

Physical Distancing or Social Distancing:
A Q Methodological Exploration of Terms for Risk Communication

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Abstract

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The COVID-19 pandemic has further demonstrated that communicating with the public during a crisis is an extremely challenging task. The field of risk communication endeavors to accomplish this with the use of various frameworks and tools. The purpose of this study was to apply Q methodology as an audience analysis tool to assess whether there are differences in participants' perceptions, viewpoints, and comprehension of the terms physical distancing and social distancing, especially among experts with a public health background and the general public. Q methodology was used for the exploration of the participants' subjective opinions, attitudes, and perspectives. In this study, two types of viewpoints were identified among the participants: the socioemotionally oriented and the rationally oriented. The research

findings suggest that terms used in risk messages should be explicitly defined to reduce the possibility of the audience ascribing their own meaning to them. It also suggests that risk communicators should avoid using multiple terms to describe similar precautionary measures.

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Introduction

Background

Risk communication, a subset of health communication, is one of the most important parts of disease outbreak response. It refers to the use of various communication techniques in the exchange of information, guidance, and opinions between experts and those facing a threat to their wellbeing (Gamhewaye, 2014; World Health Organization [WHO], 2014). Risk communicators frequently communicate with the public about issues related to disease outbreaks and disease and injury prevention. This is a complex task involving key questions such as “who is the target audience?” and “how can we reach them?” (Karasz, 2006 p. 14). Reynolds (2011) proposed that the mind teaser question when communicating about risk is “Do you want to tell people the facts or do you want to be heard?” (p. 1).

Risk communication practices recognize the importance of promoting consistent and simple recommendations so that people will not attempt to incorrectly oversimplify complex information or assign new meanings to previous messages (Brashers, 2001; Novac, 2001; Reynolds & Earley, 2010; Reynolds & Quinn, 2008). This is one of the reasons why identifying different target audiences and communicating in a way that makes them take, process, and act on the information in the intended manner is an important step in the risk communication framework (Reynolds & Quinn, 2008). The nearly impossible time constraints in a crisis, coupled with the need to disseminate accurate messages at the most appropriate time through the right channels, allows little

to no time to deliberate with potential audiences and communities (Reynolds, 2007; Quinn, 2008).

The Coronavirus disease pandemic popularizes the numerous challenges that risk communicators face during a crisis. Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus (WHO, 2020). The disease developed into a pandemic in 2020 and was formally referred to as the *2019 novel coronavirus* (Centers for Disease Control and Prevention [CDC], 2020a). The COVID-19 virus spreads primarily from person to person through respiratory droplets produced when an infected person coughs, sneezes, or talks (WHO, 2020; CDC, 2020a). It affects people differently with most infected people developing mild to moderate illness and recovering without hospitalization, while older people with underlying illness(es) are likely to develop serious illness, sometimes leading to death. Among the preventative measures identified to mitigate the risk of infection is maintaining a minimum of 6 feet (or at least 1 meter) distance between someone and people outside their household. This preventative measure has been referred to as both physical distancing and social distancing and serves as the basis of this study.

The goal of the present study is to methodologically explore participants' perceptions, viewpoints, and understanding of the terms – physical distancing and social distancing – popularized by the COVID-19 pandemic in 2020. It is important for risk communicators to understand how their audience perceives these terms because they describe one of the most crucial preventive measures against COVID-19 infection. This study uses Q methodology, which lies comfortably on a continuum between qualitative and quantitative research, as an audience analysis tool to explore the

subjective interpretation of participants' perceptions of the two terms within their lived experiences in order to develop a deeper understanding of risk perception and risk communication.

Research Questions

Assumptions underlying this study are that words matter and an audience's interpretation of words in risk communication is critical to mitigating disease outbreaks. This study applies Q methodology as an audience analysis tool to assess whether there are differences in participants' perceptions of the terms presented. The following research questions evaluate differences among the research participants' viewpoints and comprehension of the terms physical distancing and social distancing: Are there distinct types of perspectives or viewpoints about the two terms and the risk perception associated with each term? What are the characteristics of different viewpoints and how does each type approach the terms?

Literature Review

Origins and Definitions of Physical Distancing and Social Distancing

The origins of the terms physical distancing and social distancing remain uncertain, with no clear indication of who invented the terms or how the terms were invented. Horobin (2020) suggested that the term social distancing was coined in the 1950s by sociologists to "describe individuals or groups deliberately adopting a policy of social or emotional detachment" (p.1). Szasz (2020), on the other hand, traced the origin of the term back to 1963, when cultural anthropologist Edward Hall, coined the

term *proxemics* to describe studies about distancing in everyday life due to oversaturation of visual, tactile, auditory, or olfactory stimulations.

It remains to be determined how the word was introduced as an epidemiologic measure into public health lexicon. However, it is believed that the term social distance “has not been used in the exact terminology adapted by sociologists” (Ipsen, 1959 p. 162). Das Gupta and Wong (2020) argued that the term social distancing in comparison with physical distancing is a “misnomer that is not self-explanatory, conceptually ambiguous, practically misleading, and intellectually misplaced” because it has led to problematic and confusing guidelines such as those promoting social distancing while also directing the public to maintain social interaction (p.1).

One definition of social distancing in public health is “community infection control measures to achieve physical separation by restricting movements of and contacts between individuals during outbreak” (Das Gupta & Wong, 2020 p.1; Fong et al, 2020). The Centers for Disease Control and Prevention (2020b) defined both physical distancing and social distancing as the act of keeping a safe space (at least 6 feet) between yourself and other people who are not from your household.

Even though the terms were intended to have similar meanings, researchers have postulated that there is a risk of the public interpreting the terms differently. This might promote feelings of rejection among people with mental health problems because of the connotations of the word “social” (Aminnejad & Alikhani, 2020; Wasserman, van der Gaag & Wise, 2020). A 2014 systematic review conducted to understand the role of social distancing in mitigating pandemic influenza proposed that school or workplace-based interventions and closures; case-based distancing including self-isolation and

quarantine; and restriction of mobility and mass gatherings can all be considered as social distancing measures (Rashid et al., 2014).

There are also arguments suggesting that the word “safe distance” means a “physical distance” rather than a “social distance.” Furthermore, the arguments indicate that social distancing can be considered problematic and disturbing in social and cultural contexts in societies less individualized than the United States (Abel & McQueen, 2020). These arguments led the World Health Organization and some countries to abandon the term “social distancing” while others continue to use the term because of their population’s familiarity with it (Wasserman, van der Gaag & Wise, 2020; Das Gupta & Wong, 2020). A communication toolkit produced by the de Beaumont Foundation encouraged the use of the term “social distancing” instead of “physical distancing” (de Beaumont Foundation, 2020). The toolkit, which was widely circulated by the Centers for Disease Control and Prevention (CDC), was based on a national poll of 1,100 participants conducted in November 2020. The poll identified the languages that could be used to reach audiences on both sides of the political aisle in order to build trust in public health measures.

Risk Conceptualization and Risk Perception

Risk conceptualization studies posit that approaching risk perception – the subjective judgment made about the characteristics and severity of risk – with a technically objective orientation is flawed because risk communication involves more than simply telling people what the problem is. In addition, the understanding of risk by experts may be different from that of ordinary “laypersons” (Karasz, 2006; Reynolds,

2011). Navarro, et al. (2016) demonstrated how considerable differences in the ways cancer patients and medical professionals interpret commonly used terms in well-being questionnaires can present a real danger of miscommunication not just between patients and their doctors but among the medical professionals as well.

Studies have documented that effective risk communication relies on knowledge and understanding of its audience to assess its effectiveness i.e., risk messages are as effective as the subjective interpretations the audiences ascribe to the messages (Benjamin et al., 2003; Karasz, 2006). Consequently, in the case of the present study, it is important to determine if there are differences in the subjective interpretations that audience ascribes to the terms physical distancing and social distancing. Studies published during the onset of the COVID-19 pandemic have focused on the confounded effects the terms might have on the mental health of the audience. This study focuses on the audience perception of the two terms.

