

RISK PERCEPTION AND COMMUNICATION MODELING IN THE COVID-19 ERA: STUDY WITH EXPERT JUDGES

PERCEPÇÃO DE RISCO E MODELAGEM DA COMUNICAÇÃO NA ERA COVID-19: ESTUDO COM JUÍZES EXPERIENTES

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Abstract

The explanatory trajectories of knowledge management of organizations that tend to balance opportunities and capacities through motivational leadership processes are specified. A documentary, cross-sectional and non-experimental study was carried out with a selection of sources indexed to international repositories such as Academia, Copericus, Dialnet, Fronters, Latindex, Redalyc, Scielo, Scopus and Zenodo, as well as registered in ISSN-DOI in the period. 2019 to 2021. The dependency relationships between determining variables - norms, values, beliefs, perceptions - with respect to knowledge management were modeled. The model explains the balance related to power and the influence between leaders and followers. Motivational mediating variables, such as: attitude, intention, skill, and knowledge were included. In relation to the proposals of the state of knowledge and the literature reviewed, the relevance of the model compared to other proposals was discussed.

Keywords: Culture, Determinants, Management, Mediation, Model, Specification.

Resumo

São especificadas as trajetórias explicativas da gestão do conhecimento das organizações que tendem a equilibrar oportunidades e capacidades por meio de processos de liderança motivacional. Foi realizado um estudo documental, transversal e não experimental com uma seleção de fontes indexadas em repositórios internacionais como Academia, Copericus, Dialnet, Fronters, Latindex, Redalyc, Scielo, Scopus e Zenodo, bem como cadastradas no ISSN- DOI no período. 2019 a 2021. Foram modeladas as relações de dependência entre variáveis determinantes - normas, valores, crenças, percepções - no que diz respeito à gestão do conhecimento. O modelo explicou o equilíbrio entre as relações de poder e influência do líder em relação aos seus seguidores, incluindo variáveis mediadoras de ordem motivacional-atitude, intenção, habilidade e conhecimento. Em relação às propostas do estado do conhecimento e da literatura revisada, foi discutida a relevância do modelo em relação a outras propostas.

Palavras-chaves: Cultura. Determinantes. Especificação. Gestão. Mediação. Modelo.

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Introduction

Until May 2021, Covid-9 caused the death of six million people if the under-records are considered and three million are inferred, considering the excess of mortality with respect to the annual average of deaths (WHO, 2021). Se reconocen 250 mil, pero se infieren 450 mil muertes más frente a los promedios de los últimos dos años (PAHO, 2021). In this context, pandemic mitigation policies have focused on confinement and social distancing, leading to risk communication focused on the risks of contagion, illness and death.

The concept of human capital refers to knowledge networks that acquire a formative, assimilative, technological, individual, motivational and social mobility sense (GARCÍA, 2018).

Rational choice is limited to a training system where the individual generates their own opportunities and develops both skills and knowledge based on the utility and benefit of their decisions (ACAR and ACAR, 2014). In this sense, knowledge networks burst the human capital to endow it with legitimacy and transparency when debating and agreeing on the decisions that will benefit a group or community, be it academic, scientific and/or technological (HERNÁNDEZ et al., 2018).

Competition and cooperation, involved in the formation of human capital, outline the strategies for balancing demands and resources for knowledge networks. Knowledge networks determine the symbols and meanings relevant to collaboration and conflict resolution within innovative groups. In this sense, intelligent systems promote technological change and organizations must adjust their capacities to the undertaking of new knowledge (SAANSONGU and NGUTOR, 2012).

The opportunities resulting from the dynamics of innovative networks will delineate the development of skills and knowledge. It is a process of creating value for the individual, the collaborative group and the innovative organization (SÁNCHEZ et al., 2018). Although human capital highlights the importance of individual decisions in relation to innovation groups, the management culture goes beyond this synergy because it involves a balance between the values of the company and the leader's

capacity. Therefore, the specification of a model for the study of the culture of knowledge management through collaborative networks will explain such complexity.

The objective of this work is to model the perception of risk in the Covid-19 era. Based on a review of the theoretical, conceptual and empirical frameworks, logical trajectories were established for the prediction of management in the face of demands that exceed resources and their optimization is encouraged.

Are there significant differences between the categories and the findings reported in the literature regarding the qualifications of expert judges in risk perception and communication?

