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Abstract

Considering the growing salience of nuclear energy in Southeast Asia, this study examines public perceptions of nuclear energy in Singapore, a technologically-advanced and affluent nation well-equipped to develop nuclear energy capabilities. Drawing from the source credibility theory, this study examines the public's credibility perceptions of nuclear-related information sources, and their trust in potential stakeholders. Guided by the psychometric paradigm, this study also explores public perceptions of risks, benefits, and support. Four focus group discussions were conducted with Singaporeans aged 18–69. Participants across different age groups (e.g., Millennials, Generation X, Baby Boomers) concurred in their trust of potential stakeholders, risk perception, cost perception, and support. Intergenerational differences were observed for participants' media use, credibility perceptions of nuclear-related information sources, and benefit perception. This study contributed theoretically by applying the source credibility theory and psychometric paradigm in an under-studied context. Practical implications were provided for policymakers and communication practitioners to effectively evaluate public awareness and acceptance for nuclear energy. Directions for future research were discussed. In conclusion, intergenerational similarities were observed for Singaporeans' perceptions of risks, costs, and support. Meanwhile intergenerational differences were noted for their credibility perceptions of nuclear-related information sources, trust in potential stakeholders, and benefit perception.

Keywords: nuclear energy; Southeast Asia; Singapore; psychometric paradigm; source credibility theory

"I Can Live With Nuclear Energy If…": Exploring Public Perceptions of Nuclear Energy in Singapore

1. Introduction

Since its inception, nuclear energy development is an issue that has divided public perceptions (Ho, 2016). Supporters have advocated nuclear energy as a solution to several environmental issues due to its low carbon emissions (International Atomic Energy Agency, 2014). Additionally, it can address global rising energy demands and provide energy security by generating a reliable and high output of electricity (Ertör-Akyazı et al., 2012; IAEA, 2014). However, critics have opposed it due to the risks of nuclear accidents, improper radioactive waste management, weaponization of nuclear energy, and the substantial operating costs of nuclear power plants (IAEA, 2014). Such polarized attitudes toward nuclear energy are also reflected in national energy policies globally (Ho, 2016). For instance, Belgium, France, Germany, and Switzerland have decided to gradually discontinue their use of nuclear energy (Reuters, 2017, 2018; World Nuclear Association, 2016). Conversely, the United States and the United Kingdom plan to construct new nuclear power plants (CNN, 2017). These divided attitudes toward nuclear energy are similarly observed in Asia. While Indonesia and Thailand have plans to adopt nuclear energy (WNA, 2016), Vietnam recently abandoned its nuclear energy adoption plans, citing safety concerns and high costs as a deterrent (Nguyen and Ho, 2016).

Most public opinion research on nuclear energy are premised in countries that currently possess industry-scale nuclear facilities (Besley and McComas, 2015; Ho et al., 2018; Keller et al., 2012; Mah et al., 2014; Park and Ohm, 2014; Stoutenborough et al., 2013; Venables et al., 2012). However, few studies are conducted in countries which are in the preliminary phases of nuclear energy development (Ho et al., 2018). A recent meta-analysis on public perceptions of nuclear energy found that most studies were conducted in North

America and Europe, while limited studies were conducted in SEA (Ho et al., 2018). As such, this study seeks to address the research gap by exploring public perceptions in SEA countries, particularly, Singapore. Additionally, this study contributes to literature by exploring an under-studied cultural context, which differs substantially from North America, Europe, and East Asia in terms of its culture, language, and religion (Vinayak et al., 2014).

Coupled with the burgeoning salience of nuclear energy in SEA, a clear understanding of public perceptions toward nuclear energy is needed, as such attitudes may facilitate or hinder nuclear energy adoption and development (Thai Visa News, 2015; Visschers and Siegrist, 2012). For instance, Thailand's plans for nuclear energy development were met with public opposition (Pattaya Mail, 2011). However, these nuclear development plans were recently revived due to an anticipated growth in electricity demand (WNA, 2018). Similarly, Malaysia's nuclear energy development plans were stalled (Jamal, 2015). After a series of pre-feasibility studies, Malaysian authorities passed a bill to prepare Malaysia for its own nuclear power generator as early as 2030 (WNA, 2018). Although Singapore does not have concrete plans for nuclear energy development, it is currently in the nascent stage of nurturing nuclear experts and is open to nuclear energy development in the future (National Climate Change Secretariat, 2016; Siong, 2014).

The successful adoption and development of nuclear energy requires substantial start-up costs, advanced technological capabilities, and effective governance. Hence, it will be meaningful to examine public perceptions in a developed SEA country with the potential to satisfy these requirements. Considering Singapore’s regional leadership in technological development, economic affluence, and its efficient government with low levels of corruption (Driscoll, 2016), it is worthwhile to explore the underlying dynamics of public perceptions toward nuclear energy in this context.

Guided by the source credibility theory, this study aims to compare how Singaporeans

across different age groups concur and/ or differ in their credibility perceptions of potential stakeholders in managing nuclear power plants and handling nuclear accidents. Drawing upon the psychometric paradigm, this study also seeks to compare how Singaporeans across different age groups concur and/ or differ in their perceived risks, benefits, and support for nuclear energy. Theoretically, this study can contribute to public opinion research on nuclear energy by applying both the psychometric paradigm and the source credibility theory in an under-studied cultural context. Practically, the insights gleaned from this study can assist policymakers and communication practitioners in formulating and implementing effective communication strategies to raise public awareness about nuclear energy.

1.1. Study context: Singapore

Singapore occupies a land area of 719.1 km^2 (Singapore Land Authority, 2016) with an estimated population of 5.54 million (Singapore Department of Statistics, 2016). As a city-state with limited natural resources, the Republic currently relies on regional imports of petroleum, coal, and natural gas for energy production (Energy Market Authority, 2016). Over the decades, Singapore has prioritized and incorporated sustainability in its national policies by adopting cleaner energy sources such as natural gas, which powers up to 95% of Singapore's electricity demands (Tan, 2015). In light of Singapore's rising energy demands, the government is open to nuclear energy as an alternative energy source in the future (Thomas, 2010).

