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Math Anxiety Effects on Consumer Purchase Decisions

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ABSTRACT

Math anxiety is a psychological disorder wherein a person suffers from tension, apprehension, and fear because of mathematical tasks. This behavior impacts the consumers in making decisions that require numeracy skills like financial decisions or shopping. Therefore, this paper is based on reviewing how math anxiety influences consumer purchasing decisions and the primary behaviors that arise with math-anxious individuals. Such behaviors include avoiding price comparisons for discomfort with calculations, misperception or undervaluation of discounts, and impulsive purchases to avoid detailed financial evaluations. This paper will also consider how marketers might better adapt pricing strategies to serve the math-anxious consumer. Knowing how math anxiety takes hold should help companies develop pricing and promotion strategies that improve their customers' experience and ultimately lift revenues. The research concludes that higher arithmetic-anxious individuals show more price satisfaction and are more likely to purchase the product at a discount presented in a more straightforward and easily understood format.

Keywords: math anxiety, consumer, shopping, decisions, psychology, numerical, discounts, price, behavior, infographic, visuals, cognitive, strain, interpret, experience, confusion, probability, complex, tension, perception, confidence, anxious,

INTRODUCTION

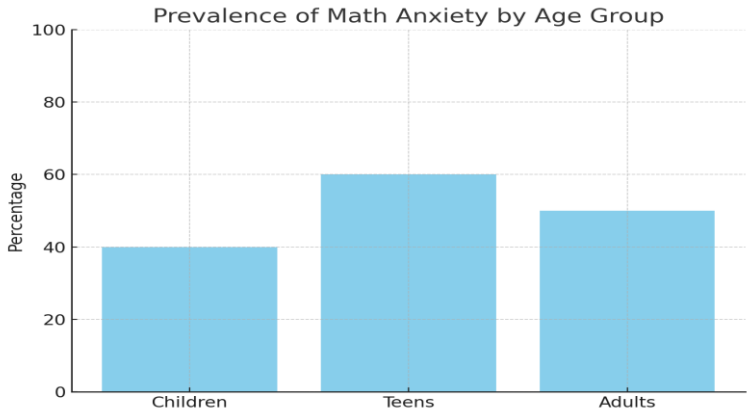
Math anxiety is a psychological disorder wherein a person suffers from tension, apprehension, and fear because of mathematical tasks. These feelings may be as light as discomfort or even extreme anxiety, and people with such anxiety often adopt avoidance behaviors. Traditionally, research into math anxiety has been performed within educational settings; however, this behavior also plays a significant role in many real-life situations that require numeracy, such as making financial decisions and shopping. Math anxiety also applies to the field of consumer behavior since most of the purchasing decisions engage numerical evaluations. In purchasing, a consumer needs to evaluate the prices, calculate the discounts, and compare the products' value- all tasks requiring some mathematical reasoning. To a person suffering from math anxiety, just these activities may cause heightened discomfort, which may eventually lead to avoidance of numbers, often with impulsive or less-than-optimal purchasing decisions. These customers would rely on other signals to make decisions rather than numeric information analysis, such as brand familiarity or emotive appeal.

This paper reviews how math anxiety influences consumer purchasing decisions and the primary behaviors that arise with math-anxious individuals. Such behaviors include avoiding price comparisons for discomfort with calculations, misperception or undervaluation of discounts, and impulsive purchases to avoid detailed financial evaluations. This paper will also consider how marketers might better adapt pricing strategies to serve the math-anxious consumer. Simplifying price presentations, intuitive discount structures, and visual displays could reduce the cognitive burden of numerical tasks associated with price presentations. Knowing how math anxiety takes hold should help companies develop pricing and promotion strategies that improve their customers' experience and ultimately lift revenues.

Understanding Math Anxiety and Its Prevalence

According to West (2022), math anxiety is a documented psychological condition, a general term describing the various emotional reactions one can develop in response to mathematics-related activities. The most important consequences are fear of doing mathematics, feelings of unpleasantness, and stress associated with working on math problems. It often

appears to be a problem in every age group and section of people; research shows its presence among young children and adults (West, 2022). Further research has suggested that the prevalence rate may be further compounded by gender, educational background, and socio-economic status. A deeper understanding of the complex structure of math anxiety and its prevalence across populations has an essential implication for addressing its debilitating effects on cognition dealing with numeracy.