The premise that guides this work is that the pandemic has had asymmetric effects between the governors and the governed, affecting the communication of the public administration and the public perception of the phenomenon (GUILLEN et al., 2021). The authorities, by betting on a mitigation focused on the spread of confinement and social distancing, caused a perception of threats, and risks that citizen have encapsulated in the distrust of their health institutions (RINCON et al., 2021). In this process, the media have played a fundamental role in contrasting the propaganda of the State (control and management of Covid-19 reflected in the hospitalized). It is a logic of verifiability that consists of comparing data from the communiqués of official press regarding the number of cases higher than the national and annual average (SANDOVAL et al., 2021). Governments ignore the data, and this lack of transparency generates the civil undertaking that consists of searching, processing and disseminating data that the State partially recognizes or exacerbates as the electoral elections approach.

Theory of risk perception and communication

Organizational culture is understood as a process of dependency between internal and external variables. It is a scheme in which technology, structure, values, norms and needs determine the motivational variables - affiliation, power, utility - and these in turn affect the consequent variables - leadership, management,

entrepreneurship, innovation, productivity, satisfaction, rotation, absenteeism, accident rate, adaptation, innovation, reputation.

In this process, the labor culture theory holds that values and norms are the determinants of consequent variables through mediating and moderating variables (SALES et al., 2016). Moderator variables can reduce or increase both negative or positive effects of variables external to the organization. Although the autocratic culture is distinguished by the one-sidedness of its decisions, in the case of knowledge, to the extent that autocratic values decrease, they affect the commitment of loyal workers to the leader. Autocratic management increases the influence of democratic values when they affect cooperation between employees. That is, the symbiosis between culture and organizational structure would suppose an asymmetric relationship between autocratic management and labor collaboration (JANIĆIJEVIĆ, 2013).

The mediating variables are those that only transfer the effects of the values and the norms on the consequent variables. This is the case of attitudes and intentions that not only link norms and values with behaviors, but also give them a cultural meaning. Autocratic values, when linked to obedience and conformity behaviors, are mediated by one-sided attitudes.

In this way, the theory of organizational culture explains scenarios of consequent variables based on autocratic or democratic values and norms.

The labor culture supposes indicators that would correspond with the features of the consequent variables. In this sense, the management culture to be indicated by self-efficacy, hope, resilience and optimism involves a process of autocratic values and standards from which emerges a leadership and with it a specialist in management (VÁZQUEZ et al., 2016).

In the opposite case, the absence of leadership and management is determined by depersonalization, exhaustion or relative frustration with unilateral tasks, objectives and goals. Therefore, the theory of labor culture explains the emergence of management only if norms and values indicate an autocratic

process from which decisions and strategies are centered on a leader specialized in management (QUINTERO et al., 2016).

However, organizational management is a more specific process than those explained by the theory of work culture. A management becomes specific because the work culture, its values and norms are specific in the objectives and goals of the management.

Studies of risk perception and communication

Organizational management, unlike the work culture, is a specific process since it involves ponderable and comparable objectives and goals. In this sense, organizational management refers to a process of indicators linked to the systematic monitoring and evaluation of processes, strategies and behaviors. Organizational management is guided by innovative values and norms. It is a process of systematic and constant change, according to the contingencies of the environment and therefore contrary to the vertical and unilateral structure of the autocratic culture (CRUZ et al., 2016).

However, organizational management derived from the autocratic culture supposes historically different goals and objectives in the face of innovations and specific changes. As the organizational management is specified and intensified, the autocratic culture is reduced to its minimum expression and gives way to a more participatory culture. Therefore, organizational management involves competition regarding proposals and monitoring and evaluations (HERNÁNDEZ and VALENCIA, 2016). It is because of these differences between cultures and management that the theory of organizational management explains the advent of an innovation and a change based on the interrelation between power - unilateral decisions and vertical structures that produce obedience and conformity in the majority - and influence - intentions of change based on innovations of minorities. That is, those who make decisions are circumscribed to power and influence relationships as the

objectives and goals are more specific, but if both are not modified from the achievement of achievements, then it is an autocratic culture (ROBLES et al., 2016).

In this way, transformational leadership is linked to variables related to the processes of influence rather than power, since the motivation for effectiveness, satisfaction and effort means characteristics of concerted management between the leader and the followers (MENDOZA et al. ., 2016). Or, when communication, cohesion and support negatively correlate with attrition, depersonalization and dissatisfaction, but positively impact the commitment, then we witness a scenario in which the autocratic majority culture interacts with the participation of minorities.

Organizational management theory explains the advent of the interrelationship between power relations -decisions deciding on the behavior of followers- and relationships of influence -talents generating opportunities and knowledge-. From both theories, labor culture and organizational management, it is possible to specify the logical explanatory trajectories of consequent variables.