However, the Singaporean authorities conducted a pre-feasibility study and found that the risks posed by nuclear energy in the Singapore context outweighed its benefits on nuclear safety, security and risk assessment, human resource development, as well as nuclear energy systems and demand (Ministry of Trade and Industry, 2012). Given the Republic's small land area and high population density (Kotwani, 2015), siting the nuclear reactor and setting up socio-politically acceptable emergency preparedness procedures will be challenging

(National Climate Change Secretariat, 2016; Phua, 2015). Moreover, most Singaporeans perceive nuclear energy as a hazardous technology, due to the potential destruction posed by nuclear accidents (Ng, 2011; Tan, 2015). Although there are currently no firm plans to incorporate nuclear into Singapore's energy mix, the government intends to develop nuclear-related expertise to manage nuclear safety amidst regional nuclear energy development plans (Kotwani, 2015; Leong, 2016). The Singapore government has also underscored the importance of public education by disseminating nuclear-related information through a combination of media platforms (Siong, 2014; Kotwani, 2015).

2. Theoretical background

Due to the complexities of nuclear energy, laypeople may lack the motivation and cognitive ability to evaluate the effectiveness of nuclear-related messages. This study utilizes the source credibility theory to understand how laypeoples' perceived expertise and trustworthiness of nuclear-related information sources and potential stakeholders function as judgement heuristics. This study also compares these credibility perceptions among Singaporeans from different age groups. This study draws upon the psychometric paradigm, which is a landmark research approach that examines public perceptions of risks (Marris et al., 1997; Siegrist, 2010). As the psychometric paradigm has been extensively applied in public opinion research on nuclear energy (Siegrist, 2010), it is well-suited to explore how different generations of Singaporeans perceive nuclear energy.

2.1. Source credibility theory

During the process of communication and information processing, individuals' attitudes and behaviors are primarily influenced by the characteristics of an information source (Kelman, 1961). The Heuristic Systematic Model (HSM) of information processing stipulates that individuals process information systematically or heuristically, which subsequently affects their attitudes toward a particular topic (Chaiken, 1980; Chaiken and

Eagly, 1989). As cognitive misers, people typically lack the motivation and cognitive abilities (e.g., limited domain-specific knowledge) to systematically process information (Chen and Chaiken, 1999; Todorov et al., 2002). Therefore, individuals typically rely on judgement heuristics or information shortcuts to evaluate information sources (Goren et al., 2009).

Source credibility is a noteworthy characteristic that determines the persuasiveness of an information source (Druckman, 2001; Miller et al., 1976). In other words, people evaluate the information source to determine if the message content, message source, and subject matter are "valid, relevant, salient and believable" (Callaghan and Schnell, 2009, p. 13). Source credibility also serves as a judgement heuristic for individuals to evaluate complex or conflicting scientific information (Callaghan and Schnell, 2009). Individuals often rely on the information disseminated by highly credible figures, such as scientists or policymakers to assess the benefits, risks, and uncertainty of scientific information (Siegrist and Cvetkovich, 2000). Studies have also demonstrated the association between the public's credibility perceptions and attitudes toward nuclear energy (Siegrist, 2005a; Viklund, 2003). Therefore, this study aims to understand how the Singaporean public perceives the credibility of nuclear-related information sources.

Source credibility is a multi-dimensional concept and judgement heuristic for evaluating message effectiveness (Hovland et al., 1953; Ohanian, 1991). Source credibility includes two key dimensions: *source expertise* and *trustworthiness* (Callaghan and Schnell, 2009; Hovland et al., 1953; Lombardi et al., 2014). *Source expertise* refers to audiences' perceptions of the source's authority, knowledge, and capabilities toward a particular subject matter (Sertoglu, 2014). This is commonly regarded as the authoritativeness (McCroskey, 1966), proficiency (Whitehead, 1968), and credentials of an information source (Berlo et al., 1969). Meanwhile, *source trustworthiness* is defined as audiences' degree of confidence and acceptance of an information source's honesty, integrity, and message content's accuracy

(Berdahl et al., 2016; van der Waldt et al., 2009).

Individuals' perceptions of *source expertise* and *trustworthiness* could contribute to message effectiveness (Berdahl et al., 2016; Chao et al., 2005). For instance, scientists are widely regarded as credible and competent sources of information (Bickerstaff et al., 2008; Fiske and Dupree, 2014). The high societal regard for scientists thus serves as an information shortcut for laypeople when forming opinions about novel or controversial technologies (Lachapelle et al., 2014; Liu and Priest, 2009). Therefore, this study aims to understand the public's credibility perceptions of individuals and organizations, such as potential stakeholders of nuclear energy and various media outlets:

RQ1: How do different age groups of Singaporeans concur and/ or differ in their credibility perceptions of the media and potential stakeholders of nuclear energy?

2.2. Psychometric paradigm

The psychometric paradigm examines various factors that influence laypeople's risk perceptions toward different hazards (Siegrist, 2010; Siegrist et al., 2005b). Laypeople quantitatively evaluated certain hazards in terms of the novelty of the hazard, severity of consequences, and knowledge about the risks associated with the hazard that is known to science (Fischhoff et al., 1978; Siegrist et al., 2005b). These quantitative assessments of perceived risks in turn inform laypeople's attitudes and acceptance of different technologies and activities (Fischhoff et al., 1978; Siegrist et al., 2005b).

Apart from evaluating different hazards quantitatively, laypeople also assess these risks qualitatively (Fischhoff et al., 1978; Siegrist, 2010). A growing body of literature suggests that laypeople consider dread risk and unknown risk when forming opinions and making risk assessments of different hazards (Siegrist et al., 2005a, 2005b). Dread risk is defined as the potential of dread, fatal consequences, and perceived lack of control of novel technologies (Siegrist et al., 2005a, 2005b). In this study, examples of dread risks include the

potential fatalities and injuries from nuclear energy adoption and development. Unknown risk refers to the perceived novelty, scientific knowledge, and delay of effects associated with the particular activity or technology (Siegrist et al., 2005a, 2005b). In this study, the unknown risks could pertain to laypeople's perceptions of the riskiness, environmental harm, and unacceptability of nuclear energy. Marris and colleagues (1997) found that participants rated the riskiness, environmental harm, and unacceptability of nuclear energy more highly than its potential risks of fatalities and injuries. In other words, laypeople's risk perceptions of nuclear energy were primarily based on their evaluations of concepts associated with dread risk, rather than unknown risk.

The psychometric paradigm has informed policymakers and communication practitioners about the factors influencing laypeople's risk perceptions toward nuclear energy (Siegrist, 2010). The knowledge and understanding of these risk factors can help policymakers and communication practitioners predict public responses to new hazards, guide educational efforts, and implement effective public communication campaigns to assuage public concerns. Therefore, this study utilizes the psychometric paradigm to understand the public's risk and benefit perceptions of nuclear energy in Singapore, while teasing out the intergenerational similarities and differences.