Risk communicators used to be criticized for inadequately theorizing and making assumptions about their audience. Scheufele (2003) criticized the risk communication manual "Risk Communication: A Mental Models Approach," written by some of the leading experts and published by Cambridge University Press, for not considering the different ways audience use or understand risk messages, and for ignoring the fact that successful communication plans have always included the awareness of audience segmentation. However, the field of risk communication has significantly evolved from what it was two decades ago. The development of Crisis and Emergency Risk Communication (CERC) integrative framework, model, and principles; research on risk perceptions theories; studies on audience analysis; and analyses of mental models and

health behavior theories have revolutionized the whole of health communication (see Quinn et al., 2008; Reynolds, 2011; Reynolds & Seeger, 2005; Reynolds & Quinn, 2008). Research has further added specific topics relating to communicating about various levels of risk and communicating with audiences from different backgrounds (see Schwartz & Woloshin, 2013; Bruine de Bruin & Bostrom, 2013; Peters, 2020).

Notwithstanding, many mental health practitioners note that risk communication during the COVID-19 pandemic ignored the detrimental effects of the terms used during mitigation, especially for people feeling excluded or isolated from their community (Chatterjee, 2020; Abel & McQueen, 2020; Wasserman et al., 2020).

Risk Research Methodology and Q Methodology

Survey questionnaires are one of the most frequently used research tools to gain insight into the audiences' conceptualization of risk. They capture a variety of public opinions using randomly selected samples of participants to ensure the generalizability of results. Many risk studies also use focus groups and interviews because qualitative methodologies offer an in-depth understanding rather than breadth (Baxter & Greenlaw, 2005).

However, underpinning these traditional methods is a power dynamic between researchers and research participants, reinforcing a top-down, subject/objects relationship (Dryzek, 1988). This contrasts with the goal of risk perception research to understand the position and perception of the audience. The unequal power distribution also eliminates the trust needed for effective risk communication, given the history of government role in the field. The Pew Research Center has published multiple reports

about the declining trust of many Americans in federal government, elected officials, and their fellow citizens. The majority of Americans believe that the government withholds important and useful information (Rainie & Perrin, 2019). This distrust can make problem-solving harder, thereby resulting in ineffective communication.

Q methodology is a potential approach to bridge the limitations of the conventional research methods and tools used in risk communication (Sell & Brown, 1984). It provides “a foundation for the systematic study of subjectivity, a person’s viewpoint, opinion, beliefs, attitude, and the like” (van Exel & de Graaf, 2005, p. 4). Zraick and Boone (1991) affirmed that Q methodology’s aims at subjectivity makes it an effective and more superior audience analysis tool than a general attitude questionnaire. Further, Cross (2005) argued that there is no other research method more suitable for the study of attitudes and subjective opinions like Q methodology and called for the use of Q methodology by researchers within health education and promotion fields. Q methodology has been utilized in multiple studies exploring attitudes and understandings of participants (see Gee, 2020; Prasad, 2001; Meloche, 1999; Pertore, 1989).

In contrast to instructive and computable scales, which compare scores and exclude non-significant relationships and subjectivity in analysis and reports based on logical distinctions used in quantitative research methodologies, Q is philosophically and methodologically oriented towards keeping the attitudes and opinions of the entire person’s subjective whole, offered up by the participant themselves. Participants’ responses in Q studies are not broken down into predetermined categories of questions and answers as is the case when analyzing surveys and questionnaires. Instead, Q

analysis correlates the totality of one participant's responses to all other participants' responses in order to identify participants that think in the same way (i.e., similar viewpoints). Participants are then grouped into multiple clusters based on the similarity of their viewpoints. For example, a questionnaire or survey study of 100 participants based on their views of the famous 2015 internet meme about the color of the dress will focus mainly on the perceived differences in the color of the dress, and the analysis may result in 50 participants identifying the dress as white and gold, 40 participants identifying the dress as blue and black, and the other 10 participants identifying the dress as neither of those colors. Most often, this result can be generalized to the wider population. Whereas, in a similar study using Q methodology, the number of participants will be much smaller since Q is concerned with uncovering the different opinions and not a generalization of the opinions. The Q study will focus on the full spectrum of the public discussion about the dress and not just the color of the dress alone, and the analysis will result in the categorization of the participants into clusters of shared viewpoints which may not necessarily be based on the color of the dress. The shared viewpoints will be considered the most obvious similarities among the individuals as opposed to the singular characteristic of the color of the dress. The results are often sophisticated opinions that offer an insight into the subjective thoughts of the participants.

Subjectivity is everywhere, from the loftiest philosophizing and diplomatic negotiating to the street talk of the juvenile gang and the self-talk of the daydreamer, and it is the purpose of Q methodology to enable the person to represent his or her vantage point for purposes of holding it constant for inspection and comparison (Brown, 1997 p. 2).

Methods

Participants and Sampling Strategy

One of the major differences between Q and other quantitative and qualitative studies is the sampling technique. Q often involves small, carefully, and purposefully selected participants, typically less than fifty (Brown, 1980). Q is administered to persons who are expected to define a factor or type. In this study, the researcher is hypothesizing that experts (those with public health background) might have unique perspectives that differ from non-experts (general public). This hypothesis is based on risk communication research that shows the differences between experts' and non-experts' interpretation of risk messages (Navarro, et al., 2016; Reynolds, 2011). Thus, the study will intentionally recruit people who are experts to make up about half of the study participants. Watts and Stenner (2012) recommend four or five participants for each expected factor or viewpoint.

This exploratory study includes 13 participants based on the premise that two to three different viewpoints will emerge in the findings. This is in line with the speculation that three perceptions may emerge: the terms have a similar meaning, the terms have different meaning, or there is an unexpected opinion about the use of the terms. The participants identified for the study include five former/current health department employees, four college students, two educators, one lawyer and one administrator. The demographic characteristics of these participants are represented in Table 1. Participation in the study was voluntary with the following inclusion criteria:

- At least five participants with some knowledge of public health and/or risk communication. Expert knowledge is not a criterion for other participants.
- The participant was 18 years old or older.
- The person could meet remotely via a video-conferencing application such as Zoom.
- The person provided informed consent in line with the requirements of the University of Washington’s Institutional Review Board.

	N (%) ^a
Age	
21 - 30	6 (46)
31 – 40	2 (15)
51 - 60	4 (31)
61 – 70	1 (8)
Sex	
Female	7 (54)
Male	6 (46)
Ethnic/Racial Identity	
Asian / Asian American	1 (8)
Black / African American	2 (15)
White	10 (77)
Occupation	
Students	4 (31)
Educators	2 (15)
Public Health/Health care	5 (38)
Others	2 (15)
^a Rounded Percentages	

Table 1: Demographic Characteristics of Participants

Developing the Q-Sample (Statement Set)

Q-set is a large and diverse collection of statements from the universe of opinions and ideas being discussed in the community. For the present study, the researcher gathered 30 statements from news articles, radio interviews, research

articles, opinions, and commentary articles in journals. The researcher captured as many subjective domains as possible to reflect the “totality of things that could be said regarding the topic” (Rhoads, 2014, p.3). The statements were structured based on Slovic’s (1987) hypothesis of the key characteristics that account for an individual’s risk perceptions and attitudes. The properties used in this study include voluntariness, dread, knowledge, and controllability.

Statements were drafted as opinions to preserve participant’s subjectivity as suggested by Gen (2020) i.e., the statements did not include facts or factual claims. For example, instead of “the term physical distancing promotes social connection and cohesion”, it was expressed as an opinion about the potential impact of the activity, such as “I think using the term physical distancing may promote social connection and cohesion.” The statements were then corrected for grammar and clarity as appropriate.

Knowledge:

1. Everybody knows that physical distancing is the practice of staying at least six feet away from others to prevent COVID-19 infection.
2. We all know that social distancing encourages the use of things such as online video and phone communication instead of in-person contact.
3. I think the terms physical distancing and social distancing have the same meaning.
4. I know that maintaining a physical distance is absolutely essential during the COVID-19 pandemic, it does not mean that we have to be socially or emotionally disconnected from our loved ones.
5. I think it is important to differentiate between the two terms.
6. Some people think that social distancing makes it sound like people should stop communicating with one another.
7. I think that physical distancing can be used to stress the need to maintain physical space when in public areas.
8. I do not care what term is used; everyone understands the precautions to avoid getting infected with COVID-19.
9. Social distancing is a familiar phrase that everyone understands to mean practicing physical separation.

10. We would have gotten COVID-19 infection under control if everyone understands the importance of keeping six feet away from others.

Dread:

11. I am really worried that I will be infected with COVID-19 even if I stay six feet away from other people.
12. I think a big problem with the term social distancing is that people may feel socially isolated.
13. I am worried that the term physical distancing does not promote staying at home and self-isolating.
14. I find it challenging to practice social connection while maintaining physical distance.
15. I think social isolation has a great impact on mental and physical health; it may lead to stress and loneliness.
16. Social distancing may be sending the wrong message to people who are struggling to get by during the pandemic.
17. Some people can interpret social distancing to mean that they should be turning inward and closing themselves off from friends and neighbors.

