Theory of Constraints & Consumer Behavior: A Comparative Analysis Between Developed & Advanced Developing Cultures

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This paper investigates a shift in consumer buying behavior because of the recent global pandemic in developing and developed consumer cultures by integrating Goldratt's Theory of Constraints (TOC) into buying cultures. TOC is the central theoretical framework behind this global catastrophe of product and labor shortages, hyperinflation, and transportation bottlenecks. This research attempts to connect TOC to paradigm shifts in consumer buying culture along with identifying possible solutions to this global phenomenon. The methodology we used to gather data includes a chain-referral sampling model distributed through social media. Findings conclude that emerging countries adjust more swiftly to constraints and had a lesser proclivity to modify purchasing habits because of a pandemic than developed economies, whose consumers suffer economic distress less frequently.

Keywords: buying preferences, TOC, buyer behavior, retail decision-making

INTRODUCTION

Consumer culture has been shifting over the last 20 years for various reasons (Arnould & Thompson, 2005). The recent COVID-19 pandemic accentuated this shift, altering purchasing patterns and preferences (Sheth, 2020). These shifts are still evident due to ongoing supply shortages and rising commodity prices. Similarly, social, health and economic trends also impacted the consumer's interaction with conventional, local retailers, and online enterprises (Morales, 2021). Featherstone (1990) states, "Consumer culture is a type of material culture aided by the market, which creates a unique interaction between the customer and the commodities or services he or she uses or consumes." The pandemic has severely impacted the economies of numerous nations and businesses, primarily due to the dramatic shift in consumer culture and purchase behavior (Vázquez-Martínez et al., 2021). Bracale & Vaccaro (2020) mention that many countries faced economic crises due to lockdown and government regulations. So, consumers were left only with the option of stockpiling and panic-buying everyday goods. While the government of more developed nations like the US was quick to make changes to their policies to mitigate the impact of COVID-19. Gallón (2022) claims that governments of developing nations such as Nicaragua were more focused on sustaining their economy because businesses were already struggling without a lockdown. Consolidating any employment sector might result in "an economic pandemic" (Gallón, 2022), and the addition of COVID-19 was seen as just another constraint to the economy. Hence, the government was not focused on mitigating the impact

of COVID-19. Nevertheless, both situations forced consumers to adapt to policy changes and change their consumption culture and patterns.

Regardless of economic system motility, according to a study by McKinsey (2020), the pandemic has altered consumer behavior in five ways: The first is the economic effect. Consumers with less disposable income prefer to spend more on necessities. As a result, grocery traffic is increasing. Second, the pandemic forces individuals to remain at home. As a result, individuals spend more time watching TV and surfing the Internet, encouraging people to adopt digital technologies, such as online buying and e-commerce. As a result, the demand for delivery and the online market is growing. Third, the pandemic disrupted business supply systems, so customers modified their purchasing habits to explore different brands and buying options instead. Also, during the outbreak, consumers purchased more locally produced goods. Furthermore, people are more likely to purchase commodities from firms that give back to society, have healthy and sanitary packaging, and care for their staff throughout the pandemic. Finally, most customers hesitate to resume their "regular" out-of-home activities (McKinsey and Co., 2020). One approach to this research is integrating Goldratt's Theory of Constraint (TOC) into consumers' buying culture. The fundamental notion of the TOC is that each process has a single constraint, and that overall process productivity can only be enhanced by improving the constraint (Theory of Constraints, 2022).

