convenience of having goods delivered? (for example, groceries) If so, how much?	Not Significant	There is no significant differernce between gender and willingness to pay for delivery.	Willingness to pay for delivery is constant regardless of gender.	
		1	With which gender do you identify?	21	Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	Significant	There is a significant difference between gender and whether one decides to abandon an online purchase to wait to buy or to buy in store due to shipping charges.	Shipping charges impact a genders purchase decision differently. It is statistically significant that females decide to abandon an online purchase to wait to buy or to buy in store due to shipping charges moreso than males.	
		5	Have you made an online purchase (purchased online and had goods delivered or picked up from store / pickup location) in the last month?	17	Did you receive free shipping (not incur an additional fee for this purchase)?	Not Significant	There is no significant difference between receiving free shipping and having made a purchase in the last month	Free shipping is independent of whther one has made a purchase in the past month	
		5	Have you made an online purchase (purchased online and had goods delivered or picked up from store / pickup location) in the last month?	21	Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	Significant	There is a significant difference between having made an online purchase in the past month and abandoning online purchase to buy in-store or wait to buy due to shipping costs.	Shipping costs may inturrupt purchase behavior. Consumers that have made a purchase in the last month is statistically significant with those that decide to abandon an online purchase to buy in-store or wait to buy due to shipping costs.	

Appendix F
Shipping Costs continued

s	Shipping charges impact consumer purchase behavior	21	Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	28	Are you willing to pay more for the convenience of having goods delivered? (for example, groceries) If so, how much?	Not Significant	There is no significant difference between the willingness to pay more to have goods delivered and abandoning an online purchase to buy in-store or wait to buy due to shipping costs.	Shipping cost is not the only factor in changing purchase behavior	Partially Supported
		25	Is there a price point where you typically choose to research (price check, read reviews, etc.) of an item online prior to making a purchase?	28	Are you willing to pay more for the convenience of having goods delivered? (for example, groceries) If so, how much?	Not Significant	There is not a significant difference between the willingness to pay more for delivery and the price point one typically chooses to research an item online prior to making a purchase.	Regardless of how much a consumer is willing to pay for convenience, the point in which they choose to research an item prior to online purchase does not change. Shipping costs and the point in which they choose to research an item prior to online purchase are components of consumer purchase behavior.	
		6	How many purchases do you typically make online in a month?	17	Did you receive free shipping (not incur an additional fee for this purchase)?	Significant	There is a significant difference between receiving free shipping and the number of purchases one typically makes in a month.	The number of purhases made is impacted by free shipping. There is a statististical significance in consumers that typically make more than 0-1 purchases and having received free shipping for their most recent online order. Consumers typically receive free shipping when they make more than 1 purchase online.	
		1	With which gender do you identify?	21	Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	Significant	There is a significant difference between abandoning online purchase to buy in-store or wait to buy due to shipping costs and gender.	Shipping costs impacts purchase behavior in genders differently. It is statistically significant that female consumers tend to abandon an online purchase to buy in-store or wait to buy due to shipping costs moreso than males.	
		21	Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	28	Are you willing to pay more for the convenience of having goods delivered? (for example, groceries) If so, how much?	Not Significant	There is no significant behavior between willingness to pay to have goods delivered and abandoning an online purchase to buy in-store or wait to buy due to shipping costs and a price point where you typically choose to research an item online before making a purchase.	Consumers do not prefer shipping costs.	
		21	Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	31	What is your estimated ratio of in-store purchasing vs. online shopping?	Significant	There is a significant difference between ratio of in-store purchasing vs online shopping and abandoning an online purchase to buy in-store or wait to buy due to shipping costs.	Shipping costs impact whether a purchase is made in-store or online. It is statistically significant that consumers that shop equally online and in store tend to abandon an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar due to shipping charges. The more consumers shop instore, the more likely they are to abandon an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar due to shipping charges.	
	Other	1	With which gender do you identify?	31	What is your estimated ratio of in-store purchasing vs. online shopping?	Not Significant	There is not a significant differece between age and estimated ratio of in-store purchasing vs. online shopping.	Whether one shops online or in-store is not influenced by age	

