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Disclaimer:

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List of Acronyms

NFM	News-finds-me perspective
PLV	Pamantasan ng Lungsod ng Valenzuela

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"I can do all things through Him who strengthens me." (Philippians 4:13)

Abstract

When forming opinions, people often ignore potentially useful information even when it is freely accessible. Such information avoidance may lead to the formation of distorted opinions that could, in turn, fuel polarization. Using a lab experiment, this paper uncovers how peer engagement and information avoidance impact opinion formation among Filipino students on a controversial social issue, to wit, the death penalty. At baseline, we asked subjects about their opinions on the death penalty and measured their general tendencies to avoid information. Participants were then prompted into online conversations where they randomly received information that either supported or opposed their opinion. We measured how subjects spent their time on the internet and recorded the clicks on different information sources using tracking software. We find that the peer opposition treatment increases engagement with opposing information but did not affect total time allocations for information engagement. Subjects displaying higher tendencies of information avoidance engaged less with opposing information, even if the costs of acquiring this information were low. Results suggest that exposure to diverse social networks may de-polarize opinions, given the right conditions. We interpret our findings with respect to the literature on information avoidance, belief formation in social networks, and within the Filipino context.

Relevance to Development Studies

Social media in development is a double-edged sword. For one, it has created an accessible avenue for advocacies, social movements, and development issues to acquire more attention from the general public. On the other hand, it has established avenues for opinion manipulation, misinformation, and opinion polarization to flourish. The adverse effects of social media have had damaging implications on public health, the environment, security of minority groups, and the integrity of democracy itself. By studying the dynamics of how online information acquisition and human behaviour work together to affect opinions, we can gain a better understanding of how to mediate or reverse the ill outcomes of social media, may it be through policy or practice.

The study explores the effects of peer interaction and information avoidance to individual opinions through an experiment conducted at a state university in the Philippines. It aims to contribute to the development studies field by developing a better understanding of how people choose to engage with information and how this engagement affects their opinions, particularly for people from developing countries. Most resources surrounding this topic are written in the context of people in developed countries, who have very different social norms and network dynamics compared to people in developing countries. As information acquisition becomes a more social process, the need to study this issue in different social contexts becomes increasingly important. A better understanding of this topic is crucial as the developing world begins to cope with the new reality of rampant social media use and easy information access, which can hinder, and at the same time, expedite development.

Keywords: polarization, information avoidance, behavioural economics, social media

Chapter 1

Introduction

The internet has become the political forum of the modern age. With an increasing number of people who access information from social media platforms and web pages¹, the internet has developed into the primary source of information for most people. However, the ease of access and connectivity that accompany internet technology have changed the way people seek and process information, creating problems of its own. These problems include the rampant spread of misinformation and selective exposure to information within echo chambers. Selective exposure influences independent decision-making for a variety of issues like health and political support, which collectively affect policy outcomes and implementation. Heightened tensions due to conflicting beliefs on an array of societal issues create polarized societies that promote an “us versus them” mentality. If left unchecked, polarization will become difficult to heal and will threaten all institutions essential to democracy (Carothers and Donohue, 2019).

Polarization has become one of the biggest global problems today, affecting both developed and developing countries (Carothers and Donohue, 2019). For this reason, many researchers have taken an interest in studying the rise of polarization in the age of social media. So far, the analysis of polarization has mostly been confined to the discussion of social network diversity with little mention of individual agency and preferences, which may influence the decision to engage with information. For example, people might opt not to engage with shared information because of hedonic or strategic motivations. In addition, most papers on the topic are conducted in the context of high-income or developed countries, resulting in implications specific to their background. The dynamics of polarization might be different in developing countries, where people tend to have a higher dependency on social capital for financial and non-financial advantages (Woolcock and Narayan, 2000). This dependency may affect how opinions form as information-seeking in the age of social media becomes a more social process.

To explore how individual behaviour and social networks affect opinions, we conducted a lab experiment at a state university in the Philippines with the participation of young adults aged between 18 and 24². We asked for baseline opinions on the death penalty and measured tendencies to avoid information using an information avoidance scale developed by Howell and Shepperd (2016). Participants were then prompted into online conversations where they randomly received information that either supported or opposed their opinion. We measured how they spent their time on the internet and recorded the number of clicks on different information sources using tracking software. With the results of the experiment, we aimed to answer two main research questions: (i) Does opposing information relayed by online peer opposition prompt people to access more varied information? (ii) Does the user’s decision to engage with opposing information change depending on their degree of information avoidance?

We found that the amount of time spent on information did not vary between treatment groups; however, participants engaged more with information acquired from their assigned

¹ According to the International Telecommunication Union (ITU), at the end of 2018, 51.2% of the world population, or 3.9 billion people, are connected to the internet with the population continuing to grow steadily, especially in developing countries.

² Compared to other age groups, young people aged 18-24 have the highest social media presence in the country (Aguilar, 2019).

peer treatments. Higher tendencies of information avoidance led to less engagement on opposing information even if participants did not need to exert any time or effort to acquire the information. Larger movements towards more neutral opinions are associated with higher opposing information engagement, which suggests its de-polarizing effects.

Overall findings suggest that more exposure to diverse sets of information increases engagement with different viewpoints, which can mediate polarization. To ensure the effectiveness of diversified information exposure in neutralizing polarized opinions, it is important to decrease tendencies of information avoidance by reducing the disincentives associated with opposing popular beliefs. We interpret our findings with respect to the literature on information avoidance, belief formation in social networks, and within the Filipino context.

1.1 Brief Background: Polarization in the Philippines

The Philippines' long-standing history as a democracy has been remarkably free of deep political rifts despite its archipelagic structure and population with diverse religions, ethnic groups, and socio-economic classes (Slater and Arugay, 2018). This changed with the 2016 electoral victory of President Rodrigo Duterte, who was not part of the elite group that previously dominated Philippine politics. His victory was a call for drastic change and strong leadership to solve pressing social and political problems (Arugay, 2017). Duterte and his administration met this demand for change by initiating policy discussions that revolved around controversial issues like the war on drugs, legalization of divorce, legalization of same-sex civil unions, reinstatement of the death penalty, and the implementation of the reproductive health bill. These discussions have been amplified by social media, resulting in rising tensions between different social and ideological groups.

The role of social media on opinion polarization in the Philippines should not be discarded or downplayed. Reports suggest that Duterte's presidential win and continued support is attributed to strategies that rely on social media engagement (Curato, 2016; Postill, 2018; Gavilan, 2016). The influence of social media in the Philippines is not very surprising given recent reports on how often and how much Filipinos immerse themselves in it. The Philippines was proclaimed the "Social Media Capital of the World" in 2018³ with the Filipino population spending double the global average time on social media⁴. Apart from that, 93% of the Filipino population is active on social media with 86% of mobile numbers connected to 3G or 4G networks (Mateo, 2018). The fact that social media use is becoming increasingly embedded in the lives of many as a source of information and networking makes the need to explore the dynamics of polarization in this context more urgent.

1.2 Research Questions

To understand how polarization flourishes on social media, we focus on the role of peer interaction and information avoidance as instruments that determine information engagement. Two main research questions to guide us through this study:

- (i) Does opposing information relayed by peer engagement prompt people to access more varied information?
- (ii) Does the user's decision to engage with opposing information change depending on their degree of information avoidance?

³ The title was awarded by the Digital Global Report.

⁴ The global average of time spent on social media is 2 hours.

Chapter 2

Review of Related Literature

This section discusses an existing body of literature that contains theories and empirical studies related to our research. The objectives of this section are: (i) to discuss the relationship of social life, bias, and conformity; (ii) to explain information avoidance and discuss how it forms and dissipates; and (iii) to elaborate on the changes in people's information-seeking behaviour in the era of social media.

2.1 Conformity and Belief Formation

Literature throughout the years has shown that behaviour and bias follow a contagion effect, where the actions of others can influence individual behaviour (Bicchieri and Xiao, 2009; Krupka and Weber, 2009; Claidière and Whiten, 2012). This influence can change judgements and beliefs, and even objective perceptions of the truth. In an experiment, Kataria (2012) finds that differences in views and disagreements in policy recommendations can exist because of personal preferences and beliefs.

Although this bias is found to be transferrable within groups, it is possible for people to shift away from it when exposed to feedback. Li et al., (2019) finds that people can wean themselves off conformity bias if the information provided by social behaviour is found to be uninformative or of little use. While humans have the tendency to follow social information, feedback allows people to adjust their perceived validities of different information sources. This finding is supported by some recent research on social reinforcement learning, which suggests that people adjust their beliefs based on the perceived validity and usefulness of various information sources (Campell-Meiklejohn et al., 2017).

In social networks that are homogenous in opinions, there may be a lack of feedback and access to different types of information, which strengthens the influence of a predominant view within the group. By increasing the circulation of opposing information, a better understanding of diverse arguments surrounding the issue could cause a change in the perceived validities of different information sources. Relying on different sources of valid information can neutralize conformity bias and change overall opinion on the topic.

2.2 Information Avoidance

Information avoidance occurs when people choose to avoid free and useful information that could improve decision making (Golman et al., 2017). Individuals normally avoid information that threatens a cherished belief, a habit, or a current emotion. The degree of perceived threat associated with information and the inclination for avoidance move simultaneously, where a higher perceived threat would mean a higher likelihood of avoidance (Sweeny et al., 2010).

Researchers have been successful in reducing avoidance by decreasing the perceived threat associated with information. One method to decrease avoidance, proposed by Howell and Shepperd (2012), is through affirmation. Their study showed that by affirming people of their overall integrity, it is possible to decrease defensiveness and reduce aversion towards information that threatens self-respect. They find that people who went through affirmation interventions were less likely to avoid threatening health-related information when given a choice to access it. Another method also explored by Howell and Shepperd (2013) is contemplation. In theory, prompting people to contemplate their reasons for avoiding

specific pieces of information reduces the importance of accompanying threats, which allows them to override actions based on emotions, replacing them with objectively better decision-making (Batha and Carroll, 2007 as cited in Howell and Shepperd, 2013). Their results show that contemplation interventions worked to reduce avoidance of health-related threatening information, but only for treatable diseases. The effectiveness of these information avoidance mediation efforts is yet to be tested on threatening information related to political views and ideology.

2.3 Social Networks and Social Media

The interaction of media sources on social media can affect emotion, behaviour, and cognition (Hwang and Kim, 2015). There are two conflicting arguments in the literature that summarize the effects of social media exposure to the prevalence of polarization. One argument proposes that social media networks are personalized in a way that rarely allows the user to see different points of view, making it harder to objectively judge which information should affect personal stands and values (Vitak et al., 2011). Another argument implies that social media can mediate polarization by bringing together users with different points of view on a similar platform, increasing their chances of encountering diverse sources of information (Papacharissi, 2002, p. 23).

To investigate the causal effect of social media to the online political landscape, Lee et al. (2018), observed the changes of political views in a sample of South Korean adults through a survey spanning 4 years (2012-2016). Their findings suggest that political polarization increases because of increased political engagement, which includes the sharing and consumption of political news online. In another study of two Facebook groups, Rathnayake and Suthers (2019) found that while social media could create ideological echo chambers, it could also be a tool for diversifying exposure to different ideologies by allowing people with different backgrounds to co-exist on the same platform.

