

Cross-Disciplinary Communication in a Translational Medicine Center: An Analysis of Networks and Logics

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This article explores the communication patterns and beliefs of researchers and clinicians working in translational medicine organizations. From an institutional logics' perspective, we conducted this case study using surveys, network analysis, and interviews. Our network analysis revealed that most members had frequent communication with others, showing high connectivity between and within subgroups. Probing the corpus of interview notes and using an iterative approach, we found that basic researchers and clinicians differentially recognized and referred to the logics of care and the logics of science. However, both groups were able to identify some forms of bridged logics. This article contributes to our understanding of the development of robust translational medicine and the use of institutional logics in action.

Keywords: translational medicine, organizational communication, health communication

Over the last 20 years, scholars have explored hybrid professions and organizations (Ashcraft, 2001; Battilana, Besharov, & Mitzinneck, 2017; Billis, 2010; Borys & Jemison, 1989; Castor & Cooren, 2006; Harter, Leeman, Norander, Young, & Rawlins, 2008; Pache & Santos, 2013; Poole, Putnam, & Seibold, 1997; Sillince & Barker, 2012). However, this research has not yet penetrated the burgeoning work on translational medicine (Marincola, 2003; Wehling, 2008; Woolf, 2008). Translational medicine is not so much an effort to hybridize, "mixing of core organizational elements that would not conventionally go together" (Battilana et al., 2017, p. 129), but to *bridge* the work of researchers and clinicians. Thus, the challenge of translational medicine is to construct communication channels that facilitate interactions between those working in the

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laboratory and those working at the bedside and, in several definitions, the community (Cohrs et al., 2015). Institutional theory plays a role in this enterprise because these cross-disciplinary bridges are launched from differing institutional logics.

There is scant communication scholarship exploring translational medicine. Indeed, Robert (2017) argued that translational research is a communication problem that health communication scholars should address. Specifically, he identified two communication challenges as “connection and collaboration between scientists [referring to researchers] themselves and between scientists [referring to researchers], clinicians, and patient/publics” (Robert, 2017, p. 219).

Focusing on the first two components of translational medicine (research and clinical work), this study has two main objectives (a) to study the communication connections between researchers and clinicians working in a translational medicine center and (b) to identify the institutional logics they express connecting to translational medicine. In the following sections, we briefly review the literature on translational medicine and the challenges faced by both practitioners and analysts in the field. This leads to a review of the theoretical framework of institutional logics, especially in the professions of science and medicine. We then describe our research setting, an academic translational medicine center. Our analysis consists of two parts. First, we display the results of the network study based on the participants’ reports of working together. These findings lead us to the analysis of interview data, which reveals differences in how scientists and clinicians view the logics of care and science and the possibilities for bridging logics. In conclusion, we outline the challenges of translational medicine, including those faced by analysts who study this process.

Literature

Translation Medicine Research

According to Woolf (2008), translational research means “different things to different people” (p. 211). Translational research is often used interchangeably with translational medicine. Each is part of the emerging field of translational science concerned with making the boundaries between science and medicine permeable. In other words, it translates scientific research into clinical practice (Marincola, 2003; Wehling, 2008). There are two dominant conceptualizations of this process in health research. First, translational medicine refers to the “‘bench-to-bedside’ enterprise of harnessing knowledge from basic sciences to produce new drugs, devices, and treatment options for patients” (Woolf, 2008, p. 211). Second, it indicates “translating research into practice by ensuring that new treatments and research knowledge actually reach patients or populations for whom they are actually intended and are implemented correctly” (Woolf, 2008, p. 211). In essence, translational medicine is a salient, albeit difficult process, developing in the commercial and academic field that hopes to build a bridge between science and medicine.