One of the most important areas of investigation considered by scholars has been the spread of math anxiety into cognitive processes involved in numeracy or the processing of numbers. According to Pelegrina et al. (2020), Math anxiety weakens working memory in carrying out arithmetic operations; it weakens working memory in processing numerical information, which increases the latencies of responses, reduces accuracy, and increases the occurrence of mathematical errors. In addition, negative emotional reactions, in service to negative affect, stress responses could occur because of anxiety produced and directly harm concentration, problem-solving capabilities, and engagement with numerical information (Pelegrina et al., 2020).

Math anxiety can take a declining turn in motivation and self-confidence, leading to avoidance activities and decreased efficacy in mathematical undertakings (Pedersen, 2024). In decision-making circumstances where numerical data have to be considered, it would also show avoidance or reluctance to become involved in decisions in math that could affect their ability or capability to make an appropriate decision based on numerical data. According to Pedersen, (2024), the effect of math anxiety on overall numeracy and cognitive processes requires an all-inclusive understanding of its impact on diverse demographic groups of different age brackets.

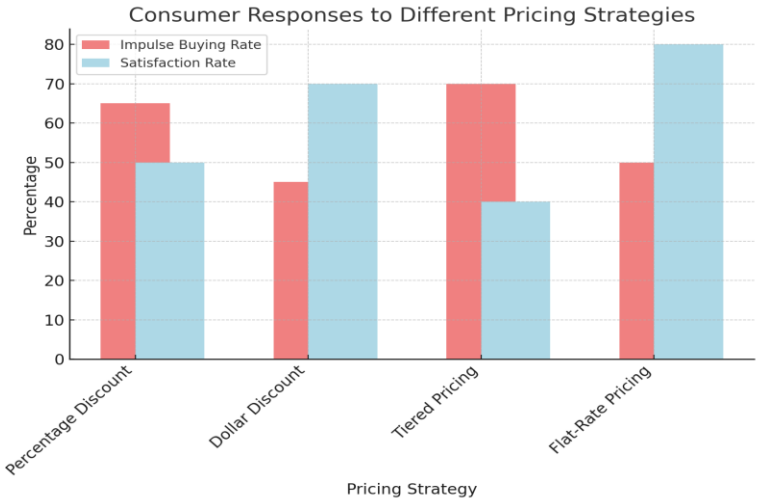
When making purchase decisions, many consumers avoid numerical information because they have a sense of mathematical anxiety (Andersen et al., 2024). This is also because such customers with high math anxiety can be demonstrated to act uncomfortable or apprehensive when numerical data is more extensive, comparisons comprehensive in scope, unit costs, or even calculations that they have to perform to complete multi-part offer evaluations. Given this situation, these consumers may opt to downplay or avoid significant numerical information to support purchase cues that might be more emphatic or more articulately put (Andersen et al., 2024). The avoidance may thus lead to suboptimal choices as consumers with arithmetic anxiety may not make sufficiently calculated assessments of the value or, instead, the economy of the goods they intend to purchase.

The Impact of Math Anxiety on Consumer Purchase Decisions

According to Andersen et al. (2024), math anxiety is also commonly observed to lead consumers to avoid numeric information in their purchase decisions. Individuals with high levels of math anxiety will likely feel uncomfortable or stressed by complex numerical data, such as detailed price comparisons, unit prices, or the calculations involved in evaluating multi-part deals. For this reason, such consumers might bypass or skip the critical numeric details and move towards simplified or emotionally driven purchasing cues. This avoidance can lead to poorer choices because math-anxious individuals will not as fully determine the value or whether a product is the most cost-effective (Andersen et al., 2024).