LITERATURE REVIEW

COVID-19 has severely damaged our economies, resulting in catastrophic personal outcomes and a decline in demand and consumption. After the World Health Organization (WHO) labeled COVID-19 a worldwide pandemic in the first quarter of 2020, many countries announced a statewide lockdown to prepare for this pandemic. For instance, Kaur & Malik (2020) stated that on March 24, 2020, India went under a statewide lockdown, following in the footsteps of other major economies like China and the US. This action impacted its 1.3 billion people for 21 days, eventually extending to May 3 and 31, 2020. Moreover, an individual's preference and behavior will likely shift with catastrophes and accidents. Wang et al. (2020) argue that understanding consumer culture and behavior during and after the COVID-19 pandemic can assist policymakers and regulators in modifying inventories and response tactics. One significant change in consumer behavior seen across many countries during the pandemic was bulk buying for just-in-case (JIC) situations (Bloomberg, 2012). Significantly, the rapid spread of COVID-19 has threatened the agricultural supply chain and raised consumer concerns about food security (Wang et al., 2020). Many people hurried to store food, particularly fresh agricultural commodities, to ensure household food security, similar to before Hurricane Sandy devastated New York City in 2012 (Bloomberg, 2012). Dholakia (2020) claims that bulk buying is driven by fear or anxiety and social influence, which marketers seldom research. Furthermore, these occurrences occur in gaps, and people's knowledge tends to emerge with encountering such events (Baker et al. 2020). Even though there is no looming scarcity of available staples in the current situation of coronavirus 2019, a frenzied rush of available staples was noticed across retail establishments with empty shelves at times (Kaur & Malik, 2020). Kaur and Malik (2020) claim that many psychologists, such as Paul Marsden, think there are three core needs in response to such behavior. It includes the desire to feel in control of your activities, the need to bring comfort to families, and the need to establish the habit of shopping accordingly. Wang et al. (2020) believed that individuals were motivated by several reasons and psychological processes: **1)** The first is due to the degree to which a particular risk causes "dread." Dreaded risks are viewed as uncontrollable, catastrophic, and potentially disastrous. **(2)** The second reason is seen as "unknown," including the novel, unobservable, and unfamiliar hazards with delayed repercussions (Callen et al. 2014). **(3)** Another reason is an individual's risk exposure, including personal and social exposure (Hanaoka et al., 2018). For instance, if your family and friends start bulk buying, you are also more likely to buy bulk. The spread of COVID-19 has immense repercussions, not only on economic volatility but also on consumer culture and behavior in many countries worldwide (cite). On the one hand, more developed economies such as the US have seen a global surge in digital transactions and bulk buying behavior. However, developing nations such as Nicaragua have seen little to no change in consumer behavior (cite).

Developed Versus Developing Consumer Culture

The United States is one of the biggest economies in the world, but it is also one of the world's biggest consumers of natural resources. Despite accounting for fewer than 5% of the global population, Americans generate more than 20% of total revenues (Gierlinger & Krausmann, 2011). Additionally, in the late 19th century, the United States challenged the United Kingdom as a significant economic power and has since taken a dominating place in the global economy. At the beginning of the 21st century, the United States produced about 30% of the global gross domestic product (GDP) (Gierlinger & Krausmann, 2011). Furthermore, the COVID-19 pandemic brought many changes in consumer culture and behavior in the US. It includes bulk and panic buying daily necessities such as toilet paper, and many consumers shifted their eating habits away from restaurants and bars (Wang et al., 2020). On the other hand, Nicaragua is one of the largest yet one of the slowest growing countries in Central America regarding nominal GDP (World Bank, 2022). Despite the global economic turmoil throughout the years, Nicaragua has outperformed the rest of Latin America and the Caribbean in terms of growth. Following a two-year recession caused by the sociopolitical crisis of 2018, the country experienced further declines in economic activity because of the COVID-19 pandemic and two major hurricanes in 2020 (Jarquín, 2022), both of which had destructive force, causing extensive damage, loss of life, and intensifying the risks of COVID-19 transmission. Moreover, Nicaragua's COVID-19 experience was different. Unlike most Latin American countries, Nicaraguan authorities avoided lockdowns and other standard containment measures; their containment procedures were among the poorest in the world (Jarquín, 2022).

Impact of Covid-19 Pandemic

The COVID-19 outbreak has caused many American consumers to shift their food purchasing behavior abruptly and substantially in reaction to legislative changes and public or personal health concerns (Jensen et al., 2021). Concerns about supply chain risks and shortages prompted people to bulk buy goods. Considering these circumstances, many customers shifted their food expenditures away from food service (e.g., restaurants and dining venues) and toward food stores (Jensen et al., 2021). As per our survey results, people in the US shifted to buying goods in bulk quantities and storing them for just-in-case scenarios. The COVID-19 outbreak is being unusually experienced in Nicaragua. Nicaragua has no regulations and no public information regarding its spread amid both an economic slump and a socio-political crisis (Armed Conflict Location & Event Data Project, 2020). Like the US, the COVID-19 outbreak has also caused many Nicaraguan consumers to shift their purchasing behavior concerning public and personal health concerns. Although there has not been an increase in bulk buying patterns, buying more goods online and buying goods wholesale have seen an increase as per our survey.

