

**Exploring the Influence of Priming on Accessibility and Desirability: Implications for
Option Generation in Decision-Making**

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Abstract

While previous research on priming has primarily focused on how individuals choose between pre-generated options, everyday decision-making often involves generating options before making a choice. External cues can influence the accessibility of certain pre-generated options, thereby increasing the likelihood of selecting them. Consequently, priming seems to not only enhance the accessibility of these options but also their desirability. However, when individuals need to generate options themselves because pre-generated ones are unavailable, it becomes important to examine whether priming still affects the accessibility and desirability of options. This study aimed to investigate the impact of priming through option generation in order to gain a more comprehensive understanding of decision-making processes. It was hypothesized that priming would affect the accessibility of options but would not affect their desirability. To test this, an online experiment was conducted, involving a visual prime, to assess its effect on the accessibility and desirability of types of take-away food. Data were collected from 90 participants, who were randomly assigned to two conditions: India and Italy. A 2 (prime condition: India versus Italy) x 2 (food type: Indian versus Italian) x 2 (measure: accessibility versus desirability) repeated measures analysis of variance (ANOVA) revealed a nearly significant, reversed three-way interaction, $F(1, 88) = 3.695, p = 0.058$. Reactance could potentially explain this reversed effect, as participants might have been aware of the prime stimulus and deliberately chosen not to indicate a food preference aligned with the country they were primed with.

Keywords: decision-making, priming, option generation, accessibility, desirability

Exploring the Influence of Priming on Accessibility and Desirability: Implications for Option Generation in Decision-Making

Shall I wear a red sweater or a green sweater today? Shall I take the bus, or cycle to work? Shall I go out for dinner tonight or make my own food? Individuals make plenty of them every single day, big and small: decisions. Researchers claim that individuals make approximately 35,000 decisions a day (Sahakian & LaBuzetta, 2013). Some of the human decision-making is conscious, but most of it happens unconsciously (Aarts & Dijksterhuis, 2000). For decades, social scientists have been working on this topic, and scientific knowledge about the processes behind it is growing (Tiemeijer, 2010). Decision-making is widely recognized as a complex phenomenon, as it involves various cognitive processes that result in the selection of one action or choice from several alternatives (Chambon et al., 2022; Newell & Shanks; 2014). These processes entail assessing multiple alternatives, considering expectations, handling conflicting goals, and evaluating diverse preferences (Weber & Johnson, 2009). Additionally, factors like limited rationality, ambiguity, and inconsistency also contribute to the complexity and uncertainty of decision-making processes (March, 1994). Decision-making requires the integration of diverse cognitive processes, including information processing, reasoning, and judgment, along with emotional factors such as motivations, desires, and affective responses. Moreover, environmental factors, such as resources, constraints, and external cues, further influence decision-making processes (Chambon et al., 2022).

External cues can be actively employed to influence decision-making processes, through the utilization of it as priming mechanism. Priming refers to the activation of mental concepts or associations through exposure to external cues, temporarily enhancing their accessibility (Bargh & Chartrand, 2014). As a result, the increased accessibility makes it more likely for these concepts to be activated by subsequent stimuli (Higgins, 1996). By making primed concepts more accessible, external cues have the ability to influence cognitive processes, perceptions, and behaviors, ultimately shaping individuals' thoughts and actions. In addition, research has shown that priming not only affects behavior but also motivation. Previously, it was widely believed that consciousness was a necessary component for goal pursuit processes. However, more recent research has revealed that these processes can operate even without conscious awareness (Bargh et al., 2001; Custers & Aarts, 2010). During pioneering experiments on unconscious goal pursuit, Bargh and colleagues (2001) used priming stimuli in the form of achievement- and cooperation-related words. These stimuli were employed to activate the goals of performing well or cooperating, without the participants' conscious awareness. It seems that any stimulus associated with a particular concept has the capacity to

not only activate the semantic features of that concept but also its dynamic aspects, including goals associated with it (Bargh et al., 2001). For example, when achievement is used as a prime, it not only activates associated concepts like success and effort, but also stimulates the intention to perform well and overcome obstacles in pursuit of goals.

By increasing the accessibility of certain concepts, priming can effectively enhance motivation beyond mere cognitive mechanisms and involve affective aspects as well. While some suggest that priming boosts motivation by making the primed option more desirable, a more plausible explanation lies in the increased exposure and subsequent likelihood of selecting the primed option (Custers & Aarts, 2010). Priming increases accessibility, what could explain its influence on both behavior and motivation. Based on this perspective, it can be argued that priming operates through decision-making processes, shaping individuals' intentions and actions towards achieving their goals (Loersch & Payne, 2014). Primed options become more accessible during individuals' decision-making processes, but the level of desirability remains unaffected by priming (Custers & Aarts, 2010). This paper aims to further explore the relationship between decision-making processes and priming. The crucial question remains whether priming solely influences the selection of the primed option or if it also affects the desirability, making individuals genuinely prefer that option. The focus lies in examining how priming can potentially influence the generation of options in decision-making processes. Because, in the absence of priming, individuals might not have even taken a specific option into consideration (Kalis et al., 2013). However, priming plays a crucial role by effectively activating and improving the accessibility of that particular option.

Decision-Making

Expanding on the previous discussion regarding the impact of priming on decision-making, it is important to explore the factors driving individuals' decision-making. Rational choice theories have greatly influenced the study of decision-making, where rational behavior aims to maximize utility for individuals. Explanations and predictions of human decision-making often rely on the assumption that individuals make rational decisions (Tversky & Kahneman, 1981). Besides, within the societal context, individuals are expected to be rational and consistently make well-considered decisions in numerous situations. Rational choice theories typically employ utility functions as a means to represent preferences. These functions allow decision-makers to assess and compare their options (Green, 2002). Consider, for instance, the Expected Utility Theory. This theory states that individuals make rational decisions by weighing alternatives based on their expected utility and probability. It emphasizes the maximization of expected utility when making choices (von Neumann & Morgenstern,

1947). The value of a choice is determined by the expected utility of possible outcomes, multiplied by their probabilities. The option that maximizes the expected utility, representing the desirability associated with that choice, will be selected (Kahneman & Tversky, 1982). This implies that, irrespective of how choices are presented, individuals make decisions based on the same set of preferences. However, individuals may exhibit other preferences in varying situations or as a result of fluctuating circumstances.