Much of the existing literature on translational medicine focuses on the challenges of doing this work (Poher, Neuhauser, & Poher, 2001). In a 2004 commentary on the discipline of translational medicine, Mankoff, Brander, Ferrone, and Marincola (2004) identified three major challenges of translational medicine:

Translating basic science into clinical studies, translating clinical studies into medical practice and health care policy, and funding the enterprise (p. 4). Similarly, Zhou, Li, Bosworth, Ehiri, and Lou (2013) conducted a qualitative study exploring the challenges of conducting translational research in China and argued that difficulties stemmed from attaining funding, expanding multidisciplinary cooperation, and developing multidisciplinary translational researchers. These barriers include academic contexts that emphasize departmental advancements rather than interdisciplinary programs (Pober et al., 2001). This work demonstrated that the difficulties with translational work lie in constructing the material, disciplinary, and communicative conditions for collaborating effectively and meaningfully.

In addition to Robert (2017) cited above, other communication scholars point to the possibilities of translational research. Treise, Baralt, Birnbrauer, Krieger, and Neil (2016) highlighted the “benefits of translational collaboration for addressing complex health problems” and suggested that the work is most successful when the people involved feel like “full partners in collaboration” (p. 196). Parrott (2008) emphasized the need to study the underlying values and beliefs that hinder and afford translational research, maintained through the disciplinary, organizational, and departmental contexts in which the work is facilitated. One approach to understanding those underlying values and beliefs is to consider institutional logics, to which we now turn.

Institutional Logics and Translational Medicine

Friedland and Alford (1991), Thornton and Ocasio (2008), and Thornton, Ocasio, and Lounsbury (2012) defined institutional logics as “socially constructed historical patterns of cultural symbols and material practices including assumptions, values, and beliefs, by which individuals and organizations provide meaning to their daily activities, organize time and space, and reproduce their lives and experiences” (Thornton and Ocasio, 2008, p. 100). Through an institutional logics’ perspective in a communicative sense, we draw on Lammers and Proulx (2016), who defined logics as arguments about the world.

Institutional logics provide theoretical constructs to explain how people act, giving sense to a common purpose. As Shaw, Kontos, Martin, and Victor (2017) explained, health care providers “bring institutional ideas into being as institutional logics” (p. 83). As a result, the multiple interplays of institutional logics create diverse organizational situations. Therefore, as Brantnell and Baraldi (2020) argue, segmenting or compartmentalizing strategies influence how logics work in organizations. Furthermore, as part of the segmenting process, bridging “has been proposed as a strategy to deal with conflicting logics” (p. 686).

The interplay of logics within academic healthcare organizations is translational medicine. As Lander (2016) stated, achieving translational science purposes is based on missions of care, training, and research. Specifically, “by enacting their tripartite mission, academic healthcare organizations act as boundary-spanning organizations between care and science institutional logics manifesting implicit and socially shared rules of the game that prescribe behavior within a social group, thereby facilitating clinical translation” (Lander, 2016, p. 1525). In addition, Dunn and Jones (2010) previously recognized the interplay of the logic of science and care, cautioning how hard it is to integrate them.

Logic of Science

The institutional logic of science has been conceived of as a traditional type of knowledge and method. Lander (2016) explained that this logic is based on “CUDOS—communalism, universalism, disinterestedness, and organised scepticism—as idealisations of the norms of the scientific professions and primarily focuses on generating theory using scientific methods” (p. 1525). However, the logic of science is not only applicable to scientists in a laboratory, as “historians, writers, painters, auto mechanics and workers in many different fields often try to build more general concepts from specific and precise observations” (Allen & Baker, 2017, p. 33). Therefore, science is based on common processes shared by different disciplines, in which each defines its own set of activities and approaches them with knowledge.

Logic of Care

In contrast to the logic of science, the logic of care is connected to medical practices that manage illness. According to Lander (2016), care “draws on clinical experience, intuition, diagnostic testing, and patient preferences to enact the ‘art’ of medicine” (Malterud, 2001; McDonald, Cheraghi-Sohi, Bayes, Morriss, & Kai, 2013; Reay & Hinings, 2009, p. 1525). As Berggren and Karabag (2019) stated, this type of logic is manifested through the Hippocratic Oath, a “taken-for-granted ethical system” (Jotterand, 2005, p. 107) based on a “philosophy of medicine that explores the values internal to medicine, thus providing a medical-moral philosophy so as to be able to resist the deformation of medical professionalism by bioethics, biopolitics, and governmental regulation” (Jotterand, 2005, pp. 108–109). Moreover, Frost and Edgell (2022) described it as a “style of moral reasoning that prioritizes the enhancement of individual well-being or reduction of individual harm, rooted in empathy, and accounts for context and individual circumstances” (p. 3). Thus, taking good care of a person implies looking for the best approaches for evaluating what works best at each moment for each person (Bjornsdottir, 2018).