RESEARCH METHODOLOGY

The participants of this research were recruited through chain-referral sampling. The study used a self-administered anonymous questionnaire developed identically in both English and Spanish using Google Forms. Participants were recruited using social media platforms like Instagram, Facebook, and Whatsapp specifically in the United States and Nicaragua. Both questionnaires got 100 responses each, making a total of 200 completed surveys collected. Demographics like age, gender, educational level, and occupation were measured in the survey but are not further analyzed in this study. (Table 1.) The questionnaire included *impact statements* that required participants to rank 4 items using a 5-point I strongly agree-I strongly disagree scale. ("My shopping decisions have been affected by the following: Increase in cost of goods, decrease in income or earning potential, limited supply or access to goods, and shift in preferences"). The survey did also include *5 yes/no questions* ("Has the pandemic affected the way you shop for goods?", "Before the pandemic did you buy in bulk?", "Since the pandemic started, have you started to buy in bulk?", "Did you rely on/use online shopping before the pandemic?", "Since the pandemic started, have you used food/groceries delivery services more frequently?") from which 2 were excluded from analysis due to its bad fit statistically ("Before the pandemic did you buy in bulk?, "Did you rely on/use online shopping before the pandemic?") *2 yes/no/maybe questions* ("Do you expect/plan to go back to pre-pandemic buying

approaches/decisions if the pandemic ends?", "Do you think your friends and family have altered their shopping habits as a result of the pandemic?") that were excluded due to its theoretical irrelevance, and *3 multiple response questions* ("How has the pandemic affected the way you shop?", "What are the major areas your decisions have changed because of the pandemic", "What are your key considerations while buying goods?") from which 1 was excluded from analysis due to its theoretical irrelevance ("What are your key considerations while buying goods?").

To comply with ethical standards and procedures, all participants were above 18 years old, informed about their rights, and asked to consent at the beginning of the questionnaire. All data analysis for this study was done using Microsoft Excel.

We defined an Impact Score as a numeric measure that helps to understand changes in buying preferences due to constraints caused by the Covid-19 pandemic on the individual consumer. The impact score was measured using an Impact questionnaire, which included inquiries about the utilization of new services, new buying patterns, and decisions. We coded answers either as 0 ("Item not selected") or 1 ("item selected") for multiple response questions and 0 ("No") and 1 ("Yes") for yes/no questions. See Table 2 for the complete impact score items.

We defined each factor with a score of 0.20 for a maximum of 1.0 (Table 3.). To rank individuals on a 5-point scale, from Very low impact to Very high impact, items' total scores were averaged creating a decimal number within the Impact Score scale, resulting in a reliable measure of impact allowing to run T-tests. Table 4 shows the descriptive statistics of the impact scores for both English and Spanish participants.

We used a 5-point Likert scale, ranging from 1 (Strongly disagree) to 5 (Strongly agree) with four statements of impact (e.g "My shopping decisions have been affected by the following: Increase in cost of goods, decrease in income or earning potential, limited supply or access to goods, and shift in priorities or interests"). The total score was averaged to create a reliable measure of impact.

FINDINGS

To test whether Covid-19 had a higher impact in one population over the other, we estimated a t-test assuming unequal variances between the impact scores reported for both populations with English responders as variable 1 and Spanish responders as variable 2. The English responders (M=0.442, SD=0.138) indicated to be significantly more impacted by the Covid-19 pandemic than the Spanish-speaking participants (M=0.352, SD=0.119). (Table 4.) The difference was statistically significant (p=0.0033, t-Stat=2.98) revealing the US sample population experienced a moderate impact compared to the Nicaragua sample population who experienced a low impact in their buying decisions. Table 5 summarizes the results of the t-test.

As a second impact measurement, we conducted a t-test assuming unequal variances with averages of US sample populations (M=14.21, SD=3.57) as variable 1 and Nicaragua sample populations (M=12.67, SD=4.85) as variable 2. See table 6 for descriptive statistics. After running the t-test, the model was revealed to be statistically significant (p=0.01, t-Stat=2.55). Based on these results, it can be assumed Covid-19 had a higher effect on the US population sample buying decisions than it had on the Nicaragua population sample. See table 7 for a summary of the results.

DISCUSSION & CONCLUSIONS

In this study, we examined the difference in the impact of constraints caused by the COVID-19 pandemic on buying decisions between the populations of developed and developing economies. All participants of this study reported a certain degree of impact in purchasing goods due to constraints provoked by the COVID-19 pandemic.

Overall, our results suggest developing economies such as Nicaragua, due to lighter constraints (less-restrictive lockdown policies, reliable access to goods), had smaller changes in buying patterns due to lower COVID-19 impact. Notably, developed economies such as the United States had a higher impact on purchasing behavior due to tighter lockdown policies, and pre-existing buying patterns. We found that

developing economies adapt more easily to constraints and have a lower tendency to change buying patterns due to a pandemic than developed economies whose populations tend to experience economic distress less often. Our study has several industry implications. The retail industry can benefit from our findings as understanding how populations are impacted by global and local health crises allows them to create customized strategies according to how the communities react. Effective market strategies can allow customers to have an improved experience, increase sales, improve quality of customer service, and experience higher satisfaction levels. The packaged goods industry can also benefit from this study as it would allow the creation of improved distribution strategies according to the changes experienced by the population.