Modelling of risk perception and communication

Unlike the culture and work management where fatalistic or optimistic scenarios are anticipated based on correlations between external variables with respect to variables internal to the organization, the specification of a model integrates the variables to infer trajectories of dependency relationships. The specification of a model supposes a revision of the relations of dependence established in studies of the prediction of a process, strategy or behavior. It is assumed that the explanatory variables with respect to the variables to be predicted form a system of logical trajectories known as the nomological network. In this sense, dependency relationships explain the nomological networks that are established from a review of the literature during a given period (GARCÍA et al., 2016).

However, the specification of a model to depend on enough studies related to a process, strategy or behavior, assumes preponderant trajectories that have not always been demonstrated by the studies (GARCIA, 2020). Therefore, it is necessary to

postulate dependency relationships that, since they have not been established logically or empirically, creativity or intuition can postulate as feasible relationships between the variables reviewed, or postulate variables that are not conceptualized or weighted by the state of knowledge. In the case of relationships not established by the literature, it is possible to infer them from studies in which the variables were conceptualized and / or weighted in order to explain other processes, strategies or behavior similar or different from those that are intended to explain. In the case of variables not used in the studies of a process, strategy or organizational behavior, it is possible to infer it from the correlations between indicators.

The specification of a model is made from 1) include the empirical relationships demonstrated by the literature reviewed and 2) propose variables and relationships not established by the state of knowledge. In this sense, the studies of culture and labor management have shown that values and norms are variables external to the relations of power and influence in an organization.

However, norms and values when interacting with environmental contingencies are associated with the processing of available information known as beliefs and perceptions (OMOTAYO and ADENIKE, 2013). The external variables; values, norms, beliefs and perceptions explain consequent variables such as; entrepreneurship, innovation, satisfaction, productivity, competitiveness, turnover, absenteeism, dissatisfaction, unproductivity, compliance or obedience.

However, since the determining variables are indicative of general processes that would affect specific variables, they must be mediated or moderated by variables such as attitudes, abilities, opportunities, intentions, knowledge or emotions (GONZALEZ & TORTOLERO, 2020). The mediating and moderating variables allow to specify and intensify the effect of the determining variables on the consequent variables. This is how the culture model of knowledge management would include six explanatory hypotheses of trajectories of logical relations between the determining variables and management, mediated by motivation, attitude, intention, skills and knowledge.

These are the studies related to the traditional and transformational leadership styles in which the difference between external demands and resources optimized by

the talent of the leader is explained but reducing the participation to a function of expectation (GARCIA, 2021). Knowledge networks are the result of the interaction between market demands and the optimization of resources based on information on possible scenarios. Opportunities and capabilities are concomitant because they derive from a participatory and competitive culture. In these investigations, the effects of the surrounding information with respect to culture and management are explained by the interrelation of the determinant variables with leadership styles, opportunities, capacities, objectives and goals. The management that proposes feasible scenarios is studied from the intentionality of its objectives and goals based on information from the balance between demands and resources. The formation of knowledge networks is explained by the norms, values, beliefs and perceptions of talents, as well as the motivation of leaders, the formation of skills, knowledge and attitudes around planned and systematic decisions.

Method

The literature published from 2019 to 2021 was reviewed. In relation to the analysis of the state of the art, an exploratory work was proposed and a cross-sectional study regarding the observation threshold, considering that the phenomenon is permanent.

A search of articles in indexed repositories: 1) Academia, 2) Copernicus, 3) Dialnet, 4) Ebsco, 5) Frontiers, 6) Latindex, 7) Redalyc, 8) Scielo, 9) Scopus y 10) Zenodo was carried out, considering the analysis period, as well as the keywords: a) risk perception and b) risk communication. From a total of 320 abstracts, 6 were selected that made up the analysis sample related to the perception of knowledge as part of the formation of intellectual capital.

The opinion questionnaire, content analysis and Delphi technique were used for data analysis and information processing, considering the period of observation and systematization of the state of knowledge.

Opinion Questionnaire. It included questions related to risk communication, considering the findings regarding the effect of the confinement strategy on teleworking, social distancing on the perception of contagion and public trust towards the application of tests or vaccines.

Content Analysis. A keyword search was carried out in www.google.scholar in order to be able to select the abstracts and process the data according to the qualification of expert judges (attached to the transdisciplinary academic network) on the subject. A value of -1 was assigned to the summaries that reported the perception of knowledge as an exogenous process to the formation of intellectual capital, with 0 for those who only mentioned the concept and +1 for those who modeled the term as a variable.