Appendix F
Brick and Mortar versus Online Shopping

Group	Hypothesis	Q1		Q2		Result	Conslusion	Interpretation	Hypothesis Fully, Partially, or Not supported
B&M VS ONLINE SHOPPING	Perceived total value received will determine where consumers place an order (in-store or online)	21	Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	24	Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?	Significant	There is a significant difference between abandoning an online purchase to wait to buy or visit a B&M due to shipping charges and the ability to price check/compare prices/read online reviews to impact shopping behavior at a B&M	Shipping charges and perception of better value impact a purchase decision. Consumers that have abandoned an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar due to shipping charges, is statistically significant with the ability to price check / compare and read online reviews sometimes impacting consumer shopping behavior.	Fully Supported
		21	Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	31	What is your estimated ratio of in-store purchasing vs. online shopping?	Significant	There is a significant difference between ratio of in-store purchasing vs online shopping and abandoning an online purchase to wait to buy or visit a B&M due to shipping charges.	Shipping costs impact whether a purchase is made in-store or online or at all. It is statistically significant that consumers that shop equally online and in store tend to abandon an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar due to shipping charges. The more consumers shop instore, the more likey they are to abandon an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar due to shipping charges.	
		24	Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?	25	Is there a price point where you typically choose to research (price check, read reviews, etc.) of an item online prior to making a purchase?	Significant	There is a significant difference between the price point typically chosen to research an item online prior to making a purchase and the ability of price checking/comparing prices/reading reviews being able to impact ones shopping behavior in a B&M.	The abilty to price check/compare prices/read online reviews impacts shopping behavior, both in store and online. Consumers whos shopping behavior sometimes or always invloves product research while shopping in-store, tend to have a higher price point in which they typically choose to research an item online prior to making a purchase. Consumers are willing to pay more for an online purchase when performing product research instore.	
		24	Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?	31	What is your estimated ratio of in-store purchasing vs. online shopping?	Significant	There is a significant difference between the ratio of in-store purchasing vs online shopping and the ability of price checking/comparing prices/reading reviews being able to impact ones shopping behavior in a B&M	Price checking is a factor in deciding where to purchase from (in-sore or online). Those who make between 25 and 50% of their purchases in store (or 75 to 50% online) tend to frequently make purchases online while standing in a store.	
		28	Are you willing to pay more for the convenience of having goods delivered? (for example, groceries) If so, how much?	31	What is your estimated ratio of in-store purchasing vs. online shopping?	Significant	There is a significant difference between the ratio of in-store purchasing vs online shopping and the willingness to pay more for delivery.	Consumers may prefer online shopping although delivery costs are incurred. Consumers who purchase approximately 75% in store (25% online), tend to be willing to pay 0-<10% more for delivery.	
		1	With which gender do you identify?	32	As online shopping continues to grow in popularity and in store sales decline, retailers will continue to have to make changes to their operations, which may include closure of expensive traditional brick-and-mortar locations. Have you been affected by this effect of the rise in online shopping?	Significant	There is a significant difference between gender and having been affected by the effect of the rise in online shopping.	The rise in online shopping impacts genders differently. It is statistically significant that females have been affected by the effect of the rise in online shopping moreso than men.	

Appendix F
Brick and Mortar versus Online Shopping continued

	The rise in online shopping impacts demographics differently	2	What is your age?	32	As online shopping continues to grow in popularity and in store sales decline, retailers will continue to have to make changes to their operations, which may include closure of expensive traditional brick-and-mortar locations. Have you been affected by this effect of the rise in online shopping?	Not significant	There is not a significant difference between age and having been affected by the effect of the rise in online shopping.	Age does not impact whether or not one has been affected by the effect of the rise in online shopping	Partially Supported
		4	Do you live in an urban, suburban, or rural location?	32	As online shopping continues to grow in popularity and in store sales decline, retailers will continue to have to make changes to their operations, which may include closure of expensive traditional brick-and-mortar locations. Have you been affected by this effect of the rise in online shopping?	Significant	There is a significant difference between the type of location one resides (urban, suburban, rural) and having been affected by the effect of the rise in online shopping.	Location impacts the degree in which one has been affected by the effect of the rise in online shopping. Consumers that reside in Rual locations have been affected by the effect of the rise in online shopping more so than consumers in Suburban and Urban locations.	
	Other	1	With which gender do you identify?	31	What is your estimated ratio of in-store purchasing vs. online shopping?	Not significant	There is not a significant difference between gender and the ratio of in-store purchasing vs online shopping.	Ratio of in-store vs online shopping is not influenced by gender.	
		26	How often do external circumstances impact your shopping behavior? (weather, illness, etc.)	32	As online shopping continues to grow in popularity and in store sales decline, retailers will continue to have to make changes to their operations, which may include closure of expensive traditional brick-and-mortar locations. Have you been affected by this effect of the rise in online shopping?	Not significant	There is not a significant difference between the frequency in which external circumstances impacts ones shopping behavior and having been affected by the effect of the rise in online shopping.	Frequency in which external circumstances impacts ones shopping behavior has not changed since the rise of online shopping.	
		1	With which gender do you identify?	9	Did you choose a ship-to-home, ship-to-store, or a ship to pick-up-point (ex. Amazon locker) option?	Not significant	There is no significant difference between gender and whether one chose ship-to-home, ship-to-store, or ship to pick-up-point option.	Where one chooses to ship their order is not influenced by gender.	