The Prospect Theory (Kahneman & Tversky, 1979) provides a more flexible approach to understanding psychological aspects of decision-making. This theory acknowledges individuals' sensitivity to changes in reference points and framing choices, as well as the variability of their preferences. It also explains how individuals assess risks and rewards according to their personal preferences. Likewise, the process of goal setting is influenced not only by objective value and expectancy, but also by individuals' subjective interpretation of these factors (Doyle, 2004). Psychological factors, in turn, can influence their preferences. Despite the more flexible approach of the Prospect Theory, researchers believe that human behavior cannot be fully explained by rationality. Individuals do not always behave pure rationally, and often fail to select the option that best suits their needs and preferences. Simon (1990) argued that due to cognitive limitations, the limited availability of information, and limited time, individuals are unable to make rational choices. Rationality is rather bounded. Consider a scenario where individuals face challenges in making conscious and rational choices, like when buying a smartphone. Factors like choice overload, social influence, and fear of making mistakes can hinder objective reasoning, leading to decisions influenced by external pressures or impulsive reactions rather than personal preferences. Often, emotions, judgments, and actions are not primarily shaped by conscious thinking and reasoning. Instead, they can be influenced and initiated by seemingly insignificant cues or primes, lacking apparent relevance or significance (Loersch & Payne, 2011).

Priming

While decision-making processes and the concept of priming have been studied in the academic world for a considerable amount of time, initially, there was less attention given to their relationship with each other. Priming was initially introduced to increase the likelihood of a behavioral response (Bargh, 2014). The idea of "perceiving is for doing" served as the fundamental premise. It suggested that individuals' perception was closely linked to their behaviors, emphasizing that perception was more than just a passive observation. Priming would have the ability to cause behavior in a direct way (McArthur & Baron, 1983). While the effect of perceptual priming may be relatively easily understood, the processes behind higher-

level priming effects remain less transparent (Bargh, 2014). Consider decision-making processes, where the impacts of priming may be subtle and not always be readily observable. Subtle influences often operate outside conscious awareness but can subtly bias behavior. Unconscious influences often experienced as “intuition” and “gut instinct” play a substantial role in shaping decisions and driving human behavior (Newell & Shanks; 2014). Typically, individuals perceive their judgments, behaviors, and motives as voluntary choices that emanate from personal interests and preferences (Loersch & Payne, 2014).

Though not fully understood, priming seems to have a significant impact on higher-level processes. One notable effect is its ability to stimulate goal pursuit, which is commonly believed to be motivated by deliberate choices and conscious control (Bargh & Chartrand, 2014). In this regard, individuals not only lack awareness of the mechanisms by which they process information, but also remain oblivious to the presence of influential information (Bargh & Pietromonaco, 1982). Goals, defined as desired states or behaviors with subjective value, act as motivators for individuals (Papies, 2016). Goals are stored in mental structures, including context, the goal itself, and the actions required for achievement. Primes activate these structures, inducing goal-directed behaviors without conscious intentions (Aarts & Dijksterhuis, 2000). For instance, when individuals are thirsty, priming the concept of drinking can increase consumption (Veldkamp et al., 2008). This highlights how goal activation can shape behavior and motivation.

Option Generation

The existing body of research on priming and human decision-making has primarily focused on how individuals pursue their goals by choosing between different options and putting these options into actions (Kalis et al., 2013). For example, during experimental studies, participants are asked what they think is the best strategy to solve a specific problem (A, B, or C). Through priming, specific goals can be activated, rendering certain options or goals more accessible and thereby increasing the likelihood of goal-directed behavior. This may explain why priming can exert influence on behavior and motivation. When an option becomes more easily accessible due to priming, individuals are more likely to consider and choose that particular option. Nonetheless, in everyday life, it is uncommon to be explicitly presented with a limited set of options and be required to choose between them (Kalis et al., 2013). Before making a choice, individuals typically engage in a process of generating various alternatives before selecting one. While priming can influence motivation by increasing the accessibility of goals, there is insufficient clear evidence to support this assumption when individuals are tasked

with generating their own options instead of being presented with a predetermined set of choices.

Integrating Decision-Making and Priming

An important issue raised by researchers in recent years, also known as the “many effects of one prime problem”, is the lack of specific causality when establishing effects of priming. While the influence of priming on perception and behavior is evident, determining the causal link between a specific priming event and its resulting effect remains unclear (Loersch & Payne, 2011). While a wide range of outcomes have been shown to be influenced by primes, the majority of these effects have been demonstrated using nearly identical methodologies. Typically, the procedure involves initially activating a specific concept by presenting images, words, or texts related to the concept, thereby making it accessible for further information processing. The effect of this activated concept on judgment, behavior, or motivation, is measured through a second task that is intentionally unrelated. The Situated Inference Model, proposed by Loersch and Payne (2011), argues that individuals’ interpretation of primed information is dependent of their present situation. The presence and absence of priming effects can be explained by considering three basic premises: (1) a priming stimulus increases the accessibility of related information; (2) this information is mistakenly attributed to the individual’s spontaneous response towards an object in the situation, and (3) the misattributed content is employed to address the prevailing question posed by the environment (Loersch & Payne, 2011). Put differently, the overall accessibility of a particular construct following a single prime can lead to distinct shifts in judgment, behavior, and motivation.