RQ2: How do different age groups of Singaporeans concur and/ or differ in their perceived risks, benefits, and support of nuclear energy?

3. Method

3.1. Data collection

This study utilized focus group discussions (FGDs) to elicit insights from Singaporeans across different age groups. Although FGDs do not provide nationally-representative data (Berdahl et al., 2016; Lock et al., 2014), it is well-suited for the complex topic areas in this study that require elaboration to facilitate easier comprehension among

laypeople (Carey and Asbury, 2012). The participant-led discussions and interpersonal interactions in FGDs can facilitate information exchange (Onwuegbuzie et al., 2009), deliberation, and encourage collective brainstorming (Smithson, 2000). Although participants may be influenced by more vocal respondents (Stewart et al., 2007), this method yields high ecological validity by mimicking the flow of daily conversations (Lock et al., 2014). Moreover, FGDs are instrumental in measuring social attitudes by identifying the similarities and differences in opinions among participants (Stewart et al., 2007). FGDs are also an established qualitative research method in science communication, such as nuclear energy (Berdahl et al., 2016; Lock et al., 2014), stem cell research (Pfeffer, 2008), and biotechnology (Beckwith et al., 2003).

3.2. Sampling and recruitment

A total of 39 participants were recruited using non-probability sampling. To capture an extensive range of perceptions, four FGDs were conducted, with group sizes ranging from 9 to 10 respondents. Each FGD represented a range of ages, as detailed in Table 1. Participants were recruited via emails and recruitment leaflets handed out at public places. Only Singapore citizens and permanent residents were recruited to accurately gauge public perceptions of nuclear energy in Singapore. An equivalent proportion of male and female participants were recruited to minimize gender bias. To ensure that the attitudes of all prominent social groups were captured, a racial quota was maintained for each FGD. The sample constituted 76.9% Chinese, 12.8% Malay, 5.1% Indian, 2.6% Eurasian, and 2.6% from other ethnicities, which resembles Singapore's population demographics.

One FGD was held with undergraduates from a large public university in Singapore, while the other 3 FGDs were conducted with members of the public. Apart from the FGD conducted with university students (FGD 1) aged from 18 to 24, the 3 FGDs held with the public were segmented according to age: FGD 2 participants (Millennial generation) were

aged from 18 to 34, FGD 3 participants (Generation X) were aged from 35 to 50, and FGD 4 participants (Baby Boomer generation) were aged from 51 to 69 (see Table 1). This age classification was derived based on the general age of majority for contractual capacity in Singapore[1] (Yeo, 2015), and the definition of generations by the Pew Research Center[2] (Pew Research Centre, 2015). As the Millennial generation surpassed the Baby Boomers as the largest generation globally (Cosseboom, 2015), an additional FGD session was conducted with college undergraduates.

[Insert Table 1 about here.]

Prior to each FGD, informed consent was sought from all the participants. Participants also provided their demographic information and rated their knowledge of nuclear energy by answering a pre-FGD questionnaire. Each FGD lasted for 2h and light refreshments were provided. Upon completion, the participants comprising of college undergraduates received course credits, while members of the public received S$90 each.

3.3. Moderation and guide

The FGDs were conducted in English and moderated by a member of the research team, who was assisted by an assistant moderator in notetaking. This ensured a smooth transition between subject matters while addressing all topic areas, and that every participant was given ample opportunity to speak. The moderator for FGD 1 and FGD 2 was a doctoral student well-trained in social science research with FGD moderation experience. Both the moderators for FGD 3 and FGD 4 were college faculty members in the social sciences.

The moderators followed a semi-structured moderator's guide to steer the FGDs. It

[1] The general age of majority of contractual capacity in Singapore stands at 18, with the exception of contractual agreements relating to land, which remains at 21 (Yeo, 2015). This was taken into account as this signified the individual's attainment of adulthood, in which they could exercise sensible judgements about national issues and impact policy decisions that could extend to such national issues as the development of nuclear energy.

[2] Age was chosen as the predominant classification method as the demographic and attitudinal differences between generations may elicit vastly different opinions regarding nuclear energy (Harber, 2011). This included differences in education levels, media consumption patterns, and preferred communication styles. While the age classification ensured that the participants could voice their opinions freely, it also strived to achieve a wide range of ages within each group to obtain a diversity of perspectives.

was formulated based on existing public opinion research on nuclear energy. The moderator's guide included a pre-determined list of questions and prompts, which was used in all the FGDs to facilitate free-flowing discussion among participants. Drawing upon the source credibility theory, the moderator's guide began with a discussion on the communication channels used by participants to acquire and receive nuclear-related information, and their perceived credibility of these information sources. The subsequent questions explored participants' trust in relevant stakeholders in managing nuclear power plants and handling nuclear accidents. Thereafter, the guide included key questions related to the participants' perceived benefits and risks of nuclear energy, which was informed by the psychometric paradigm. Apart from the general benefits and risks related to nuclear energy, participants were also asked to relate these questions to the Singapore context, and provide their overall judgement of nuclear energy (See Appendix A).

3.4. Analysis

The FGDs were digitally-recorded, transcribed verbatim, and analyzed by research team members. To ensure confidentiality, all personal information was removed from the transcripts and quotes, and replaced with an alphanumeric code. The transcripts were then imported into the *NVivo* software for data management. A deductive approach of coding was first adopted, whereby codes were created based on existing literature. An inductive coding approach was also utilized concurrently to capture emerging data during the coding process.

This study followed Berdahl et al.'s (2016) and Lock et al.'s procedure of analyzing the data collected. The data analysis procedure includes examining transcripts meticulously, generating codes, and identifying themes apart from the predetermined categories in the semi-structured moderator's guide. To ensure inter-coder reliability, a coding scheme was first established by two researchers to code and analyze the FGD transcripts in *NVivo*. The coders then coded the transcripts independently and compared their coding using *NVivo*. An

average intercoder score of Cohen's kappa= 0.73 was obtained for all the codes in all the transcripts, which indicated a good inter-coder reliability score based on Cohen's (1960) standards.