Appendix F
Product Research

Group	Hypothesis	Q1		Q2		Result	Conslusion	Interpretation	Hypothesis Fully, Partially, or Not supported
online reviews	Product research (price checking, comparing, reading reviews) is a factor in consumer purchase behavior	21	Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	25	Is there a price point where you typically choose to research (price check, read reviews, etc.) of an item online prior to making a purchase?	Significant	There is a significant difference between the price point typically chosen to research an item online prior to making a purchase and abandoning an online purchase to wait to buy or visit a B&M due to shipping charges.	The ability to price check/compare/read online reviews and shipping costs are factors in making a purchase. It is statistically significant that consumers who decide to abandon an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar store instead, typically choose to research an item(s) that are between $51 and $100 prior to making a purchase	Fully Supported
		24	Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?	25	Is there a price point where you typically choose to research (price check, read reviews, etc.) of an item online prior to making a purchase?	Significant	There is a significant difference between the price point typically chosen to research an item online prior to making a purchase and the ability of price checking/comparing prices/reading reviews being able to impact ones shopping behavior in a B&M.	The abilty to price check/compare prices/read online reviews impacts shopping behavior, both in store and online. Consumers that sometimes/frequently make online purchases while standing in a store tend to research all or most items before making a purchase regardless of price.	
		24	Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?	31	What is your estimated ratio of in-store purchasing vs. online shopping?	Significant	There is a significant difference between the ratio of in-store purchasing vs online shopping and the ability of price checking/comparing prices/reading reviews being able to impact ones shopping behavior in a B&M	Price checking impacts consumers ratio of in-store purchasing vs online shopping. Those who make between 25 and 50% of their purchases in store (or 75 to 50% online) tend to frequently make purchases online while standing in a store.	
		24	Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?	28	Are you willing to pay more for the convenience of having goods delivered? (for example, groceries) If so, how much?	Significant	There is a significant difference between the willingness to pay more for delivery and the ability to price check/compare prices/read online reviews.	The ability to price check/compare prices/read online reviews and shipping costs are factors in making a purchase. Consumers that frequently make purchases online while standing in a store are willing to pay 0-5% more for delivery.	
		21	Do you ever shop online and abandon your purchase and decide to wait to buy, or choose to visit a brick-and-mortar (traditional) store instead, when you see that you will incur shipping charges?	24	Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?	Significant	There is a significant difference between abandoning an online purchase to wait to buy or visit a B&M due to shipping charges and the ability to price check/compare prices/read online reviews to impact shopping behavior at a B&M	Shipping charges and perception of better value impact a purchase decision. Consumers that have abandoned an online purchase and decide to wait to buy, or choose to visit a brick-and-mortar store instead due to shipping charges, sometimes tend to look online and read reviews/check pricing while shopping in a store. Consumers search for value both instore and online.	

