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Social Representations of COVID-19 Vaccines: A Structural Approach

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This study explored the social representations of COVID-19 vaccines. Specifically, it investigated the content and the structural configuration of the social representations of COVID-19 vaccines among working-age eligible recipients. Data were collected from 50 fully vaccinated and 50 unvaccinated working-age individuals from the Western Visayas Region. We used the Hierarchical Evocation Method (HEM) to gather and analyze the data. HEM integrates thematic analysis and rank order analysis to generate the content and structure of social representations. Our findings show that both the fully vaccinated and unvaccinated understood COVID-19 vaccines in terms of *Benefits, Health and Safety Concerns, Public Health and Medicine, Socio-economic/political/cultural Aspects,* and *Conspiracy*. The structural configuration of the social representation of COVID-19 vaccines showed that *Benefits* was central among fully vaccinated, whereas *Health and Safety Concerns* was central among unvaccinated. Our findings offer insights about participants' choice of either accepting or refusing vaccines. Theoretically, the findings exemplify the foundational concept of cognitive polyphasia, which suggests that people's understanding of COVID-19 vaccines consists of contradictions which are weighted against each other. Moreover, the communication of COVID-19 vaccine-related policies should highlight benefits and clarify risks, while policy formulation should be informed by local understandings.

Keywords: COVID-19 vaccines, social representations, Hierarchical Evocation Method, structural configuration, cognitive polyphasia

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The COVID-19 vaccination campaign in the Philippines commenced in late February 2021, following the arrival of the first batch of vaccine doses (Rappler, 2021). However, a survey conducted in March 2021 revealed that 60% of Filipinos were hesitant to receive vaccines, reflecting a significant reluctance to be inoculated against the deadly disease (Yu et al., 2021). By May 2021, this figure had improved slightly, but a considerable 33% of the population remained unwilling to be vaccinated (Yu et al., 2021). By the end of the same year, a statement from the National Task Force against COVID-19 reported that despite consistent vaccine delivery in the following months, turnout remained low, falling short of earlier projections (Kabagani, 2021). Responses to the RESBAKUNA campaign, the nationwide COVID-19 vaccination initiative, have been predominantly negative (Catapang & Cleofas, 2022).

The general distrust of vaccines and low vaccination turnout can be attributed to several factors, including structural issues such as limited vaccine supply, uneven distribution, inadequate healthcare systems, and poorly managed vaccination programs (Amit et al., 2022). Additionally, vaccine-related controversies, such as the Dengvaxia scare, have significantly eroded public trust in vaccines (Amit et al., 2022; Mendoza et al., 2021; Yu et al., 2021). In this study, we looked at people's social representations of COVID-19 vaccines to gain a more nuanced understanding of why people may be willing or unwilling to accept vaccination. We begin with the relevant literature on the nature of COVID-19 vaccines and their benefits as well as side effects.

COVID-19 Vaccines

Vaccines are biomedical preparations used to safely elicit and/or enhance immunity against pathogens causing infections and diseases (Pollard & Bijker, 2021). Administered in liquid states, vaccines contain antigens synthesized from a disease-causing pathogen. Upon administration, these antigens trigger immune reactions that consequently confer protection against infections (Czochor & Turchick, 2014; Pollard & Bijker, 2021). Recently, vaccine development has focused on suppressing the spread of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) that causes Coronavirus

Disease 2019 (COVID-19). The World Health Organization (WHO) (2021a) has listed over 300 COVID-19 vaccines manufactured by pharmaceutical companies in different countries. Commonly known COVID-19 vaccines are BioNTech/Pfizer, Oxford/AstraZeneca, Johnson & Johnson/Janssen, Sinovac, Sputnik V, and Moderna.

The effectiveness and safety of COVID-19 vaccines are well documented. Studies have established that vaccines lower COVID-19-related hospitalization rates (Moline et al., 2021) and chances of invasive procedures like intubation (Weissman et al., 2020). Vaccines also reduce the risk of infection and the likelihood of severe symptoms, life-threatening complications, and death (Lipsitch & Dean, 2020). The most common side effects reported after COVID-19 vaccination include pain at the injection site, fever, fatigue, headaches, chills, and diarrhea (WHO, 2021b). These mild, short-term side effects are usual reactions to vaccines and take a few days to wane. Cases reported with adverse effects related to COVID-19 vaccines, such as anaphylaxis, blood clots, myocarditis, and pericarditis, are rare (Centers for Disease Control and Prevention [CDC], 2021; Maragakis & Kelen, 2021). The relationship between adverse events following COVID-19 vaccination remains unclear, as review of relevant clinical information has not established a causative relationship with COVID-19 vaccines (CDC, 2021). There has been a consensus within the scientific community that COVID-19 vaccines are vital in the effort to upend the pandemic and its corresponding health, socio-economic, and psychological burdens (Sturgis et al., 2021).

Social Representations of COVID-19 Vaccines

Social representations are constellations of shared and valued meanings attributed to social objects or phenomena by individuals and socio-cultural groups (Joffe, 2002). Specifically, social representations have been defined as a network of *knowledge, attributions, attitudes, emotions, stereotypes, and perceptions* (Echabe et al., 1994; Morera et al., 2015) about objects or phenomena. Generally, they develop through two distinct communicative mechanisms: anchoring and objectification (Abric, 1996; Höijer, 2011). Anchoring involves linking new or unpopular ideas to existing concepts, creating associations

that make novel ideas understandable. Objectification, on the other hand, involves translating abstract concepts into concrete, perceptible forms, making them relatable. Representations of COVID-19 vaccines may be anchored by connecting them to past events, like the Dengvaxia scare (Yu et al., 2021), or metaphorizing them as a panacea for the COVID-19 pandemic. They can be objectified through portraying vaccines in terms of side effects, administration tools like injections, or personifications like healthcare professionals. Anchoring and objectification as mechanisms of social representation are facilitated by ongoing interactions and communications between and among members of groups. This includes, but is not limited to, interaction between experts and lay people, discussions among family members at home (Robles & Baquiano, 2021), and exposure to various forms of media or cultural beliefs (Wachelke, 2008).