Discussions about information-seeking behaviour in the age of social media revolve around the development and strengthening of online social networks as carriers of information. To explain the mechanisms of this change in more detail, the next sub-sections discuss the News-Finds-Me Perception and literature about the effects of social network heterogeneity on opinion polarization.

2.3.1 News-Finds-Me (NFM) Perception

While social media networks can create a community of discourse and political participation, it also creates a change in news and information-seeking behaviour. A change in information-seeking behaviour, identified by recent studies, is referred to as the News-Finds-Me (NFM) perception (Gil de Zúñiga et al., 2017). The NFM perception implies that citizens believe they can stay informed about the news through indirect sources and incidental exposure.

Gil de Zúñiga et al. (2017) find that in a U.S. panel-survey data, participants who perceived that they can passively keep updated with the news were less likely to use traditional media sources and became less knowledgeable about social and political issues over time. Thus, arguing the need for active news and information-seeking to facilitate better knowledge exchange. A feature of the NFM perception is the reliance on social network peers for information (Song et al., 2019). Toff and Nielsen (2018) find that most of their interviewees expressed that they do not actively seek information about the news because they will eventually be exposed to it. They find that people are confident in their social networks and their lived experience of how news was able to reach them without seeking for it.

An explanation for this change in information-seeking behaviour might be explained by Elenbaas et al. (2013). They propose that while the interaction of information availability and

the motivation to learn more about one's political environment is initially a positive one, it can gradually weaken. As the saturation of information in the news increases, people are less motivated to search for information. In this situation, highly motivated information-seekers tend to reach a learning ceiling, while it becomes easier for less motivated people to keep updated with the news.

2.3.2 Homogenous and Heterogeneous Social Networks

Previous research finds that having predominantly similar views within your social network prompts selective exposure of information (Lee et al., 2014; Iyengar and Hahn, 2009; Bienenstock et al., 1990). Through the process of community building and information sharing, people on social media have created factions that are closed only to information that conforms to a predominant narrative within the group. This may increase the likelihood of extremism and polarization that is less tolerant of diverse points of view, creating an echo chamber that continually reinforces individual beliefs (Zollo et al., 2015).

Although research suggests that people are personally motivated to seek information that agrees with their pre-existing opinions, Garrett et al. (2013) suggest that they do not necessarily actively avoid contact with opposing information when they come across it. Introducing diverse arguments and viewpoints about a social issue allows people to be more tolerant and understanding towards dissimilar views, leading to de-polarizing effects (Mutz and Mondak, 2006). While a good amount of research attests to the de-polarizing effects of a diverse network, new research proposes a different result. In their study, Bail et al. (2018), expose participants to messages from opposing political ideologies on a wide range of issues. For one group, they find a significantly stronger belief in their ideologies after exposure to opposing messages. The other group in their study also experienced a strengthening of beliefs but was statistically insignificant. Reasons for the different outcomes after exposure to opposing messages have not yet been extensively explored.

2.4 Research Gap: Experimental Evidence and Information Avoidance

This study contributes to the existing literature in three ways: (i) We implemented a combination of a lab experiment and surveys for the data collection method. By adding an experimental approach, we gain the ability to analyse the effects of peer engagement in a controlled setting, and we minimize the likelihood of self-reporting bias. (ii) We explored the role of information avoidance on an individual's engagement with information. By including information avoidance in our analysis, we examine the role of information-seeking preferences and behaviour in the decision to engage with information, which is rarely mentioned in the discussion about opinion polarization on social media. (iii) We explored the effects of different information engagement measures on a person's opinion. An outcome of information exposure through social networks is information engagement, which is difficult to precisely measure with survey instruments that rely on self-reporting and recall. We measure the extent of information engagement and analyse it against the differences in levels of support on a social issue before and after the session. By doing this, we uncover if information engagement caused the changes in opinion or if there are other factors to consider.

Chapter 3

Conceptual Framework

The aim of this conceptual framework is to explain how social networks and personal preferences affect information acquisition and how this affects opinion formation.

$$f = f_t + f_b \quad (\text{Eq. 1})$$

$$\alpha + \gamma = 1 \quad (\text{Eq. 2})$$

$$\alpha = \alpha_t + \alpha_b \quad (\text{Eq. 3})$$

$$\gamma = \gamma_t + \gamma_b \quad (\text{Eq. 4})$$

$$f = (\alpha_t f_t + \gamma_t f_t) + (\alpha_b f_b + \gamma_b f_b) \quad (\text{Eq. 5})$$

Eq. 1 shows f , total information received by the individual, which is a sum of f_t , a representation of total opposing information and f_b , a representation of total affirming information. Carriers of information are classified in Eq. 2, as α , the ratio of information received through active seeking prompted by personal motivation, and γ , the ratio of information received through passive seeking. In this context, information through passive seeking can come from a variety of sources that reduce the time and effort cost of information acquisition to a value that is close to zero, such as targeted ads and personal social networks. For this paper, we focus mainly on social networks as carriers of information in passive seeking. Quantities of information from active and passive seeking are not expected to be proportional. However, since both α and γ are expressed as ratios, the collective value of both variables should sum up to one.

We attempt to understand the dynamics of information acquisition by delving more into α and γ . We begin by expanding the components of α in Eq. 2, which we define as a sum of two variables α_t and α_b . Both variables in Eq. 3 represent two types of information that a user can receive through active seeking— α_t , the ratio of opposing information acquired over total information, and α_b , the ratio of affirming information over total information. Eq. 4 expands γ as the total sum of γ_t , the ratio of opposing information from passive seeking over total information, and γ_b , the ratio of affirming information from passive seeking over total information. We factor for the carriers of information and expand Eq. 1 to Eq. 5, which shows that the composition of the total information pool is dependent on information-seeking preferences and the diversity of information shared within the network.

Under the news-finds-me perception, where people rely on their social networks for information (Gil de Zúñiga et al., 2017, p. 107), total γ is greater than α . However, for individuals that are more self-motivated to actively seek information, α is greater than γ . A greater γ_t than γ_b means that the individual receives more opposing information from his peers, which signals that the social network is more likely heterogenous in views and more opposing information is shared. Greater α_b than α_t would imply that the individual prefers to actively seek affirming information than opposing information.

From this, we infer that the pool of information acquired depends on two main factors: (i) internal factors like the personal motivation to actively seek information and information-seeking preferences, and (ii) external factors like the diversity of views within the social network and frequency of information sharing. These factors determine the variety of information within the total pool, but do not necessarily increase the variety of information that the individual chooses to engage with. However, if the quantity of a certain type of

information within the pool is higher, it would translate to a higher probability of engagement. Thus, a higher total f_t would increase the probability of engaging with opposing information, and a higher probability of engaging with affirming information is expected if the information pool is comprised of higher f_b .

The components of an individual's total information pool, f_t and f_b , serves as input for opinion formation. A person's opinion on an issue is a product of the information an individual chooses to engage with and the beliefs of close social networks. A function that illustrates the different factors that affect a person's agreement on a certain issue is presented in Eq. 6.

$$B = \beta_t i_t f_t + \beta_b i_b f_b + \begin{bmatrix} \beta_1 \\ \vdots \\ \beta_n \end{bmatrix} \times \begin{bmatrix} \text{family} \\ \text{friends} \\ \text{core social groups} \end{bmatrix} + \beta_c C + \beta_e e, \quad (\text{Eq. 6})$$

$$0 \leq B \leq 1$$

$$0 \leq i_t, i_b \leq 1$$

$$\sum_n^1 \beta + \beta_i + \beta_c + \beta_e = 1 \quad (\text{Eq. 7})$$

In this function, B represents the opinion on a social issue and has a value between 0 and 1. In this case, 0 and 1 represent extreme, opposing support (or opposition) on the social issue. Total online information engagement is represented by $i_t f_t + i_b f_b$, where f_t is total opposing information and f_b is total affirming information, as previously specified. i_t and i_b are the rates of information engagement for total opposing information and total affirming information, respectively, and have values between 0 and 1. Both rates of information engagement are dependent on behavioural factors such as information openness, avoidance, and decision to prioritize one type of information over the other. How $i_t f_t + i_b f_b$ affects B depends on the importance they put on the information and how they interpret it. This effect manifests through β_t and β_b , the weights of influence assigned to each type of information.

Previous literature indicates, interaction with different social groups leads to a contagion effect that influences individual opinions (Bicchieri and Xiao, 2009; Krupka and Weber, 2009; Claidière and Whiten, 2012). This is represented by the vector of social groups and the weights of their influence, β_1 until β_n , where n represents the number of influential social groups in an individual's life. Another potential source of influence is existing contextual cultures, religions and social constructs, which are collectively represented as C , with a weight of influence, β_c . Lastly, β_e represents the weight of influence of e , an individual's unique lived experiences that relate to the social issue. For example, a person with separated parents would have first-hand experiences that affect his opinion on the legalization of divorce.

Our study focuses on the role of $i_t f_t + i_b f_b$, total information engagement. We acknowledge that it is almost impossible for individuals to equally engage with all information in their total pool because of time and attention constraints. The type of information the individual chooses to prioritize, given the constraints, is dependent on individual behaviour and preferences, which are accounted for in the rates of consumption, i_t and i_b . Thus, if the individual chooses to avoid certain types of information and prefers to access others, this should manifest in the rates of information engagement. Those with a higher aversion to threatening information find a higher i_b , while those who are very open to opposing information find a larger i_t . People's perceived importance of the information and what they learn from it serves as feedback, which should affect the relative weights of influence on the individual's opinion like what was found in Li et al. (2019).

Chapter 4 Empirical Strategy

4.1 Experimental design

The experiment was drafted with the objective to recreate a scenario where an individual using the internet is prompted into a conversation about an important political or social issue. The conversation serves as a starting point for information sharing, where subjects receive information that either affirms or opposes their opinions. Through the experiment, we observe how peer interaction and the individual's information avoidance scores affect information engagement and support for the social issue. Since opinions are also shaped by other factors that we cannot control for in the field, such as interactions with close social networks that may sway participant views, it will be more difficult to isolate the effects of different variables affecting opinion formation in an uncontrolled setting. For this reason, and for ethical reasons concerning consent and surveillance, we opt to conduct the experiment in a lab setting.

For this study, we focus on a single issue that is perceived as relevant and polarizing in the Philippine context. We chose this social issue based on the results of a pre-experiment survey that was conducted two weeks prior to the experiment. For this exercise, we limit our choices to the list of radical policy discussion topics mentioned in Section 1.1, mainly because these issues have received a lot of media attention⁵ in the Philippines. It also shortlists topics that might be more polarizing than others. Baseline survey questions and information that was shared during the session revolved around the chosen topic. It is important to highlight that the participants' reasons for support or opposition are not the main points of discussion, but rather, it is how different factors affect their decision to engage with information and how this engagement changes their initial opinion on the topic. The process of how the social issue was chosen is discussed further in section 4.3.

The experiment took place in the Pamantasan Lungsod ng Valenzuela (PLV), a state-owned university situated in northern Metro Manila. Students were recruited as participants on a volunteer basis and were offered academic incentives in exchange for participation.⁶ The data were gathered over a period of two days, September 6 and September 13, 2019. The participants were divided into five timeslots with each timeslot able to accommodate a total of 72 students. Two computer rooms, which can hold 40 people each, were rented during the days of the experiment. One room was used for the control group, and the other room was used for the treatment group. Students were randomly divided into two groups only before entering their assigned rooms. Students were allowed to choose their own computers upon entering.