The Situated Inference Model offers a valuable framework for understanding how individuals’ inferred goals and subsequent motivation can be influenced by the subjective meaning of accessible information. Despite individuals having the same information, the motivational implication strongly depends on the meaning of the accessible content within the present situation. The interpretation and impact of accessible information are determined by the context and personal significance attributed to the information (Loersch & Payne, 2011). Thus, goal-priming effects occur when individuals are encouraged to think about their current desires, raising the question: “What do I want?” If the information provided by a prime is mistakenly attributed to an individual’s instinctive reaction to the situation and is considered a reliable source of information to address the fundamental question, a priming effect is likely to occur. Thus, the pursuit of goals can manifest through unconscious mental processes triggered by aspects of the environment. Consequently, individuals can express an intention to undertake

certain actions without being consciously aware of the underlying factors that generate such desires or goals (Loersch & Payne, 2011).

The Present Study

The contrast between the current literature and real-life situations provides an opportunity to conduct additional research on decision-making. The present study investigates the influence of priming on goal pursuit through option generation, to advance a broader understanding of decision-making processes. Building upon prior research of Custers and Aarts (2007), the current study aims to explore the potential influence of priming on the accessibility and desirability of options. Custers and Aarts (2007) demonstrated that the extent to which individuals choose to pursue a goal that comes to mind depends on its attainability and desirability. These factors are commonly regarded as requiring conscious consideration according to prevailing theories on goal pursuit (Custers & Aarts, 2007). However, as demonstrated by more recent research, the pursuit of goals that individuals set and adopt can be prepared unconsciously (Aarts et al., 2008; Custers & Aarts, 2010). Yet, this does not suggest that they are never aware of goals. Goals become apparent when their representations reach conscious awareness, a process likely regulated by the focus of attention (Aarts et al., 2004). This awareness is triggered when individuals are specifically prompted, such as when they are directly asked to identify their present goals (e.g., “What do you want to eat?”) (Aarts et al., 2008). The question arises whether the goals being asked to identify are stated because they are accessible or also because they are genuinely desirable. The main research question of this study is: “To what extent do priming effects shape accessibility versus reflecting desirability?”

In order to address this question and investigate the effects of priming, an online experiment will be conducted. As previously discussed, priming the concept of drinking can lead to an increase in consumption (Veldkamp et al., 2008). The present study aims to examine how a prime stimulus influences the accessibility and desirability of different types of food. This will be investigated using a consumer preferences questionnaire. Depending on the condition in which participants are assigned, they will be primed with an image of either India or Italy in one of the questions. Afterwards, participants will be asked to list three types of take-away food, which they will later be asked to rank based on their preferences. This study aims to test two hypotheses. First, it is hypothesized that exposure to a prime would result in participants listing the food type associated with the prime more frequently and placing it higher on the list (e.g., in the first position) compared to when they are not primed, indicating an increased accessibility due to the prime. Secondly, it is hypothesized that when participants are asked to rank the food types according to their preferences, the primed food types will receive

a lower ranking compared to their original ranking during listing. This suggests that the prime does not influence the desirability of primed food types. The enhanced level of accessibility would lead participants initially including the primed food type on their list, even though it may not be desirable. When prompted to evaluate the desirability of the food types, participants would then reevaluate and diminish the perceived desirability of the primed food type in comparison to their initial ranking when listing. In goal-setting research, participants are typically instructed to achieve a specific target behavior. Consequently, they do not need to question their desire for the behavioral state but rather follow the experimenter's instructions outlining the desired state (Custers & Aarts, 2005). Participants may develop awareness of their motivation once the behavior is executed, particularly when explicitly asked to reflect upon it (Custers & Aarts, 2010). This study aims to provide clarity on whether certain specified types are as truly as desirable as they appear, or whether they are reported simply because they are accessible. It explores how priming influences option generation and its subsequent implications for decision-making.

Methods

Prior to the experiment, the research question, hypotheses, and methodology were preregistered on the Open Science Framework (OSF). This aligns with the principles of Open Science, promoting transparency and enhancing research credibility (Simmons et al., 2021).

Participants and Design

A total of 100 participants completed this online experiment. Since this study used a new research paradigm, an a priori estimate of the effect size was hard to make and could potentially lead to incorrect results. Additionally, calculating the statistical power was not feasible. Therefore, a sample size of 100 participants was chosen as a pragmatic compromise, assuming it would be sufficiently large to detect meaningful effects within the scope of this study. However, it is important to acknowledge that the chosen sample size may have limitations in terms of statistical power and generalizability. Participants were randomly distributed across the two conditions using counterbalancing with a 1-to-1 allocation ratio. The allocation was facilitated by the experimental program 'Gorilla Experiment Builder' (Cauldron Science, 2016), ensuring an unbiased distribution of participants across the conditions. The non-completion of the experiment by three participants in the India condition, caused an imbalance in the distribution of participants across the conditions. Consequently, sample sizes were 48 participants in the India prime condition and 52 participants in the Italy prime condition. Ten participants were excluded from the dataset due to the application of predetermined exclusion criteria. These criteria encompassed factors such as missing data and responses that could not

be accurately classified. None of the participants in the experiment were assumed to have prior knowledge of the experiment's purpose. As a result, the final dataset for analysis consisted of 90 participants (see Table 1 for the distribution of age groups), with 43 participants in the India condition and 47 participants in the Italy condition.

For each participant, the level of accessibility and desirability for the food types Indian and Italian was measured, resulting in an experimental 2 (prime: India and Italy) x 2 (food type: Indian and Italian) x 2 (measure: accessibility and desirability) factorial design. This design allows for exploring the effects of priming on listing food types (measure: accessibility) and the subsequent ranking of those items (measure: desirability). In this context, the prime is the independent variable, and food type and measure are the dependent variables. The factorial design incorporated the conditions of India and Italy as control conditions for each other, establishing a baseline for comparison within the design. During the measurements of accessibility and desirability for Indian food, India was assigned as the prime condition, while Italy served as the non-prime condition (control condition). Conversely, when assessing the accessibility and desirability for Italian food, Italy was assigned as the prime condition, and India served as the non-prime condition (control condition). Each participant was assigned to only one condition and completed the experiment once.

