



How Would Voters Think? The Effect of Thinking Style on Voter's Visual Attention Using Eye-Tracker

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Abstract

The usefulness of modern marketing tools, such as neuro-marketing, has developed in recent studies. Regarding the numerous investments in using these tools in the political elections of developed countries, this tool can play a crucial role in identifying and analyzing voters' preferences. In addition, based on investigations, considering the thinking style of individuals can be a reliable predictor of a voter's decisions and behaviors. In this study, by utilizing the eye-tracking tool, researchers aimed to evaluate the effect of thinking style on the visual attention of voters during the observation of political advertisements published on social networks. According to previous research, thinking style has had an impact on the visual attention of individuals. A sample of sixty-seven individuals is recruited. The results suggest that having an intuitive thinking style leads to paying more visual attention to the pictures as opposed to the texts and paying more visual attention to candidate pictures compared to conceptual pictures. Meanwhile, having a rational thinking style leads to paying more visual attention to texts in comparison with pictures as well as paying more visual attention to the conceptual pictures than the candidate pictures.

Keywords: Rational Thinking, Intuitive Thinking, Political Marketing, Neuromarketing, Eye-Tracking, Visual Attention

Introduction

Political marketing is an instrument for comprehending the preferences and desires of the voters to maximize political goals (Savig, 2003). Without any doubt, Advertisements are an effective tool to inform individuals about candidates' slogans, views, and plans to grant them the required assurances (Marshment-Le, 2009). Due to political benefits, the elections are tied and subject to huge investments, and there has been a considerable rise in political marketing and campaign funds; in the US presidential election in 2016, investment was two times as much as in 2004 (Geer, 2012; Lovett, 2019). In recent elections, candidates who have allocated more resources to publish more effective advertisements, have been elected; Hillary Clinton defeated Bernie Sanders in the Democratic party by having seven thousand more advertisements, and Donald Trump won the republican convention by having about six thousand advertisements more than his rivals (Zubak-skees, 2016).

Investigations have revealed that 85 to 95 percent of our decisions are made unconsciously. Therefore, the verbal standpoints of individuals are different from their underlying standpoints, and this leads to the emergence of neuro-marketing tools. Utilizing this tool, marketers have access to people's brains rather than asking different questions (Burgos-Campero & Vargas-Hernandez, 2013). In parallel to the advent of neuro-marketing tools, introducing and explaining thinking styles has helped researchers to have a better understanding of recognizing and predicting human decisions. According to the thinking style approach, in the decision-making process, humans use two systems. System 1 (intuitive thinking) is regarded as emotional, fast, and automatic, whereas



system 2 (rational thinking) is considered as rational, and slow, and it controls system 1 (Sloman, 1996; Stanovic & West, 2000). In other words, individuals make unconscious, fast decisions using System 1, and conscious, slow decisions using System 2 (Kahneman, & Frederick, 2002).

This study aims to examine the effect of thinking style on the visual attention of potential voters when they look at political publicities. In this study, visual attention is defined by four criteria; Time to first fixation, Fixation count, Visit duration, and Visit count of participants' eye movements while they are looking at political advertisements (pictures, texts, candidates' pictures, conceptual pictures). This research contributes to empirical studies by combining Neuro-marketing tools with thinking style in order to have clearer insights into voters' decision-making elements. Using the results of this study, politicians can enhance their advertisements' framing in order to attract voters' visual attention more effectively and consequently, optimize their campaigns and ads efficiently in case of investment and influence respectively. Furthermore, this study offers new nuances for the voters to recognize how they think and decide about political candidates, using an experimental study incorporating eye-tracking technique.

Literature review

Neuro-marketing is an interdisciplinary science that connects and merges psychology, neuroscience, and marketing. In this science, the main goal is to analyze how customers make decisions to purchase products and use services (Vlasceanu, 2014). In other words, neuro-marketing can predict customer behaviors by exploring neuro-circuit mechanisms in the brain (Gazzaniga et al., 2008). Furthermore, the emotional and perceptual reactions of customers can be derived through this precise method (Karmarkar, 2011). Eye tracking is one of the crucial tools that has been used in neuro-marketing recently. It refers to the process of catching the points of gaze in the visual attention zone. Naturally, to see objects, the eyes are required to fixate the gaze for a certain period of time, normally between 200 and 600 ms (Duchowski, 2002). In a simpler term, this tool tracks and measures eye movement that shows individuals' visual attention.

In previous studies, it was claimed that humans tend to make decisions logically (Dieckmann et al., 2009) whereas other investigations suggest that humans rely on their intuition due to a lack of human capacity to analyze complicated situations rationally (Milosavljevic & Cerf, 2008). In addition, based on previous examinations, the interaction between System 1 and System 2 forms human behaviors. Generally, employing System 2 leads to better, more precise choices and decisions. (Epstein, 2003; Kahneman, 2011; Stanovic & West, 2000).