Eight university students were recruited as personnel and were divided into two groups: four students were assigned under the peer affirmation group and four students were assigned under the peer opposition group. They were situated in the back row of their assigned computer laboratories and remained anonymous throughout the experiment. Each personnel was assigned to perform treatments on nine computer numbers. Personnel from the university's Information Technology laboratory were also on standby to troubleshoot computers in-between timeslots to ensure that computers ran smoothly during the experiments. Supplementary pictures can be found in Appendix 11.

⁵ Media attention and discussion increases the chances that participants have already formed an opinion about the issue and have discussed it with their close social networks such as their family.

⁶ The experiment was done during the first week of the school year; thus, removing any systematic bias that only students that need academic assistance would be interested in taking part in the experiment.

Privacy throughout the experiment was of utmost importance to encourage the students to use the internet as freely as possible. The experiment was conducted with a private LAN messaging application to contain social interactions within computers in the network and to retain participant anonymity. Students were never identified by their names and were only identified as numbers assigned to their chosen computers and their trial batch. They were given a choice to opt-out before beginning the experiment if they felt uncomfortable with the data being collected.

4.2 Treatment groups

Our experiment employs two different treatments, peer affirmation and peer opposition. The treatments were created to mimic interaction with a peer from a social network that is predominantly comprised of people that are homogenous (peer affirmation) or heterogeneous (peer opposition) in views. Treatments resembled social interactions and encouraged the participant to express his or her views about the shared information without judgement or feedback. Personnel that assisted in delivering the treatments were required to follow a strict script and flowchart to communicate with the participants during the experiment to ensure uniformity. Copies of the flowcharts used in the experiment are found in Appendix 2 and 3.

Peer affirmation treatment (Control). To recreate a social interaction within a network that is homogenous in views, participants were engaged in conversations about the death penalty and were sent articles that reinforced their views on the issue. Because this exchange of information makes accessing affirming information easier, respondents under this group should engage more with affirming information and less engagement should be seen, if any at all, with opposing information. Since information acts as input or feedback for opinion formation, participants in this group are expected to move towards the more extreme pole of their baseline beliefs. This means that participants under this group who initially supported the reinstatement of the death penalty should strengthen their support, while those who opposed should strengthen their opposition.

Peer opposition treatment (Treatment). For the treatment group, articles that opposed the participant's opinion on the death penalty were sent to recreate a heterogeneous social network, where different views and sources of information are being shared and talked about. Relaying opposing information improves the accessibility of this type of information, which should increase the likelihood of engagement. Engaging with opposing information should lead participants under this group to weaken their baseline opinions. For those who initially supported the death penalty, we should see their scores move towards a more opposing stance. Those who initially opposed should have their scores move towards a more supportive stance.

Table 1. Experiment Treatment and Predictions

EXPERIMENT GROUP	OPINION DEATH PENALTY	TYPE OF INFORMATION RECEIVED	TIME SPENT ON OPPOSING INFORMATION	CLICKS ON OPPOSING INFORMATION
CONTROL GROUP: PEER AFFIRMATION	FOR	FOR	-	-
	AGAINST	AGAINST		
TREATMENT GROUP: PEER OPPOSITION	FOR	AGAINST	+	+
	AGAINST	FOR		

4.3 Results of the pre-experiment survey

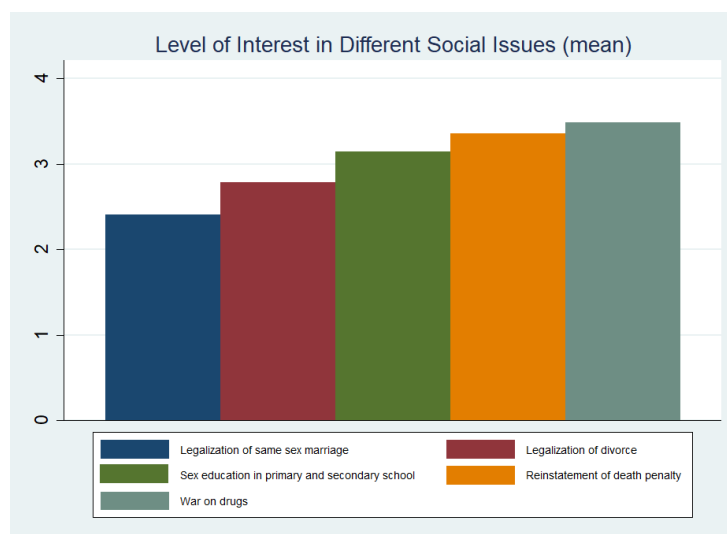
The pre-experiment survey was coursed online and was answered by 153 students from the Department of Engineering and Department of Information Technology. Survey results are summarized in the tables below:

Table 2. Participant polarization on different social issues

<i>Degree of support or opposition: Breakdown of participant answers (in %)</i>					
<i>List of different social issues (N = 153)</i>	1 (Strongly Agree)	2	3	4	5 (Strongly Disagree)
Same sex marriage should be legal	6.5	12.4	39.9	19	22.2
Divorce should be legal	14.4	27.5	28.1	15	14.4
Sex education should be taught in primary or secondary school	19.6	40.5	19.6	14.4	5.9
The death penalty should be reinstated	17	31.4	26.1	13.7	11.8
I support the war on drugs	19	37.3	28.8	6.4	8.5

The results of the first phase of the survey, which aimed to determine the degree of opinion division in different social issues, are summarized in Table 2. Based on the figure, opinions surrounding divorce were distributed almost equally between the strongly for and strongly against at 14.4% and 15%, respectively. The reinstatement of the death penalty also had an almost equal division between strongly for and strongly against, but results were still slightly favoured towards strongly for at 11.8% and 17%, respectively. For the other social issues, we see that the division between the opposing extremes is not as even.

Figure 1. Average level of interest on different social issues



Source: Author's own data collection

The results summarized in Figure 2 aimed to measure participant interest in chosen social issues. From here, we found that participants were most interested in the war on drugs,

followed by the reinstatement of the death penalty. The legalization of same-sex marriage had the least interest followed by the legalization of divorce.

Since the criteria for our social issue of focus for the experiment needs to be debatable with equally varying opinions, social issues which showed results of equally divided extremes are more favourable. Another criteria item was the sample’s interest in the topic in order to avoid less information engagement due to lack of interest. Given these two requirements, we focused our experiment on the reinstatement of the death penalty.

4.4 Experiment workflow

The experiment proper was divided into three parts: (i) a baseline survey, (ii) one hour of free internet use, and (iii) an exit survey.

Upon entering the venue, participants were asked to answer a baseline survey to complement the results from the experiment (see Appendix 5). The baseline survey was divided into five areas. The first area measured the participants’ level of support for the death penalty and their level of support for ethical, social, and normative issues connected to the death penalty. The second area measured the death penalty support of the participants’ close social groups and their degree of religiosity. The fourth area measured their likelihood to trust others. Lastly, the fifth area measured their information avoidance preferences using a questionnaire that was adapted from the Information Avoidance Scale instrument of Howell and Shepperd (2016).

Participants were given one hour to use the internet freely.⁷ During that hour, participants received private messages through a LAN network, prompting a discussion about their answers in the baseline survey. Depending on the treatment group, participants would receive messages that either relayed information that affirmed their support for the death penalty or information that opposed it. A strict flowchart was followed to ensure uniformity in conversations with all participants in the experiment. Two computer programs were used to track their internet journey: ChromeHistoryViewer.exe and Chrome Webtime Tracker. Table 3 summarizes the type of data collected by each software.

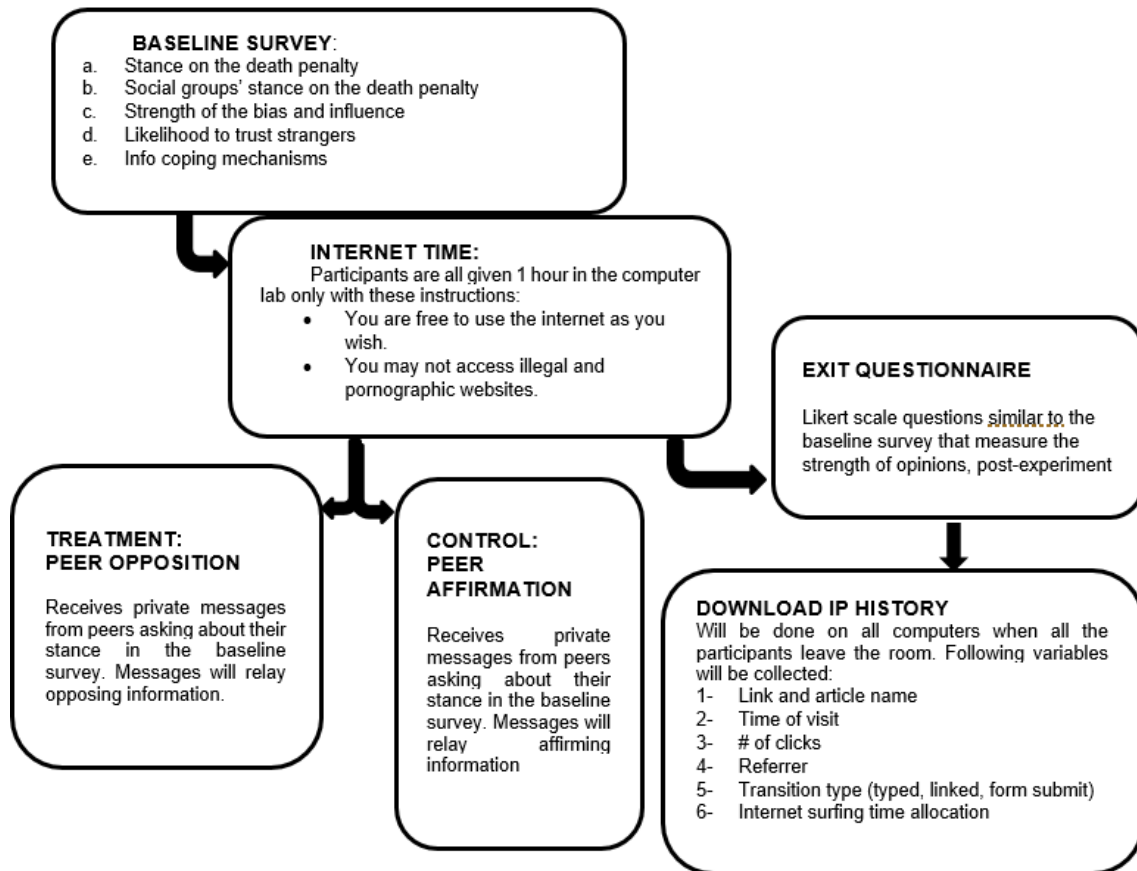
Table 3. Data collected classified by software

CHROME WEBTIME TRACKER	CHROME HISTORY VIEW
<ul style="list-style-type: none"> Percentage of time spent on each website 	<ul style="list-style-type: none"> Number of clicks per page Title of page and URL Time of visit Referrer Transition type

After the experiment, an exit questionnaire was applied to measure the participants’ agreement on the death penalty and their agreement on supporting and opposing arguments after the treatment. The data from the exit questionnaire were compared with data from the baseline survey to determine if there were any significant changes in the participants’ opinions that can be attributed to the treatment or its intended outcomes

⁷ They were not allowed to access pornographic websites, illegal websites, and were prohibited from tampering with the settings of the computer or the browser.