The discomfort associated with math anxiety can lead to more impulsive purchasing from these consumers. During the cognitive load of price or discount evaluation, math-anxious individuals would choose faster and less-contemplated decisions by avoiding the stress of mathematical evaluations (Storozuk et al., 2023). Impulse buying usually occurs based on emotions rather than on a rational assessment. Hence, marketing strategies that introduce a sense of urgency or an

emotional appeal work best to trigger purchases among math-anxious consumers, who would instead go for convenience and immediate gratification rather than deliberate carefully.



Storozuk et al. (2023) say that math anxiety can strongly limit one's ability to read and evaluate promotional offers. For example, the more complicated the calculations involved in promotional deals, such as "Buy 2, Get 1 Free" or tiered discounts, like "15% off your purchase of $100 or more," the harder it will be for a person with math anxiety to understand and evaluate. This is likely to result in confusion or misinterpretation of the actual value of the promotion such that math-anxious consumers, distracted by the offer, will either decline the offer or make less-informed choices. They will either overpay for something or miss an opportunity for saving.

Math anxiety can also deform perceptions of price and value. For those who suffer from math anxiety, calculating the actual value of discounts or comparing alternative sets of prices is excessively burdensome (Storozuk et al., 2023). Misperceptions about the exact value of products or promotions can easily result. For example, a percentage discount may be seen as less attractive when more attractive than a fixed dollar discount. This leads to suboptimal purchasing decisions. Such math-anxious customers may also perceive prices as subjectively higher or value lower than in reality due to their defective processing of numerical data.

The Role of Pricing in Consumer Behavior

Andersen et al. (2024) state that pricing is important in customer decision-making processes because price is, for the greater part, the first influencing factor on what they purchase. Furthermore, in a consumer's brain, the price acts not only as a cost indicator but also as a proxy for value and quality. It is pricing that influences customers' assessment of promotions, comparisons of products, and judgments about affordability. According to Andersen et al. (2024), most consumers make their purchasing decisions after analyzing prices and calculating how much money they will save considering the discounts or sales. For stressed beginners, though, pricing is a source of stress, hence something to be avoided; this leads them to make wrong calculations and emotional decisions rather than weighing the situation rationally.

Individuals who experience math anxiety have a harder time dealing with more complex forms of price promotions that require deeper mental processing and judgment to understand (Andersen et al., 2024). Indeed, the more complex the percentage-off or tier-price promotional offer-consider multi-item bargains, the more overwhelmed a customer who suffers from math anxiety will be. As a result of the complicated nature of the matter, they often opt to either dismiss such deals or make swift decisions that involve much less deliberation to reduce the psychological burden (Andersen et al., 2024). Moreover, people afraid of mathematics usually tend to become suspicious of complicated pricing and promotion schemes simply out of fear that they will either encounter an arithmetic error or misinterpret the actual price of what they are being presented with. The result is that individuals would opt not to make any purchases or settle for easy solutions that are often less beneficial.

Simplified pricing can be one of the easier ways to help reduce the tension that math-phobic customers feel (Huang et al., 2022). Marketers can relieve some mental torture by considering multi-attribute offers by displaying the cost in a simplified and easy-to-understand way. Flat-price pricing, for example, like "Everything for $10," or transparent, fixed discounts like "$5 off everything," might be less overwhelming and make decision-making more accessible for people anxious about arithmetic-related matters. On the one hand, simplified pricing removes the need for calculation from the consumer, thus

making them feel more confident and ultimately more satisfied, with a higher likelihood of purchasing the product or service (Huang et al., 2022).

According to My PM Interview (2024), Planning as price framing refers to how the consumer is informed about prices, and it is a cardinal element in determining how pricing information would be represented by individuals who are apprehensive about mathematics. For example, offering a price concession in a fixed cash amount format, like "$10 off", instead of a percentage format, like "10% off", may be more attractive for those clients who are insecure about their arithmetic skills because it requires much less mental concentration to comprehend than the percentage discount. Similarly, giving the sum of the discount outright or focusing on the price after the deduction spares customers from tedious arithmetic. Thus, due to this very open-and-direct method of showing the price, those customers who are genuinely anxious about mathematics can, therefore, decide with a quicker pace and higher level of confidence.