Participants were recruited via Prolific Academic and received £0.61 for 5 minutes participating, based on an hourly rate of £7.35. Considering the significant prevalence of ordering take-away meals (Davies et al., 2016), and for homogeneity reasons, only UK participants were recruited. The experiment was approved by the Faculty's Ethical Review Board (FERB, UU-SER approval number: 23-1083).

Table 1

Distribution of age groups across participants

		Frequency	Percent
Valid	18-24	17	18.9
	25-30	15	16.7
	31-40	13	14.4
	41-50	12	13.3
	51-60	20	22.2
	61-80	13	14.4
	Total	90	100.0

Procedure

The questionnaire was presented on participants' own displays (PC or laptop) as the experiment was conducted online. After registration on Prolific, participants were directed to app.Gorilla.sc to participate. The experiment involved completing a questionnaire about consumer preferences (see Appendix A), where one of the questions acted as a prime stimulus (Q10a in the India prime condition and Q10b in the Italy prime condition). Participants were presented with either question 10a or question 10b, depending on the condition they were assigned to. In this particular question, participants were instructed to indicate their preferred vacation destination. The priming stimulus consisted of an image related to the assigned prime condition (India or Italy), which was presented alongside an image of the Azores and Finland. Popular take-away meals in the UK include pizzas, Indian, Chinese, kebab, and traditional fish and chips (Davies et al., 2016). The two prime conditions were chosen based on their roughly equivalent popularity. The inclusion of the Azores and Finland as options served as distractors, to prevent participants from easily recognizing that they were being primed. These countries were chosen as they are not commonly associated with specific food types known in the UK, making them neutral options.

The experiment began with obtaining informed consent and collecting demographic information from participants. Initially, participants responded to a series of questions concerning various consumer preferences, such as chocolate, toothpaste, soft drinks, and others. These questions were designed as distractors, fostering the illusion that the questionnaire was only about consumer preferences. Then, participants encountered the question with the prime stimulus. The prime was intended to influence participants' subsequent responses. After being exposed to an image depicting either India or Italy, participants were requested to list three types of take-away food. To maintain a less conspicuous aim of the study, participants were instructed to complete a similar task regarding their music and sport preferences. Following that, participants were instructed to rank the previously listed take-away foods, music genres, and sports in order of preference, ranging from the highest (ranked as #1) to the least (ranked as #3). Subsequently, some questions regarding consumer preferences followed. Afterward, a debriefing session took place, in which participants were asked whether they were aware of the objective of the study and if they had identified any connections between the different topics presented in the questionnaire.

Data Preparation

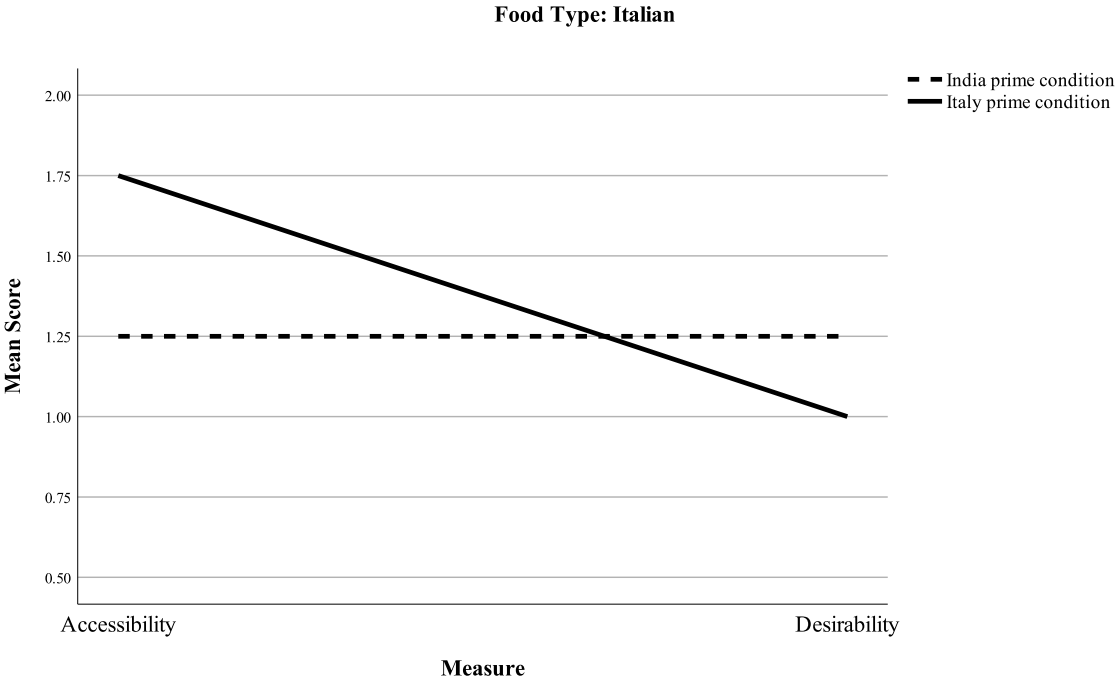
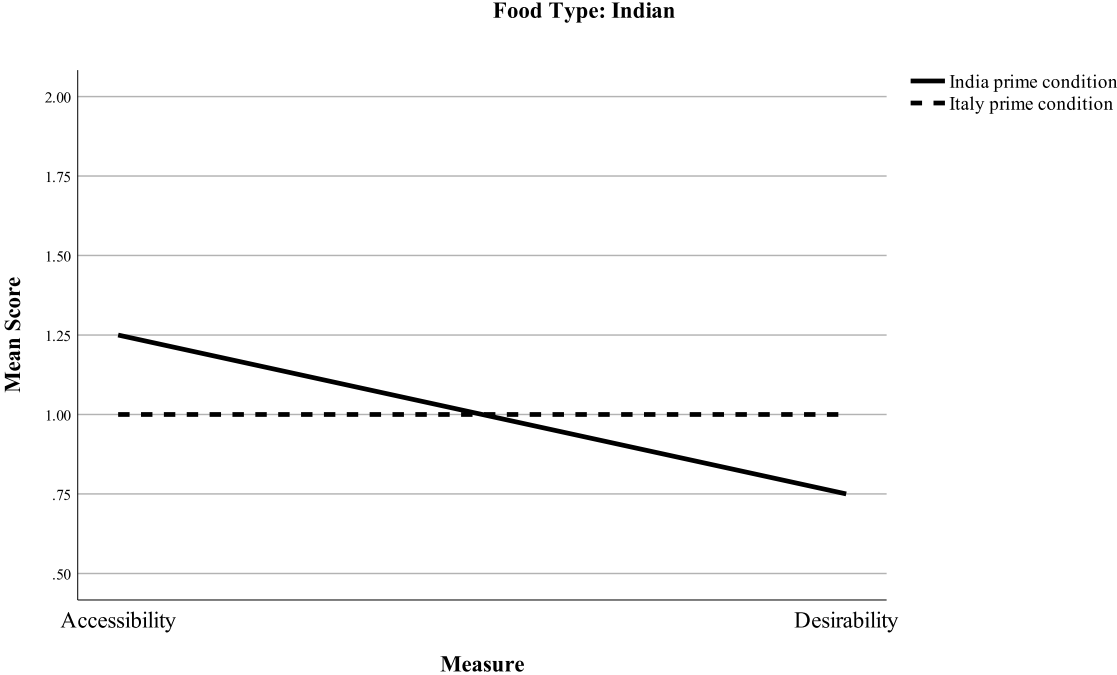
Prior to conducting the analyses, participants' responses regarding listing and ranking the food types were scored, resulting in the creation of six new variables. First, participants