Figure 2. Summary of experiment workflow



Source: Author's own

4.5 Variables and Methods of Measurement

The section below explains the relevant variables in this study and the methods used to measure them. Although we collected data on other variables throughout the process, we focus only on those relevant to the study.

4.5.1 Independent Variables

Level of support for the death penalty. This variable is measured in both the baseline and the exit survey, where participants are asked to rate their agreement to the death penalty from 1-5, where 5 signifies strongly agree and 1 signifies strongly disagree.

Level of agreement on arguments revolving around the death penalty. This variable is a generated average score of the participants' support for eight statements about common arguments surrounding the topic of the death penalty⁸. Answers were coded and reverse-coded to create a uniform scale where 5 signifies an opinion that is consistent with those who support the death penalty and 1 signifies an opinion consistent to those who oppose it.

⁸ The statements identified here were taken from the National Survey on Public Perceptions on the Death Penalty Report of the Social Weather Stations (2018).

Social groups' opinion on the death penalty. This factor in our model is divided into three variables, namely: (i) family, (ii) friends, and (iii) religion. Under family and friends, participants were asked to rate from 1-5 how much each group agreed with the idea of reinstating the death penalty, 1 representing strongly disagree and 5 representing strongly agree. Under religion, participants were asked to rate how religiously Catholic⁹ they were from 1 to 5 with 1 being the lowest rating and 5 being the highest.

Knowing a victim of a heinous crime. Since the death penalty is usually given as punishment for people convicted of heinous crimes, personally knowing a victim might provide personal experiences that translate to first-hand information which might affect their opinion of the death penalty. This variable is measured as a dummy variable, where 1 indicates that the participant personally knows a victim of a heinous crime and 0, otherwise.

Information Avoidance. The information avoidance is an average of scores from six items based on the information avoidance scale developed by Howell and Shepperd (2016). Information avoidance denotes the likelihood that the individual will not want to know a certain piece of information even if it is beneficial, available, and accessible. Under this item, participants were asked to rate their agreement with certain statements from 1 to 7 with 1 representing strongly disagree and 7 representing strongly agree. Answers were coded and reverse-coded to indicate 7 as the highest measure of information avoidance and 1 as the lowest. Some statements in the instrument by Howell and Shepperd (2016) were also deleted to increase the internal validity of the measurement. (Cronbach's alpha = 0.69)

4.5.2 Dependent Variables

User's engagement with information. This is expressed as four different variables: (i) ratio of time spent information-seeking about the death penalty, (ii) ratio of time spent on web pages which oppose the participants' view on the death penalty, (iii) total number of clicks on webpages that show information about the death penalty, and (iv) total number of clicks on webpages that oppose the participants' view on the death penalty. Clicks measure a user's variety of engagement, while time spent information-seeking measures the depth of engagement. This variable is sorted from raw data provided by ChromeHistoryViewer.exe and Chrome Webtime Tracker.

4.6 Econometric specification and analysis

Taking the assumption of randomized observations across treatment groups, it is suitable to adopt the Ordinary Least Squares (OLS) model. A model to determine the effects of the peer treatment on the user's engagement with information is specified as Eq. 7. In this model, only the treatment dummy (TD) is regressed against a vector of dependent variables, Y_j , to determine the differences in information engagement between the two treatment groups. Vector Y_j is comprised of the following variables: (i) The ratio of time spent on webpages that relate to the social issue over total time, (ii) the ratio of time spent on webpages that show opposing information over total time (iii) the total number of clicks spent on webpages that relate to the social issue number, and (iv) the number of clicks on webpages with opposing content.

⁹ Most people in the Philippines still practice Catholicism as a main religion, and the Catholic clergy has openly declared that they do not support the reinstatement of the death penalty (The Inquirer, 2019).

$$Y_{ji} = \beta_0 + \beta_2 TD_i + \varepsilon_{ji}, \quad (\text{Eq. 8})$$

$$Y_{oi} = \beta_0 + \beta_2 TD_i + \beta_3 a_i + \beta_4 (TD_i \times a_i) + \varepsilon_{ji}, \quad (\text{Eq. 9})$$

$$Y_{oi} = \beta_0 + \beta_2 TD_i + \beta_3 a_i + \begin{bmatrix} \beta_4 \\ \beta_5 \\ \beta_6 \\ \beta_7 \end{bmatrix} \times \begin{bmatrix} family_i \\ religion_i \\ gender_i \\ victim_i \end{bmatrix} + \varepsilon_{ji}, \quad (\text{Eq. 10})$$

In our second set of regressions, specified as Eq. 9, we regress the treatment dummy (TD_i), information avoidance score, a_i , and its interaction with the treatment against a subset of \mathbf{Y}_j , \mathbf{Y}_o , to determine its effects on engagement with opposing information. Vector \mathbf{Y}_o contains two measures of engagement, clicks on opposing information and the ratio of time spent on opposing information. We expand our model in Eq. 9 to Eq. 10 to account for other factors that may affect the decision to engage with opposing information, such as family's support on the death penalty ($family_i$), the subject's degree of religiosity ($religion_i$), gender ($gender_i$), and personally knowing a victim of a heinous crime ($victim_i$). We add these controls to determine if the regression results in Eq. 8 are independent of confounding effects, and to investigate if the additional controls are significantly associated with engagement.

To determine the effects of information engagement on opinion polarization, we run another set of regressions specified as:

$$Concept_{pre} - Concept_{post} = \beta_0 + \beta_1 info_i + \beta_3 a_i + \begin{bmatrix} \beta_4 \\ \beta_5 \\ \beta_6 \end{bmatrix} \times \begin{bmatrix} family_i \\ religion_i \\ victim_i \end{bmatrix} + \varepsilon_i \quad (\text{Eq. 11})$$

$$Concept_{pre} - Concept_{post} = \beta_0 + \beta_1 clicks_i + \beta_3 a_i + \begin{bmatrix} \beta_4 \\ \beta_5 \\ \beta_6 \end{bmatrix} \times \begin{bmatrix} family_i \\ religion_i \\ victim_i \end{bmatrix} + \varepsilon_i \quad (\text{Eq. 12})$$

$$Argument_{pre} - Argument_{post} = \beta_0 + \beta_1 info_i + \beta_3 a_i + \begin{bmatrix} \beta_4 \\ \beta_5 \\ \beta_6 \end{bmatrix} \times \begin{bmatrix} family_i \\ religion_i \\ victim_i \end{bmatrix} + \varepsilon_i \quad (\text{Eq. 13})$$

$$Argument_{pre} - Argument_{post} = \beta_0 + \beta_1 clicks_i + \beta_3 a_i + \begin{bmatrix} \beta_4 \\ \beta_5 \\ \beta_6 \end{bmatrix} \times \begin{bmatrix} family_i \\ religion_i \\ victim_i \end{bmatrix} + \varepsilon_i \quad (\text{Eq. 14})$$

We distinguish the participant's overall support for the death penalty (*Concept*) and his support for ethical, social, and normative arguments surrounding the death penalty (*Argument*). Although the agreement with accompanying issues of the death penalty should affect its overall acceptance, there are other factors that need to be considered. For example, the degree of religiosity ($religion_i$), personally knowing a victim of a heinous crime ($victim_i$), and the opinions of close social networks ($family_i$) could be factors that dilute the impact of information on the overall support for the death penalty. We also control for possible biased interpretation of information, which is a manifestation of information avoidance (Golman et al., 2017), a_i .

We expect information engagement to affect the overall support for the death penalty through changes in the individual's understanding of the issue. These adjustments should

change the participant's level of support for some, if not all, of the different arguments surrounding the death penalty.

Time spent on opposing information (*info*) and total clicks on opposing information (*clicks*) are expected to be highly correlated with one another. For this reason, we create two different OLS regression models for each dependent variable. Both *clicks* and *info* capture different properties of a participant's engagement with information. Variable *clicks* measures the number or variety of information sources engaged, while *info* indicates the depth of engagement.

To analyse our results, we view the overall effects of both treatments through box plot graphs and evaluate the significant factors that contribute to the effects through an OLS regression. Since the signs of the pre and post-experiment differences of the dependent variables will differ depending on baseline data, identifying the effects of information engagement on opinion formation will require us to split the sample into two groups: (i) those who initially supported the death penalty, and (ii) those who initially opposed it. Support and opposition are identified based on the participant's initial death penalty reinstatement agreement rating in the baseline questionnaire.

Chapter 5 Results and Discussion

5.1 Descriptive statistics

The experiment was attended by 233 students. However, observations were excluded if at least one of the conditions was met: (i) incomplete baseline survey data, (ii) deleted or corrupted data, and (iii) no data downloaded from at least one of the two tracking software. After factoring out the excluded observations, the total sample size was reduced to 201¹⁰.

Table 4. Descriptive Statistics by Control Group¹¹

	Total sample		Controlled		Treatment		Diff (t-test)
	Mean	SD	Mean	SD	Mean	SD	p-value
Agreement with the death penalty	3.33	1.06	3.24	1.12	3.40	1.01	0.256
Agreement with arguments about the death penalty	2.68	0.46	2.64	0.47	2.72	0.45	0.252
Gender (1 = Male)	0.67	0.47	0.60	0.49	0.73	0.44	0.052
Types of internet use							
Ratio of time spent on leisure	0.79	0.24	0.80	0.24	0.78	0.25	0.720
Ratio of time spent on productivity	0.10	0.22	0.08	0.20	0.12	0.23	0.235
Ratio of time spent information	0.11	0.14	0.11	0.15	0.10	0.13	0.812
Social groups' opinions							
Family agreement with the death penalty	3.22	0.94	3.23	0.96	3.21	0.93	0.993
Friends agreement with the death penalty	3.30	0.82	3.27	0.84	3.31	0.80	0.644
Degree of religiosity	2.64	0.97	2.70	0.98	2.59	0.96	0.432
Other variables							
Personally knowing a victim (1= Yes)	0.23	0.42	0.24	0.43	0.22	0.42	0.731
Information avoidance score	2.89	0.77	2.88	0.75	2.91	0.78	0.842
N	201		96		105		

Table 3 shows that for the variables observed and data collected, no significant difference between the treatment and control group exists, except for gender at a p-value of less than 10%. The total sample is comprised of 67% male, and 23% of the participants personally know a victim of a heinous crime. In general, the participants have a low information avoidance score with a score of 2.89 out of 7, where 7 represents the maximum score for being avoidant to information. On average, the sample shows a slightly supportive position for the death penalty; however, when taking the average score of their agreement on the arguments accompanying the issue, they show a more opposing stance. The ratio of

¹⁰ Causes for exclusion were not systematic. Comparisons with the full sample are almost impossible due to the large number of missing variables for excluded participants.

¹¹ Table 3 shows that there are no significant differences between the treatment and control group except for gender at $p < 0.10$; thus, we continue our analysis with the remaining sample.

time spent on different activities shows that across treatment groups, participants allocated their time quite similarly.

5.2 Experiment results and findings

The report on our findings is divided into three parts: First, we determine the effects of the treatment on our measures of information engagement. Then, we investigate the effects of information avoidance and its mechanisms on engagement with opposing information. Lastly, we explore the post-experiment effects on participant opinion about the death penalty.