So far, studies have only focused on investigating people's knowledge of (Abu Hammour et al., 2021; Al-Marshoudi et al., 2021; Anorue et al., 2021; Ciardi et. al, 2021; Paul et al., 2021), attitudes toward (Al-Zalfawi et al., 2021; Mannan & Farhana, 2020; Spinewine et al., 2021; Tahir et al., 2021; Tanacan et al., 2021; Verger et al., 2021), and perception of (Caple et al., 2022; Lucia et al., 2020; Mahmud et al., 2021; Ofei-Dodoo et al., 2021; Rzymski et al., 2021; Saied et al., 2021) COVID-19 vaccines. These studies provide some evidence that social representations, such as knowledge, attitudes, and perceptions, play a significant role in shaping responses to COVID-19 vaccines. People with adequate knowledge, positive attitudes, and perceptions of high risks of infection and severity are more likely to accept vaccination than their counterparts with poor knowledge, negative attitudes, and perceptions of low risks of infection and severity (Mahmud et al., 2021). These findings further imply that certain representations are more salient than others. However, while these studies have touched on facets of social representations, their primary focus was not on studying social representations directly. Instead, they focused on exploring knowledge, attitudes, and perceptions as self-contained constructs without considering social representation as a unifying concept. Furthermore, these studies did not aim to investigate how the salience of these representations differs among individuals and groups.

The importance of social representations towards a comprehensive understanding of people's responses to COVID-19 vaccines cannot be overstated. Social representations fulfill various functions. They constitute a web of knowledge, orient and justify behaviors, and even forge social identities (Morera et al., 2015). They allow people to understand, explain, and define the reality of COVID-19 vaccines, influencing their ways of thinking and behaving towards these health interventions (Howarth et al., 2004; Wachelke, 2008; Wolter, 2018). These representations also rationalize and maintain certain attitudes and behaviors. This provides a rationale for the decisions made and positions taken concerning COVID-19 vaccines. Finally, social representations define the identities of people in relation to the social objects being examined. These representations highlight distinctions between various groups by juxtaposing their understandings of the same social object. While internal inconsistencies may arise within groups due to individual variations, the core social representations that define the group's identity remain intact and resilient (Abric, 1993; Wachelke, 2012). Regarding COVID-19 vaccines, individuals may identify as pro-vaccine, while others may be anti-vaccine, depending on the nature and hierarchy of their social representations.

Social Representations Theory and the Structural Approach in the Study of COVID-19 Vaccines

Social Representations Theory (SRT) is a framework that allows for the examination of how individuals and groups construct and communicate their social realities and how they make sense of particular social objects (Baquiano & Mendez, 2016; Moscovici, 1988; Myotte-Duquet & Charissou, 2019; Rateau et al., 2012). SRT facilitates the exploration of meaning-making during phenomena of significant social import (e.g., a pandemic) and when individuals and groups perceive and interpret various social objects related to the phenomenon (e.g., vaccines) differently (Höijer, 2011; Wachelke, 2012). SRT is especially instructive in analyzing how socio-cultural factors influence people's thoughts and responses towards health and disease (Joffe, 2002). Therefore, given that vaccines are complex, emotionally charged, and contested public health objects (Sardy et al.,

2012) associated with an unprecedented pandemic, this theory offers a valuable perspective for studying them.

While social representations are mostly content, this study supports observations that representations are valued differently and therefore organized hierarchically (Wolter, 2018). Abric (1993) advanced a structural approach to social representations that distinguishes between the central and peripheral systems. The central system is the part of social representation that is "stable, rarely suffering changes," and salient (Wachelke, 2008, p. 5). The central system binds together all the elements of social representation (Abric, 1993; Wolter, 2018). The peripheral system refers to the parts of representations that are "more flexible to change and function as shields for the central ones" (Wachelke, 2008, p. 6).

The core representations of COVID-19 vaccines could be treated as those that remain relatively stable over time, while the peripheral representations, although flexible and less salient, also influence responses to the relevant social object. It is conjectured that representations that are much more frequently evoked and ranked as more important are candidates for the central system. The peripheral system, meanwhile, is made up of representations that are: frequently evoked but attributed less importance, not frequently evoked but attributed more importance, or not frequently evoked and attributed less importance (Baquiano & Mendez, 2016; Costa e Silva & Menandro, 2013).

The structural approach to social representations helped us determine what representations are more stable, salient, and likely to endure over time, as well as the representations that are more flexible and that buffer the central representations from changes. This is important given the possibility that COVID-19 vaccines would be administered annually and, as such, would necessitate continuous communication and formulation of vaccine-related information and policies.

With this, our study aimed to capture the social representations of COVID-19 vaccines among working-age eligible recipients in Western Visayas. Specifically, the study was intended to capture

1. the contents of the social representations of COVID-19 vaccines, and
2. the structure of the social representations of COVID-19 vaccines.

Methods

To answer our research questions, we used the Hierarchical Evocation Method (HEM) as our methodological framework. In the succeeding paragraphs, we outline our strategies for sampling, data gathering, ethical considerations, and steps for data analyses.

HEM: In Pursuit of Content and Structure

The Hierarchical Evocation Method developed by Jean-Claude Abric integrates thematic analysis and frequency and rank order analyses to capture the contents and structure of social representations (Myotte-Duquet & Charissou, 2019; Sardy et al., 2012). Based on verbal association tasks, HEM is widely used in the structural approach to social representations (Lo Monaco et al., 2017). HEM is further discussed in the instrument and data analysis sections.