We also expect this study to have repercussions on the supply chain and logistics industry. Our results can be insightful as the logistics industry cannot work without developing tailored systems to respond to evolving customer needs and purchasing patterns changes during constraints. This will help the management to produce according to the need and preferences of the customer, minimizing the chances of loss or wastage.

LIMITATIONS AND FUTURE RESEARCH

This study does have certain limitations. One limitation is that the questionnaire was released only in one developing economy and one developed economy. This limitation, however, can be used for further research including more levels of economic development, and population size. Furthermore, future research should account for the present level of COVID-19 in the nations investigated, alternative food sources apart from supermarkets, income, and gender as predictive factors of bulk buying and changes in consumer behavior. A second limitation was the lack of assessment and analysis of the income level of the participants. This limitation can be used for further research to understand the levels of impact according to economic power within a sample population.

We believe this study can also be applied to the service industry such as the hospitality industry to better understand the impact of constraints on the individual's preferences.

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APPENDIX

TABLE 1
DEMOGRAPHICS

		EN	***ES***
Age			
	18-24 years old	76%	64%
	25-34 years old	15%	18%
	35-44 years old	4%	11%
	45-54 years old	3%	4%
	55-64 years old	2%	3%
Gender			
	Female	58%	71%
	Male	39%	29%
	Other	3%	0%
Education level			
	Highschool	32%	11%
	University	55%	81%
	Masters or Ph.D.	13%	8%

TABLE 2
IMPACT SCORE ITEMS

Questionnaire, impact score items	
Has the pandemic affected the way you shop for goods?	
	Yes
	No
If yes, how has the pandemic affected the way you shop?	
	Buying more goods online
	Buy goods in bulk
	Covid-19 Safety measures
	Buy less frequent
	Buy more frequent
	More time at the store
	Less time at the store
	Buy at a specific time
What are the major areas your decisions have changed because of the pandemic?	
	Groceries
	Clothing
	Gas
	Vehicles
Since the pandemic started	
Have you used food/ groceries delivery services more frequently?	Yes
Have you started to buy in bulk?	No

TABLE 3
COVID-19 IMPACT SCORES

Covid-19 Impact Score Scale	
0-0.20	Very low impact
0.21-40	Low impact
0.41-0.60	Moderate impact
0.61-0.80	High impact
0.81+	Very high impact

TABLE 4
DESCRIPTIVE STATISTICS

Descriptive statistics		
	EN	*ES*
Impact score		
Mean	0.442	0.352
SE	0.014	0.012
Median	0.413	0.353
Mode	0.348	0.235
SD	0.138	0.119
Sample Variance	0.019	0.014
Kurtosis	-0.699	-0.382
Skewness	0.250	0.300
Range	0.565	0.588
Minimum	0.174	0.118
Maximum	0.739	0.706
Sum	44.217	35.176

TABLE 5
IMPACT SCORE COMPARISONS

Impact Score Comparison *t-Test: Two-Sample Assuming Unequal Variances*		
	EN	*ES*
Mean	0.40647059	0.35176471
Variance	0.01985915	0.01404914
Observations	100	100
Hypothesized Mean Difference	0	
df	192	
t Stat	2.97085258	
P(T<=t) one-tail	0.00167459	
t Critical one-tail	1.65282859	
P(T<=t) two-tail	0.00334918	
t Critical two-tail	1.97239649	

TABLE 6
DESCRIPTIVE STATISTICS

Descriptive statistics	*EN*	*ES*
Likert Scale Score		
Mean	14.21	12.67
Standard Error	0.35740224	0.48535211
Median	15	14
Mode	17	15
Standard Deviation	3.57402243	4.85352106
Sample Variance	12.7736364	23.5566667
Kurtosis	-0.146927	-1.2243821
Skewness	-0.6928029	-0.2861932
Range	16	16
Minimum	4	4
Maximum	20	20
Sum	1421	1267
Count	100	100

TABLE 7
RESULTS

Likert Score Comparison t-Test: Two-Sample Assuming Unequal Variances		
	EN	*ES*
Mean	14.21	12.67
Variance	12.7736364	23.5566667
Observations	100	100
Hypothesized Mean Difference	0	
df	182	
t Stat	2.55497239	
P(T<=t) one-tail	0.0057189	
t Critical one-tail	1.65326902	
P(T<=t) two-tail	0.0114378	
t Critical two-tail	1.97308408	