Math Anxiety and Perception of Discounts

According to Huang et al. (2022), offering multiple discounts can yield higher perceived savings and value than offering one discount of equal economic value. When several discounts are promoted to customers for example, a 25% discount and an additional 10% discount they might immediately add those numbers together and think they got a 35% discount. Even when the actual reduction is equivalent to, or even somewhat less than, the result of a single 33% discount. This perception can create a feeling of more significant savings than a single discount. This could hold even when the actual price reduction is higher. This is not an across-the-board effect since some customers have difficulty correctly integrating these figures, which can result in lower perceptions of savings when there are many discounts compared with the amount presenting them. This happens because, through the mental effort of calculating the final price, consumers are discouraged from fully realizing the value of the discount.

Two psychological concepts explain why some customers perceive quite a few discounts as less valuable than they are. These ideas include the anchoring-and-adjustment heuristic and the numerosity cue heuristic. The anchoring-and-adjustment heuristic says that most customers cling to the first discount they perceive as the "anchor," thereby actively making minor adjustments upon encountering more reductions (Mehraban, 2023). Many consumers make the mistake of generalizing the overall discount closer to the upper anchor of 25% when hit with a 25% discount after another 10%, underestimating how much money one saves. Another example is the numerosity cue heuristic, which influences consumers to stress over the number of discounts available rather than their aggregate value. It is well seen in either less motivated or less able-to-analyze-precise-price-information consumers. This, for instance, occurs when consumers focus on the number of discounts. According to Mehraban (2023), the effect of this is that people mistakenly believe that two smaller discounts are less significant than one considerable discount, even if the total value of the discounts is the same.

Math anxiety significantly affects how the final customers would act toward these pricing sets. People who experience high levels of arithmetic anxiety tend to see too much numerical information and, hence, are more likely to rely on anchoring or numerosity heuristics as shortcuts toward their purchase decisions (Huang et al., 2022). Since these consumers do not enjoy overheating their brains, especially when math calculations are required, straightforward promotions that offer a single discount will be preferred for this particular group because they use less mental work and reduce the tension associated with conducting calculations. Huang et al. (2022), says that consumers who have a low level of math anxiety are often more comfortable digesting complex numerical information. Such consumers will love multiple discounts because they can calculate the total savings accurately based on the information. Their choices in these scenarios depend on a more rational conception of total savings, not relative ease or difficulty; hence, these consumers do not care whether they receive one discount or multiple discounts.

Marketing Strategies for Math-Anxious Consumers

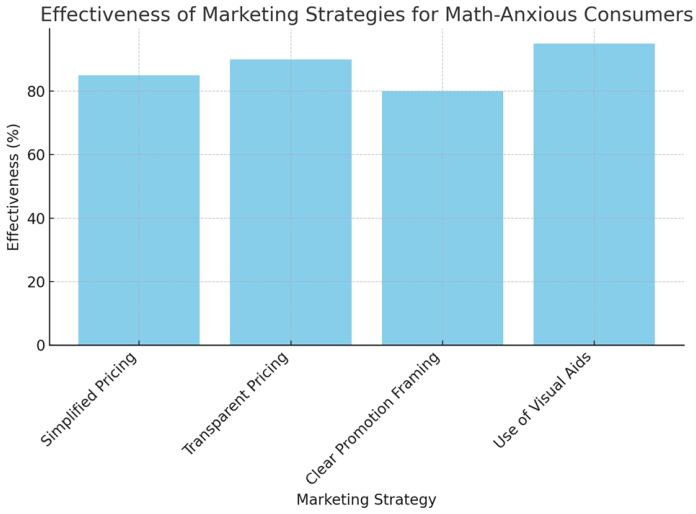
According to Malone (2023), customers with higher arithmetic anxiety tend to favor more simple price promotions, such as dollar-off discounts. The dollar-off format would be more appealing for simplicity than more complex formats, such as percentage-off discounts. The reason is that people generally avoid situations that require such calculations, irrespective of their actual mathematical proficiency (Malone, 2023). This preference holds when one needs to make purchasing decisions that involve price calculations; this preference for more accessible promotions persists. Interestingly, this yearning for more accessible promotions persists even when the deals yield lower savings than other, more complex discounting approaches. Accordingly, higher arithmetic-anxious individuals show more price satisfaction and are more likely to purchase the product at a discount presented in a more straightforward and easily understood format.