Participants

We employed purposive sampling in this study to recruit participants who could provide substantial insights about the topic under investigation (Statistics Solutions, 2021). A total of 50 vaccinated and 50 unvaccinated working-age eligible recipients were sampled from Negros Occidental, one of the identified high-risk provinces in Region VI (Department of Health Western Visayas Center for Health Development, 2021). Fifty participants for each group ensured that the study covered the requirements for theme saturation, as related studies suggest that data saturation for the qualitative analysis is reached at around ten (Sardy et al., 2012) or eleven (Myotte-Duquet & Charissou, 2019) participants. Participants were at least 18 to 64 years of age.

With regards to vaccination status, this study included fully vaccinated and unvaccinated individuals. Fully vaccinated individuals are those who received the second dose of two-dose vaccines (e.g., Pfizer, Moderna, AstraZeneca) or received a single-dose vaccine (e.g., Janssen) in the last two weeks during the data gathering period. Table 1 below summarizes the participant distribution across demographic profiles of the fully vaccinated and unvaccinated participants, respectively.

Table 1. *Participant Distribution Across Demographic Categories*

	Fully vaccinated participants	Unvaccinated participants
Age		
18–24 years old	27	12
25–54 years old	21	25
55–64 years old	2	13
Sex		
Female	19	32
Male	30	16
Prefer not to say	1	2
City/Municipality		
Bacolod City	19	17
Bago	6	20
Cadiz	1	1
Cauayan	1	0
Escalante	1	0
E.B. Magalona	1	0
Hinigaran	3	2
Ilog	1	0
Kabankalan	2	1
La Carlota	4	0
Murcia	1	0
Pontevedra	1	0
San Carlos	3	1
Talisay	3	7
Victorias	3	1

Table 1. *(continued)*

	Fully vaccinated participants	Unvaccinated participants
Highest Educational Attainment		
College graduate	21	12
College level	14	14
High school graduate	13	15
High school level	1	3
Elementary graduate	0	3
Elementary level	0	1
Vocational/Trade/Technical school	1	2
Employment status		
Employed	19	29
Not employed	23	10
Retired	1	2
Prefer not to say	7	9
Type of community		
More urban	32	21
More rural	16	29
Uncertain	2	0

Instrument

We collected data through an online survey created using Qualtrics (https://www.qualtrics.com). A translator was tapped to translate the survey from English to Hiligaynon, the major language spoken in Negros Occidental. Another third-party translator was asked to back-translate the Hiligaynon version of the survey to ensure reliability by identifying discrepancies, checking accuracy, and ensuring high quality of the translated text (Kozlova, 2021). The instrument contained a qualitative measure that asked participants: *"What are the five ideas that come to your mind when you think of COVID-19 vaccines?"* This question, a verbal association inductor, elicited evocations that enabled us to identify thematic patterns. Ample evidence points to the potency of verbal associations in revealing the content of social representations (Lo Monaco et al., 2017). We instructed participants

to list as many as five words/phrases (Costa e Silva & Menandro, 2013). Partially vaccinated individuals were excluded from the study, and unvaccinated participants whose reason for not having been inoculated was lack of access to or unavailability of vaccines were not included in the analysis. This measure was implemented to increase the validity of the representations obtained from both vaccinated and unvaccinated participants. To minimize the social desirability effect, we ensured anonymity by not requiring participants to provide their name upon answering the survey.

Following HEM, another proposed measure was the frequency of evocations in a representation. It was obtained by counting the occurrence of evocations contained in an identified representation. An additional quantitative measure, still in accordance with HEM, was the ranking of importance. It was obtained by asking the participants to rank the evocations they produced according to how important they think each evocation is relative to other evocations, with 1 as the most important and 5 as the least important. The ranking of importance allowed for the calculation of average evocation orders (AEO). AEO is the summation of evocations' ranking of importance divided by the number of evocations in a representation. This was crossed with frequency calculations to determine which representations were most likely to form part of the central core and/or the periphery.

Ethical Considerations

Prior to gathering data, we provided prospective participants with an information sheet. When the initial agreement to participate was reached, we sent the informed consent form to participants for their concurrence. It emphasized that all gathered data will be kept confidential and used solely for this study. Participants were also informed that they could withdraw for any reason at any point in the research process. The University of the Philippines Visayas Research Ethics Board reviewed and approved the conduct of the study.

Data Analysis

We followed the same steps that other researchers used to implement the Hierarchical Evocation Method (e.g., Baquiano & Mendez, 2016; Myotte-Duquet & Charissou, 2019; Sardy et al., 2012). We analyzed the data from the free association task using thematic analysis. Thematic analysis by Braun and Clarke (2012) includes six phases: 1) familiarization of the data; 2) generation of tentative codes; 3) exploration of themes; 4) recursive evaluation of prospective themes; 5) definition and identification of themes; and 6) production and elaboration of the findings. To minimize bias during data analysis, we independently coded for themes and then triangulated individual findings to generate the final themes (Myotte-Duquet & Charissou, 2019).

We utilized frequency and rank-order analyses to understand the structure of the social representations. Specifically, the frequency and the average evocation order of each theme were calculated and crossed. The frequency of a theme was obtained by counting all of its elements. A theme was identified as high frequency if its total frequency exceeded the average frequency; if it did not, it was designated as low frequency. Accordingly, the average frequency was calculated by dividing the total number of elements that comprised the evocation corpus by the number of emergent themes. Meanwhile, we determined the AEO of each theme by summing the evocation orders of all the elements that made up that theme and then dividing that result by the total number of elements in that theme. A theme was considered high-ranking when its AEO was lower than the median rank of importance; otherwise, it was designated as low-ranking. Accordingly, the median rank of importance was set at 3, the midpoint (Baquiano & Mendez, 2016) on a 5-point interval rating scale.