As this article discussed formerly, System 1 and System 2 are fast and slow respectively. Therefore, we can hypothesize that individuals with system 2 dominance tend to pay more attention to ads containing more details, and individuals with system 1 dominance tend to pay more attention to ads containing less information. In this investigation, political advertisements are composed of two categories; Candidates' pictures with slogans and conceptual pictures with slogans. Hence, it is expected that individuals with system 1 dominance pay more visual attention to pictures rather than texts, and candidates' pictures than conceptual pictures, while individuals with system 2 dominance pay more visual attention to pictures rather than texts, and conceptual pictures than candidates' pictures.

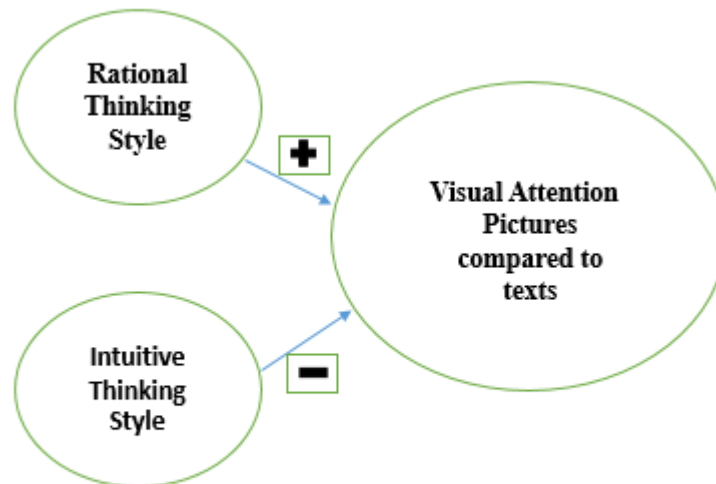
Hypothesis 1: An intuitive thinking style leads to more visual attention to pictures than texts.

Hypothesis 2: A rational thinking style leads to more visual attention to texts than pictures.

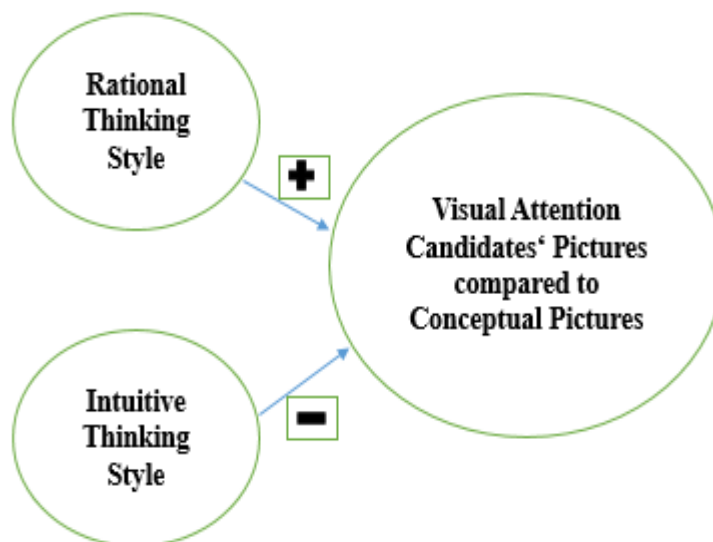
Hypothesis 3: An intuitive thinking style leads to more visual attention to candidates' pictures than conceptual pictures.



Hypothesis 4: A rational thinking style leads to more visual attention to conceptual pictures than candidates' pictures.



Conceptual model hypothesis 1 and 2



Conceptual model hypothesis 3 and 4

Methodology and procedure



In this study containing two steps, we employed a quantitative experimental design to assess the thinking style and visual attention of participants. 67 individuals participated voluntarily in this experiment; 35 women and 32 men. They were informed about the experiment, and we were granted permission to use their data from the experiment. Participants filled out the REI-40 questionnaire to measure individuals' thinking style scores. Regarding examining thinking style scores, different questionnaires have high internal reliability and validity (Phillips et al., 2016). REI-40 has been viewed and utilized as the most reliable in prior studies (Phillips et al., 2017).

64 political advertisements including pictures and texts were displayed. Advertisements were composed of 32 parliament candidates who were selected equally from both major political parties; 32 out of 64 political publicities were candidates' pictures with their slogans, and the rest were conceptual pictures with texts. Participants were requested to look at political advertisements and after each candidate's pictures, they were asked whether they knew the candidates or not. Furthermore, publicities were selected from the social media pages of candidates one week before the election. It is noteworthy to mention that the experiment's environment was designed and controlled with proper standards such as light, sound, etc. Two out of 64 political advertisements, including a conceptual picture and text and a candidate picture and text, are presented below.



حذف چهار صفر از پول ملی در شرایط کنونی اقتصاد
یک عمل خنثی است چراکه هیچ تغییر اساسی در پی نخواهد داشت

Conceptual picture with text



اصلاح نگاه به امید شرط بازسازی اعتماد مردم است.
امید زنده است.