Delphi Technique. In three rounds; 1) qualifying where the expert judges assigned a negative value to the communication of distant risks to the data of infections and deaths, as well as a positive value to the communication adjusted to the data of the Ministry of Health of the State of Mexico; 2) feedback where individual grades are compared to the general average; 3) reconsideration when personal criteria are adjusted to the general average.

The analysis package for social sciences version 23.0 was used considering the parameters of normal distribution, contingency, proportion, adjustment and residual in order to be able to observe the relationships between categories and analyzed findings, as well as their structural configuration.

Results

Table 1 shows the exclusion criteria: risk perception and communication. Perception refers to short-term expectations about vaccines. The communication suggests medium-term expectations about vaccines.

Table 1. Descriptive data

Repository	Category 1			Category 2		
	2019	2020	2021	2019	2020	2021
Academia	3	1	5	3	3	1
Copernicus	4	2	4	2	2	2
Dialnet	2	3	3	4	2	3
Ebsco	5	5	5	2	2	1
Frontiers	3	4	2	2	1	4
Latindex	1	1	4	1	3	3
Redalyc	4	2	3	3	3	5
Scielo	3	3	5	4	0	4
Scopus	0	0	0	0	0	0
Zenodo	0	2	1	0	5	1

Note: Elaborated with data study; Category 1 = Perception of Risk, C2 = Communication of risk

Table 2 shows a distribution that tends to be normal, making it possible to perform contingency analysis to test hypotheses.

Table 2. Descriptive of instrument

	E	M	SD	C1			C2		
				χ^2	df	P	χ^2	df	p
SANCHEZ et al., (2020)	e1	,783	,180	14,21	12	,01	10,32	12	,01
GARCIA (2019)	e2	,943	,105	15,46	11	,02	18,32	11	,05
GARCIA (2020)	e3	,547	,156	13,24	15	,04	19,45	16	,08
GARCIA et al., (2019)	e4	,672	,134	10,32	16	,09	12,13	15	,02
GARCIA (2021)	e5	,832	,158	14,32	10	,07	10,43	10	,04
LOPEZ (2019)	e6	,704	,120	19,32	12	,03	13,21	11	,01

Note: Elaborated with data study; E = Extract, M = Mean, SD = Standard deviation, C = category, C1 = Perception of Risk, C2 = Communication of Risk

To find and be able to establish the axes of discussion around the ten selected extracts in risk thresholds, we proceeded to estimate the matrix of probability proportions (see Table 3).

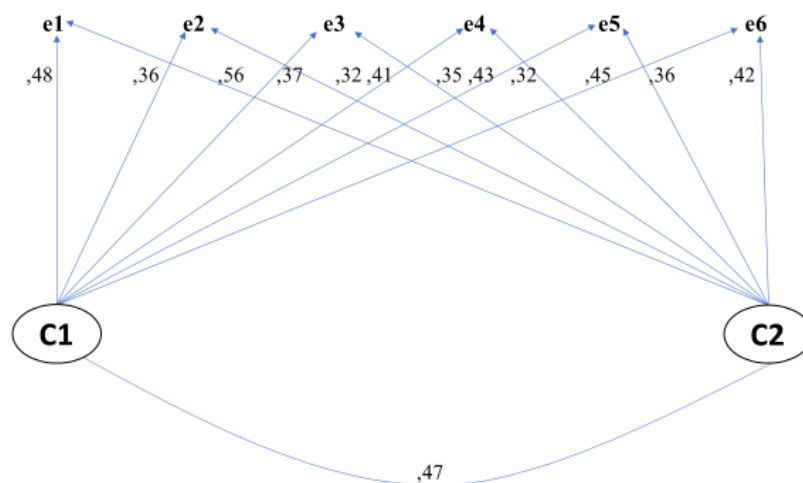
Table 3. Odds ratios among selected press releases by month during the pandemic Freire (2013, p. 40)

	n1	n2	n3	n4	n5	n6
e1	12,34 (10,21 18,43)					
e2	14,32 (13,23 19,45)	10,21 (14,32 17,45)				
e3	13,21 (10,45 15,49)	15,46 (11,90 19,34)	15,46 (12,13 14,35)			
e4	14,35 (12,13 15,46)	15,46 (10,45 18,34)	14,23 (10,45 18,21)	15,46 (12,13 19,45)		
e5	14,23 (14,35 19,56)	16,57 (13,24 19,54)	13,24 (10,45 17,45)	13,24 (14,32 15,40)	11,23 (14,35 19,54)	
e6	14,56 (13,24 15,46)	15,43 (17,34 19,45)	14,35 (10,43 18,43)	12,13 (15,46 18,53)	19,43 (14,35 18,21)	14,32 (12,34 17,43)

Note: Elaborated with data study; e1 = SANCHEZ et al., (2020), e2 = GARCIA (2019), e3 = GARCIA (2020), e4 = GARCIA et al., (2019), e5 = GARCIA (2021), e6 = LOPEZ (2019).