Voluntariness:

18. Cultivating social connections while practicing physical distancing can keep people from worrying about uncertainty and disruption in their lives.
19. I help promote emotional togetherness during the pandemic; social distancing does not mean we cannot connect with neighbors.
20. Everybody knows that what is needed to prevent COVID-19 infection is greater physical distance between people, not great social distance.
21. We all have the fundamental need for connection with one another; people who break COVID-19 precautions should be supported socially and emotionally.

Controllability:

22. I think using the term physical distancing may promote social connection and cohesion.
23. I do not think staying connected with loved ones during the pandemic will keep you grounded or keep you from feeling anxious and depressed.
24. I am sure that maintaining social and emotional connectedness is more critical even when physical distancing is necessary.
25. I find it very hard to adhere to staying six feet apart when I am spending time with other people.
26. I spend time with other people during the pandemic because social isolation is not good for my mental wellbeing.
27. If someone in my household become infected with COVID-19, I will be able to put space between myself and the infected person while also providing them with emotional support.
28. Staying physically isolated from other people during the pandemic is frustrating, but I am afraid of getting infected.

29. I am very worried that the government is controlling the places I can and cannot go. No one can protect me from COVID-19.
30. Staying six feet apart from people to avoid getting infected with COVID-19 is easy for me.

Q Procedures and Q Sorting

A sample was recruited (13 persons for the present study) though this can vary depending on the needs and interests of the researcher (Brown, 1980; Watts & Stenner, 2012). Each participant rank-ordered or sorted the statements according to “statements that I agree with” or “statements I disagree with” as illustrated in Figure 1. The result of the ranking, known as Q-sort, was factor analyzed so that each sort was compared (correlated) with all of the other participants in the sample (i.e., individuals, not their traits, were compared with each other). The resulting analysis would reveal patterns, distinguishing (or distinctive) statements and consensus statements, which could be used to highlight differences and similarities in the understandings of the terms in question.

Finally, a post-sort interview was conducted where Q sorters were asked to explain their sorting processes and the reason(s) for ranking the statements in their unique ways. Gallagher and Porock (2010) proposed that conducting a post-sort interview can increase the validity and improve the transparency of Q studies, and therefore increase the rigor of the technique. Karasz (2006) and Kosterner et al. (2021) demonstrated how conducting a short 15 to 30 minutes interview with Q sorters can provide insights into their reasoning and identify topic-related issues that the researcher may not be aware of. A step-by-step guide of this study’s technique is outlined below.

LEAST AGREE				MOST AGREE		
-3	-2	-1	0	1	2	3
(3)						(3)
	(4)				(4)	
		(5)		(5)		
			(6)			

Figure 1: Statement Ranking Chart for Q sorting

Step-by-Step Guide of Technique

This study conducted remote and semi-remote Q sessions with participants. Each Q session involved five basic steps: orientation, initial sort, zig-zag sort, post-sort survey, and post-sort interview. The average length of time for a session was about 50 minutes. The sessions were not recorded. The researcher captured each participant's response on separate sort sheets during the sessions.

Pre-session – The statements and ranking charts were sent by mail or hand delivered to participants.

Orientation – The researcher provided an electronic version of the informed consent form for participants to read, briefly explained the study, and provided follow-up contact information. REDCap was used to obtain informed consent.

Initial sort – Each participant was asked to briefly read all the statements (Q-set), and to divide the statements into piles with which the participant generally agreed and disagreed. Participants were given an option of a third pile for statements they could not

decide if they disagreed or agreed with. They were also informed that they could change their decision about any statements until the procedure was complete.

Zig-zag sort – Each participant then selected the two statements from the disagree pile that they disagreed with the most and the researcher instructed them to put the statements on the left-hand side of the sort sheet. This step was done for the agree pile, but the statements were placed on the right-hand side of the sort sheet. The researcher then explained to the participant that they are creating a distribution curve, with ‘most agree’ on the right, ‘neutral’ in the middle, and ‘most disagree’ on the left. Next, the researcher and participants engaged in this zig-zagged procedure for moderately agreed/disagreed and least agreed/disagreed statements. Finally, the researcher asked the participant if they were satisfied with the distribution before capturing the responses on his own sort sheet.

Post-sort survey – Each participant was asked to complete a short (2-minute) survey to collect basic demographic data such as age, gender, ethnic/racial identity, and occupation. They were also asked to comment on any statement that piqued their interest or stood out to them. Participant’s survey and interview responses were written down on the second page of their respective sort sheets.

Post-sort interview – Interviews were conducted after the Q sort was complete. See Appendix 1 for interview questions used in this study.

Completion – At the end of the Q session, the researcher explained that the sort would be compared to all other participants sorts, such that different interpretations or

viewpoints would emerge. Participants were encouraged to follow up with the researcher if they had any questions.

Analysis of Data

At the end of each session, the data (participant's Q-sort) were entered into the statistical software program PQ Method. This program was used to accomplish the statistical procedures constituting Q analysis, which are correlation, factor extraction, factor analysis, factor rotation, and scoring. The analyzed results include normalized factor scores, statements sorted by consensus and disagreement by factor, factor arrays, distinguishing statements by factor, and consensus statements. These results provide a multifaceted window into participant's subjective viewpoints about the terms. Analytical decisions in Q are made as the results are produced; thus, the extensive rationales for each analytical step are provided in the results section.

Validity, Reliability, and Replicability

In Q, validity is a non-contentious point since there is no right or wrong point of view and a person's point of view is simply their own. Brown (1980) noticed that "A person's judgement as to the best way to solve the energy problem is simply his viewpoint. It may be regarded by some as wrong-headed, or Pollyanna (i.e., extremely optimistic), by others as liberal or conservative, but that it is his (viewpoint) is seldom in doubt" (p. 4).

Reliability in Q, on the other hand, is concerned with the likelihood that a person will sort items in the same way time after time. According to Brown (1980), Q stability is

robust at an estimate of 85% consistency up to a year later, meaning that a person will sort a statement set similarly eight out of ten times within a year. Nonetheless, a person may change his or her viewpoint over time.

Q is interested in the diversity of attitudes and viewpoints among a particular population and does not hypothesize about the percentage of people who hold those viewpoints (Cross, 2005). It is unlikely, but theoretically possible that the persons' sample are the only people in the world that have the perceptions of the terms the way they do, their viewpoints are therefore not generalizable but may serve to be a basis for further studies.

Results

The scientific and objective foundation of Q methodology is the quantification of different viewpoints provided by the Q sorts of the 13 participants (Coogan & Herrington, 2011). This involves a technical and statistical procedure referred to as factor analysis. Factor analysis considers the level of similarity, dissimilarity, agreement, and disagreement between participants' Q sorts. Participants' Q sorts are then compared to each other and statistically similar sorts are grouped together into factors or "types" that represent similar points of view and perspectives on the topic. This study revealed two types of perspectives about the comprehension of the terms physical distancing and social distancing:

- Type A – Socioemotionally oriented
- Type B – Rationally oriented

The free software program PQ Method – version 2.35 was used for this analysis.

Analysis Procedures and Results

- *Step 1 – Correlation Matrix:* The statements and the individual Q sorts provided by the 13 participants were entered into the program. Each sort was assigned a unique identification. In this study, participants were identified by the alphabetized abbreviations of states in the US (e.g., AL, AK, AZ, etc.). All 13 sorts were then correlated with each other as shown in Appendix 2. The correlation matrix indicates full agreement to full disagreement between the sorts. This analysis step serves as

the transition phase to the factor analysis and little attention is given to the matrix (Brown, 1980, p. 207).

- *Step 2 – Factor Extraction:* The purpose of the factor extraction is to “identify the number of the natural groupings of Q sorts by virtue of being similar or dissimilar to one another” (van Exel & de Graaf, 2005, p. 8). Participants with similar viewpoints will “load” onto the same factor (i.e., grouped together for inspection for the researcher). Version 2.35 of the PQ Method software has three alternative options for factor extraction, including Brown Centroids Analysis, Horst’s Centroid Analysis, and Principal Components Analysis (PCA). PCA was used for this study because it always extracts the maximum number of factors possible with the PQ Method (which is eight factors) whereas the Brown Centroids usually extracts seven factors and Horst’s Centroid extracts factors at the limiting level of correlation which can be less than eight factors. The extraction of the maximum number of “unrotated” factors enables the full examination of the natural groupings of the Q sorts. The correlation as shown in Table 2 runs along a continuum from +1 to -1, indicating a perfect positive to negative relationship in each factor. PCA also offers simple and mathematical computations of the Eigenvalues which were used in the next step of the analysis. PCA is the default method of factor extraction in the SPSS statistical software package.