Candidate picture with slogan



Results

In this article, thinking style was regarded as the independent variable, and visual attention was the dependent variable. Linear regression was utilized to test the hypotheses. The results of regression analysis are presented in two ways below. First, the scores for intuitive and rational thinking styles were computed as a continuous variable using a 5-point Likert scale. Second, these scores were considered as categorical variables coded as 0 and 1. For the individuals with a score of intuitive or rational thinking above the average, we coded it as 1, and below average as 0. The results show that the intuitive thinking style led to more visual attention to the pictures compared to texts, such that fixation count, visit duration, and visit count have a significant relationship with the intuitive thinking style. Therefore, the hypothesis 1 is supported. Whereas, rational thinking style did not lead to more visual attention to the texts as opposed to pictures. Hence, hypothesis 2 was not supported.

Furthermore, the results show that an intuitive thinking style led to more visual attention to candidates' pictures in comparison with conceptual pictures using the visit count indicator. Therefore, hypothesis 3 is partially supported. In addition, the rational thinking style led to more visual attention to conceptual pictures set against to candidates' pictures, such that fixation count, visit duration, and time to first fixation have significant relationships with the rational thinking style. That said, hypothesis 4 is supported. The results of the analyses are presented below.

Durbin Watson	Adjusted R- squared	R-Squared	Coefficient of Determination	F-test	Independent Variable		Dependent Variable	Zone
					Rationality	Intuitiveness		
1/575	0/140	0/180	0/006	4/613	0/264* (0/027)	0/174 (0/138)	Time to first fixation (continuous)	Pictures to texts
1/682	0/124	0/164	0/010	4/112	0/243* (0/042)	0/174 (0/141)	Visit duration (continuous)	
1/693	0/074	0/116	0/050	2/746	0/199 (0/104)	0/120 (0/320)	Visit count (continuous)	
1/586	0/119	0/159	0/012	3/961	0/248* (0/042)	0/124 (0/297)	Time to first fixation (categorical)	
1/680	0/096	0/137	0/025	3/329	0/214 (0/082)	0/119 (0/320)	Visit duration (categorical)	
Durbin Watson	Adjusted R- squared	R-Squared	Coefficient of Determination	F-test	Independent Variable		Dependent Variable	Zone
					Rationality	Intuitiveness		



1/783	0/155	0/194	0/003	5/041	0/197 (0/092)	0/284* (0/016)	Time to first fixation (continuous)	Candidate picture to conceptual picture
2/314	0/070	0/112	0/050	2/655	0/313* (0/012)	0/176 (0/147)	Visit count (continuous)	
1/930	0/096	0/137	0/025	3/338	0/165 (0/178)	0/172 (0/153)	Time to first fixation (categorical)	
2/118	0/077	0/119	0/045	2/842	-0/053 (0/666)	-0/330** (0/008)	Visit duration (categorical)	
2/187	0/110	0/151	0/016	3/725	0/336** (0/007)	0/270* (0/026)	Visit count (categorical)	

Standardized Beta is reported inside the parentheses, and p-value is displayed inside the parentheses.

The upper table represents the results of testing hypotheses 1 and 2, and below that, is the results if testing hypotheses 3 and 4.

$p < 0.05$, * $p < 0.01$, * $p < 0.001$

Conclusion

Since us election in 2016, political advertisements in digital media have been an imperative tool to persuade more potential voters insofar as Donald Trump allocated 150 million dollars in this domain (Lapowsky, 2016). Furthermore, the emergence of new technologies such as eye tracking in conjunction with human behavior psychology (thinking style), has bolstered the mix and usage of political science, neuroscience, and marketing. Hence, there is no need to ask questions to predict voter's preferences directly. Utilizing neuro-marketing in political science enables marketers to hold reliable information from voters' brains indirectly (Burgos-Campero & Vargas-Hernandez, 2013). This analysis seeks to explore the influence of thinking style on the visual attention of voters which has not been common in previous studies. This could be one of the major contributions of this study. Previous studies explored the impact of thinking style on visual attention when individuals look at nutrition labels (Ballco & De magistris, 2017). Results show that the intuitive thinking style tends to pay more attention to pictures than nutrition labels and the rational thinking style leads to more attention to the nutrition labels than pictures (Ares et al., 2014; Hogarth, 2001). In the educational field, a study showed that students with higher rational thinking styles have more visual attention to texts than pictures, and students with higher intuitive thinking styles have more visual attention to pictures than texts (Tsianos et al., 2009). The results of this study is aligned with previous available literature in other domains.

Besides employing new technology and using thinking styles, using the outcomes of this analysis, politicians can improve their advertisements' structure so as to attract voters' visual attention more effectively and consequently, optimize their campaign costs efficiently. For future studies, to expand this study, it is expected to manipulate the thinking style of participants using the standard method in the literature (Wilson, 1991; McMackin, 2000; Jordan, 2007). Also, this model can be tested in different countries with different voting regulation to explore the effect of voters' thinking styles on their visual attention the advertisements.



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