This study also adhered to Braun and Clarke's (2006) guidelines for thematic analysis to determine the themes and sub-themes that emerged from the FGD. Themes were primarily derived from the repeated presentation of a subject matter within and across the participant's narratives. These repeated patterns were based on its relevance in addressing the research questions and the frequency of mentions. The themes (i.e., primary and emergent themes) were identified by including various perspectives in data interpretation, or "investigator triangulation" (Patton, 2002, p. 247), which added strength to the hybridized analytical approach in this study. First, primary themes were identified using deductive coding based on the main arguments presented in existing literature and the moderator's guide. Following, the major themes and sub-themes were coded based on the moderator's guide and FGD transcripts. The major nodes for coding included "sources of information," "perceptions," "trust in relevant stakeholders," and "scenario-based questions." Meanwhile, emergent themes were identified by research team members through a formal coding process using inductive coding. In other words, the emergent themes that did not fit into the pre-existing primary themes were coded individually.

4. Results

Six key themes emerged from the participants' responses; two of which pertained to credibility perceptions of nuclear-related information sources and trust in potential stakeholders, while four major themes included public perceptions of benefits, risks, costs, and support for nuclear energy. Of the major themes, the features of credibility for information sources emerged inductively from the data. Meanwhile, the other five major themes were primary themes that were predetermined before data collection (see Tables 2

and 3).

[Insert Tables 2 and 3 about here.]

4.1. Credibility of nuclear-related information sources

4.1.1. Types of communication mediums

The participants mainly accessed nuclear-related information using four types of communication mediums: print media, broadcast media, online and social media, and word-of-mouth. Print media consisted of newspapers, magazines, and academic journal publications. Nuclear-related information propagated through radio and television were categorized as broadcast media. Apart from social media, online media included messaging applications, websites, and search engines. Finally, conferences, discussions, education, and military training were classified as word-of-mouth. Inter-generational differences were observed in the participants' media consumption and information-seeking behaviors. Participants from FGD 1 and FGD 2 utilized online and social media most frequently and accessed information via broadcast media least frequently. Conversely, broadcast and print media were most commonly used among the respondents from FGD 3 and FGD 4, while online and social media were least commonly used.

The respondents across the four FGDs identified the type of communication medium as a crucial feature in determining source credibility of nuclear-related information. The respondents concurred that a general hierarchy of source credibility exists. Print media was perceived as the most credible communication channel, followed by broadcast media, word-of-mouth, and online and social media. Print media such as academic papers were perceived as credible information sources as they were based on empirical evidence, while newspapers were perceived as credible information sources as they provide balanced viewpoints. The younger and older participants held differing credibility perceptions toward social media and search engines in providing nuclear-related information. Participants from FGD 1 and FGD 2

perceived social media as credible, as users can determine the information source's credibility by analyzing the webpage's hyperlink and cross-verifying with other information sources. Although the participants from FGD 3 and FGD 4 acknowledged that search engines like Google are “very powerful” due to the extensive range of information sources, they felt that its credibility was compromised as content posted is not regulated.

4.1.2. Sources of information

Across the four FGDs, participants mainly perceived established media outlets, scientists, government, and international governing organizations (IGOs) as credible sources for nuclear-related information. The participants trusted established mainstream media such as newspapers and documentaries, due to its editorial control. The participants concurred that nuclear scientists, government, and IGOs were credible information sources due to their nuclear expertise and access to exclusive nuclear-related information. Furthermore, participants trusted the Singapore government for its high transparency and competency, while IGOs were perceived as objective information sources with a global outlook.

However, a participant in FGD 2 expressed his reservations about the mainstream media's credibility and objectivity, as some media outlets were known to favor certain people in power. Other participants in FGD 2 were also skeptical of local and international media outlets as they felt that the bribing of reporters to review certain issues were quite prevalent in SEA. As such, credibility perceptions also depend on the news organization's reputation.

4.1.3. Content of information

The content of information also emerged as an important component for determining source credibility. The participants across all FGDs evaluated the credibility of nuclear-related information by cross-verifying it with other information sources. Nuclear-related information was perceived as credible if the content corroborated with existing literature. Factual nuclear-related information was also perceived as being more credible than

opinionated nuclear-related information. One participant from FGD 1 mentioned that personal opinions on online forums such as Reddit include emotionally charged content which explicitly intend to persuade other online users to think in a certain way, thereby decreasing its credibility.

Despite this, the participants also trusted value-laden information from influential, successful, and expert speakers. For instance, a participant from FGD 2 asserted, "people who are on TED[3] are supposed to be very credible, but all these are opinions. Although, if Jack Ma[4] said that is a very good opinion, I will just take it." Hence, the participants trusted and accepted opinions by speakers perceived to be skilled, knowledgeable, attractive, worthy, and respectable. The information source was therefore perceived as a more important indicator of source credibility than the content of information.

4.2. Trust in potential stakeholders

4.2.1. Managing nuclear power plants

Across the FGDs, the participants identified several potential stakeholders to manage the nuclear power plants: nuclear experts, commercial operators, IGOs (e.g., the United Nations), the Singapore government, foreign governments (e.g., Japanese, Russian governments), non-governmental organizations, and watchdogs. However, the participants across the four FGDs were unable to trust a single potential stakeholder whole-heartedly. One participant from FGD 3 mentioned that scientists are definitely important, but they are typically "in cahoots" with the government. Most respondents also distrusted commercial operators due to their profit motivations. Additionally, participants recognized the limited capacity of IGOs such as the United Nations to enforce changes, despite their nuclear-related

[3] TED is a non-partisan, non-profit organization devoted to spreading ideas through short, impactful talks. TED has involved expert speakers from different disciplines and cultures to share their ideas about a variety of topics ranging from science to business to global issues (TED, 2017).

[4] Jack Ma is the founder and executive chairman of the Alibaba Group, a conglomerate of internet-based businesses. Ma is among the world's most influential businessmen, coming in second in Fortune's 2017 "World's 50 Greatest Leaders" list (Joslin, 2017). He is also recognized as China's biggest philanthropist, and has given numerous lecturers throughout his career.

expertise. This general distrust also extended to foreign and local national governments. Although some respondents trusted the Japanese and Russian governments' experience in managing nuclear power plants, most participants preferred the Singaporean government to have a major involvement. This view was expressed by most participants, regardless of their political allegiances. One participant in FGD 4 expressed that "As much as I hate their guts… I trust their honesty." Despite this, the participants also mentioned the need for NGOs and watchdogs to keep checks and balances on the government or the scientists.