Once the probability ratio matrix was established, which indicates that the consultation decisions of the selected literature are at the permissible risk threshold for decision-making, a model of structural equations was estimated in order to appreciate its composition of categories and extracts (see Figure 1).

Figure 1. Structural equation modelling



Note: Elaborated with data study; C1 = Perception of Risk, C2 = Communication of Risk, e1 = SANCHEZ et al., (2020), e2 = GARCIA (2019), e3 = GARCIA (2020), e4 = GARCIA et al., (2019), e5 = GARCIA (2021), e6 = LOPEZ (2019).

The adjustment and residual parameters [$\chi^2 = 13,24$ (13df) $p > ,05$; NFI = ,997; CFI = ,990; RMSEA = ,006] suggest the non-rejection of the null hypothesis relative to the significant differences between the models reported in the literature with respect to the structure established in the present work.

Discussion

The contribution of this work to the situation lies in the modeling of the perception of knowledge, if the literature consulted links this process to the formation of intellectual capital, as well as to the management of entrepreneurship and innovation. In relation to the theoretical, conceptual and empirical frameworks, the inclusion of organizational culture as a mediator of the demands of the environment and the structural representation of organizational resources is recommended.

The modeling of the perception and communication of risks was contrasted with three references of the six selected for analysis with experts. This is so because these three studies refer to both categories as mediators of anti-Covid-19 policies.

PEREZ et al., (2016: p. 7) suggested that the estimation of decision thresholds be established from a modeling of trajectories, but in the present work the relationships between the categories and the extracts at least indicate a complex structure of data that can be actionable, but adjustable to the decision criteria in the evidence.

AGUILLAR et al., (2018: p. 25) They consider knowledge management as a source of data that can be materialized in task protocols for the achievement of objectives discernible to goals, although in the present work it is noted that the perception of risk is linked to knowledge management. The influence of the pandemic seems to have established a more permissible threshold of risks for knowledge managers than are reported in the state of the art.

GARCIA (2021; p. 31) suggests risk management thresholds whose decisions are legitimized based on the codification of objectives, tasks and goals, but in this work it has been shown that risk perception is linked to knowledge management in the selected literature, differentiating itself as an alternate process and a clear impact on

performance. Research lines related to risk management will clarify the limits of intention to carry out a task based on data-oriented goals.

Lines concerning risk perception and knowledge management will make it possible to warn of the risk thresholds related to decisions to train intellectual capital in health contingencies such as the SARS CoV-2 pandemic and the Covid-19 disease.

The contribution of the present work to the state of knowledge consists in the specification of the relations and the logical trajectories between the cultural variables that determine the management of knowledge through mediating variables. However, the possible relationships between the variables included in the model suppose more explanations that can be compared with the established ones. In this sense, the debate around the direct determination of the management from the norms, values, beliefs and perceptions contrasts with the specification of the present model, since the mediating variables could be suppressed in autocratic organizations and diversified into participative organizations. Therefore, the specification of the model explains the culture and management of organizations balanced between their demands and resources, opportunities and capacities, power and influence. In contexts of uncertainty, scarcity and risk, organizations tend to be more participatory and require models of culture and management that are more diverse, specific and innovative.

Even when the environment is uncertain, organizations have based their emergence and persistence on the balance between their processes. The objectives and goals of the organizations not only reflect their culture, but also base their human essence, since leaders and followers are the central elements of their intentions and products.

Conclusion

The model can be made from six references that explain the asymmetries between rulers and ruled in the face of the pandemic. Such proposal lies in the establishment of two perceptual categories around which six findings converge, reflecting the logic of citizen verifiability that emerges from the lack of transparency of

the State regarding the pandemic. In this sense, expert judges corroborate the assumption according to which the rulers ignore the data of the ministries and statistical institutions regarding infection, disease and deaths from Covid-19. In such a scenario, the media is a contrast to government propaganda that minimizes or overlooks the differences between official records and their press releases, statements, or conferences.

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Data do envio: 12/04/2020

Data do aceite: 10/11/21