In translational medicine, the logics of science and care coexist and manifest through researchers and clinicians. As Llopis and D’este (2016) described,

the logic of science is particularly oriented to basic science contributions (. . .); meanwhile, the care logic often promotes different and often competing demands and frequently is less interested in a deep understanding of the fundamental origins of a disease, and more concerned with how existing knowledge can be put into practice. (p. 1514)

According to the translational research process, action begins with basic research, which advances knowledge that is then transferred to clinicians for the treatment and prevention of human diseases. Therefore, bridging these two logics in translational medicine organizations is necessary. In this sense, as Lander (2016) confirmed, “academic healthcare organizations implicitly aim for a combination of care and science institutional logics and the creation of a hybrid, bridging, institutional logic that facilitates translational science” (p. 1526). Now, we turn to how these two logics are bridged.

Communication as a Bridge Across the "Valley of Death"

Bridging the gap between researchers and clinicians is an important challenge to translational medicine (Kong & Segre, 2010; Restifo & Phelan, 2011). Previous scholars have studied how hard it is for translational scholars to cross through a basic science research stage, through a translation to a human phase, to finally reach a translation patient phase (Seyhan, 2019). Although efforts have been made, various obstacles impede the crucial process of crossing the "translational gap," also known as the "Valley of Death," where translation fails (Gamo et al., 2017, p. 1; Parrott, 2015). While some factors have been studied, such as reproducibility, clinical relevance, privacy issues, and risks (Seyhan, 2019), communication is still an unexplored bridge.

One of the main problems in crossing the Valley of Death is the unforeseen consideration of the communication discipline related to science. As Seyhan (2019) declared, "neither basic scientists, preoccupied with discoveries nor clinical scientists and clinicians, busy with clinical studies, are keen to communicate or cooperate" (p. 5). Furthermore, this gap between researchers and clinicians has been scarcely addressed from a communication perspective.

Few communication scholars have researched translational science (Parrott, 2015; Silk et al., 2020), with most focusing only on the phase that connects the bedside to the community. For example, Silk et al. (2020) researched translational actions related to health communication through interventions that included educational materials and outreach activities directly to communities. Furthermore, the authors argued that communication scholars "are unique trained in communication theory, research methods, and behavioral sciences, which positions them to move emerging science across social systems" (Silk et al., 2020, p. 1270). However, no communication literature has addressed the bridge between researchers and clinicians.

Based on the foregoing discussion of challenges in translational medicine and the institutional logic framework, we propose the following research questions:

RQ1: What are the patterns of communication between researchers and clinicians in a translational medicine organization?

RQ2: What are the beliefs held about translation medicine among researchers and clinicians working in a translational medicine organization?

To answer these questions, we conducted a network analysis of communication ties between researchers and clinicians as members of a translation medicine center and collected interviews to explore their beliefs. The research site is described below.

Case Study

We address these research questions through a case study of an academic healthcare center for translational medicine in Chile. We will refer to it as "The Center" to protect our participants' privacy. The

Center comprises 31 members, 8 of whom are researchers, 21 of whom are clinicians, and 2 administrators. The Center specializes in treating and studying rare cases and endocrinological diseases, focusing on the Chilean population served by the university health network to which the Center belongs. The Center is organized under two main divisions: the basic science researchers' area and the clinical area, which are subdivided into different programs according to the participants' specialization areas.

Methods

To conduct this exploratory investigation, we followed a mixed-methods approach (Creswell, 2013), combining both quantitative and qualitative methods to gain a better understanding of communication patterns at the Center. Before beginning our research, we obtained authorization from the University's Committee on Scientific Ethics in the Social Sciences, Arts, and Humanities to use our interview protocol.