received a score ranging from 0 to 3 on the variables ‘accessibility Indian’, ‘accessibility Italian’, ‘desirability Indian’, and ‘desirability Italian’. The accessibility variables were associated with the question requiring participants to list three types of take-away food, while the desirability variables were linked to the subsequent ranking question. For each variable, participants were assigned a score for each specified type of take-away food, based on their categorization as either Indian (for the Indian variables), Italian (for the Italian variables), and the rank at which the take-away food was positioned. The ranking used for the accessibility variables was based on the order of listing. Thus, the accessibility and desirability variables were examined in terms of the category to which the take-away food belonged and its respective ranking position. If the take-away food did not fit into the category of the food type of the variable in question, the participant received a score of 0 on the respective response. If the take-away food could be categorized accordingly, the participant received a score of 1, 2, or 3, depending on its rank (1 point = rank 3, 2 points = rank 2, 3 points = rank 1). As a result, each participant received three distinct scores per variable. The sum of these scores was then calculated, yielding a single score per variable for each participant. Due to the clear categorization of all provided answers into either Indian, Italian, or other food types (e.g., pizza, Italian, curry, Indian, fish & chips, and Chinese), there was no need for inter-rater reliability assessment.

The hypothesized results of the effects of priming on the accessibility and desirability of food types can be found in Figure 1. Note that due to the widespread popularity of Italian cuisine as one of the most well-known cuisines in Europe (Sert, 2017), it would be expected that the food type Italian receives a higher score than Indian. To account for the possibility that any observed effect could be influenced by the ranking position of food types, two additional variables were created that disregard the rank. These variables allow for an analysis that investigates whether there is a higher occurrence of Indian or Italian food across the two conditions. On these variables, participants were assigned a score of 1 if any of their three listed take-away foods could be categorized as Indian (for the variable ‘mentioning Indian’) and Italian (for the variable ‘mentioning Italian’), and a score of 0 if they could not.

Figure 1

Hypothesized Results of The Influence of The Prime Condition on Accessibility and Desirability



Note. Upper pane food type: Indian; lower pane food type: Italian.

Results

A 2 (prime condition: India versus Italy) x 2 (food type: Indian versus Italian) x 2 (measure: accessibility versus desirability) repeated measures analysis of variance (ANOVA) revealed a nearly significant reversed three-way interaction, $F(1, 88) = 3.695, p = 0.058$. It was expected that the prime condition would exhibit higher mean scores on the primed food type in comparison to the non-primed food type, as well as in comparison to the other condition. According to the hypothesis, mean desirability scores would be lower compared to the mean accessibility scores. Nevertheless, when closely examining the mean scores for each variable, it becomes evident that the opposite anticipated outcome is observed. One notable finding is the presence of an almost significant two-way interaction between food type and measure, exhibiting the same pattern of values as the three-way interaction, $F(1, 88) = 3.695, p = 0.058$. The analysis revealed a trend suggesting that the effect of measure on the outcome varied depending on the food type, although it did not reach statistical significance. All other effects of this analysis were also found to be non-significant, $p > 0.05$.

Although none of the effects reached statistical significance, the mean scores of the variables are notably remarkable. When analyzing the impact of the prime condition on food type, it can be observed that the mean accessibility scores for Indian food are higher in the Italy prime condition compared to the India prime condition (see Table 2 for an overview of the mean scores across the prime conditions). On the other hand, the mean accessibility scores for Italian food are higher in the India prime condition compared to the Italy prime condition. Furthermore, when looking at the measures of the primed food type, the mean accessibility score for Indian food is found to be lower on average compared to the mean desirability score within the India prime condition. Likewise, for Italian food, the mean accessibility score is lower than the mean desirability score within the Italy prime condition. It is noteworthy that the mean scores of the accessibility and desirability variables for both food types within the Italy prime condition are closely aligned. In contrast, when comparing it to the India prime condition, the scores are more distinct from each other. Furthermore, from the total mean scores, it can be observed that Indian food received a lower score compared to Italian food, although this difference was not found to be statistically significant (see Table 2 for an overview of the total mean scores). This outcome was predicted beforehand.