The participants across all FGDs eventually decided that a joint venture involving multiple potential stakeholders would be the best option. A participant from FGD 2 mentioned that:

> "I would let this scenario be a joint venture…Singapore government owns 50% and the technical know-how from the foreign entity comes in and tries to transfer this knowledge to us, and eventually work towards full independence by our government. So fully operated by Singapore scientist[s] and government authorities." (P8G3SG)

4.2.2. Handling nuclear accidents

The participants identified nuclear experts, commercial operators, IGOs, the Singapore government, foreign governments (e.g., Japanese, Russian governments), plant operating authorities, and volunteers as potential stakeholders if a nuclear accident occurred in Singapore. Majority of the participants trusted any individual or organization with relevant expertise to handle a potential nuclear accident. Some participants also mentioned the need to assemble a nuclear crisis reaction team. The participants also identified local life-saving forces such as the Singapore Civil Defense Force (SCDF) as a potential stakeholder due to their knowledge of Singapore's environmental conditions. Although they were aware that the SCDF did not currently possess nuclear-related expertise, the participants felt that the SCDF could be trained to react in these circumstances.

Intergenerational differences were observed as participants in FGD 4 held a high level of trust in the government to handle nuclear accidents, while participants in FGD 1 and FGD 2 expressed mixed reactions. Some participants trusted the government due to their personal political beliefs, while others felt that the government would underplay the destruction of the nuclear accident by censoring mainstream media outlets. Despite this, participants from FGD 1 and FGD 2 still expected the local government to take responsibility in handling nuclear accidents.

The participants from FGD 1 and FGD 2 also trusted and welcomed any individual or organization such as foreign governments or IGOs to provide assistance in handling the nuclear accident. Other participants also corroborated that the "Russian or Japanese should be best in handling crises" due to their experience in problem-solving and cleaning up after a nuclear accident. A participant from FGD 1 mentioned that IGOs could take on an advisory role and collaborate with the local government for crisis communication to the public.

4.3. Attitudes toward nuclear energy

4.3.1. Benefit perception

The participants across all FGDs noted the high reliability and efficiency of nuclear as an energy source, its environmental benefits, economic benefits, and the self-sufficiency it provides for energy production and electrical generation. Of them, the latter three benefits were specifically relevant to Singapore. Notably, intergenerational differences were observed as the participants from different FGDs mentioned certain benefits more frequently. The participants from FGD 1 and FGD 2 mentioned the high reliability and output of nuclear energy, and its environmental benefits most frequently. Meanwhile, the respondents from FGD 3 highlighted the high reliability and efficiency of nuclear energy and its economic benefits. The participants from FGD 4 brought up the self-sufficiency for energy production and electrical generation, as well as the economic benefits of nuclear energy most frequently.

4.3.2. Reliable and efficient energy source

Many participants acknowledged the efficiency and reliability of nuclear energy. The participants perceived nuclear energy as an unyielding energy source, even during the monsoon or dry seasons in Singapore. The participants also recognized its high efficiency for electrical generation, in comparison to renewable energy sources. Several participants also described nuclear as a sustainable energy source that "don't *sic* need a lot of uranium to generate a lot of power."

4.3.3. Environmental benefits

Most participants agreed that nuclear is an environmentally-friendly energy source that releases less carbon emissions as compared to conventional forms of energy, such as fossil fuels. One participant from FGD 3 also recognized that nuclear energy could complement Singapore's environmental policies to reduce its carbon footprint.

4.3.4. Economic benefits

Across all FGDs, most participants recognized that nuclear energy development would generate many job opportunities and boost economic development, especially in light of the current lackluster employment prospects and stagnant economic growth. Participants across the four FGDs also mentioned that Singapore could export the surplus energy generated from the nuclear power plants for additional revenue. One participant from FGD 3 alluded to Singapore's success in water technology,[5] and mentioned that many countries could benefit if Singapore adopted nuclear energy. Another participant from FGD 3 also mentioned that nuclear energy adoption could reinforce Singapore's economic leadership in SEA.

[5] Through the constant innovation of water management and treatment technologies, Singapore has managed to address its scarcity in clean water by establishing a sustainable water supply from varying sources, also known as the Four National Taps (Economic Development Board Singapore, 2017). This includes water in local catchment areas, imported from neighboring countries, reclaimed water (NEWater), as well as desalinated water (Public Utilities Board Singapore, n. d.). In light of the success of local firms in the global water industry, Singapore has also assumed global leadership for its technological innovations in this industry (Teng, 2016).

4.3.5. Self-sufficiency

Across the four FGDs, the participants perceived nuclear energy as an avenue for Singapore to address its rising energy demands and achieve its goals as a technologically advanced nation. Instead of relying on foreign imports for natural gas, participants also felt that Singapore could be self-sufficient in satisfying its energy needs and stabilize electricity prices. The participants also referred to Singapore's advanced water technology and self-sustainability in water.

4.4. Risk perception

The participants identified nuclear accidents, weaponization of nuclear energy, production of radioactive waste, health hazards from radioactive exposure, and terrorist attacks as perceived risks associated with nuclear energy. The potential threats of terrorist attacks and a plausible strain of diplomatic ties with neighboring countries were particularly relevant to the Singapore context. No intergenerational differences were found as the participants unanimously mentioned the risks of nuclear accidents most frequently.

4.4.1. Nuclear accidents

Most participants immediately associated the risk of nuclear energy with the Fukushima and Chernobyl nuclear accidents. They also expressed concern that a nuclear accident occurred in spite of the safety precautions established for the Fukushima nuclear power plant. Therefore, many participants described nuclear energy as a dangerous and highly destructive technology with long-term damage, which commonly incites fear. One participant from FGD 1 asserted that Chernobyl is still suffering from the widespread effects from the nuclear accident even after many decades. Another participant from FGD 1 mentioned that he only heard about nuclear energy during an accident, which led to his negative impression of nuclear energy. Many participants also noted that there is no room for error due to Singapore's limited physical space. One participant from FGD 3 stated that "if

there were actually to be a nuclear accident in Singapore, I don't think there's anything you can do you know. We are just a dot. If there's an accident, the whole country is gone."

4.4.2. Weaponization of nuclear energy

Although the FGD moderators mentioned at the start of the session that the discussion would be based on nuclear energy, several participants still mentioned the weaponization of nuclear energy as a risk. Many participants felt that nuclear energy could be used to develop weapons of mass destruction, while citing North Korea's development of nuclear weapons. A few participants also attributed their negative impressions of nuclear energy to the bombing incidents at Hiroshima during World War II.

4.4.3. Production of radioactive waste

Although many participants perceived nuclear energy as an environmentally sustainable energy source, they recognized that the danger posed by the production of radioactive waste may outweigh the detriments of greenhouse effects. Other participants expressed concern over the disposal of nuclear waste, which could be transformed into nuclear weapons by terrorists. The participants also felt that there would be insufficient land to bury or dispose the radioactive waste in Singapore, leading to long-term environmental pollution. Some participants also stated that the improper handling of radioactive waste could contaminate local water supplies, which will negatively affect Singaporeans and strain Singapore's diplomatic ties with neighboring countries.