SORTS	Factors							
	1	2	3	4	5	6	7	8
1 AL	0.6454	0.0803	0.5277	0.1807	-0.1379	-0.2656	-0.1258	-0.1027
2 AK	0.5981	0.4008	-0.2129	0.2392	-0.4104	-0.2759	-0.2043	-0.1545
3 AZ	0.6841	-0.0593	-0.1849	0.4567	-0.2581	0.3457	0.2286	-0.0664
4 AR	0.4470	0.5807	0.2047	0.4148	0.3147	0.0244	0.0220	0.2348
5 CA	0.7164	0.3737	-0.1015	-0.4233	-0.1980	-0.0035	0.1520	0.1164
6 CO	0.6805	0.4816	-0.2383	-0.3268	-0.0235	0.1210	-0.0931	0.2162
7 CT	0.7675	-0.3124	0.0018	0.0207	-0.1157	0.4523	-0.1618	-0.0033
8 DE	0.7579	-0.1071	0.2561	0.0748	0.3927	0.0463	-0.1100	0.1039
9 FL	0.7171	0.2487	0.0970	-0.2011	0.2654	-0.0490	0.3807	-0.3679
10 GA	0.7190	-0.2486	0.3218	-0.3113	-0.0145	0.0972	-0.2974	-0.1404
11 HI	0.5207	-0.5095	0.3298	-0.0464	-0.2963	-0.2119	0.3297	0.2857
12 ID	0.7457	-0.3803	-0.3946	0.0915	0.2411	-0.0884	0.0726	-0.0710
13 IL	0.6680	-0.3530	-0.4751	0.0292	0.1706	-0.3464	-0.1286	0.0920
Eigenvalues	5.8865	1.6409	1.1356	0.9113	0.8062	0.6728	0.5443	0.4153
% Expl. Var.	45	13	9	7	6	5	4	3

Table 2: Factor Matrix (Unrotated)

- Step 3 – Rotating Factors:* The factor rotation was computed analytically using Varimax Rotation in PQ Method. Factor rotation enables the examination of the factors from different angles. The Varimax rotation allows for the maximum positions of the sorts into the most appropriate number of factors (types) objectively, regardless of the researcher’s hypothesis. Contrastingly, the judgmental form of factor rotation allows for the hand rotation of the factors based on the researcher’s theoretical assumptions, knowledge, or preconceived ideas which can sometimes involve ensuring that some sorts load onto a factor. Since this study is exploratory and the researcher does not have a pre-determined theory or suspicion, the Varimax rotation was used.
- Step 4 – Choosing Factors to Rotate:* Choosing the final number of factors to rotate via Varimax requires both statistical, practical, and theoretical evaluation. The Eigenvalues in Table 2 were used to determine the approximate number of factors to

include in Varimax rotation. Eigenvalues of the factors indicate the degree of communality (i.e., a high Eigenvalue shows that more participants are loaded onto that factor). Therefore, a three-factor Varimax rotation analysis was initially conducted since factors 1, 2, and 3 in Table 2 have Eigenvalues of above 1. Factors that do not reach the Eigenvalue of above 1 should not be easily discarded, especially in large studies, because Eigenvalues can be inflated with many participants (Coogan & Herrington, 2011). In addition to the three-factor rotation, the researcher ran two-factor and four-factor Varimax rotations to ensure that factors were neither overstated nor understated. The two-factor rotation was found to provide the clearest and strongest factors with the highest number of participants loading on all factors. The three-factor rotation resulted in non-significant loading where one participant did not load onto any of the factors and the four-factor rotation resulted in confounding where one participant loaded onto multiple factors. The researcher conducted multiple hand rotations for the three- and four-factor rotations in an attempt to load all the sorts but to no avail. The “unloading” sort, which can practically be dropped from the analysis, was not dropped from the three-factor or four-factor rotation because of the small study size. Instead, the two-factor rotation was further evaluated using the formula proposed by Webler, Danielson & Tuler (2009, p. 31) and explained by Damio (2018, p. 72) for selecting the appropriate number of factors. The two-factor rotation met the formula criteria of:

Simplicity – fewer factors are better as it makes the viewpoints at issue easier to understand; Clarity – the factor which each sorter loaded highly on; Distinctness – lower correlations between factors are better as highly correlated factors are saying similar things; and Stability – certain groups of people tend to cluster together.

- *Step 5 – Flagging Factors:* As indicated in the previous step, the loading of each participant onto one factor is sometimes not obvious. Flagging allows the researcher to either manually or automatically flag a participant's sort into a factor that they belong to. For this study, flagging was done automatically by PQ Method which flagged sorts only if they were significant on one factor at $p < .05$. All the sorts of the two-factor rotation were flagged as statistically significant whereas one to two sorts of the three- and four-factor rotations were not flagged as significant. As a result, a two-factor rotation was chosen. Table 3 shows the factor that each participant automatically fits into, with the 'X' next to the correlation score for each factor. Once flagging was completed, the complete analysis – calculation of factor scores and difference scores – of the Q-sorts based on the two factors were reported and explained below. The factors were then conceptualized as the “types” which represent participants' viewpoints that are highly correlated with one another. The two types accounted for 58% of the variance in the sample. Table 4 shows the moderate correlation between Type A and Type B at 0.54. This means that there are some shared understandings between the two types but also differences in the ways the issue is understood.

Q SORT	Type A	Type B
1 AL	0.4370	0.4817X
2 AK	0.1920	0.6939X
3 AZ	0.5573X	0.4011
4 AR	-0.0398	0.7318X
5 CA	0.2994	0.7505X
6 CO	0.2019	0.8088X
7 CT	0.7855X	0.2637
8 DE	0.6445X	0.4130
9 FL	0.3815	0.6562X
10 GA	0.7072X	0.2803
11 HI	0.7270X	-0.0467
12 ID	0.8133X	0.1980
13 IL	0.7366X	0.1680
% Expl. Var.	31	27

Table 3: Factor Matrix with an X Indicating a Defining Sort (computer generated flag at $p < .05$)

Factors	1	2
1	1.0000	0.5391
2	0.5391	1.0000

Table 4: Correlations Between Factor Scores (Type A and Type B)

Factor Scores

PQ Method computed factor scores based on the sorts flagged for each type. Factor scores, also called factor z scores, are the aggregates of the individual sorts flagged as the best representative of the factor. The factor arrays, Figures 2 and 3, are a simplified way of looking at the factor z scores of each statement in a ranked order. A factor array represents the composite Q sort of a hypothetical participant with a 100% loading onto that factor (type). The statements at the extreme ends of the factor arrays are referred to as characterizing statements which are used, together with the post-sort interview, to describe the composite viewpoints represented by that factor (van Exel & de Graaf, 2005, p. 10).

The factor scores also produce the distinguishing and consensus statements for the types. The distinguishing statements for Type A are presented in Table 6; these are the statements that the participants in Type A order significantly different when compared to participants in Type B. All 19 distinguishing statements were statistically significant at $p < .05$ with 13 statements significant at $p < .01$. The consensus statements presented in Table 7 are the statements that Type A and Type B participants generally agreed on. None of the consensus statements are statistically significant at $p < .01$.

Factor scores for each of the types are presented in Appendix 3 and 4. The Composite Reliability of 0.97 for Type A and 0.96 for Type B, as shown in Table 5, indicate the consistency of the participants in each factor.