5.2.1 Effects of peer opposition on information engagement

Table 5 Effects of Peer Opposition on Information Engagement (Parameter Estimates)

	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
	Ratio of total time spent on information (Ave: 0.116)	Ratio of time spent on opposing info (Ave: 0.049)	Total clicks on information (Ave: 1.915)	Total clicks on opposing info. (Ave: 0.751)
Treatment (1= Peer Opposition; 0= Peer Affirmation)	-0.027 (0.027)	0.090*** (0.012)	-0.521* (0.30)	1.28*** (0.167)
N	201	201	201	201

Significance: * = 10%, ** = 5%, and *** = 1%

In Table 5, we show the results of the treatment on our metrics for information engagement. Results show that both peer affirmation and peer opposition groups do not differ in time spent information-seeking. Instead, those in the peer opposition group spent more time on opposing information. Participants who received opposing information had fewer clicks on information in total; however, they had significantly more clicks on opposing information. It is worth noting that the effect of the peer opposition treatment on both opposing information engagement metrics is, by no means, small. Table 5 shows that peer opposition led to an increase in time spent on opposing information that is more than double the average of the whole sample's allocation. Large effects of the peer opposition treatment were also found on total clicks on opposing information. We found that those under the opposition treatment increased their clicks on opposing information by 170% of the whole sample's average.

5.2.2 Information avoidance and engagement with opposing information

In Table 6, we focus on the effects of peer opposition and information avoidance on the variety and depth of engagement with opposing information, which are measured by clicks and time spent on the information, respectively. The first and second models explore the effects of our treatment and information avoidance on the ratio of time spent on opposing information, while the third and fourth models measure the effects on the number of clicks on opposing information. The second and fourth models include other control variables to test for confounding effects.

**Table 6 Effects of Information Avoidance on Opposing Information Engagement
(Parameter Estimates)**

	Ratio of time spent on opposing info (Ave: 0.049)		Total clicks on opposing info. (Ave: 0.751)	
	I	II	III	IV
Treatment (1= Peer Opposition)	0.187*** (0.050)	0.188*** (0.051)	2.29*** (0.668)	2.513*** (0.677)
Information Avoidance	0.000 (0.001)	0.001 (0.003)	-0.050 (0.087)	0.046 (0.083)
Treatment x Information Avoidance	-0.033** (0.016)	-0.034** (0.017)	-0.347* (0.209)	-0.436** (0.212)
Religion		0.004 (0.006)		0.024 (0.090)
Family		-0.001 (0.007)		0.061 (0.084)
Knowing a victim (1= Yes)		-0.000 (0.013)		0.484** (0.230)
Gender (1=Male)		0.002 (0.015)		0.354** (0.159)
N	201	201	201	201

NOTE: Significance: * = 10%, ** = 5%, and *** = 1%; Standard errors are presented in parentheses. Standard errors presented for all are robust to account for heterogeneity. See Appendix 8 for more details.

The first model found that participants who were exposed to the treatment had a significantly deeper engagement with opposing information. Effects of the peer opposition treatment to time spent on opposing information increased by four-fold of the average with an increase of 18.7 percentage points. Participants with higher information avoidance scores in the treatment group spent less time on opposing information. Moreover, an individual with an average information avoidance score of 2.89 is associated with a decrease of total time spent on information by 8.67 percentage points, which decreased the effect of the peer opposition treatment by roughly 50%.

Despite the changes and the addition of controls in the second model, results show that the parameter estimates of peer opposition and its interaction with the information avoidance score are nearly identical to the values found in the first model. This suggests the participants' aversion to spending time on opposing information is independent of other variables.

The third model explored the pure effects of the peer opposition treatment and its interaction with information avoidance to the variety of opposing information sources engaged with. Exposure to the peer opposition treatment increased the total number of clicks on opposing information by 2.3 clicks. Higher information avoidance scores were also associated with lower clicks on opposing information. Having an average information avoidance score of 2.89 is associated with one less click on opposing information.

In the fourth model, controlling for other factors strengthened the negative association of avoidance to clicks on opposing information. The significance of information avoidance, interacted with the peer opposition treatment, shows that the aversion to clicking on more opposing information is also independent of other factors. We note that the effect of information avoidance is not trivial. The average information avoidance score of 2.89 almost halves the effect of peer opposition treatment on clicks on opposing information. Knowing a victim of a heinous crime was also found to be associated with a significant increase in the

number of clicks. Participant’s degree of religiosity and opinions of close social networks on the death penalty did not significantly affect the variety of opposing information engaged with.¹²

5.2.3 Post-experiment effects

The analysis of post-experiment effects on participant opinion is divided into two parts. The first part is a graphical analysis of changes in sample distributions, through which, we can determine if the treatments have improved or worsened polarization within the groups. The second part is a statistical analysis of how each measure of information engagement affected participant opinion on an individual level.

Figure 3. Sample distribution of death penalty agreement ratings by treatment group

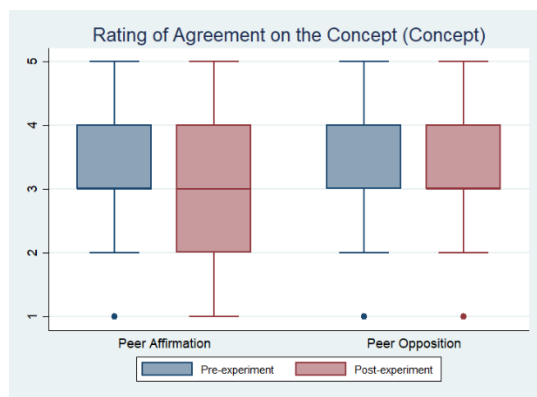


Figure 4. Sample distribution of average argument agreement ratings by treatment group

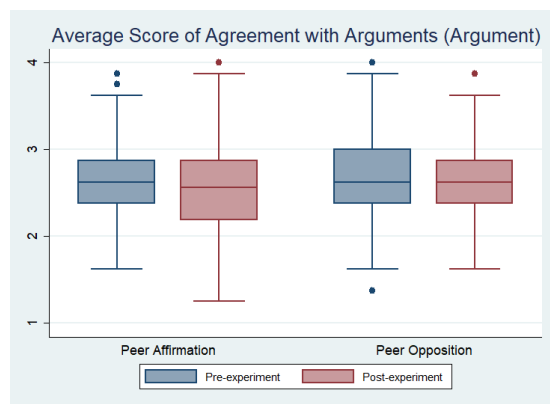


Figure 3 displays the sample distribution of the participants’ agreement rating on the statement, “The death penalty should be reinstated” (*Concept*), while Figure 4 shows the sample distribution of the average agreement ratings given to statements related to the death penalty and its underlying issues (*Argument*). The distributions are classified by treatment group and show the differences pre and post-experiment.

In Figure 3, we find that both treatment groups had similar sample distributions in the overall support for the death penalty before the experiment. Post-experiment distribution for the peer affirmation group shows that some participants moved towards being more anti-death penalty. On the other hand, the peer opposition group had almost the same pre-experiment distribution.

In Figure 4, we see that the sample distribution of the peer affirmation group tended to move towards opposite poles, expanding the range of sample ratings after the experiment. While, the sample distribution of the peer opposition group moved towards a more neutral score, compressing the distribution and condensing the range of ratings. The change in Figure 4 is more obvious for those that had an initial average score that tended to support pro-death penalty views.

For the second part of our analysis, we split the sample into two groups: (i) those who initially opposed the reinstatement of the death penalty, and (ii) those who initially supported

¹² Additional regressions to factor for the possible interaction effects of knowing a victim and gender were employed; however, the parameter coefficients were insignificant after accounting for robust standard errors. These regressions are shown in Appendix 11.

it.¹³ Both overall support for the death penalty and average levels of support for its accompanying arguments are encoded in a way where a rating of 1 would mean a strong opposition for the death penalty and a rating of 5 would mean strong support. Therefore, a negative difference for either measure would indicate that the participant has moved towards being more pro-death penalty, while a positive difference would signify movement towards being more anti-death penalty.

Table 7 Post-experiment effects for opposers of the death penalty (Initial rating 1-2)

	<i>Concept_{pre} – Concept_{post}</i> Ave: -0.122				<i>Argument_{pre} – Argument_{post}</i> Ave: 0.088			
	I	II	III	IV	V	VI	VII	VIII
Total number of clicks on opposing info. (avg.: 0.878)	-0.269** (0.092)		-0.270** (0.120)		0.004 (0.037)		0.011 (0.040)	
Ratio of time spent on opposing information (avg.: 0.062)		-3.029 (1.84)		-3.235* (1.65)		-0.314 (0.494)		-0.215 (0.513)
Information avoidance score			-0.154 (0.199)	-0.126 (0.186)			0.022 (0.073)	-0.018 (0.072)
Religion			0.175 (0.104)	0.188* (0.104)			-0.038 (0.048)	-0.035 (0.041)
Family			0.002 (0.131)	-0.043 (0.137)			0.062 (0.049)	0.062 (0.049)
Knowing a victim (1= Yes)			-0.291 (0.412)	-0.369 (0.422)			-0.094 (0.138)	-0.079 (0.136)
Gender			-0.089 (0.295)	-0.054 (0.297)			-0.036 (0.127)	-0.036 (0.127)
N	41	41	41	41	41	41	41	41

Significance: * = 10%, ** = 5%, and *** = 1%; Standard errors are presented in parentheses. Standard errors presented for models II, III, and IV are robust to account for heterogeneity. See Appendix 9 for more details.

Table 7 shows the pre and post-experiment differences in death penalty support and average support for its underlying issues for participants who initially opposed the death penalty. Results show that for this group, depth and variety of engagement with opposing information were both associated with larger movements towards a pro-death penalty stance. Changes in the support ratings for the accompanying issues of the death penalty, however, were not associated with any controls and information engagement metrics.

Participants who clicked on at least one source of opposing information experienced a shift towards support for the death penalty that was double the group’s average change. Subjects in this group who spent 30% of the allotted time experienced a shift of

¹³ We consider an agreement rating of 3 to be part of support towards the death penalty. When primed further, participants who answered a rating of 3 stated that the death penalty might be appropriate for severe heinous crimes. Thus, we interpret this as a form of mild support, where the death penalty is only acceptable if all other methods would be inappropriate.

approximately 1 whole point along the agreement scale, toward support for the death penalty. However, the effect of time spent on opposing information is diluted by the participants' degree of religiosity. Having the highest self-rating for religiosity almost completely offsets the effects of spending 30% of allotted time on opposing information. It is important to note that the results of these regressions should be taken with caution because of the small sample size of this group.

Table 8 Post-experiment results for supporters of the death penalty (Rating: 3-5)

	<i>Concept_{pre} – Concept_{post}</i> Ave: 0.231				<i>Argument_{pre} – Argument_{post}</i> Ave: 0.093			
	I	II	III	IV	V	VI	VII	VIII
Clicks on opposing information (avg.: 0.719)	0.045 (0.023)		0.031 (0.051)		0.038* (0.022)		0.038 (0.023)	
Ratio of time spent on opposing information (avg.: 0.045)		-0.239 (0.689)		-0.252 (0.703)		0.631** (0.297)		0.638** (0.301)
Information avoidance score			-0.028 (0.092)	-0.038 (0.092)			-0.043 (0.042)	-0.039 (0.040)
Religion			-0.116 (0.076)	-0.118 (0.076)			-0.019 (0.037)	-0.020 (0.033)
Family			-0.054 (0.082)	-0.051 (0.082)			0.040 (0.037)	0.039 (0.035)
Gender			0.063 (0.143)	0.087 (0.141)			-0.088 (0.062)	-0.080 (0.061)
Knowing a victim (1= Yes)			0.214 (0.161)	0.220 (0.161)			0.063 (0.073)	0.086 (0.069)
N	160	160	160	160	160	160	160	160

NOTE: Significance: * = 10%, ** = 5%, and *** = 1%; Standard errors are presented in parentheses. Standard errors presented for models III, IV, VII, and VIII are robust to account for heterogeneity. See Appendix 10 for more details.