Table 2*Descriptive Statistics of the mean scores across prime conditions and the total mean scores*

	Condition	Mean	Std. Deviation	N
Indian food accessibility	Italy prime	1.34	1.323	47
	India prime	0.91	1.171	43
	Total	1.13	1.265	90
Indian food desirability	Italy prime	1.36	1.309	47
	India prime	1.02	1.282	43
	Total	1.20	1.300	90
Italian food accessibility	Italy prime	1.19	1.116	47
	India prime	1.65	1.325	43
	Total	1.41	1.235	90
Italian food desirability	Italy prime	1.21	1.122	47
	India prime	1.40	1.158	43
	Total	1.30	1.136	90

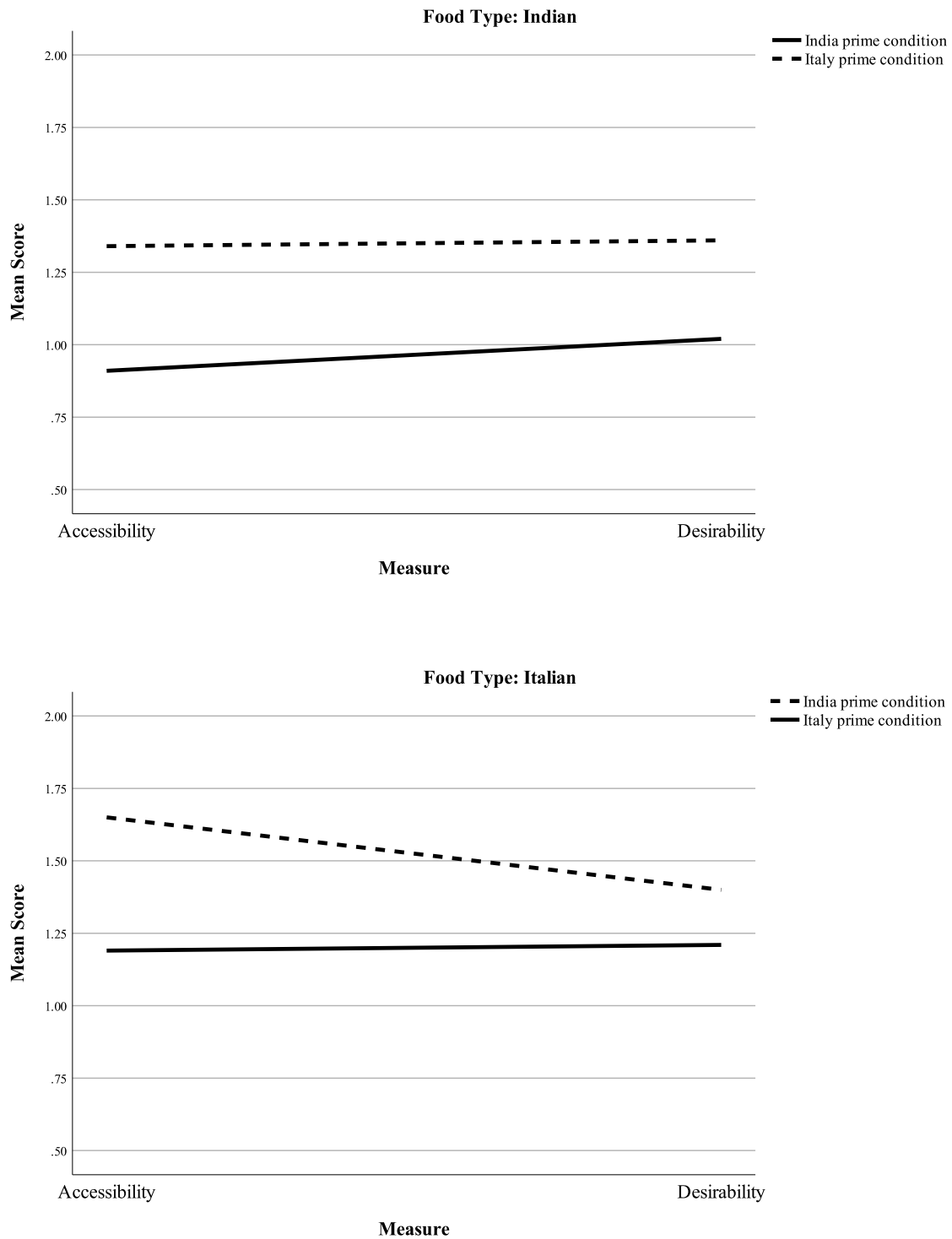
Figure 2 provides a visual representation of the nearly significant three-way interaction, depicted through two graphs. The upper graph illustrates the mean accessibility and desirability scores on Indian food of both the prime condition (India) and the non-prime condition (Italy). The lower graph illustrates the mean accessibility and desirability scores for Italian food of both the prime condition (Italy) and the non-prime condition (India). As depicted in the figure, the Italy prime condition exhibits a consistent pattern in scores for both Indian and Italian food. In contrast, the India prime condition reveals a visible difference between Indian food and Italian food.