We then classified the themes into quadrants according to whether they were high/low frequency and high/low rank (Baquiano & Mendez, 2016; Costa e Silva & Menandro, 2013). This configuration is illustrated in Table 2 below.

Table 2. *Structural Analysis of Social Representations*

		AOE	
		High rank (< 3)	*Low rank (> 3)*
Frequency	*High frequency* $(> f_{\underline{x}})$	Central core	First periphery
	Low Frequency $(< f_{\underline{x}})$	Contrasted elements	Second periphery

Results

In this section, we present the findings derived from the analysis of the evocation corpus. Specifically, the themes that constitute the social representations and their structural configuration are shown and described. The findings vis-à-vis the group categories (fully vaccinated and unvaccinated) are presented independently.

Social Representations of COVID-19 Vaccines Among the Fully Vaccinated

The evocation corpus obtained from the fully vaccinated participants is composed of 250 words, phrases, and statements. Five themes were derived from the evocation corpus through thematic analysis. Following previous studies (e.g., Baquiano & Mendez, 2016), evocations belonging to themes with very low frequencies, i.e., less than 5% of the total number of evocations (in this case 12.5), were excluded from the analysis. Table 3 shows the emergent themes alongside their corresponding subthemes, sample evocations, and frequency of occurrence.

As shown in Table 3, Benefits, Health and Safety Concerns, Public Health and Medicine, Socio-economic/political Aspects, and Conspiracy are the five superordinate themes that emerged from the evocation corpus. The Benefits theme indicates that COVID-19 vaccines were understood as a necessary, safe, and effective measure to

Table 3. *Themes, Subthemes, Sample Evocations, and Frequency of Occurrence Derived From the Free Association Task About COVID-19 Vaccines Among Fully Vaccinated Participants*

Themes	Subthemes	Sample evocations	Frequency
Benefits	Protection	Protection from being infected with COVID-19; Can help the body to fight against COVID-19 virus	129
	Safety	Safety; Safe for everyone	
	Immunity	Herd immunity; Immunity	
	Cure	Cure; Panacea	
	Prevention	Prevention; Can lower your risk of getting the virus	
	Solution	A step to eliminate COVID; Solution to the pandemic; Lessen the cases and to help flatten the curve	
	Mobility	*Para makapasok sa paaralan o lugar o kahit saan man*; Freedom	
	Effectiveness	Effective; Efficacy	
	Need	Necessity; Need	
Health and safety concerns	Side effects	Side effects; Very critical as to the side effect; Irritating; Painful	48
	Risks	It is so risky since it has not yet [been] proven to be 100% safe; Not safe; Dangerous; Makapatay (Deadly)	
	Fear	Afraid that the vaccine is not effective; *Pagkabalaka* (Anxious); Scared; I think I would get infected	
	Uncertainty	Doubtful at first; Doubts about COVID-19 vaccines; Before my vaccination I do not believe in it	
Public health and medicine	Diseases	COVID-19; Virus; Physical conditions	24
	Medicine	Medicine; Antibodies	
	Public health	Health; Public health	
	Care actors	Healthcare workers	
	Medical acts	Injection; Vaccination	
	Brand	Sinovac; Its effect to the body differs on the brand of vaccine	

Table 3. *(continued)*

Themes	Subthemes	Sample evocations	Frequency
Socio-economic/ political aspects	Economics	Poverty; Free	16
	Political	Protocol; Voluntary not mandatory	
	Social	Social responsibility; Creates faction and chaos among the people whether to get vaccinated or not	
Conspiracy	Profiteering	Money making scheme; Some government made money on the vaccines; Pharmaceutical business	13
	Zombie apocalypse	Zombie apocalypse; Zombie	
	Experiment	Experiment	
Total frequency			230
Average frequency			46

end the pandemic. They were variously described as “essential,” “safe for everyone,” and efficacious in evading the COVID-19 virus. Vaccines were seen as an intervention that confers protection by enabling the body to fight off and resist the virus. Consistent with their actual and intended function, vaccines were linked to the development of immunity and herd immunity since they “boost the immune system” of the human body. As “prevention” and "cure," vaccines were referred to as a preventive measure that lowers the risk of infection and severe symptoms and a panacea that heals a person infected with a disease. Moreover, COVID-19 vaccines were metaphorized as “the answer” and characterized as a “solution.” They were perceived as a measure that can flatten the curve by minimizing the risks of infection and transmission and consequently reducing the number of COVID-19 patients. Accordingly, vaccines were viewed as a catalyst that would restore a sense of normalcy by expediting the suspension of restrictions and allowing people to travel, return to school, and go back to their workplaces.

The Health and Safety Concerns theme highlights the understanding of COVID-19 vaccines with regards to their potential negative impacts on health, focusing on both side effects and risks. Vaccines were seen as an intervention that inadvertently results

in outcomes that range from immediate irritation and pain upon injection to critical conditions later. Their safety and effectiveness were also considered unwarranted, being deemed as “not yet proven to be 100% safe.” Vaccines were also characterized as dangerous. Participants thought that they could result in COVID-19 infection (“I think I would get infected”) and, in general, “make people sick.” They were also described as deadly. Vaccines “might kill people” or “cause death” were especially poignant evocations, as participants claimed that people have died after receiving vaccines, with some being unable to “handle the dosage.” These perceived side effects and risks are then related to states of fear and uncertainty. Being “scared,” “nervous,” and anxious (“*pagkabalaka*”) over the effectiveness (e.g., “afraid that the vaccine is not effective”) and the effect (e.g., death as in “*takot akong mamatay*" [I’m afraid of dying]) of the vaccines were expressed. A fear of syringes was likewise noted (“*kahaladlokan sang dagom*" [the needle scares me]). Vis-à-vis uncertainty, vaccines were also described as “complicated.” Participants had doubts over vaccines (e.g., “doubts about COVID-19 vaccines”) and their safety (e.g., “is the vaccine safe?”). Fear and uncertainty were especially prominent before receiving vaccines. This was clear in evocations such as, “I am afraid at first” and “before my vaccination I do not believe in it.”