	Factors	
	1	2
No. of Defining Variables	7	6
Average Rel. Coef.	0.800	0.800
Composite Reliability	0.966	0.960
S.E. of Factor Z-Scores	0.186	0.200

Table 5: Factor (Type) Characteristics

No.	Statement	Factors			
		1	2	1	2
		Q-SV	Z-SCR	Q-SV	Z-SCR
15	I think social isolation has a great impact on mental and physical health; it may lead to stress and loneliness.	3	1.93	3	1.36
19	I help promote emotional togetherness during the pandemic; social distancing does not mean we cannot connect with neighbors.	2	0.93	1	0.31
16	Social distancing may be sending the wrong message to people who are struggling to get by during the pandemic.	2	0.86*	0	-0.05
28	Staying physically isolated from other people during the pandemic is frustrating, but I am afraid of getting infected.	1	0.71*	-2	-0.73
12	I think a big problem with the term social distancing is that people may feel socially isolated.	1	0.59*	-1	-0.39
6	Some people think that social distancing makes it sound like people should stop communicating with one another.	1	0.29	-1	-0.31
22	I think using the term physical distancing may promote social connection and cohesion.	0	0.04	-2	-0.57
25	I find it very hard to adhere to staying six feet apart when I am spending time with other people.	0	0.02*	-2	-0.80
30	Staying six feet apart from people to avoid getting infected with COVID-19 is easy for me.	0	-0.26*	1	0.85
11	I am really worried that I will be infected with COVID-19 even if I stay six feet away from other people.	-1	-0.32*	-3	-1.87
1	Everybody knows that physical distancing is the practice of staying at least six feet away from others to prevent COVID-19 infection.	-1	-0.34*	2	0.96
13	I am worried that the term physical distancing does not promote staying at home and self-isolating.	-1	-0.62	-2	-1.25
23	I do not think staying connected with loved ones during the pandemic will keep you grounded or keep you from feeling anxious and depressed.	-1	-0.66*	-3	-1.93
21	We all have the fundamental need for connection with one another; people who break COVID-19 precautions should be supported socially and emotionally.	-2	-0.73*	0	0.27
9	Social distancing is a familiar phrase that everyone understands to mean practicing physical separation.	-2	-1.41*	1	0.51
3	I think the terms physical distancing and social distancing have the same meaning.	-2	-1.46*	-1	-0.36
20	Everybody knows that what is needed to prevent COVID-19 infection is greater physical distance between people, not great social distance.	-3	-1.53*	0	-0.11
29	I am very worried that the government is controlling the places I can and cannot go. No one can protect me from COVID-19.	-3	-1.54	-3	-2.17
8	I do not care what term is used; everyone understands the precautions to avoid getting infected with COVID-19.	-3	-1.61*	1	0.40

Table 6: Distinguishing Statements for Type A [P < .05; Asterisk (*) Indicates Significance at P < .01; Both the Factor Q-Sort Value (Q-SV) and the Z-Score (Z-SCR) are Shown.]

No.	Statement	Factors			
		1		2	
		Q-SV	Z-SCR	Q-SV	Z-SCR
2*	We all know that social distancing encourages the use of things such as online video and phone communication instead of in-person contact.	1	0.77	2	1.01
4*	I know that maintaining a physical distance is absolutely essential during the COVID-19 pandemic, it does not mean that we have to be socially or emotionally disconnected from our loved ones.	3	2.06	3	1.91
5*	I think it is important to differentiate between the two terms.	3	1.13	1	0.84
6	Some people think that social distancing makes it sound like people should stop communicating with one another.	1	0.29	-1	-0.31
7*	I think that physical distancing can be used to stress the need to maintain physical space when in public areas.	2	0.90	3	1.29
10*	We would have gotten COVID-19 infection under control if everyone understands the importance of keeping six feet away from others.	0	-0.03	-1	-0.56
13	I am worried that the term physical distancing does not promote staying at home and self-isolating.	-1	-0.62	-2	-1.25
14*	I find it challenging to practice social connection while maintaining physical distance.	-2	-1.02	-1	-0.53
15	I think social isolation has a great impact on mental and physical health; it may lead to stress and loneliness.	3	1.93	3	1.36
17*	Some people can interpret social distancing to mean that they should be turning inward and closing themselves off from friends and neighbors.	0	0.12	0	0.07
18*	Cultivating social connections while practicing physical distancing can keep people from worrying about uncertainty and disruption in their lives.	1	0.70	2	1.01
19	I help promote emotional togetherness during the pandemic; social distancing does not mean we cannot connect with neighbors.	2	0.93	1	0.31
22	I think using the term physical distancing may promote social connection and cohesion.	0	0.04	-2	-0.57
24*	I am sure that maintaining social and emotional connectedness is more critical even when physical distancing is necessary.	2	1.01	2	0.90
26*	I spend time with other people during the pandemic because social isolation is not good for my mental wellbeing.	0	-0.20	0	0.19
27*	If someone in my household become infected with COVID-19, I will be able to put space between myself and the infected person while also providing them with emotional support.	-1	-0.33	0	-0.25
29	I am very worried that the government is controlling the places I can and cannot go. No one can protect me from COVID-19.	-3	-1.54	-3	-2.17

Table 7: Consensus Statements – Those That Do Not Distinguish Between ANY Pair of Factors. [All Listed Statements are Non-Significant at $P > .01$, and Those Flagged With an * are also Non-Significant at $P > .05$.]

Type Profiles

Type A – Socioemotionally oriented

This type is defined by 7 of the 13 participants in the study. It comprised of three students, one educator, one public health/health care employee, and one Other occupations. The composite Q sort, Figure 2, represents how a hypothetical respondent with a 100% loading onto Type A would have ordered the Q set statements. The emphasis on the differences between the two terms is central to this viewpoint. Participants strongly agreed with the need to differentiate between the two terms (statement #5, +3) and disagreed with the statements indicating that the terms have a similar meaning (#8, -3; #3 & #9, -2). A participant explained the differences between the terms as,

“physical distancing is the space apart, the 6 feet...social distancing is not gathering together for like parties, sporting events, weddings.”

Participants sharing this viewpoint further thought that everyone does not share the same understanding of the precautions needed to prevent COVID-19 infection (#8 & #20, -3). As one participant put it,

“the ‘we’ and ‘everybody’ statements are harder. I know of these things, but I am not sure of others.”

In this viewpoint, participants recognized the negative emotional effects of the term social distancing (#16 & #19 & #24, +2) but cautioned against using the need for emotional connection to justify breaking preventive precautions (#21, -2). As one of the participants explained,

“I agree with the need for emotional connection, but I’m conflicted about it because it feels irresponsible, and punishment doesn’t work either. Will supporting them encourage their behavior?”