Appendix F
Product Research continued

Ability to Price check/ Compare Prices/ Read	Regardless of demographics, consumers engage in product research	1	With which gender do you identify?	24	Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?	Not Significant	There is not a significant difference between gender and the ability to price check / compare and read online reviews impacting ones shopping behavior while shopping in a brick-and-mortar store.	Price checking behaviors in-store are independent of gender.	Fully Supported
		1	With which gender do you identify?	25	Is there a price point where you typically choose to research (price check, read reviews, etc.) of an item online prior to making a purchase?	Not Significant	There is not a significant difference between gender and a price point where one typically chooses to research an item online prior to making a purchase.	The price point in which one typically chooses to research an online item prior to purchase is not impacted by gender.	
	Consumers require up-to-date information when researching product	5	Have you made an online purchase (purchased online and had goods delivered or picked up from store / pickup location) in the last month?	24	Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?	Not Significant	There is not a significant difference between having made an online purchase in the last month and the ability to price check / compare and read online reviews impacting ones shopping behavior while shopping in a brick-and-mortar store.	Having made an online purchase within the last month is not impacted by the ability to price check/compare price/read reviews impacting ones behavior in-store.	Partially Supported
		6	How many purchases do you typically make online in a month?	24	Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?	Significant	There is a significant difference between the number of purchases one typically makes in a month and the ability to price check / compare and read online reviews impacting ones shopping behavior while shopping in a brick-and-mortar store.	The ability to conduct product research prior to making an online purchase does not impact the shopping behavior of consumers that typically make between 0-3 purchases a month.	
		5	Have you made an online purchase (purchased online and had goods delivered or picked up from store / pickup location) in the last month?	25	Is there a price point where you typically choose to research (price check, read reviews, etc.) of an item online prior to making a purchase?	Not Significant	There is not a significant difference between whether one has made an online purchase in the last month and a price point where one typically chooses to research an item online prior to making a purchase.	Whether one has made an online purchase in the last month does not impact the price point one typically chooses to research an online item prior to purchase.	
	Other	24	Does the ability to price check / compare and read online reviews impact your shopping behavior while shopping in a brick-and-mortar (traditional) store?	32	As online shopping continues to grow in popularity and in store sales decline, retailers will continue to have to make changes to their operations, which may include closure of expensive traditional brick-and-mortar locations. Have you been affected by this effect of the rise in online shopping?	Not significant	There is not a significant difference between the ability of price checking/comparing prices/reading reviews being able to impact ones shopping behavior in a B&M and having been affected by the rise in online shopping	The ability to price check/compare prices/read reviews has not been affected by the rise in online shopping.	

Appendix F
Product Research continued

		25	Is there a price point where you typically choose to research (price check, read reviews, etc.) of an item online prior to making a purchase?	28	Are you willing to pay more for the convenience of having goods delivered? (for example, groceries) If so, how much?	Not Significant	There is not a significant difference between the willingness to pay more for delivery and a price point where one typically chooses to research an item online prior to making a purchase.	The willingness to pay for shipping is independent of a price point typically chosen to research an item online prior to purchase. Product research occurs regardless of consumers' willingness to pay for shipping.	.