The Public Health and Medicine theme demonstrates the inextricable link between COVID-19 vaccines and medical and public health matters. Participants understood vaccines in terms of diseases and medicines. They perceived vaccines as a response to the disease caused by the novel coronavirus and associated them with physical conditions and illnesses that could have been side effects or comorbidities. Vaccines were also viewed as medicines that contain antibodies, enhancing the body's immune system and protecting public health by promoting herd immunity. Vaccines were appraised in relation to their brands, such as “Sinovac,” which are thought of as having variable effectiveness and effects on the body. They were likewise linked to care actors like doctors, nurses, and scientists and considered to have been "brought [about] by [the] hard work of healthcare workers.” COVID-19 vaccines were also objectified through concrete medical acts like getting injected (“with a sharp needle”) during inoculation.

The Socio-economic/political Aspects theme brings together understandings that pertain to the more systemic dimensions attributed to COVID-19 vaccines. It includes meanings concerning how certain socio-economic and political structures organize vaccines, as well as how vaccines organize social relationships. Socially, COVID-19 vaccines were linked to a moral dimension, with receiving them being seen as a social responsibility that protects others' safety, as well as a source of social division, "[creating] faction and chaos among the people [about] whether to get vaccinated or not." Socio-economically, vaccines were viewed as a free commodity, supplied by the government, and not receiving them as possibly leading to job loss ("*madulaan pangabuy-an*") and poverty. Politically, vaccines were perceived as a form of government regulation, required for travel and entry into public spaces, and as a voluntary yet potentially mandatory government-sanctioned protocol.

Finally, the Conspiracy theme suggests that COVID-19 vaccines were understood as a collusion among high-ranking government officials, pharmaceutical companies, and scientists to achieve specific ends. Vaccines were viewed as a money-making or profiteering scheme perpetrated by the government or the pharmaceutical industry, which has great control over supplies and production. Moreover, vaccines

Table 4. *Structural Configuration of the Social Representations of COVID-19 Vaccines Among Fully Vaccinated Participants*

		AOE	
		High rank (< 3)	*Low rank (> 3)*
Frequency	*High frequency (>46)*	Central core Benefits (*f*=129; AEO=2.86)	First periphery Health and safety concerns (*f*=48; AEO=3.02)
	Low Frequency (<46)	Contrasted elements Conspiracy (*f*=13; AEO=2.69)	Second periphery Public health and medicine (*f*=24; AEO=3.17) Socio-economic/political aspects (*f*=16; AEO=3.06)

were metaphorized as a global scale experiment and associated with the plot to create zombies and spur a zombie apocalypse.

Table 4 shows the structural configuration of the social representations of COVID-19 vaccines among the fully vaccinated participants. It was found that Benefits, having high frequency and high rank, constitutes the central core. Moreover, it was revealed that Health and Safety Concerns, with high frequency and low rank, is situated in the first periphery, while Conspiracy, with low frequency and high rank, is located in the zone of the contrasted elements. Finally, Public Health and Medicine and Socio-economic/political Aspects, having low frequencies and low rank, are found to comprise the second periphery.

Social Representations of COVID-19 Vaccines Among the Unvaccinated

The evocation corpus obtained from the unvaccinated participants is likewise composed of 250 words, phrases, and statements. Five themes were derived from the evocation corpus through thematic analysis. As with the Fully Vaccinated, evocations belonging to themes with very low frequencies, i.e., less than 5% of the total number of evocations (in this case 12.5), were excluded from the analysis. Table 5 below shows the emergent themes alongside their corresponding subthemes, sample evocations, and frequency of occurrence.

Table 5 shows that Health and Safety Concerns, Public Health and Medicine, Conspiracy, Benefits, and Socio-economic/political/cultural Aspects are the five superordinate themes that emerged from the evocation corpus consolidated from the unvaccinated participants. The Health and Safety Concerns theme highlights the negative implications of COVID-19 vaccines on people's health, emphasizing the potential risks associated with vaccination. Participants expressed concerns about vaccine safety and effectiveness, as evidenced by the evocations "not safe," "not effective," "*delikado*" (dangerous), and "*makapatay*" (deadly). These understandings are associated with feelings of fear (e.g., "*kulbaan*" [scared] and "*nahadlok magpabakuna*" [afraid of getting vaccinated]) and uncertainty (e.g., "*gapangduha-duha*" [hesitant], "*wala kasiguraduhan*" [no guarantee], and "*indi pa*

Table 5. *Themes, Subthemes, Sample Evocations, and Frequency of Occurrence Derived From the Free Association Task About COVID-19 Vaccines Among Unvaccinated Participants*

Themes	Subthemes	Sample evocations	Frequency
Health and safety concerns	Risks	*Malain ang epikto sang bakuna sa imo lawas* (The vaccine will have negative effects on the body); Delikado; Makapatay	111
	Uncertainty	Lot of what if; *Wala kasiguraduhan* (There's no certainty)	
	Fear	*Nahadlok* (Scared); *Nahadlok nga basi mag lala ang gina batyag* (I'm scared that my condition will worsen)	
	Side effects	Side effects; There will be side effects on me	
	Anti-vaccine sentiments	*Wala ko gapati sa vaccine* (I don't believe in vaccines); It's not necessary; *Choice kugid nga ndi magpavaccine* (It is my choice not to get vaccinated)	
Public health and medicine	Disease	Lot of health problems; Kidney failure; Heart failure	39
	Medicine	Medicines; Antibodies	
	Health	Health	
	Medical acts	Injections; *Dagom* (Needle)	
	Care actors	Nurse	
Conspiracy	Deception	Deception; A hoax	27
	Experiment	Experiment	
	Depopulation	Depopulation	
	Profiteering	Business; Profiteering	
	New World Order	World Order; One World Government; Controls people	