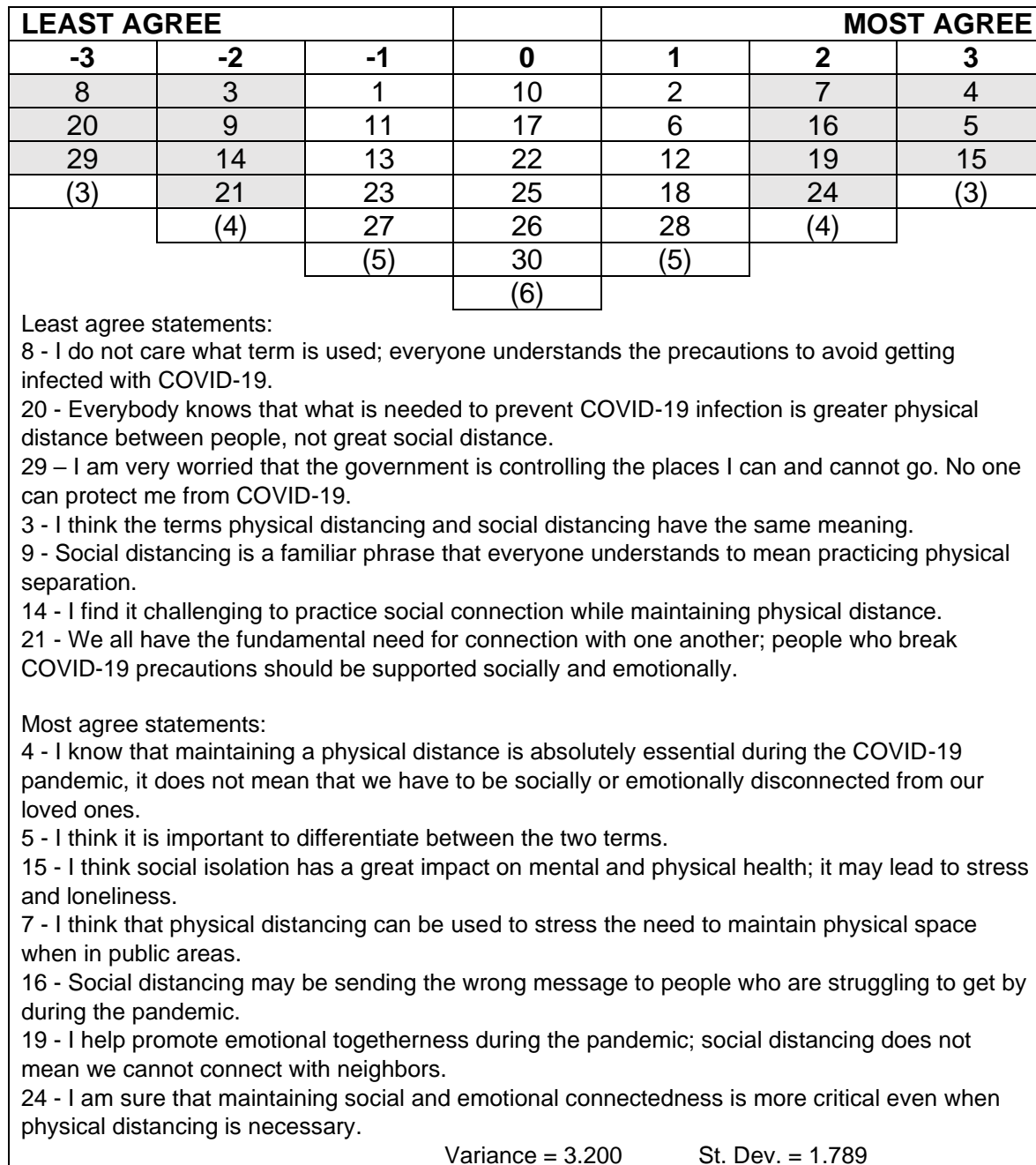


Figure 2: Model Q-sort for Type A

Type B – Rationally oriented

This type is defined by 6 of the 13 participants in the study. It is comprised of four public health/health care employees, one educator, and one Other occupations. The composite Q sort, Figure 3, represents how a hypothetical respondent with a 100% loading onto Type B would have ordered the Q set statements. In contrast to the first viewpoint identified with this research, Type B is characterized by the understanding that the terms were meant to have the same meaning. This viewpoint is explained by two participants as,

“from the beginning, I have a preference for physical distancing since that is what we were doing and precised language was needed but for the most part, people don’t pay attention to language...everyone understands social distancing to mean physical distancing and will be able to keep space while maintaining emotional connection.”

“physical distancing is the 6 feet separation, same exact definition as social distancing backed by a cultural context that doesn’t play in the definition but exists.”

These explanations are in line with participants’ disagreement with statements that presented the term physical distancing as an insufficient precaution in comparison with social distancing (#11, -3; #13 & #25, -2). This viewpoint furthermore reflects an understanding that the term social distancing was used to encourage connecting through technology like video calls (#2, +2). Participants sharing this viewpoint also perceived the potential implications of interchanging the usage of the terms. One participant explained it as,

“We use physical distancing at work, and I haven’t thought much about social distancing before this research but with knowledge of social isolation, I think about how interchanging the terms and mental health fit into it and the support and connection it promotes.”

Similar to Type A, the participants in Type B strongly agreed with the detrimental effects of social isolation (#15, +3) and the need for social and emotional connection while maintaining physical distance (#3, +3). All of the participants in Types A and B also strongly disagreed with the perception of overreaching government control (#29, -3).

LEAST AGREE				MOST AGREE		
-3	-2	-1	0	1	2	3
11	13	3	16	5	1	4
23	22	6	17	8	2	7
29	25	10	20	9	18	15
(3)	28	12	21	19	24	(3)
	(4)	14	26	30	(4)	
		(5)	27	(5)		
			(6)			

Least agree statements:

11 - I am really worried that I will be infected with COVID-19 even if I stay six feet away from other people.

23 - I do not think staying connected with loved ones during the pandemic will keep you grounded or keep you from feeling anxious and depressed.

29 - I am very worried that the government is controlling the places I can and cannot go. No one can protect me from COVID-19.

13 - I am worried that the term physical distancing does not promote staying at home and self-isolating.

22 - I think using the term physical distancing may promote social connection and cohesion.

25 - I find it very hard to adhere to staying six feet apart when I am spending time with other people.

28 - Staying physically isolated from other people during the pandemic is frustrating, but I am afraid of getting infected.

Most agree statements:

4 - I know that maintaining a physical distance is absolutely essential during the COVID-19 pandemic, it does not mean that we have to be socially or emotionally disconnected from our loved ones.

7 - I think that physical distancing can be used to stress the need to maintain physical space when in public areas.

15 - I think social isolation has a great impact on mental and physical health; it may lead to stress and loneliness.

1 - Everybody knows that physical distancing is the practice of staying at least six feet away from others to prevent COVID-19 infection.

2 - We all know that social distancing encourages the use of things such as online video and phone communication instead of in-person contact.

18 - Cultivating social connections while practicing physical distancing can keep people from worrying about uncertainty and disruption in their lives.

24 - I am sure that maintaining social and emotional connectedness is more critical even when physical distancing is necessary.

Variance = 3.200

St. Dev. = 1.789

Figure 3: Model Q-sort for Type B

Discussion and Conclusions

The goal of the present study was to assess if there are differences among participants' viewpoints and comprehension of the terms – physical distancing and social distancing. This exploratory study was informed by multiple commentaries and arguments in the media and journals about the potential implications of using one term as opposed to the other. The results from the study show fascinating differences as well as similarities in the participants' subjective interpretation and understanding of the two terms. The hypothesis that experts (those with public health background) will have different perspective from the non-experts (the general public) was proven to be true with four of the five experts sampled loading onto Type B. Additionally, the single expert that loaded onto Type A expressed a shift in their viewpoint at the end of their Q session.

The presence of different perspectives about an issue is not new in risk communication. Risk communication scholars and practitioners have extensively explored, practiced, and written about audience segmentation and the psychosocial factors that influence audience interpretation and understanding of risk messages (Eisenmen et al., 2007; Reynolds, 2011). This study adds to that knowledge by providing two different discourses, presented as socioemotionally oriented and rationally oriented, in the conceptualization of two terms used extensively during the COVID-19 outbreak.

While the extraction of a third additional type appeared possible with a large sample size, the moderate correlation coefficient between the two types and the high

composite reliability indicated that the potential type extractable would have extremely similar viewpoints to the extracted two types, likely loading onto the two types with adequate rotation. The findings for each of the research questions proposed is discussed below.

Research Questions

Are there distinct types of perspectives or viewpoints about the two terms and the risk perception associated with each term? What are the characteristics of different viewpoints and how does each type approach the terms?

The study found two different viewpoints and varying perspectives among participants. Type A can be described as a viewpoint with a strong emphasis on the differences between the two terms while recognizing their personal experience of helping to promote social connection during the COVID-19 pandemic. In this regard, Type A stresses the need for social and emotional connection with a perception of increased risk associated with social isolation. They responded strongly to statements linked with knowledge and voluntariness (#3, #5, #8, #20). It is surprising that these participants perceive that not everyone fully understands the distancing precautions needed to avoid getting infected while also showing approval for “tough love” for people who break the precautions. The three college students in this type provided examples of how their classmates who broke safety precautions did not face any serious consequences from school administrators and suggested the need for school administrators to strongly rebuke such behaviors with a limited suspension of students.

Two participants expressed how the Q session made them better understand the intended meaning of the terms and how the use of the term physical distancing at the beginning of the pandemic may have alleviated the perception of closing oneself up during the shutdowns.

Type B clearly expresses a critical opinion of why the two terms were used, how the terms were meant to have similar meanings, and the need to examine the terms from a biological and logical standpoint with the removal of emotions. The participants showed a strongly approving stance towards the use of physical distancing and the benefit of that term's clarity. Type B responded strongly to statements linked with dread and controllability with physical distancing (#11, #13, #22, #25). It can be deduced that Type B expressed confidence in their ability to practice physical distancing – whether just 6 feet apart or staying home – and associated the practice with a lower risk of infection. The omission of the use of facemasks and coverings in the statements is a limitation that does not seem to affect participants in type B. This may be due to how the use of facemask was promoted as an additional precaution to distancing messages. Facemask as a precautionary measure was subjected to contentious debate and became uncoupled from other measures. However, the omission of facemasks when developing the set of statements was an unintentional oversight by the researcher.

Unsurprisingly, a couple of strong opinions were shared by both types. All of the participants indicated their ironclad approval of the way the government acted throughout the pandemic including the shutdown measures and restrictions of businesses. This, however, must be put into context. All of the participants can be considered liberals in terms of political ideologies. Their opinions align with recent polls

from the Pew Research Center showing the disagreement between Democrats and Republicans over policies and procedures related to the pandemic (Deane, Parker & Gramlich, 2021). Another noteworthy theme is the acknowledgment of the relationship between isolation and physical and mental health among all the participants. This should be a highly welcomed perception in public health and could be put in the context of the increased promotion of mental wellbeing among the “general public” during the pandemic.