Table 8 shows us the pre and post-experiment differences for participants that initially supported the reinstatement of the death penalty. For this group, none of the information engagement metrics and controls were associated with changes in their overall support for the death penalty. However, post-experiment differences towards a more supportive stance for anti-death penalty arguments were associated with more time spent on opposing information. Participants who spent 10% of their allotted time on opposing information experienced a 0.063 shift in their average ratings of support for issues related to the death penalty, moving towards a more anti-death penalty position.

5.3 Discussion

The discussion dedicates two sections to explain the results of the study and its mechanisms with more depth, and adds a third section to discuss limitations and avenues for future research. In the first section, we discuss the effects of peer opposition and information

avoidance on information engagement and its implications for social media use and polarization. The second section discusses the effects of information engagement on changes in participant opinion in more depth.

5.3.1 Peers, information avoidance, and information engagement

We find that participants mostly engaged with information relayed to them from their corresponding treatments. Time spent on information between the two groups were statistically the same, but the type of information accessed depended on peer treatment. This suggests that information engagement could be highly dependent on the time cost of acquisition, which is reduced when information is relayed by a peer. This proves to be consistent regardless of the type of information relayed. Similar results were found with clicks on information. These findings depict the description of the news-finds-me perspective, where information-seeking has become more passive and information that the participant chooses to engage with will most likely come from peers rather than self-motivated search (Gil de Zúñiga et al., 2017).

Decreasing the time cost of information acquisition through peer interaction increases the likelihood of information engagement, but engagement is also dependent on behavioural factors unique to the participant. Our results are somewhat consistent with the findings of Garrett et al. (2013), which suggest that people do not necessarily avoid contact with information that challenges their opinions. However, we find that this changes as the perceived threat of opposing information increases. Findings show that participants in the peer opposition group engaged less with opposing information if their information avoidance scores were higher. The magnitude and significance of the effects of information avoidance are independent of other controls, suggesting that aversion to information is not necessarily dependent on family background or religion. The independence of information avoidance from other factors makes a case for researchers to study why and how aversion to political information forms. It might also explain why exposure to opposing information leads to unexpectedly different effects, in varying magnitudes, for certain groups and individuals.

According to previous research (Sweeny et al., 2010; Golman et al., 2017), information avoidance develops because of hedonic reasons related to unpleasant feelings or sensations. Therefore, it might be necessary to minimize the social consequences of opposing popular beliefs and opinions, which are worsened by some current social media practices and cultures. For example, the rising popularity of call-out culture and trial by publicity might exacerbate people's aversion to opposing information because it increases the threat of othering and distorts views of self-integrity. If de-polarization strategies are focused only on increasing the exchange of diverse information without considering the outcomes of an increasingly hostile online environment, such as higher tendencies of information avoidance, efforts to mediate polarization might prove to be futile.

5.3.2 Effects of information engagement on participant opinion

To begin this section, we display the results of an ordinal logistic regression, where the dependent variable captures the participant's level of support towards the reinstatement of the death penalty (*Concept*). From Table 9, we see that the participant's average level of support for social and ethical issues accompanying the death penalty significantly influences his overall support for the issue. Results also show that the participant's level of agreement on the social issue is also strongly influenced by the family's opinions. This finding hints at the role of conformity within close social networks on individual opinion formation.

Table 9. Factors affecting overall agreement to the reinstatement of the death penalty

Agreement with the death penalty (Concept)	Coef.	Std. Err.	P>z
Average score of agreement on arguments surrounding the death penalty	2.05***	0.34	0.00
Gender (Male = 1)	0.09	0.31	0.78
Family agreement with the death penalty (family)			
Disagree	3.17***	1.02	0.00
Neutral	3.60***	1.01	0.00
Agree	4.71***	1.03	0.00
Strongly Agree	4.92***	1.15	0.00
Friends agreement with the death penalty (friends)			
Disagree	0.3	1.5	0.9
Neutral	1.4	1.5	0.4
Agree	1.1	1.5	0.5
Strongly Agree	1.6	1.7	0.3
"I am a religious person and I follow the teachings of the church" (religion)			
Agree	0.42	0.50	0.40
Neutral	0.95**	0.49	0.05
Disagree	1.02*	0.61	0.09
Strongly Disagree	1.31	0.90	0.14
Personally knowing a victim (Y=1)	0.45	0.34	0.18
τ_1	7.21		
τ_2	9.29		
τ_3	11.41		
τ_4	13.85		

Our previous regressions show that more information engagement led to a weakening of initial opinions and larger shifts towards the opposing view. Considering overall support for the death penalty, participants who initially opposed it were found to have a more supportive stance after engaging with opposing information. Based on the average level of support for accompanying arguments, those who initially supported the death penalty were found to have a more opposing stance if they spent more time on opposing information.

From our findings, we propose that information engagement can affect opinion formation in two ways. First, we consider that for the group which initially opposed the death penalty, the average level of support for social and ethical arguments accompanying the death penalty was 2.31. This number is greater than the group's average score for overall support for the issue at 1.68¹⁴. Under this group, we find that the depth and variety of information engagement led directly to a shift in their overall agreement rating of the death penalty; however, their support for the issue's accompanying arguments did not change. Therefore, we propose that the effect of opposing information on individual opinion can manifest as an adjustment towards a level of agreement that is more consistent with their support for a variety of ethical, social, and economic concerns accompanying the social issue. Second, input from opposing information can educate the individual about the different implications of a social issue, leading to more understanding of the opposition. This eventually results in

¹⁴ See Appendices 10

a change of perspective, which we imply based on the strong association of support for accompanying arguments and overall support for the social issue. We observe this phenomenon under the group who experienced post-experiment changes in their support for the arguments accompanying the death penalty but did not experience any changes in overall support for the issue.

However, the dynamics of change in the overall support for the death penalty might not be straightforward because of other factors affecting it. The combination of these factors may affect the flexibility of opinions, especially for shifts towards the opposing view. We see this in Figure 3, where changes in the sample distribution of overall support for the death penalty were barely noticeable under the peer opposition group.

The relationship between information engagement and opinion formation has many implications. Online engagement can be solicited through social media campaigns, where the scope and aggressiveness of information targeting depend on the willingness to pay and endowment of the promoter. Thus, having no limit on online political information ad spending makes it possible for well-endowed parties to sway public opinion toward their favour by paying social media platforms to prioritize their content, regardless of how groundless or misinformed it is. Also, the use of political communication algorithms to relay information to those that are already presumed to be supporters can make polarization worse. The association of engagement with opinion formation also shows that people can change strong, underlying political opinions through greater engagement with opposing information. Cultivating the right social media environment for more information exchange and respectful sharing between opposing peers as a pathway to de-polarization seems promising. To do this, however, more research about the effects of the current social media environment on behaviour is necessary.

5.3.3 Limitations and avenues for future research

In this section, we discuss the main limitations of our study and suggest possible avenues for future research. First, to study the cause-and-effect dynamics of peer interaction, information avoidance, and opinion formation, the experiment focused more on internal validity rather than external validity. Thus, the outcomes of the research might change in a different setting. While the study focused on the differences between two extreme treatments, where peer affirmation shared purely affirming information and peer opposition shared purely opposing information, we acknowledge that conclusions would be more robust with the inclusion of a group that received no treatment.

To establish social media norms that hinder the growth of polarization through increased engagement with varied information, studying how to reduce information avoidance in this context might be worthwhile. Previous research on how to reduce information avoidance tendencies has focused primarily on health information (Howell and Shepperd, 2012; Howell and Shepperd, 2013). While methods have proven to be effective in the context of their research, there is a need to confirm if the same outcome could be expected for aversion to opposing political information.

Chapter 6 Conclusion

Opinion polarization has become a pressing problem that threatens democratic institutions in both developed and developing countries. Previous research about the formation of extremist opinions has predominantly focused on selective exposure to information and homogeneity of opinions in social networks (Lee et al., 2014; Iyengar and Hahn, 2009; Bienenstock et al., 1990). Thus, to add to existing literature, we account for individual behaviour and employ an experimental approach in data collection. This paper reports on an experiment that was designed to understand the dynamics of how peer interaction and information avoidance associate with information engagement and opinion formation. Our main findings contribute to the understanding of how individual agency affects the decision to engage with online political information.

Our findings suggest that the type of information acquired from peers does not influence total time spent engaging with information, but rather, it dictates the kind of information that individuals engage with. Results are consistent with the news-finds-me perspective (Gil de Zúñiga et al., 2017), which hint at the association of time cost of information acquisition and engagement. While our findings are consistent with Garrett et al. (2013), who find that people do not actively avoid opposing information, we argue that the consistency of his findings is dependent on individual behaviour. We find that engagement with opposing information decreases as general tendencies to avoid information increase. Thus, higher information avoidance levels can dilute, or even off-set, the de-polarizing effects of being involved in a social network that is diverse in opinions.

Based on our results, we propose that information engagement affects the formation of opinions in two ways. First, engagement can lead to a readjustment of initial opinions to meet a level of support that is more consistent with their agreement on ethical, social, and normative affairs that accompany the social issue. Second, individuals learn from opposing information, leading to more understanding of the opposition's views, which results in a change of perspective. This adjustment of perspective changes how people view the affairs associated with the social issue in question. These findings are consistent with Li et al (2019) and Campell-Meiklejohn et al. (2017), who find that additional information and changed perceptions adjust existing viewpoints. Our results also support the findings of Mutz and Mondak (2006), who find that involvement in networks that are diverse in opinions combat polarization by increasing access to different viewpoints and fostering understanding towards dissimilar views. However, it is important to note that the level of support for a particular social issue is also dependent on other factors such as the opinions of family. This might be more applicable in developing countries where in-group and out-group distinctions are more defined due to the importance of social capital (Woolcock and Narayan, 2000).

The study has implications on how current social media practices can hinder polarization or allow it to flourish. First, our results confirm the polarizing effects of echo chambers and affirm the de-polarizing potential of networks that are diverse in views. Second, the association of information avoidance on engagement suggests that hostile social media environments can lead to persistent polarization, despite increased information sharing. To mediate this, there is a need to promote alternative practices that reduce the social disincentives of opposing popular opinions, like the display of more empathy and respect in political discussions over trial by publicity and othering. Lastly, the relationship between information engagement and opinion formation prompts the need to evaluate the risks presented by biased journalism and paid online engagement campaigns initiated by political players.