Appendix G
Final Spearman's Rho Results

Question #		1	2	4	5	6	7	9	10
1	Correlation Value								
	N								
2	Correlation Value	0 0.317							
	N	*879*							
4	Correlation Value	0 0.144	0 0.186						
	N	*879*	*878*						
5	Correlation Value	0.916 0.004	0.079 -0.059	0.534 0.021					
	N	*880*	*879*	*879*					
6	Correlation Value	0 0.159	0.067 0.062	0.034 0.072	0 0.204				
	N	*879*	*878*	*878*	*879*				
7	Correlation Value	0.962 0.002	0.269 -0.037	0.108 0.054	0.203 -0.043	0 -0.298			
	N	*878*	*877*	*877*	*878*	*877*			
9	Correlation Value	0.429 -0.027	0.99 0	0.387 0.029	0.427 0.027	0.299 -0.035	0.073 -0.061		
	N	*878*	*877*	*877*	*878*	*877*	*877*		
10	Correlation Value	0.394 -0.029	0.005 -0.097	0.053 -0.066	0.152 0.049	0.895 -0.005	0 -0.151	Unable to test. Useable N only chose "Ship to home"	
	N	*850*	*849*	*849*	*850*	*849*	*849*		
12	Correlation Value	0.181 -0.045	0 -0.199	0.144 -0.049	0.375 -0.03	0.348 -0.032	0.032 0.073	0.831 -0.007	0.009 -0.09
	N	*877*	*876*	*876*	*877*	*876*	*876*	*876*	*848*
17	Correlation Value	0.005 0.094	0.073 0.061	0.611 -0.017	0.507 0.022	0 0.168	0 -0.297	0.257 0.038	0.001 0.112
	N	*877*	*876*	*876*	*877*	*876*	*876*	*876*	*848*
21	Correlation Value	0 0.134	0.611 0.017	0.017 0.081	0.015 0.082	0.005 0.095	0.377 -0.03	0.331 -0.033	0.985 0.001
	N	*878*	*877*	*877*	*878*	*877*	*876*	*876*	*848*
24	Correlation Value	0.031 -0.073	0 -0.215	0.521 -0.022	0.081 0.059	0 0.144	0 -0.172	0.069 0.062	0.59 -0.019
	N	*876*	*875*	*875*	*876*	*875*	*874*	*874*	*848*
25	Correlation Value	0.996 0	0.332 -0.033	0.268 0.037	0.085 0.058	0.001 0.115	0.061 -0.064	0.689 0.014	0.55 -0.021
	N	*872*	*871*	*880*	*872*	*871*	*870*	*870*	*842*
26	Correlation Value	0.002 0.106	0.621 -0.017	0.066 -0.062	0 0.127	0.001 0.117	0.286 -0.036	0.499 -0.023	0.37 0.031
	N	*879*	*878*	*878*	*879*	*878*	*877*	*877*	*849*
28	Correlation Value	0.134 -0.051	0 -0.127	0.044 -0.068	0.063 0.063	0 0.182	0 -0.126	0.069 -0.062	0.155 0.049
	N	*877*	*876*	*876*	*877*	*876*	*875*	*875*	*847*
29	Correlation Value	0 0.144	0.02 0.078	0.776 0.01	0.038 0.07	0.001 0.116	0.002 -0.104	0.035 -0.071	0.396 0.029
	N	*878*	*877*	*877*	*878*	*877*	*876*	*876*	*848*
31	Correlation Value	0.154 -0.048	0.001 -0.117	0.012 -0.085	0 0.217	- **0.438**	0 -0.186	0.138 -0.05	0.282 0.037
	N	*878*	*877*	*877*	*878*	***877***	*876*	*876*	*848*
32	Correlation Value	0.014 0.083	0.772 -0.01	0.718 0.012	0.982 -0.001	0.842 -0.007	0.648 -0.015	0.827 0.007	0.651 -0.016
	N	*877*	876	*876*	877	876	875	875	847
43	Correlation Value	0.043 0.068	0.005 0.094	0.19 -0.044	0.198 0.043	0 0.201	**0** **-0.534**	0.568 -0.019	0 0.133
	N	*877*	*876*	*876*	*877*	*876*	***876***	*876*	*848*
44	Correlation Value	0.611 -0.017	0.004 -0.096	0.084 0.058	0.131 -0.051	0 -0.275	**0** **0.808**	0.414 -0.028	0 -0.146
	N	*879*	*878*	*878*	*879*	*878*	***878***	*878*	*850*

Appendix G
Final Spearman's Rho Results continued

12	17	21	24	25	26	28	29	31
0 -0.123 *875*								
0.042 -0.069 *875*	0.127 0.052 *876*							
0 0.121 *873*	0.08 0.059 *874*	0 0.128 *875*						
0.008 0.089 *869*	0.06 0.064 *870*	0.001 0.114 *871*	0 0.207 *869*					
0.126 -0.052 *880*	0.311 -0.034 *880*	0 0.177 *878*	0 0.125 *876*	0.318 0.034 *872*				
0.472 0.024 *874*	0.464 0.025 *875*	0.333 -0.033 *876*	0.007 0.092 *874*	0.245 0.039 *871*	0 0.151 *877*			
0.901 -0.004 *875*	0.058 0.064 *876*	0.042 0.069 *877*	0.167 0.047 *875*	0.011 0.086 *871*	0.081 0.059 *878*	0.02 0.078 *878*		
0.029 0.074 *875*	0.007 0.09 *876*	0.302 0.035 *877*	0 0.138 *875*	0 0.144 *872*	0 0.147 *878*	0 0.202 *876*	0.112 0.054 *877*	
0.307 0.035 874	0.536 -0.021 875	0.02 0.079 *876*	0.886 -0.005 874	0.555 0.02 870	0.317 0.034 877	0.058 0.064 875	0.351 0.032 876	0.008 -0.089 *876*
0.005 -0.095 *875*	0 0.214 *875*	0.536 0.021 *875*	0.003 0.1 *873*	0.157 0.048 *869*	0.882 0.005 *876*	0.091 0.057 *874*	0 0.163 *875*	0.001 0.116 *875*
0.018 0.08 *877*	0 -0.213 *877*	0.005 -0.095 *877*	0.011 -0.085 *875*	0.334 -0.033 *871*	0.978 -0.001 *878*	0.749 -0.011 *876*	0.06 -0.064 *877*	0 -0.15 *877*

Appendix G
Final Spearman's Rho Results continued

	32	43	44

0.017 -0.08 *874*		
0.885 0.005 *876*	0 -0.22 *877*	