This study demonstrated that the field of risk communication still has some work to do in ensuring that experts and non-experts have the same understanding and ascribe similar meanings to risk messages. While the terms “physical distancing” and “social distancing” might have been introduced as synonyms, it is clear that there are different perceptions of the two terms and different levels of risk associated with them. Risk communicators should consider eliminating the use of synonymous and/or multiple terms to describe similar precautionary measures.

Whenever possible, risk communicators should consider explicitly defining the precautions they want the public to follow instead of assigning a term to describe it. An important question to consider before introducing a term for risk communication is “Can a simple phrase describe the precautionary measure the term is supposed to define?” The answer is yes for the COVID-19 pandemic because the precautionary measures could be simply and clearly described as: stay six feet apart, avoid crowded places, avoid close-contact settings, and avoid confined and enclosed spaces. This provides a clear and unambiguous description of what is needed from the public and reduces the possibility that the audience will ascribe their own meaning to risk messages.

Strengths, Limitations, and Future Research

One of the strengths of this study lies in its design method. The use of Q methodology as a factor analysis tool for audience analysis allows participants to share their subjective viewpoints of the issue at hand. Drafting statements as opinions rather than facts further enabled the researcher to capture the participants' intuitive perspectives while simultaneously identifying similarities and subtle differences between their viewpoints. The use of double negative statements like #23 "I do not think staying connected with loved ones during the pandemic will keep you grounded or keep you from feeling anxious and depressed" caused some confusion among many participants who had to set those statements aside until the end of their sorting. This is not a surprising limitation with Q methodology since any statement can be interpreted differently.

Further, the use of the personal pronoun "I" and the indefinite pronoun "Everybody" in some of the statements proved to be a strength initially thought of as a limitation during the Q sessions. The personal and indefinite pronouns resulted in some distinguishing characteristics between the two types of viewpoints the study identified. The demographic profile of the sample shows that the researcher did not recruit enough racially, politically, and occupationally diverse participants. Future research should take this into consideration. Researchers should also consider how age and gender factor into the different viewpoints. The study also fell short in studying the psychological underpinnings of risk assessment for each factor. Future research should consider expanding their scope to examine the psychosocial and/or personality traits associated with the understanding of terms used in risk communication. Another limitation of this

study is that the small sample size means that demographic correlation cannot be established.

There are obvious limitations to Q methodology studies as a whole; one being that the results are unlikely to indicate anything about the distribution of opinions in the population selected for the study. The findings of this exploratory research will not be generalizable in the sense that one cannot necessarily expect that the topologies will constitute all of the possible viewpoints in a population. However, the findings further strengthen risk communicator's efforts to recognize and address the potential differences between how experts and audiences perceive terms used in risk communication.

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Appendix 1: Post-Sort Interview Questions

The researcher aims to conduct semi-structured interviews with Q sorters using the following guide:

Researcher: The purpose of this interview is for you to tell me why you arrange the statements the way you did. As I told you at the beginning of our session that there is no right or wrong way to arrange the statements, there is no right or wrong way to answer the questions I will be asking either.

Understanding of the research topic

- How will you describe the terms physical distancing and social distancing?
 - Do you think this Q session change your understanding of the terms?
 - Tell me how this session might have changed your understanding?
- Can you remember the first time you came across the terms? (The terms were used during the 2003 SARS epidemic, 2006 avian flu (H5N1), and 2020 COVID-19 pandemic)

Rationale behind Q sorting

- Please explain why you agree most with the two statements you have placed below the “3”
 - How do these statements differ from the others that you agree with?
- Please explain why you disagree most with the two statements you have placed below “-3”.
 - How do these statements differ from the others that you disagree with?
- Why do you place statements at the top or bottom of the sort sheet?
 - What influenced your decision?
- Can you identify any statement that piqued your interest or stood out to you, regardless of where you placed it?
 - Tell me why this statement stands out to you?
- Do you have any questions or comments about this research or the methodology?

Researcher: Thank you so much for sharing these additional insights with me. Your experience is invaluable to this study.

The extensive and elaborate methodological principles and technical procedures of Q methodology were presented by Brown in “Political Subjectivity: Application of Q methodology in Political Science” (Brown, 1980). Karasz (2006) phenomenally demonstrated the application of Q methodology in her health communication study, “Anti-corporate Collectivists, Capable Individuals, and Relativists: A Q methodological exploration of audiences for health communication about contaminated soils.”

Appendix 2: Correlation Matrix Between Sorts

SORTS	1	2	3	4	5	6	7	8	9	10	11	12	13
1 AL	100	43	36	39	40	29	41	55	44	50	43	27	25
2 AK	43	100	49	40	50	52	29	24	36	28	14	30	39
3 AZ	36	49	100	30	39	35	66	44	37	28	34	56	39
4 AR	39	40	30	100	30	41	17	41	42	15	-1	16	7
5 CA	40	50	39	30	100	79	42	37	61	45	27	35	35
6 CO	29	52	35	41	79	100	43	42	53	37	6	35	36
7 CT	41	29	66	17	42	43	100	56	37	69	45	61	48
8 DE	55	24	44	41	37	42	56	100	54	59	39	53	49
9 FL	44	36	37	42	61	53	37	54	100	48	26	49	32
10 GA	50	28	28	15	45	37	69	59	48	100	50	47	39
11 HI	43	14	34	-1	27	6	45	39	26	50	100	40	36
12 ID	27	30	56	16	35	35	61	53	49	47	40	100	85
13 IL	25	39	39	7	35	36	48	49	32	39	36	85	100

Appendix 3: Factor Scores for Type A

Factor Scores -- For Factor 1 (Type A)

No.	Statement	Z- SCORES
4	I knew that maintaining a physical distance is absolutely es	2.064
15	I think social isolation has a great impact on mental and ph	1.935
5	I think it is important to differentiate between the two ter	1.134
24	I am sure that maintaining social and emotional connectednes	1.012
19	I helped promote emotional togetherness during the pandemic;	0.928
7	I think that physical distancing can be used to stress the n	0.898
16	Social distancing may be sending the wrong message to people	0.855
2	We all know that social distancing encourages the use of thi	0.772
28	Staying physically isolated from other people during the pan	0.708
18	Cultivating social connections while practicing physical dis	0.696
12	I think a big problem with the term social distancing is tha	0.590
6	Some people think that social distancing makes it sound like	0.286
17	Some people can interpret social distancing to mean that the	0.123
22	I think using the term physical distancing may promote socia	0.038
25	I find it very hard to adhere to staying six feet apart when	0.018
10	We would have gotten COVID-19 infection under control if eve	-0.030
26	I spend time with other people during the pandemic because s	-0.198
30	Staying six feet apart from people to avoid getting infected	-0.263
11	I am really worried that I will be infected with COVID-19 ev	-0.317
27	If someone in my household become infected with COVID-19, I	-0.329
1	Everybody knows that physical distancing is the practice of	-0.337
13	I am worried that the term physical distancing does not prom	-0.615
23	I do not think staying connected with loved ones during the	-0.664
21	We all have the fundamental need for connection with one ano	-0.731
14	I find it challenging to practice social connection while ma	-1.023
9	Social distancing can be seen as a familiar phrase that ever	-1.412
3	I think the terms physical distancing and social distancing	-1.463
20	Everybody knew that what is needed to prevent COVID-19 infec	-1.527
29	I am very worried that the government is controlling the pla	-1.535
8	I do not care what term is used; everyone understands the pr	-1.613

Appendix 4: Factor Scores for Type B

Factor Scores -- For Factor 2 (Type B)