4.4.4. Health hazards from radioactive exposure

Many participants across the four FGDs also displayed consternation over radioactive exposure in causing enduring health hazards. One participant from FGD 4 mentioned that "even a small dose of radiation in the long term will affect your health." Meanwhile, another participant from FGD 3 was worried that the radioactivity in nuclear power plants might detrimentally affect the living conditions and physical development of his children and the

future generations.

4.4.5. Terrorist threats and attacks

Across all FGDS, some participants emphasized the need to establish safety and security mechanisms. They were worried about the threat of "nuclear terrorism" which may generate more radioactive waste, negatively affect human health, and pollute the environment. Several participants across the FGDs also mentioned that Singapore does not have room for error to recover from terrorists' attacks armed with nuclear weapons.

4.5. Cost perception

Although our research question did not include cost perception, the concept emerged inductively from the FGDs. Participants from the four FGDs pointed out monetary costs and opportunity costs associated with nuclear energy. Mixed responses about the monetary costs were obtained from the four FGDs. While some participants perceived nuclear as a cost-efficient energy source due to its low costs of energy production, others asserted that the start-up costs and expertise training involves substantial financial investments. The participants in FGD 2 and 3 also noted that Singapore would lose oil refineries like Exxon Mobil and Shell, which have invested significantly in Singapore's economy. Meanwhile, other participants felt that financial investments in nuclear energy would be too costly if it fails. The participants also stated that the financial investments on nuclear energy could be spent on pursuing renewable energy sources.

4.6. Support for nuclear energy

The participants across all the FGDs were generally unsupportive of nuclear energy. Most participants felt that the risks outweighed the benefits in the local context, as "the radioactivity will decimate Singapore instantly" if a nuclear accident were to occur. Many participants also felt that there were safer ways for Singapore to develop its economy, and the investments for nuclear energy could be used to establish Singapore as a financial hub

instead. They were also unsupportive of nuclear energy development plans in SEA. Most participants felt that Singapore and its neighboring countries were not ready for nuclear energy development due to the close geographical proximity of Singapore, Malaysia and Indonesia, as well as the strained regional diplomatic tensions surrounding the annual haze problem.[6]

Despite this, some participants were optimistic that the benefits of nuclear energy could match up with the risks in the long-term, as nuclear energy could be harnessed in a safer manner by learning from past nuclear accidents. As such, respondents' negative sentiments toward nuclear energy were attributed to the lack of nuclear-related expertise and technological capabilities to ensure nuclear safety currently. In other words, their support for nuclear energy were largely contingent on Singapore's nuclear-related capabilities. Participant from FGD 1 and FGD 2 also mentioned that the large-scale environmental hazards and waste production from other conventional energy sources such as oil spills, did not receive as much dramatic media coverage as nuclear energy.

4.6.1. Conditional acceptance

Despite the participants' generally unsupportive attitudes for nuclear energy across all the FGDs, some participants reluctantly accepted nuclear energy under certain circumstances. One participant from FGD 3 mentioned that "[they] have no choice. [They] don't have any power to oppose it." Another participant also cited the incident when the government went ahead with the construction of two casinos, despite public criticisms (Berger, 2005). The participants also reluctantly accepted nuclear energy development if Singapore is required to jump on the bandwagon and avoid lagging behind other SEA countries that have pursued

[6] Since 1972, the agricultural and forest fires caused by corporations and farmers in Indonesia every year have resulted in a smoky haze which affects the South East Asian region for months, causing a significant deterioration in air quality that can lead to severe long-term health effects (BBC News, 2015; Lee, 2015). Despite the Indonesia's struggles in resolving this issue (BBC News), the authorities have criticized the neighboring countries for complaining about the haze, straining the regional diplomatic ties (The Straits Times, 2015).

nuclear energy. Some participants also suggested that nuclear energy may be necessary in the long-term, when traditional energy sources run out.

5. Discussion

In summary, the participants evaluated the credibility of communication channels in terms of the source and content of nuclear-related messages. In relation to RQ1, intergenerational differences were observed in terms of the most frequently used communication channel to obtain nuclear-related information, and participants' perceived credibility of online and social media. Meanwhile, participants across different age groups concurred that a joint venture among potential stakeholders would be the best option in managing the nuclear power plants. They also trusted any individual or organization with nuclear expertise to handle nuclear accidents.

The participants identified general perceptions of benefits and risks associated with nuclear energy, while relating them to the Singapore context. With regard to RQ2, intergenerational differences were observed as certain benefits were mentioned more frequently in particular FGDs. Contrastingly, the participants across all FGDs unanimously mentioned nuclear accidents most frequently when asked about their perceived risks of nuclear energy. Moreover, participants across all FGDs perceived costs in terms of the monetary costs and opportunity costs. Participants were also generally unsupportive of nuclear energy, but reluctantly accepted the adoption and development of nuclear energy due to commercial reasons, survival and self-sufficiency, and their perceived inability to oppose the government's decisions.

5.1. Implications

5.1.1. Theoretical implications

In line with the source credibility theory, the findings suggest that participants evaluated nuclear-related information based on the source's characteristics. In spite of the

intergenerational differences, the participants based their credibility perceptions on the same criteria. Participants' perceptions of source characteristics (e.g., type of communication medium) prevailed over their assessments of the nuclear-related content. Congruent with Hovland et al.'s (1953) research, the findings also implied that participants' trust in potential nuclear stakeholders were based on perceived source expertise and trustworthiness.

The participants evaluated nuclear energy in terms of its risks, benefits, monetary costs, and opportunity costs. Therefore, this presents a worthwhile premise for future quantitative research to advance the psychometric paradigm by incorporating the abovementioned considerations. Moreover, future studies can determine whether the psychometric paradigm can account for individual data, inter-generational comparisons, and aggregate data.

5.1.2. Policy implications

The insights gleaned from this study can help inform policymakers and communication practitioners in formulating and implementing effective public education initiatives about nuclear energy. First, policymakers and communication practitioners can segment the public according to their age groups and media consumption behaviors to formulate effective public communication tactics and disseminate nuclear-related messages. For instance, nuclear-related media messages can be disseminated in public-service announcements via print and broadcast media to the Baby Boomers and Generation X. Meanwhile, nuclear-related information could be conveyed to Millennials via infographics, listicles, and videos on online and social media. Policymakers may also provide avenues for public consultation (e.g., online deliberation platforms for the Millennials, and face-to-face discussions for Generation X and the Baby Boomers) to understand public concerns and make better-informed national decisions regarding nuclear energy. Targeted outreach initiatives may also improve the effectiveness of public communication about national

policies, which is vital in ensuring the success of its implementation.