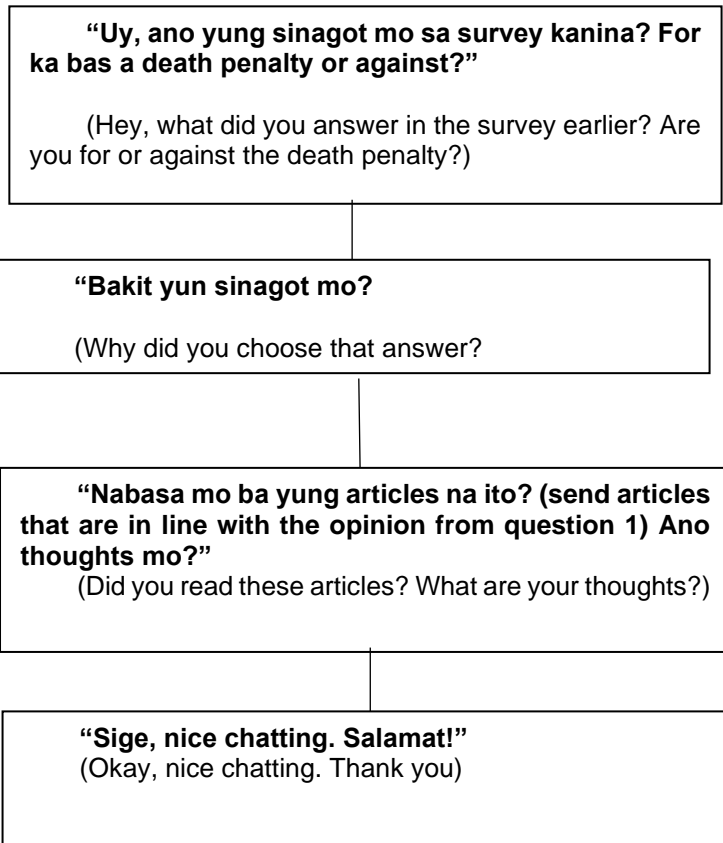
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Appendices 2. Conversation flowchart provided to student personnel (Peer Affirmation)

Conversation scripts are in a mix of Tagalog and English to mimic the more casual conversations in social media messaging. English translations in parentheses.

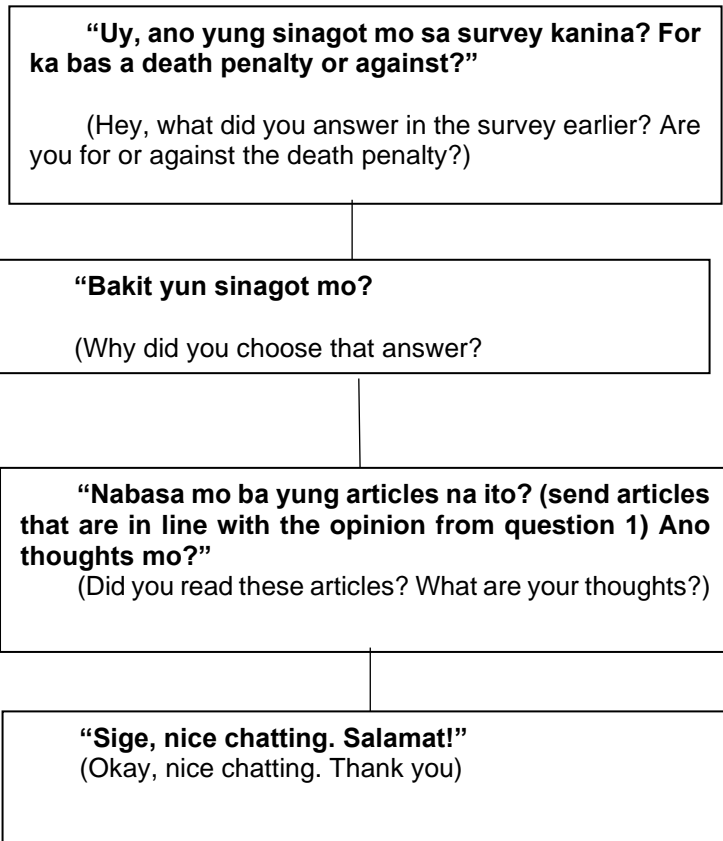


NOTES:

- **Articles that will be sent will depend on the answer to the first question:**
 - People who answer PRO will receive articles under the PRO category of the article list
 - People who answer ANTI will receive articles under the ANTI category of the article list
- **IMPORTANT: Do not deviate from the workflow provided.**

Appendices 3. Conversation flowchart provided to student personnel (Peer Opposition)

Conversation scripts are in a mix of Tagalog and English to mimic the more casual conversations in social media messaging. English translations in parentheses.



NOTES:

- **Articles that will be sent will depend on the answer to the first question:**
 - People who answer PRO will receive articles under the ANTI category of the article list
 - People who answer ANTI will receive articles under the PRO category of the article list
- **IMPORTANT: Do not deviate from the workflow provided.**

Appendices 4. Article list provided to all student personnel

ARTICLES **AGAINST** THE DEATH PENALTY (**ANTI**)

Why the death penalty is unnecessary, anti-poor, error-prone (Punongbayan and Mandrilla, 2017)

<https://www.rappler.com/thought-leaders/161072-death-penalty-unnecessary-anti-poor-error-prone>

Catholic clergy leads fight vs death penalty (The Inquirer Staff, 2019)

<https://newsinfo.inquirer.net/1145651/catholic-clergy-leads-fight-vs-death-penalty>

Five reasons to abolish the death penalty (Amnesty International, 2019)

<https://www.amnesty.org.au/5-reasons-abolish-death-penalty/>

Death penalty: Why not? (Habito, 2019)

<https://opinion.inquirer.net/123091/death-penalty-why-not>

Why bringing back the death penalty is not the solution (Dollaga, 2019)

<https://opinion.inquirer.net/122344/why-bringing-back-the-death-penalty-is-not-the-solution>

ARTICLES **FOR** THE DEATH PENALTY (**PRO**)

Death penalty should be revived (Katigbak, 2018)

<https://www.philstar.com/opinion/2018/08/13/1842031/death-penalty-should-be-revived>

Duterte on the death penalty: It's the only way to instill fear (ABS CBN News, 2017)

<https://news.abs-cbn.com/news/07/24/17/duterte-on-death-penalty-its-the-only-way-to-instill-fear>

Why ending the death penalty only benefits the worst of criminals (La Valle, 2019)

<https://thefederalist.com/2019/05/30/ending-death-penalty-benefits-worst-criminals/>

Rapist-murderer's near-release, a huge argument for capital punishment (Tiglao, 2019)

<https://www.manilatimes.net/2019/08/30/opinion/columnists/topanalysis/rapist-murderers-near-release-a-huge-argument-for-capital-punishment/608128/>

'Hanging Judge' favors death penalty (Romero, 2019)

<https://www.philstar.com/nation/2019/08/27/1946686/hanging-judge-favors-death-penalty>

Appendices 5. Baseline survey questionnaire

COMPUTER NUMBER: _____

ROOM NUMBER / TIME/ DATE: _____

Greetings! I am Ariane Lim, a Master's student at the International Institute for Social Studies in the Hague, Netherlands. I have partnered with Pamantasang Lungsod of Valenzuela (PLV) to conduct my research on information-seeking behavior of young people. The objective of this research is to further understand how young people access information online and this is part of the data collection process. The whole process will take a total of approximately 1 hour and 30 minutes. It will comprise of a first survey, after that, you will be given 1 hour to use the internet as you would like. During the 1 hour of free time, there will be fellow students asking you about your answers in the first survey. Lastly, you will be asked to answer an exit survey.

The data collected during this process will be analyzed on an aggregate level and will be used for the purpose of the research only. Your names will be kept anonymous throughout the process. Participation in this experiment is voluntary and you can opt-out of the process at any time. Please answer the questions as honestly as possible.

Thank you for your cooperation.

Instructions: Please encircle the number that corresponds to your choice.

- 1) I am for re-nstating the death penalty in the Philippines.

1	2	3	4	5
(Strongly Disagree)				(Strongly Agree)

- 2) An accused person is presumed innocent until proven guilty in court

1	2	3	4	5
(Strongly Disagree)				(Strongly Agree)

- 3) It is possible for an innocent person to be punished for a crime he did not do

1	2	3	4	5
(Strongly Disagree)				(Strongly Agree)

- 4) Most people in prison are innocent of the crime they are accused of having committed

1	2	3	4	5
(Strongly Disagree)				(Strongly Agree)

- 5) It is very possible that the courts would wrongfully sentence people accused of doing a crime

1	2	3	4	5
(Strongly Disagree)				(Strongly Agree)

- 6) Punishing a criminal by the death penalty would provide some comfort to the family of the victim

1	2	3	4	5
(Strongly Disagree)				(Strongly Agree)

- 7) The death penalty speeds up justice for the victims.

1	2	3	4	5
(Strongly Disagree)				(Strongly Agree)

- 8) Life imprisonment is SUFFICIENT penalty for people who commit heinous crimes

1	2	3	4	5
(Strongly Disagree)				(Strongly Agree)

- 9) It is possible that a person who committed a heinous crime could still change his/her life and be a good citizen

1	2	3	4	5
(Strongly Disagree)				(Strongly Agree)

10) My family believes that the death penalty should be reinstated (maybe because of religious or human rights beliefs)	1	2	3	4	5
(Strongly Disagree)					(Strongly Agree)
11) My friends/peers believe that the death penalty should be reinstated (maybe because of religious or human rights beliefs)	1	2	3	4	5
(Strongly Disagree)					(Strongly Agree)
12) I am a religious person and I strongly believe in the teachings of the Catholic church	1	2	3	4	5
(Strongly Disagree)					(Strongly Agree)
13) I studied in a Catholic or religious school	1	2	3	4	5
(Strongly Disagree)					(Strongly Agree)
14) I personally know someone that has been a victim of a heinous crime	1	2	3	4	5
(Strongly Disagree)					(Strongly Agree)
15) I like having conversations with different kinds of people	1	2	3	4	5
(Strongly Disagree)					(Strongly Agree)
16) I easily trust others	1	2	3	4	5
(Strongly Disagree)					(Strongly Agree)
17) I value other people's opinions and views	1	2	3	4	5
(Strongly Disagree)					(Strongly Agree)
18) I am accepting of people I just meet and refrain from judging others	1	2	3	4	5
(Strongly Disagree)					(Strongly Agree)
19) I can talk with people about sensitive issues like religion and politics	1	2	3	4	5
(Strongly Disagree)					(Strongly Agree)

Appendices 7. Cronbach's alpha: Information avoidance scale

Item	Obs	Sign	item-test correlation	item-rest correlation	average interitem correlation	alpha
I would rather not know about information that challenges by views and opinions	201	+	0.4599	0.2126	0.3303	0.7115
I would avoid learning about information that goes against my views and opinions	201	+	0.4957	0.255	0.3169	0.6988
Even if it will upset me, I want to know why people have opinions that oppose mine	201	+	0.7153	0.5402	0.2346	0.6051
I want to know the views of other people that do not agree with my opinion	201	+	0.7115	0.5349	0.236	0.607
It is important to know why people disagree with your opinion about certain issues	201	+	0.7593	0.6035	0.2181	0.5824
I want to immediately know why people do not share the same opinion as I do	201	+	0.6072	0.3939	0.2751	0.6549
Test scale					0.2685	0.6877

Appendices 8. Robustness Check: Effects of information avoidance on opposing information engagement