Table 5. *(continued)*

Themes	Subthemes	Sample evocations	Frequency
Benefits	Protection	Provides protection against the disease	24
	Immunity	Boost immune system; Immunity from the virus	
	Necessary	Necessary	
	Prevention	Stop the spread; COVID-19 prevention	
	Safe	Safe	
	Mobility	For travel purposes; To access markets or malls	
Socio-economic/ political/cultural aspects	Religion	*Indi mag sugot ang amon simbahan* (Our church won't allow us); *Kay na katagna na ang mga balatian* (Because illness is a normal part of life); *Ky my Ginoo q sa kabuhi q* (Because I have God in my life)	17
	Socio-economic aspects	No vaccine, no entry, no work; *Istorbo sa ubra* (Hindrance to work)	
	Political aspects	Mandatory; Requirement (School, job, and other establishments)	
Total frequency			218
Average frequency			43.6

desidido mag pa vaccine" [still undecided whether to get vaccinated]). These concerns also come with explicit anti-vaccine sentiments such as, "*wala ako nagapati sa vaccine*" (I don't believe in vaccines), "*indi gid ko magpavaccine*" (I don't want to get vaccinated), and "*choice kugid nga ndi magpavaccine*" (it is my choice not to get vaccinated).

The Public Health and Medicine theme highlights the close association between COVID-19 vaccines and medical matters and public health concerns. From a public health perspective, vaccines are linked to diseases, with participants understanding them in relation to disease-causing pathogens such as "virus[es]" that result in the "COVID-19" disease. They were also associated with certain

health conditions or “illness[es],” such as “kidney failure,” “heart failure,” and “high blood” pressure, which are common comorbidities considered before inoculation. Participants mentioned experiencing these health problems and described their bodies as “too weak” to receive the vaccine. Vaccines were also understood as medicines that act as "virus fighters" by carrying antibodies that boost an individual's immune system and ensure “health.” They were linked to care actors like nurses, who facilitate inoculation. Finally, evocations such as "*dagom*" (needle) and "injections" indicate that COVID-19 vaccines were understood as inextricable from the medical act of vaccination.

The Conspiracy theme indicates that COVID-19 vaccines were associated with covert plots intended to deceive and control the public. Vaccines were viewed as “hoax” and a form of “deception.” They were likewise deemed an “experiment” being conducted worldwide with the recipients as the test subjects. As an experiment, COVID-19 vaccines were regarded as a deliberate effort to depopulate the world. They were also thought of as “implants” designed to control people—a scheme that forms part of a bigger plot to advance a totalitarian New World Order (“World Order” or “One World Government”). Moreover, participants considered profiteering as the main goal of COVID-19 vaccines. One striking evocation stated: “The government is taking advantage of this pandemic to make business.”

The Benefits theme denotes that COVID-19 vaccines were understood as a health measure that confers “safety” and “protection.” They were metaphorized as shields (“panagang”) against the virus and further described as “safe,” “necessary,” and “very important” amidst the global health crisis. Consistent with their intended function, participants viewed COVID-19 vaccines as a health supplement that “boosts immunity” and enables the body to resist viruses. Aside from the various attributes linked to COVID-19 vaccines, they were also associated with mobility. Specifically, vaccines were deemed key to the new normal since they will facilitate the suspension of restrictions and allow people to travel and access public spaces again.

The Socio-economic/political/cultural Aspects theme encompasses the structural dimensions of the understanding of COVID-19 vaccines. From a socio-economic perspective, vaccines were associated with limited mobility for the unvaccinated (“*limitado ang*

mga tawo nga wala vaccine") and difficulties in working and earning. They were seen as hindrances to regular work routines ("*istorbo sa ubra*"), potentially impacting income. In the political aspect, vaccines were understood as regulations that are strictly implemented ("*strikto ang patakaran*"), with inoculation being mandatory and enforced as "requirements [for] schools, jobs, and other establishments." From a cultural perspective, participants associated COVID-19 vaccines with religious beliefs and indicated several reasons to justify their refusal. Some individuals declined vaccination due to their church's prohibition ("*indi mag sugot ang amon simbahan*") or their belief that all occurrences, including diseases, are predestined or foretold ("*kay tanan may rason" and "kay na katagna na ang mga balatian*"). Others, relying on their faith, refused vaccination because they believed that divine protection alone would suffice against COVID-19 ("*ky my Ginoo q sa kabuhi q*").

Table 6 shows the structural configuration of the social representations of COVID-19 vaccines among the unvaccinated. The results showed that Health and Safety Concerns, having high frequency and high rank, constitutes the central core. Public Health and

Table 6. *Structural Configuration of the Social Representations of COVID-19 Vaccines Among Unvaccinated Participants*

		AOE	
		High rank (< 3)	*Low rank (> 3)*
Frequency	*High frequency (>43.6)*	Central core Health and safety concerns (*f*=111; AEO=2.95)	First periphery
	Low Frequency (<43.6)	Contrasted elements Public health and medicine (*f*=39; AEO=2.97) Conspiracy (*f*=27; AEO=2.93) Benefits (*f*=24; AEO=2.88)	Second periphery Socio-economic/ political/ cultural aspects (*f*=17; AEO=3.65)

Medicine, Conspiracy, and Benefits, with high rank but low frequency, are located in the zone of the contrasted elements. Meanwhile, Socio-economic/cultural/political Aspects, having low frequency and low rank, comprises the second periphery. Results also showed that no theme satisfied the criteria for the first periphery.

Discussion

The findings of this study revealed that similar representations of COVID-19 vaccines emerged among the fully vaccinated and unvaccinated participants. These are Benefits, Health and Safety Concerns, Public Health and Medicine, Socio-economic/political/cultural Aspects, and Conspiracy. How these representations were expressed and elaborated, and how they were subsequently configured to form a discernible structure, however, revealed the distinction between the two groups.