In addition to investigating the three-way interaction, a 2 (prime condition: India and Italy) x 2 (food type: Indian and Italian) repeated measures analysis of variance (ANOVA) was conducted. For this analysis, the focus was not on the score of participants, but rather on whether they did or did not mention Indian and Italian food when listing take-away foods. For this analysis, the two additional variables were utilized as these disregard ranking. These variables enable examination of whether there is a greater occurrence of Indian or Italian food across the two conditions. The score of food type on these variables could take on values 0 or 1, indicating whether participants mentioned the relevant food type (1) or not (0). A significant main effect of food type was observed, $F(1, 88) = 4.896, p = 0.030$. This finding indicates that there is a significant difference in disparity in the frequency of mentions for Indian or Italian food. Specifically, Italian food was mentioned more often ($M = 0.68, SD = 0.503$) compared to Indian

food ($M = 0.51$, $SD = 0.470$). This demonstrates that Italian food not only has a higher mean score, based on ranking, but is also mentioned more frequently compared to Indian food.

Figure 2

Actual Results of The Influence of The Prime Condition on Accessibility and Desirability



Note. Upper pane food type: Indian, lower pane food type: Italian.

Discussion

The current literature on priming and human decision-making primarily focuses on individuals' selection among different pre-generated options. However, real-life decision-making often involves generating multiple alternatives before making a choice (Kalis et al., 2013). External cues have the ability to make certain pre-generated options more accessible, and thereby increase the likelihood of their selection. Therefore, it may appear that certain options, due to priming, not only become more accessible but also become more desirable. In practice, when pre-generated options are not available and individuals have to generate options themselves, the question arises whether priming facilitates an increase in the generation and selection of the primed options. The obtained results contradict the initial hypotheses and do not provide empirical support for them. It was not found that priming significantly affects the accessibility of the primed food type. Participants exposed to an image of India did not exhibit a higher frequency or quicker recall of Indian food items compared to those exposed to an image of Italy, and vice versa. In fact, participants in both prime conditions scored higher on non-primed food types compared to primed food types. Although it did not reach statistical significance, it is still worth mentioning. Moreover, no significant differences between measures were observed, suggesting that there is no effect of priming on the desirability of the primed food types. Contrary to expectations, the primed food type did not receive a lower ranking score compared to its initial ranking when listing. The only significant finding was the main effect of food type, which was found in an additional analysis. This suggests that participants mentioned Italian food significantly more frequently than to Indian food. This finding aligns with the initial expectations (shown in Figure 1), based on the popularity of Italian food in Europe (Sert, 2017).

Potential Explanations

The results raise questions about the underlying factors that may explain the lack of support for the hypotheses. An aspect that could have impacted the results, is the limited power of the study resulting from a small sample size. In experimental research, it is common to collect a substantial amount of data from participants to enable comprehensive analyses. Nevertheless, it was not feasible to do so during this experiment. Participants could complete the listing and ranking tasks after exposure to the prime only once, resulting in a relatively restricting amount of data collected from each participant. This may have led to the absence of statistically significant findings.

A potential explanation for the reversed effect, although not found to be significant, is that participants might have been aware of the prime stimulus. Loersch and Payne (2011)

proposed that the effectiveness of priming relies on individuals misattributing their prime-induced mental content to their own thoughts. Individuals then assimilate the thoughts activated by the priming procedure into their self. However, this process becomes hindered if individuals are conscious of the external source of their mental content, namely the priming procedure (Framorando & Gendolla, 2019). Underlying processes, such as behavior correction, play a crucial role in understanding why primes lose their effectiveness when individuals are aware of them (Gendolla, 2015). These underlying processes are rooted in individuals' preference for autonomy and the belief that one's actions align with their thoughts and decisions (Ryan & Deci, 2000; Loersch & Payne, 2011). Taking this into consideration, it can be expected that individuals develop a dislike towards external influences, like priming procedures they become aware of. As a result, they may exhibit reactance in an effort to restore their sense of freedom and autonomy (Brehm, 1966; Wicklund, 1974). Participants might have been aware of the prime stimulus and have deliberately chosen not to indicate a food type aligned with the country they were primed with. Future research should explore reactance as a potential underlying mechanism and assess its presence to gain a more comprehensive understanding of its role in priming interventions.

Importance of the Study

Despite the lack of statistical significance, the findings of this study hold implications for priming research. Understanding the effects of priming on option generation provides valuable insights into cognitive processes and decision-making contexts. The relatively limited attention given to the role of option generation in priming and decision-making studies is noteworthy, proving an intriguing starting point for further exploration and expansion in this area. Moreover, this study aimed to highlight the importance of distinguishing between accessibility and desirability in priming studies, as they can independently impact decision-making regarding option generation. Separating these constructs opens up new opportunities for scientific inquiry and a deeper understanding of their role in decision-making processes. Additionally, priming research contributes to the field of nudging by informing the design of effective behavioral interventions. Through an understanding of how priming affects cognitive processes, researchers can identify strategic intervention points and design tailored nudges aimed at specific goals or behaviors. The findings of this study offer valuable insights and potential directions for future research.

Limitations

As previously mentioned, a limitation of this study is the relatively modest sample size, which may have resulted in limited statistical power. Furthermore, the collection of additional

demographic information could have offered a more comprehensive understanding of the participants' backgrounds and helped address potential confounding factors related to their cultural backgrounds. For this study, the collected demographic information was limited to gender, age category, and residence in the UK. Despite conducting statistical tests and implementing counterbalanced distribution of participants, the presence of a higher number of participants of Indian descent in the Italy condition, and vice versa, could potentially be attributed by chance. This chance variation potentially explains the unexpected, reversed effect observed, where the non-primed food displayed higher scores compared to the primed food within the prime condition. Moreover, the fact that participants' prior experience with ordering food was not investigated, could have impacted the results. A considerable number of participants were excluded from the analysis because they listed food types other than take-away foods (e.g., fruits, groceries). It is reasonable to assume that these excluded participants may not be familiar with the process of ordering food. It is therefore possible that a number of participants that was included in the analysis were also unfamiliar with the process of ordering food and instinctively thought of the most common types of take-away food. Hence, it is plausible that the prime did not exert a substantial influence on their choices. A final limitation of the study is that participants may not have correctly recognized the images used as priming stimuli as representing India or Italy. As shown in Appendix A, the images were presented without any accompanying labels. This lack of explicit identification may have resulted participants to not make the connection between the image of India or Italy and Indian or Italian food. Also, the similarity between the two images is noticeable, raising the possibility that participants might have mistakenly identified one image as another. Therefore, it is crucial to carefully consider the selection of stimuli and ensure that the prime is sufficiently robust.