Second, policymakers and communication practitioners can clarify the misconceptions and reservations toward nuclear energy identified in this study. For example, the participants mistakenly perceived that the daily operation of nuclear power plants can emit radiation that harms the environment and public health. The participants also misapprehended that the technology utilized in nuclear power plants can be weaponized. These misconceptions can be addressed by establishing an official nuclear institution in Singapore to take charge of nuclear-related matters, release accurate information, and address popular myths of nuclear energy. Similarly, scientific spokespersons (e.g., nuclear experts, official spokespersons from government organizations) can be leveraged on to convey factual information about nuclear energy, including its benefits and risks, to the public.

Third, policymakers and communication practitioners can emphasize the key benefits of nuclear energy in public communication campaigns to increase public exposure to the benefits of nuclear energy. In particular, message strategies can emphasize the reliability and efficiency of nuclear energy, its environmental and economic benefits, and its ability to help Singapore attain energy self-sufficiency. With regard to economic development, message strategies could highlight the possibility of exporting the surplus of energy to other countries and job creation in nuclear-related industries. In terms of energy self-sufficiency, policymakers and communication practitioners could allude to Singapore's success in overcoming its water scarcity and achieving self-sufficiency through technological innovation of water management and treatment. By drawing parallels between water and energy self-sufficiency, the Singaporean public may be more accepting of nuclear energy if traditional energy resources were to run out. To alleviate the public's fears, policymakers should also develop a clear and concrete plan that addresses how Singapore would minimize the possibility of a nuclear accident, terrorist threats and attacks, and how it would contain

radioactive waste. Such plans should also be accompanied with clear messaging strategies that convey how these public concerns can be handled by the relevant authorities.

Apart from these public education initiatives, policymakers can consider incorporating nuclear-specific content in various phases of the formal education curriculum. For instance, policymakers can consider integrating basic nuclear knowledge into science education (e.g., secondary schools, junior colleges). Additionally, nuclear science and engineering programs could be offered in local tertiary education. Considering the absence of nuclear power projects in Singapore, policymakers can also consider collaborating with research institutes in countries with existing nuclear facilities to nurture local nuclear experts. These education initiatives can increase public nuclear knowledge in Singapore and develop nuclear expertise to accurately assess the risks that may arise from potential nuclear energy development in SEA in the long-term.

5.2. Limitations and future research

Due to the exploratory nature of this study, data was collected from 39 respondents across 4 FGDs. As such, the findings in this study cannot be generalized to the population of Singapore and to other SEA countries. Nonetheless, this limitation was mitigated by recruiting participants from a wide range of ages and utilizing a racial quota in each FGD to reflect Singapore's ethnic composition. Instead of obtaining a large sample of participants, qualitative researchers have also established the importance of achieving a saturation of ideas in the FGDs (Mason, 2010; Morse, 2000). Based on the scope of the study, the quality of data obtained, and the nature of the topic, a saturation of ideas was achieved when similar ideas and themes were repeated by the participants during the fourth FGD. That being said, future studies could collect nationally-representative survey data from Singapore and other SEA countries for regional comparison, especially since SEA countries have unique cultural contexts and differ in their technological and economic capabilities, as well as their phase of

nuclear energy development. Based on the potential stakeholders identified by the FGD participants in this study, future research can also consider acquiring and comparing perspectives from these potential stakeholders regarding nuclear energy.

6. Conclusions and policy implications

In conclusion, this study highlights the intergenerational differences in Singaporeans' credibility perceptions of nuclear-related information sources, trust in potential stakeholders, and their attitudes toward nuclear energy. It also reveals policy recommendations for key communication strategies to raise Singaporeans' awareness of the benefits and to dispel misconceptions related to nuclear energy. This will enable them to make better-informed decision about a technology that has been negatively portrayed by the mass media.

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Appendix

Appendix A. — Focus group moderator's guide

A. Whenever you receive information related to nuclear energy, which communication channels do you normally get it from?

B. What aspects of a communication channel makes you think it is credible/not credible?

C. When it comes to managing nuclear power plants, who do you trust?

D. When it comes to handling a nuclear accident, who do you trust?

E. What potential benefits do you think are associated with nuclear energy? What potential benefits do you think are associated with nuclear energy in the context of Singapore?

F. What potential risks do you think are associated with nuclear energy? What potential risks do you think are associated with nuclear energy in the context of Singapore?

G. On the whole, is there a higher level of benefits, higher level of risks, or are they equal/ around the same? *[Note: The sequence of* "*higher level of benefits,*" "*higher level of risks,*" *and* "*equal/around the same*" *in question G was randomized for each focus group.]*

Appendix B

Table 1

Focus group participant details

Group no.	Participants	Participants (no. and gender)	Age	Generations
FGD1	Undergraduates	10 (4 males, 6 females)	18-24 *M* = 21.1; *SD* = 2.28	The Millennial generation
FGD2	General public	9 (5 males, 4 females)	18-34 *M* = 26.2; *SD* = 5.09	The Millennial generation
FGD3	General public	10 (6 males, 4 females)	35-50 *M* = 41.8; *SD* = 5.85	Generation X
FGD4	General public	10 (5 males, 5 females)	51-69 *M* = 55.6; *SD* = 5.17	Baby Boomer generation