<p>Post-experiment results for opposers of the death penalty (Rating: 1-2)</p> <p>MODEL I</p> <p>Dependent variable: Ratio of time spent on opposing information</p> <p>Heterogeneity tests</p> <p>A. Test for Heterogeneity</p> <hr/> <p align="center">Breusch-Pagan / Cook-Weisberg test for heteroskedasticity</p> <hr/> <p align="center">Ho: Constant variance</p> <hr/> <p align="center">chi2(1) = 91.11</p> <p align="center">Prob > chi2 = 0.0000</p> <hr/> <p><small>*Standard errors have been adjusted in the corresponding regression to account for the existence of heterogeneity found in this test</small></p>
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MODEL II

Dependent variable: Ratio of time spent on opposing information
Multicollinearity and Heterogeneity tests

A. Test for Multicollinearity

Variable	VIF	1/VIF
Treatment x Information avoidance score	17.09	0.058503
Treatment (1 = Peer Opposition)	15.77	0.063422
Information avoidance score	2.34	0.428076
Knowing a victim (1=Yes)	1.06	0.946799
Religion	1.05	0.954195
Gender (1=Male)	1.04	0.962303
Family	1.03	0.968878
Mean VIF	5.62	

B. Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 62.43

Prob > chi2 = 0.0000

*Standard errors have been adjusted in the corresponding regression to account for the existence of heterogeneity found in this test

Post-experiment results for opposers of the death penalty (Rating: 1-2)

MODEL III

Dependent variable: Ratio of time spent on opposing information
Heterogeneity tests

A. Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 66.75

Prob > chi2 = 0.0000

*Standard errors have been adjusted in the corresponding regression to account for the existence of heterogeneity found in this test

MODEL IV

Dependent variable: Clicks on opposing information
Multicollinearity and Heterogeneity tests

A. Test for Multicollinearity

Variable	VIF	1/VIF
Treatment x Information avoidance score	17.09	0.058503
Treatment (1 = Peer Opposition)	15.77	0.063422
Information avoidance score	2.34	0.428076
Knowing a victim (1=Yes)	1.06	0.946799
Religion	1.05	0.954195
Gender (1=Male)	1.04	0.962303
Family	1.03	0.968878
Mean VIF	5.62	

B. Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 84.71

Prob > chi2 = 0.0000

*Standard errors have been adjusted in the corresponding regression to account for the existence of heterogeneity found in this test

Appendices 9. Robustness check: Post-experiment effects

Post-experiment results for opposers of the death penalty (Rating: 1-2)

MODEL I

Dependent variable: $Concept_{pre} - Concept_{post}$
Multicollinearity and Heterogeneity tests

B. Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 16.05

Prob > chi2 = 0.0001

*Standard errors have been adjusted in the corresponding regression to account for the existence of heterogeneity found in this test

Post-experiment results for opposers of the death penalty (Rating: 1-2)

MODEL II

Dependent variable: $Concept_{pre} - Concept_{post}$
Multicollinearity and Heterogeneity tests

A. Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 15.81

Prob > chi2 = 0.0001

*Standard errors have been adjusted in the corresponding regression to account for the existence of heterogeneity found in this test

Post-experiment results for opposers of the death penalty (Rating: 1-2)

MODEL III

Dependent variable: $Concept_{pre} - Concept_{post}$

Multicollinearity and Heterogeneity tests

B. Test for Multicollinearity

Variable	VIF	1/VIF
Gender (1=Male)	1.21	0.82567
Knowing a victim (1=Yes)	1.21	0.828556
Information avoidance score	1.15	0.868883
Clicks on opposing information	1.11	0.903067
Family	1.03	0.973045
Religion	1.03	0.973182
Mean VIF	1.12	

C. Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 16.86

Prob > chi2 = 0.0000

*Standard errors have been adjusted in the corresponding regression to account for the existence of heterogeneity found in this test

Post-experiment results for opposers of the death penalty (Rating: 1-2)

MODEL IV

Dependent variable: $Concept_{pre} - Concept_{post}$

Multicollinearity and Heterogeneity tests

A. Test for Multicollinearity

Variable	VIF	1/VIF
Gender (1=Male)	1.2	0.832746
Knowing a victim (1=Yes)	1.16	0.864157
Information avoidance score	1.15	0.870207
Ratio of time spent on opposing information	1.09	0.920002
Family	1.06	0.939923
Religion	1.04	0.964698
Mean VIF	1.12	

B. Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 20.03

Prob > chi2 = 0.0000

*Standard errors have been adjusted in the corresponding regression to account for the existence of heterogeneity found in this test

Post-experiment results for opposers of the death penalty (Rating: 1-2)

MODEL V

Dependent variable: $Argument_{pre} - Argument_{post}$

Multicollinearity and Heterogeneity tests

C. Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 0.00

Prob > chi2 = 0.9461

Post-experiment results for opposers of the death penalty (Rating: 1-2)

MODEL VI

Dependent variable: $Argument_{pre} - Argument_{post}$

Multicollinearity and Heterogeneity tests

D. Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 0.02

Prob > chi2 = 0.8774

Post-experiment results for opposers of the death penalty (Rating: 1-2)

MODEL VII

Dependent variable: $Argument_{pre} - Argument_{post}$

Multicollinearity and Heterogeneity tests

A. Test for Multicollinearity

Variable	VIF	1/VIF
Gender (1=Male)	1.21	0.82567
Knowing a victim (1=Yes)	1.21	0.828556
Information avoidance score	1.15	0.868883
Clicks on opposing information	1.11	0.903067
Family	1.03	0.973045
Religion	1.03	0.973182
Mean VIF	1.12	

B. Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 0.01

Prob > chi2 = 0.9545

Post-experiment results for opposers of the death penalty (Rating: 1-2)

MODEL VIII

Dependent variable: $Argument_{pre} - Argument_{post}$

Multicollinearity and Heterogeneity tests

A. Test for Multicollinearity

Variable	VIF	1/VIF
Gender (1=Male)	1.2	0.8316
Knowing a victim (1=Yes)	1.18	0.850198
Information avoidance score	1.14	0.87607
Ratio of time spent on opposing information	1.04	0.957835
Religion	1.04	0.962368
Family	1.02	0.981589
Mean VIF	1.1	

B. Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 0.01

Prob > chi2 = 0.9445

Post-experiment results for opposers of the death penalty (Rating: 3-5)

MODEL I

Dependent variable: $Concept_{pre} - Concept_{post}$

Multicollinearity and Heterogeneity tests

Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 0.81

Prob > chi2 = 0.3677

Post-experiment results for opposers of the death penalty (Rating: 3-5)

MODEL II

Dependent variable: $Concept_{pre} - Concept_{post}$

Multicollinearity and Heterogeneity tests

Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 0.72

Prob > chi2 = 0.3971

Post-experiment results for supporters of the death penalty (Rating: 3-5)

MODEL III

Dependent variable: $Concept_{pre} - Concept_{post}$

Multicollinearity and Heterogeneity tests

A. Test for Multicollinearity

Variable	VIF	1/VIF
Information avoidance score	1.12	0.889202
Religion	1.1	0.910389
Clicks on opposing information	1.06	0.930311
Gender (1=Male)	1.06	0.940518
Knowing a victim (1=Yes)	1.06	0.94319
Family	1.05	0.950642
Mean VIF	1.08	

B. Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 12.79

Prob > chi2 = 0.0003

*Standard errors have been adjusted in the corresponding regression to account for the existence of heterogeneity found in this test

Post-experiment results for supporters of the death penalty (Rating: 3-5)

MODEL IV

Dependent variable: $Concept_{pre} - Concept_{post}$

Multicollinearity and Heterogeneity tests

A. Test for Multicollinearity

Variable	VIF	1/VIF
Information avoidance score	1.13	0.88116
Religion	1.1	0.911113
Knowing a victim (1=Yes)	1.05	0.948704
Family	1.05	0.949926
Ratio of time spent on opposing information	1.04	0.963426
Gender (1=Male)	1.03	0.970223
Mean VIF	1.07	

B. Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 14.54

Prob > chi2 = 0.0001

*Standard errors have been adjusted in the corresponding regression to account for the existence of heterogeneity found in this test

Post-experiment results for opposers of the death penalty (Rating: 3-5)

MODEL V

Dependent variable: $Argument_{pre} - Argument_{post}$

Multicollinearity and Heterogeneity tests

Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 0.15

Prob > chi2 = 0.6985

Post-experiment results for opposers of the death penalty (Rating: 3-5)

MODEL VI

Dependent variable: $Argument_{pre} - Argument_{post}$

Multicollinearity and Heterogeneity tests

Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 0.29

Prob > chi2 = 0.5874

Post-experiment results for supporters of the death penalty (Rating: 3-5)

MODEL VII

Dependent variable: $Argument_{pre} - Argument_{post}$

Multicollinearity and Heterogeneity tests

A. Test for Multicollinearity

Variable	VIF	1/VIF
Information avoidance score	1.12	0.889202
Religion	1.1	0.910389
Clicks on opposing information	1.06	0.930311
Gender (1=Male)	1.06	0.940518
Knowing a victim (1=Yes)	1.06	0.94319
Family	1.05	0.950642
Mean VIF	1.08	

B. Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 3.16

Prob > chi2 = 0.0755

*Standard errors have been adjusted in the corresponding regression to account for the existence of heterogeneity found in this test

Post-experiment results for supporters of the death penalty (Rating: 3-5)

MODEL VIII

Dependent variable: $Argument_{pre} - Argument_{post}$

Multicollinearity and Heterogeneity tests

A. Test for Multicollinearity

Variable	VIF	1/VIF
Information avoidance score	1.14	0.880871
Religion	1.1	0.911245
Knowing a victim (1=Yes)	1.05	0.949034
Family	1.05	0.949521
Ratio of time spent on opposing information	1.04	0.962489
Gender (1=Male)	1.03	0.969826
Mean VIF	1.07	

B. Test for Heterogeneity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 2.18

Prob > chi2 = 0.1401

Appendices 10. Means of opinion measures pre and post-experiment by support towards the death penalty

	Sample opposing the death penalty		Sample supporting the death penalty	
	Mean	Std. Dev	Mean	Std. Dev
$Concept_{pre}$	1.683	0.471	3.738	0.705
$Argument_{pre}$	2.314	0.398	2.778	0.426
$Concept_{post}$	1.804	0.954	3.506	0.971
$Argument_{post}$	2.225	0.424	2.684	0.468
$Concept_{pre} - Concept_{post}$	-0.122	0.900	0.231	0.826
$Argument_{pre} - Argument_{post}$	0.272	0.205	0.281	0.245
N	41		160	

Appendix 11
Photos and Documentation

Photo 1. Experiment site



Photo 2. Registration for participants of the experiment



Photo 3. Participants answering the baseline survey



Photo 4. Troubleshooting and testing in-between sessions



Photo 5. Participants during the one-hour internet free time



Photo 6. Session orientation



NOTE: A 10-minute orientation is held at the beginning of every session to cover following: (i) To explain purpose of the experiment, (ii) to explain the rules of free internet hour (no pornography, no accessing of illegal websites), (iii) to discuss the consent forms, and (iv) to elaborate on the flow of the experiment.

Photo 7. Photo with partners from PLV upon forging the partnership



From left to right: Prof. Patrick Francisco (Information Technology Department, Chairman); Ariane Lim (Principal researcher); Dr. Nedeña Torralba (President, Pamantasan ng Lungsod ng Valenzuela); Ms. Angeleca San Jose (Head of Academic Affairs, Pamantasan ng Lungsod ng Valenzuela)