Understandings of COVID-19 vaccines under the Benefits theme indicate that social representations of both fully vaccinated and unvaccinated people are largely consistent with scientific research. Studies and clinical trials have supported the notion that vaccines are safe and effective in conferring immunity and protection (Pollard & Bijker, 2021; Tartof et al., 2021). For example, COVID-19 vaccines have been shown to reduce rates of COVID-19-related hospitalization (Moline et al., 2021) and the likelihood of invasive operations such as intubation (Weissman et al., 2020). Vaccines also minimize the chance of infection and the possibility of severe symptoms, life-threatening consequences, and mortality (Lipsitch & Dean, 2020). The same is true for the understanding that vaccines reduce infection and transmission and thus provide a solution to the COVID-19 problem. This finding, in particular, lends support to studies (e.g., Al-Zalfawi et al., 2021; Gallè et al., 2021) that show that public understanding regarding the role of vaccines as a preventative strategy is high, with more than 80% correctly identifying that COVID-19 vaccines prevent infection. Among the fully vaccinated participants, COVID-19 vaccines also emerged as a means of "cure", in addition to “prevention.” However, this is not an accurate characterization of vaccines. Vaccines, as a form of medicine, only serve as a preventive measure, rather than a

treatment. Despite this inaccuracy, viewing vaccines as a "cure" has practical implications. As has been noted, it is the social representation of reality and not reality itself that animates responses to social objects (Wachelke, 2008). Therefore, since it emerged exclusively among the fully vaccinated, it can be considered as a representation that has facilitated vaccine reception.

The representations of COVID-19 vaccines among both fully vaccinated and unvaccinated individuals under the Health and Safety Concerns theme have shown that the risks associated with the vaccines were exaggerated. It is consistent with other research (e.g., Al-Marshoudi et al., 2021; Anorue et al., 2021) suggesting that public knowledge about COVID-19 vaccine side effects is inadequate. While vaccines do have some side effects, they are limited to pain at the injection site, fever, fatigue, headaches, chills, and diarrhea (WHO, 2021b), not death, as was frequently cited in the free association task. The association between vaccines and death, and vaccines and side effects is consistent with a topic modeling study that looked at 4,877 comments in 50 COVID-19 vaccine-related Facebook posts of the Department of Health between April and September 2021. Two topics out of the 25 topics generated specifically revolved around deaths attributed to COVID-19 vaccines and another two topics talked about side effects (Catapang & Cleofas, 2022). Studies have likewise shown that severe complications (e.g., anaphylaxis) are rare (CDC, 2021; Maragakis & Kelen, 2021). This is in contrast to salient risk-related evocations like, "the vaccine will have negative effects on the body" or "I'm scared that my condition will worsen."

The fully vaccinated and the unvaccinated differed only in one subtheme under Health and Safety Concerns. This was the Anti-vaccine Sentiments subtheme, which included statements like, "I don't believe in vaccines" and "it is my choice not to get vaccinated." Since it exclusively emerged among the unvaccinated, these sentiments as representations most likely served as scripts (Lahlou, 2001) that oriented behavior towards vaccine refusal.

The Public Health and Medicine theme reveals that both the fully vaccinated and unvaccinated possess a sound understanding of vaccine mechanisms. Vaccines are commonly perceived as medicines that have an impact on public and community health. Additionally,

they are primarily administered by healthcare professionals, such as nurses. The recognition that vaccines contain antibodies that are introduced into the body through injection and the consideration of comorbidities when accepting COVID-19 vaccines align with expert literature (Czochor & Turchick, 2014; Pollard & Bijker, 2021). This suggests that somehow expert knowledge about the mechanisms is diffused and fused to lay understandings with some extent of accuracy.

The Socio-economic/political/cultural Aspects theme highlights the idea that vaccines, as social objects, shape social relationships and are structured by political and economic forces. This aligns with literature suggesting that COVID-19 vaccines have a broad impact on socio-economic activities (Deb et al., 2022), as well as the political (Paul et al., 2021) and cultural factors (Ullah et al., 2021) that act upon them. A notable aspect of this representation is the difference in understanding between the fully vaccinated and unvaccinated individuals. The notion that vaccines are available for free emerged only among the fully vaccinated, which may have facilitated vaccine acceptance by eliminating the all-important economic hurdle of cost. In contrast, religious or faith-based reasons for not getting vaccinated, such as believing that diseases are prophesied and only God can save people from COVID-19, exclusively emerged among the unvaccinated, potentially impeding vaccine reception. This finding is consistent with the previously mentioned topic modeling study that also identified religious comments, such as trusting in Jesus and having faith in God (Catapang & Cleofas, 2022).

The Philippines is one of the top three countries where people are most likely to believe in conspiracy theories, according to a study by De Coninck et al. (2021). This corresponds to the findings of the current study, as they reveal that COVID-19 vaccines are understood as a Conspiracy. Specifically, it was shown that the participants, whether fully vaccinated or unvaccinated, evoked conspiracy theories consistent with conspiracy beliefs surrounding COVID-19 vaccines in other parts of the world. These include the belief that vaccines are a form of deception used to cover up: 1) pharmaceutical companies' profiteering schemes (Ullah et al., 2021), 2) the elite's plan to control people via microchips or implants (Ullah et al., 2021), and 3) the plan to depopulate the world (Islam et al., 2021). Zombies and zombie

apocalypse via experimental COVID-19 vaccines (Fauzia, 2021) were also among the widely held conspiracy theories revealed by the findings of this study. The unvaccinated also cited more conspiracy theories (five) than the fully vaccinated (only three). This suggests that conspiracy theories are more salient among the unvaccinated group, which partly explains their vaccination status. Conspiracy theories, in general, lead to distrust in science and, in particular, reinforce vaccine refusal. The Conspiracy theme resonates with findings from a Dengvaxia study, where participants were convinced that vulnerable populations, such as children and the urban poor, were being utilized as test subjects for the Dengvaxia vaccine (Yu et al., 2021).