No.	Statement	Z- SCORES
4	I knew that maintaining a physical distance is absolutely es	1.913
15	I think social isolation has a great impact on mental and ph	1.364
7	I think that physical distancing can be used to stress the n	1.286
18	Cultivating social connections while practicing physical dis	1.006
2	We all know that social distancing encourages the use of thi	1.005
1	Everybody knows that physical distancing is the practice of	0.956
24	I am sure that maintaining social and emotional connectednes	0.903
30	Staying six feet apart from people to avoid getting infected	0.853
5	I think it is important to differentiate between the two ter	0.836
9	Social distancing can be seen as a familiar phrase that ever	0.506
8	I do not care what term is used; everyone understands the pr	0.400
19	I helped promote emotional togetherness during the pandemic;	0.314
21	We all have the fundamental need for connection with one ano	0.272
26	I spend time with other people during the pandemic because s	0.194
17	Some people can interpret social distancing to mean that the	0.067
16	Social distancing may be sending the wrong message to people	-0.050
20	Everybody knew that what is needed to prevent COVID-19 infec	-0.112
27	If someone in my household become infected with COVID-19, I	-0.252
6	Some people think that social distancing makes it sound like	-0.312
3	I think the terms physical distancing and social distancing	-0.364
12	I think a big problem with the term social distancing is tha	-0.386
14	I find it challenging to practice social connection while ma	-0.528
10	We would have gotten COVID-19 infection under control if eve	-0.558
22	I think using the term physical distancing may promote socia	-0.570
28	Staying physically isolated from other people during the pan	-0.729
25	I find it very hard to adhere to staying six feet apart when	-0.802
13	I am worried that the term physical distancing does not prom	-1.246
11	I am really worried that I will be infected with COVID-19 ev	-1.873
23	I do not think staying connected with loved ones during the	-1.929
29	I am very worried that the government is controlling the pla	-2.165

Appendix 5: Differences between Factor Scores for Type A and Type B

Descending Array of Differences Between Factors 1 and 2 (Type A and Type B)

No.	Statement	Type A	Type B	Difference
11	I am really worried that I will be infected with COVID-19 ev	-0.317	-1.873	1.557
28	Staying physically isolated from other people during the pan	0.708	-0.729	1.437
23	I do not think staying connected with loved ones during the	-0.664	-1.929	1.265
12	I think a big problem with the term social distancing is tha	0.590	-0.386	0.976
16	Social distancing may be sending the wrong message to people	0.855	-0.050	0.906
25	I find it very hard to adhere to staying six feet apart when	0.018	-0.802	0.820
13	I am worried that the term physical distancing does not prom	-0.615	-1.246	0.631
29	I am very worried that the government is controlling the pla	-1.535	-2.165	0.630
19	I helped promote emotional togetherness during the pandemic;	0.928	0.314	0.614
22	I think using the term physical distancing may promote socia	0.038	-0.570	0.608
6	Some people think that social distancing makes it sound like	0.286	-0.312	0.598
15	I think social isolation has a great impact on mental and ph	1.935	1.364	0.571
10	We would have gotten COVID-19 infection under control if eve	-0.030	-0.558	0.529
5	I think it is important to differentiate between the two ter	1.134	0.836	0.298
4	I knew that maintaining a physical distance is absolutely es	2.064	1.913	0.150
24	I am sure that maintaining social and emotional connectednes	1.012	0.903	0.109
17	Some people can interpret social distancing to mean that the	0.123	0.067	0.057
27	If someone in my household become infected with COVID-19, I	-0.329	-0.252	-0.078
2	We all know that social distancing encourages the use of thi	0.772	1.005	-0.233
18	Cultivating social connections while practicing physical dis	0.696	1.006	-0.310
7	I think that physical distancing can be used to stress the n	0.898	1.286	-0.388
26	I spend time with other people during the pandemic because s	-0.198	0.194	-0.393
14	I find it challenging to practice social connection while ma	-1.023	-0.528	-0.495
21	We all have the fundamental need for connection with one ano	-0.731	0.272	-1.003
3	I think the terms physical distancing and social distancing	-1.463	-0.364	-1.099
30	Staying six feet apart from people to avoid getting infected	-0.263	0.853	-1.116
1	Everybody knows that physical distancing is the practice of	-0.337	0.956	-1.293
20	Everybody knew that what is needed to prevent COVID-19 infec	-1.527	-0.112	-1.416
9	Social distancing can be seen as a familiar phrase that ever	-1.412	0.506	-1.918
8	I do not care what term is used; everyone understands the pr	-1.613	0.400	-2.013

Appendix 6: Factor Q-Sort Values for Each Statement

No.	Statement	Factor Arrays	
		1 (Type A)	2 (Type B)
1	Everybody knows that physical distancing is the practice of	-1	2
2	We all know that social distancing encourages the use of thi	1	2
3	I think the terms physical distancing and social distancing	-2	-1
4	I knew that maintaining a physical distance is absolutely es	3	3
5	I think it is important to differentiate between the two ter	3	1
6	Some people think that social distancing makes it sound like	1	-1
7	I think that physical distancing can be used to stress the n	2	3
8	I do not care what term is used; everyone understands the pr	-3	1
9	Social distancing can be seen as a familiar phrase that ever	-2	1
10	We would have gotten COVID-19 infection under control if eve	0	-1
11	I am really worried that I will be infected with COVID-19 ev	-1	-3
12	I think a big problem with the term social distancing is tha	1	-1
13	I am worried that the term physical distancing does not prom	-1	-2
14	I find it challenging to practice social connection while ma	-2	-1
15	I think social isolation has a great impact on mental and ph	3	3
16	Social distancing may be sending the wrong message to people	2	0
17	Some people can interpret social distancing to mean that the	0	0
18	Cultivating social connections while practicing physical dis	1	2
19	I helped promote emotional togetherness during the pandemic;	2	1
20	Everybody knew that what is needed to prevent COVID-19 infec	-3	0
21	We all have the fundamental need for connection with one ano	-2	0
22	I think using the term physical distancing may promote socia	0	-2
23	I do not think staying connected with loved ones during the	-1	-3
24	I am sure that maintaining social and emotional connectednes	2	2
25	I find it very hard to adhere to staying six feet apart when	0	-2
26	I spend time with other people during the pandemic because s	0	0
27	If someone in my household become infected with COVID-19, I	-1	0
28	Staying physically isolated from other people during the pan	1	-2
29	I am very worried that the government is controlling the pla	-3	-3
30	Staying six feet apart from people to avoid getting infected	0	1
Variance= 3.200 St. Dev.= 1.789			

Appendix 7: Factor Scores with Corresponding Ranks

No.	Statement	Factors			
		1 (Type A)		2 (Type B)	
1	Everybody knows that physical distancing is the practice of	-0.34	21	0.96	6
2	We all know that social distancing encourages the use of thi	0.77	8	1.01	5
3	I think the terms physical distancing and social distancing	-1.46	27	-0.36	20
4	I knew that maintaining a physical distance is absolutely es	2.06	1	1.91	1
5	I think it is important to differentiate between the two ter	1.13	3	0.84	9
6	Some people think that social distancing makes it sound like	0.29	12	-0.31	19
7	I think that physical distancing can be used to stress the n	0.90	6	1.29	3
8	I do not care what term is used; everyone understands the pr	-1.61	30	0.40	11
9	Social distancing can be seen as a familiar phrase that ever	-1.41	26	0.51	10
10	We would have gotten COVID-19 infection under control if eve	-0.03	16	-0.56	23
11	I am really worried that I will be infected with COVID-19 ev	-0.32	19	-1.87	28
12	I think a big problem with the term social distancing is tha	0.59	11	-0.39	21
13	I am worried that the term physical distancing does not prom	-0.62	22	-1.25	27
14	I find it challenging to practice social connection while ma	-1.02	25	-0.53	22
15	I think social isolation has a great impact on mental and ph	1.93	2	1.36	2
16	Social distancing may be sending the wrong message to people	0.86	7	-0.05	16
17	Some people can interpret social distancing to mean that the	0.12	13	0.07	15
18	Cultivating social connections while practicing physical dis	0.70	10	1.01	4
19	I helped promote emotional togetherness during the pandemic;	0.93	5	0.31	12
20	Everybody knew that what is needed to prevent COVID-19 infec	-1.53	28	-0.11	17
21	We all have the fundamental need for connection with one ano	-0.73	24	0.27	13
22	I think using the term physical distancing may promote socia	0.04	14	-0.57	24
23	I do not think staying connected with loved ones during the	-0.66	23	-1.93	29
24	I am sure that maintaining social and emotional connectednes	1.01	4	0.90	7
25	I find it very hard to adhere to staying six feet apart when	0.02	15	-0.80	26
26	I spend time with other people during the pandemic because s	-0.20	17	0.19	14
27	If someone in my household become infected with COVID-19, I	-0.33	20	-0.25	18
28	Staying physically isolated from other people during the pan	0.71	9	-0.73	25
29	I am very worried that the government is controlling the pla	-1.54	29	-2.17	30
30	Staying six feet apart from people to avoid getting infected	-0.26	18	0.85	8