Appendix C

Table 2

Overview of participants' responses to RQ1

RQ1: How do different age groups of Singaporeans concur and/or differ in their credibility perceptions of the media and potential stakeholders of nuclear energy?				
	Millennials (Aged 18–34)	Generation X (Aged 35–50)	Baby Boomers (Aged 51–69)	Summary
Types of communication mediums used to access nuclear-related information	1. Online and social media 2. Print media 3. Word-of-mouth 4. Broadcast media	1. Print media 2. Broadcast media 3. Word-of-mouth 4. Online and social media	1. Print media 2. Broadcast media 3. Word-of-mouth 4. Online and social media	**Similarities**: ▪ Generation X and Baby Boomers used print media most frequently to access nuclear-related information. ▪ Generation X and Baby Boomers used online and social media least frequently to access nuclear-related information. **Differences**: ▪ Millennials used online and social media most frequently to access nuclear-related information, which differs from Generation X and Baby Boomers.
Hierarchy of source credibility for communication mediums	1. Print media 2. Broadcast media 3. Online and social media 4. Word-of-mouth	1. Print media 2. Broadcast media 3. Word-of-mouth 4. Online and social media	1. Print media 2. Broadcast media 3. Word-of-mouth 4. Online and social media	**Similarities**: ▪ Participants across all age groups perceived print and broadcast media as the most credible communication mediums. ▪ Both Generation X and Baby Boomers perceived online and social media as non-credible nuclear-related information sources. **Differences**: ▪ Unlike the other two age groups, Millennials perceived online and social media as credible nuclear-related information source.
Evaluating ***source*** credibility of nuclear-related information	▪ Nuclear scientists ▪ SG government ▪ IGOs ▪ Media outlets	▪ Nuclear scientists ▪ SG government ▪ IGOs ▪ Media outlets	▪ Nuclear scientists ▪ SG government ▪ IGOs ▪ Media outlets	**Similarities:** ▪ Participants across all age groups identified similar credible sources of nuclear-related information. ▪ Participants across all age groups evaluated credibility of media outlets based on their reputation.

Evaluating ***content*** credibility of nuclear-related information	▪ Information that corroborates with existing literature ▪ Factual nuclear-related information ▪ Opinions from influential speakers	▪ Information that corroborates with existing literature ▪ Factual nuclear-related information ▪ Opinions from influential speakers	▪ Information that corroborates with existing literature ▪ Factual nuclear-related information ▪ Opinions from influential speakers	**Similarities:** ▪ Participants across all age groups evaluated the content credibility of the nuclear-related information sources similarly.
Trust in potential stakeholders in ***managing NPP***	▪ Nuclear experts ▪ Commercial operators ▪ SG government ▪ Foreign government ▪ IGOs ▪ NGOs & Watchdogs	▪ Nuclear experts ▪ Commercial operators ▪ SG government ▪ Foreign government ▪ IGOs ▪ NGOs & Watchdogs	▪ Nuclear experts ▪ Commercial operators ▪ SG government ▪ Foreign government ▪ IGOs ▪ NGOs & Watchdogs	**Similarities:** ▪ Participants across all age groups felt that a joint venture involving multiple potential stakeholders would be the best option.
Trust in potential stakeholders in ***handling nuclear accidents***	▪ Nuclear experts ▪ Commercial operators ▪ Plant operating authorities ▪ IGOs ▪ Foreign governments ▪ SG government	▪ Nuclear experts ▪ Commercial operators ▪ Plant operating authorities ▪ IGOs ▪ Foreign governments ▪ SG government	▪ Nuclear experts ▪ Commercial operators ▪ Plant operating authorities ▪ IGOs ▪ Foreign governments ▪ SG government	**Similarities**: ▪ Participants across all age groups identified the same potential stakeholders for handling nuclear accidents. **Differences**: ▪ Millennials expressed mixed levels of trust toward the SG government. ▪ Baby Boomers expressed a high level of trust toward the SG government.

Table 3

Overview of participants' responses to RQ2.

RQ2: How do different age groups of Singaporeans concur and/ or differ in their perceived risks, benefits, and support of nuclear energy?				
	Millennials (Aged 18–34)	Generation X (Aged 35–50)	Baby Boomers (Aged 51–69)	Summary
Benefit perception	▪ High reliability and output ▪ Environmental benefits ▪ Economic benefits ▪ Self-sufficiency for electricity generation	▪ High reliability and output ▪ Environmental benefits ▪ Economic benefits ▪ Self-sufficiency for electricity generation	▪ Self-sufficiency for electricity generation ▪ Economic benefits ▪ High reliability and output ▪ Environmental benefits	**Similarities**: ▪ Millennials and Generation X highlighted the high reliability and output of nuclear energy and its environmental benefits. **Differences**: ▪ Baby Boomers emphasized the economic benefits of nuclear energy and its ability to provide SG with self-sufficiency in electricity generation.
Risk perception	▪ Nuclear accidents ▪ Weaponization of nuclear energy ▪ Radioactive waste ▪ Health hazards ▪ Terrorist attacks ▪ Strain diplomatic ties	▪ Nuclear accidents ▪ Weaponization of nuclear energy ▪ Radioactive waste ▪ Health hazards ▪ Terrorist attacks ▪ Strain diplomatic ties	▪ Nuclear accidents ▪ Weaponization of nuclear energy ▪ Radioactive waste ▪ Health hazards ▪ Terrorist attacks ▪ Strain diplomatic ties	**Similarities**: ▪ Participants across all focus groups highlighted nuclear accidents.
Cost perception: ***Monetary costs***	▪ Low production cost ▪ High start-up costs	▪ Low production cost ▪ High start-up costs	▪ Low production cost ▪ High start-up costs	**Similarities**: ▪ Participants across all focus groups expressed mixed feelings about the monetary costs regarding nuclear energy.
Cost perception: ***Opportunity costs***	▪ Too costly if nuclear energy fails ▪ Investments could be spent on renewable energy sources instead. ▪ Lose major investments from fossil fuel companies	▪ Too costly if nuclear energy fails ▪ Investments could be spent on renewable energy sources instead. ▪ Lose major investments from fossil fuel companies	▪ Too costly if nuclear energy fails ▪ Investments could be spent on renewable energy sources instead. ▪ Lose major investments from fossil fuel companies	**Similarities**: ▪ Participants across all focus groups identified the same opportunity costs incurred in nuclear energy development.

Support (SG)	▪ Opposed nuclear energy development in SG ▪ Reluctantly accepted nuclear energy under certain conditions.		▪ Opposed nuclear energy development in SG ▪ Reluctantly accepted nuclear energy under certain conditions.		▪ Opposed nuclear energy development in SG ▪ Reluctantly accepted nuclear energy under certain conditions.		**Similarities**: ▪ Participants across all focus groups **generally opposed** nuclear energy development in SG ▪ Participants across the focus groups **conditionally accepted** nuclear energy development for commercial reasons, survival and self-sufficiency, and their perceived inability to oppose government decisions.
Support (SEA Countries)	▪ Opposed nuclear energy development in SEA		▪ Opposed nuclear energy development in SEA		▪ Opposed nuclear energy development in SEA		**Similarities**: ▪ Participants across all focus groups **generally opposed** nuclear energy development in SEA due to close geographical proximity and strained diplomatic tensions surrounding annual haze problem