Future Research and Practical Implications

Future research should consider alternative explanations, explore potential moderating variables, and employ larger sample sizes to ensure reliability and generalizability. Comprehensive investigations can deepen understanding of the interplay between priming and individuals' perceptions and preferences regarding options. Future research with a larger and more diverse sample could address the statistical power limitation and provide stronger evidence for the hypotheses. Collecting demographic information would also be beneficial to better understand and account for potential confounding variables related to participants' cultural backgrounds. Measuring accessibility and desirability as distinct constructs and examining their connection to option generation provides valuable insights into the specific mechanisms through which priming influences decision-making. The construct accessibility

involves assessing the ease with which certain goals or options come to mind after exposure to a prime. It is interesting to investigate the role of priming on option generation in this context. On the other hand, the construct desirability focuses more on evaluating individuals' subjective evaluations and preferences regarding the primed options or goals. It is important to bear in mind that, for instance, an increase in one construct as an effect of the prime does not necessarily imply an increase in the other construct as an effect of the same prime. The more knowledge is acquired in this regard, the greater the practical implications will be. Additionally, it is of interest to further explore the impact of priming on reactance in greater depth.

Priming research has practical implications for behavior change interventions, the design of tailored nudges, and the facilitation of goal achievement. By understanding how priming influences cognitive processes and behavior, interventions can be strategically designed to align with individuals' goals in specific contexts. Applying priming techniques in advertising and marketing can enhance persuasive power and desired consumer responses. Moreover, priming research plays a significant role in the development of effective behavioral interventions that align with both individuals' personal goals and broader governmental goals, ultimately promoting positive behavior. This emphasizes the effectiveness of priming techniques in promoting social change and facilitating the attainment of desired societal outcomes.

Conclusion

To conclude, decision-making is a complex phenomenon influenced by cognitive processes, emotions, and environmental influences. An environmental influence that has received extensive attention is priming. While previous research on priming has mainly focused on how individuals choose between pre-generated options, everyday decision-making often involves generating alternatives before selecting one. This study aimed to explore the impact of priming on decision-making through option generation and provide a more comprehensive understanding of decision-making processes. An online experiment was conducted to investigate whether priming affects the accessibility and desirability of food types via option generation. The main research question of this paper was: "To what extent do priming effects shape accessibility versus reflecting desirability?" The results did not demonstrate a significant effect of priming on accessibility and desirability. Although the proposed hypotheses did not receive empirical support, this study has made a valuable contribution by opening new avenues for future research. Applying a deeper and more comprehensive understanding of priming empowers individuals to make positive changes, facilitates tailored interventions, and contributes to behavior change strategies in various domains. Understanding the power of

priming opens up new possibilities for designing interventions aimed at promoting positive outcomes and influencing decision-making processes.

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Appendix A**Questionnaire India Prime Condition and Italy Prime Condition**

Please answer the following questions about yourself.

1. To which gender identity do you most identify?

- A. Female
- B. Male
- C. Prefer not to say
- D. Other (please specify)

2. How old are you?

Please select:

18-24, 25-30, 31-41, 50-61, 61-70, 81+

3. Are you the primary decision-maker in your household regarding purchasing products?

- A. Yes
- B. No
- C. Other (please specify)

4. How do you typically find out about brands and products?

- A. Commercials/TV
- B. Social media
- C. Friends and family
- D. In retail stores
- E. Other (please specify)

5. Which of these factors are most important when choosing a product?

- A. Trust
- B. Reputation
- C. Price
- D. Availability
- E. Other (please specify)

6. *When deciding what to purchase, do you usually plan ahead or decide at the time of purchase?*

- A. Decide at the time of purchase
- B. Plan ahead of purchase

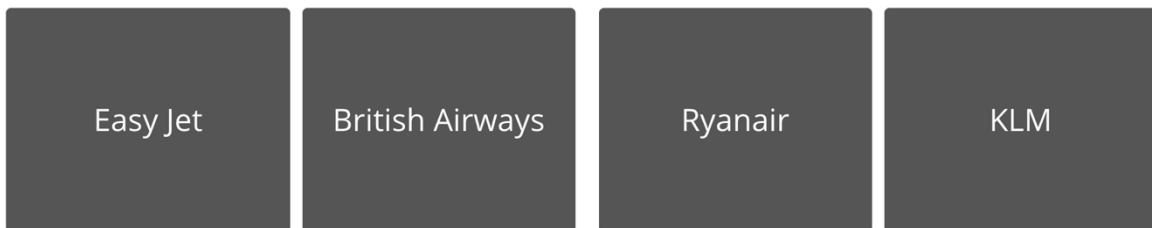
7. *Which of the following brands do you typically buy?*



8. *Which of the following brands do you typically buy?*



9. *Which of these airlines do you prefer most?*



10a. *Which location would you prefer for a vacation?*



10b. Which location would you prefer for a vacation?



11. When ordering for delivery, which of these brands would you prefer?

Deliveroo

Just Eat

Uber Eats

Other

12. What type of food would you then order? Please name a type of food.

13. Please name a different type of food than your previous answer?

14. Finally, name a different type of food than your previous answers?

15. Finally, name a different type of food than your previous answers?

16. We would like to know more about your preferences. Please name a music genre you like.

17. Please name a different music genre than your previous answer?

18. Finally, name a different music genre than your previous answers?

19. Lastly, name a sport.

20. Please, name a different sport than your previous answer?

21. Finally, name a different sport than your previous answers?

22. Which of the following brands do you typically buy?



23. Which of the following brands do you typically buy?