Theoretically, our findings exemplify the foundational concept of cognitive polyphasia. Cognitive polyphasia was first coined by Moscovici to account for paradoxical meanings attributed to psychoanalysis (de-Graft Aikins, 2012). Social representation theories utilize the concept to describe the nature of social representations as sometimes incoherent and made up of thoughts that are often fragmented and contradictory (Höijer, 2011). Abric (1996) was pointing at this when he described the logic of social representations as a "socio-cognitive logic ... of a particular type integrating both the rational and the irrational, accepting what seems to be contradictory" (p. 77).

The coexistence of contradictory views regarding COVID-19 vaccines is pronounced in the shared understanding of Benefits and Health and Safety Concerns among both the unvaccinated and fully unvaccinated groups. This contradiction is also reflected in the co-occurrence of Benefits and Conspiracy beliefs. This integration of opposing views highlights the limitations of the dichotomous notion that unvaccinated people only perceive vaccines negatively, while fully vaccinated people only view them positively.

Regardless of vaccination status, the findings of this study show that people's understanding of vaccines is not limited to contradictory views, such as Benefits and Health and Safety Concerns. They also understand vaccines as part of a wide array of associations, like Public Health and Medicine, Socio-economic/political/cultural Aspects, and Conspiracy. These understandings are synthesized to form a web of knowledge about the vaccines and subsequently tapped in orienting and justifying behaviors. Therefore, for vaccination efforts to be successful, it is imperative to incorporate these diverse social

representations of COVID-19 vaccines when communicating vaccine information and formulating public health interventions.

The resurgence and emergence of new strains of COVID-19 necessitated the development of new vaccines to ensure continued protection. The threat posed by new strains, combined with uncertainties over the duration of immunity provided by vaccinations, has prompted proposals for a yearly COVID-19 vaccine shot. With all these considered, the findings of this study may prove useful to public health authorities and the media when communicating policies and interventions regarding COVID-19 vaccines. Furthermore, health authorities could gain insight on how to best formulate and implement policies. In the following paragraphs, we discuss these practical implications and outline some recommendations.

Concerning communication, health authorities and the media must closely monitor how vaccine-related information is conveyed to the public. For example, the findings of this study indicate that both fully vaccinated and unvaccinated individuals represent vaccines in terms of Benefits as well as Health and Safety Concerns. However, while the former focuses on Benefits, the latter prioritizes Health and Safety Concerns, such as risks and side effects. On the one hand, this requires health authorities to highlight vaccine benefits while also ensuring that the risks are not exaggerated. On the other hand, this suggests that media coverage of vaccines should include observed positive effects of COVID-19 vaccines rather than sensationalizing alleged cases of death or severe side effects, which are frequently misattributed to vaccines. This acknowledges the media's critical role in shaping perceptions and representations. Highlighting benefits might entail looking beyond vaccines' effects on physical health. Emphasizing that vaccines have the potential to restore normalcy and mobility (including the ability to travel to and from school/the workplace), as well as promoting their economic benefits (such as being able to return to work), may bolster vaccine acceptance. Meanwhile, ensuring that vaccine risks are not exaggerated includes providing comprehensive yet clear clarification and accounting for reports that claim vaccination has resulted in deaths and other adverse outcomes. These reports must be thoroughly addressed in layman's terms to avoid the emphasis on risks over benefits, as seen in the unvaccinated group in this study. It

is critical that the media seek advice from experts in order to avoid misattributions and faulty conclusions that could have irreversible impacts on public opinion. Accordingly, the media must take an active part in debunking vaccine conspiracy theories. The #CheckktheFAQs program of the Department of Health, launched through various social media platforms, could be improved and modified to facilitate these communication measures.

Regarding implementation, vaccine policies and interventions must be anchored in local understandings. Knowing the social meanings people have about vaccines can help health officials determine their explanations, attributions, attitudes, emotions, and stereotypes about the social object. This, in turn, would help them to see where the people are coming from and, as a result, become more informed about the kinds of policies and approaches that are most effective. As has been noted, "failing to explore and understand lay representations of health and illness ... can present insurmountable obstacles to developing effective community health programs" (Howarth et al., 2004, p. 10). As of now, The Philippine National Deployment and Vaccination Plan for COVID-19 Vaccines (Philippine Government, 2021) has only integrated expert/specialist perspectives. The notion that social representations orient and justify behavior thus calls for a two-way process of formulating a vaccination plan, whereby lay people heed the experts (top-down) while the experts pay attention to lay perspectives (bottom-up) via community level participatory approaches.

Limitations and Implications for Future Research

This study gathered and analyzed data from participants residing in the Negros Province. To increase the transferability of findings, future research can expand the scope to include samples from other provinces in Western Visayas or even other regions across the Philippines. We employed purposive sampling to ensure that we obtained rich and high quality responses. However, as a non-probability sampling technique, purposive sampling is susceptible to several biases, such as undercoverage bias and sampling bias. To minimize these biases, we recommend that future researchers consider using probability sampling techniques alongside well-defined inclusion criteria in their

participant selection. Moreover, since this study focused on the content and structure of social representations in both fully vaccinated and unvaccinated individuals, future studies could look into the process by which social representations develop and differentiate between and among groups. For instance, they can study the nature of interactions and information sources between fully vaccinated and unvaccinated individuals as they constitute their social representations of COVID-19 vaccines. Given its useful implications in the area of communication and implementation of policies, researchers can likewise consider exploring related health objects. Ideally, they can explore the social representations of COVID-19 booster shots, which are important to ensure that vaccines confer protection for the long term.

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