One of the best ways to engage customers who are anxious about mathematics is by simplifying the price presentations (Malone, 2023). Complex pricing systems, including reductions based on percentages or multitier deals, produce anxiety and may bewilder. With explicit pricing, marketers can socialize the costs. For instance, they are reducing the number of

calculations that need to be made by consumers by offering integrated values, such as "2 for $20," or offering flat percentage promotions to consumers, such as "$10 off". In pricing simplification Dollar rhythm research, it has been stated that by simplifying prices in this manner, math-anxious individuals are more confident in their purchasing decisions, making shopping more enjoyable (Malone, 2023).

Another essential technique to help alleviate anxiety amongst math-anxious customers is transparent pricing. Knowing the actual price of a product involves less guesswork when pricing is clearly and transparently displayed (Curling-Hope, 2023). Businesses ensure customers do not need to calculate savings by including the original and final prices after website discounts. For instance, indicating that an item officially sold for $50 could sell at "Now $40" because of a discount simplifies such offers for those customers who doubt their mathematical skills. According to Curling-Hope (2023), eliminating hidden fees or unclear promotion terms will increase trust and reduce consumer stress.

There is a strong probability that the way ads are framed could significantly impact a customer's decision-making process in terms of mathematics (Andersen et al., 2024). Customers like these would most likely be interested in a deal framed in simple, easy-to-understand terms and angled towards established price cuts or savings. For example, "$20 off all over $100" is more accessible than discounts relying on a multi-tier system or a percentage fall. When the savings can be framed functionally and straightforwardly, customers who feel they are not good at arithmetic will swiftly weigh the value proposition without getting confused with heavy math problems (Andersen et al., 2024). This is because the savings are in a format that is convenient and easy to understand. Promotional materials should contain short and clear messages to ensure that such customers do not experience disorientation or confusion.



When interpreting numerical information, visual aids play a crucial role in assisting anxious consumers (Storozuk et al., 2023). Reducing apprehension can be achieved by highlighting the final prices in bold, crossing out the initial prices, and then color coding labels to show "50% off" or "Save $10.". Visuals can put such cognitive strain on interpreting the numbers more quickly and even go as far as helping customers feel more confident about their purchases (Storozuk et al., 2023). Using an infographic, a comparison chart, or simply visuals that point out the savings on price will also guide clients who are nervous about mathematics by lowering anxiety and enhancing understanding. These marketing strategies—more straightforward pricing presentations, pricing transparency, effectively framing promotions, and the use of visual aids—can help organizations create a friendlier and less stressful shopping environment for customers who feel anxious about math.

CONCLUSION

Math anxiety severely impacts customer behavior: it dictates how one approaches buying decisions, valuations of discounts, and price promotions. Adults with math anxiety tend to avoid intense numerical information situations that can create problems in price comparisons, the evaluation of promotions, and making financially sound decisions. This is because the avoidance factor leads to impulsive purchases and wrong interpretations of discounts, resulting in less-than-optimal results for the shopping process. The marketer needs to take active remedies by employing methods that appeal to the math-anxious consumer's demands. The cognitive effort and anxiety of purchase can be reduced to a considerable degree when price displays are made simpler, pricing more transparent and visual, and promotions easier to understand. While these changes are welcome for those people who are anxious about mathematics, they also can have some bottom-

line effects in terms of growing customer loyalty and sales. Other marketing strategies and tools that businesses can use to enhance their services and make easy access for the demographics of customers with math anxiety are personalized pricing displays and making their websites easier to navigate when shopping online. This conceptualization of mathematics anxiety has been further developed. Businesses catering to the needs of mathematics-anxious customers will be able to generate more customer satisfaction and build a competitive advantage in markets that are steadily getting consumer-oriented approaches.

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