Participants

From the total of 31 members of the Center, six scientists (of eight, or 75%) and seventeen clinicians (of 21, or 81%) participated in this research, corresponding to at least one representative for each program of the Center. Two administrators were also included. In total, 25 members participated in this research. Although they were not experts in translational medicine, they facilitated communication among the Center members. The majority of the participants were male (78%). In terms of their faculty academic affiliation, 91% belonged to Medicine, 4% were from Chemistry and Pharmacy, and 4% were from Biological Sciences and Medicine. The Center interviewees that belong to the basic sciences area worked on programs of immunology (4%), biomedical research (4%), genetics and epigenetics (4%), biochemistry and mass spectrometry (4%), animal and cell models (4%), and the new drugs area (4%); meanwhile, interviewees from the clinical area belonged to the programs of thyroid pathologies (17%), gynecology-endocrinology (13%), adrenal and cardiometabolic diseases (13%), endocrine hypertension (8%), adult metabolic bone disease (8%), pituitary pathology (8%), pediatric endocrinology (4%), and andrology (4%). All interviewees participated in the research activities. Participants were chosen based on their availability.

Procedures

We conducted interviews online using Zoom between December 2020 and March 2021. Interviews were conducted in Spanish and then transcribed and translated into English by one of the researchers. The interviews ranged between 15 and 60 minutes. All discussions, apart from notes taken, were audio recorded with the interviewees' consent. At the end of each interview, we shared our understanding with the respondents to provide them with an opportunity to endorse or amend what they had said.

Measures

Semi-Structured Interview Guideline

As Tracy (2013) noted, interviewees "have a unique depth and breadth of experience" (p. 141). We used a semi-structured interview guide to obtain their beliefs and to understand their views of the logics

of care and science. The open-ended questions in the interview guide asked about (a) participants' conceptualization and vision of translational medicine, (b) participants' roles at the Center, and (c) the main strengths and weaknesses of translational medicine.

Network Analysis

To capture the internal communication connections of the members of the Center, we used Exponential Random Graph Models (ERGM) to identify the individual, relational, and structural signatures that best explain the motivations behind their interactions. ERGM is a stochastic model that provides an appropriate analytic methodology to test multi-theoretical multilevel network hypotheses (Contractor, Wasserman, & Faust, 2006; Robins, Pattison, Kalish, & Lusher, 2007; Wasserman & Pattison, 1996). This statistical model estimates the likelihood of the observed network structures emerging from all possible network configurations generated based on certain hypothesized self-organizing principles. In this ERGM, the dependent variable is the whole communication network established by all the members of the Center as one observation, and the independent variables are the researchers' and clinicians' traits and networks' characteristics. Like logistic regressions, ERGM uses the Maximum Likelihood Estimation (MLE) to estimate the network statistics' coefficients. Positive and significant coefficients indicate that the corresponding independent variable is more likely to influence conversations between two translational researchers than by random chance. Negative and significant coefficients suggest that the independent variable is less likely to result in discussions between two of the members of the Center than by chance alone.

We asked each of the Center's members to what extent they interacted with a particular colleague from the Center using a 5-point Likert scale ranging from "Never" (1) to "Always" (5). Based on their responses, we built a direct communication network. A communication tie exists from member A to member B if member A indicates having occasional (3), frequent (4), or always (5) conversations with member B.

After building the communication network, we defined an ERGM model that explained the likelihood of a member of the Center mentioning frequent conversations with other members. We used the statistical methods outlined by Robins, Snijders, Wang, Handcock, and Pattison (2007) to analyze (a) the likelihood of communication ties between two members, (b) reciprocity between two members, (c) the concentration of communication ties (i.e., popularity), (d) the distribution of communication sending (i.e., activity), (e) incomplete communication triangles (i.e., two-paths), and (f) complete communication triangles (i.e., triadic closure). Additionally, we added a term to measure the likelihood of two members of the same unit mentioning frequent conversations (i.e., unit homophily). We conducted this analysis using R 4.1.1 with the "ergm" package from *Statnet*.

To assess the fit of the estimated ERGM to the observed data, we used the simulation-based Goodness of Fit (GoF) test from the *ergm* package. We sampled one network of every 1,000, spread it across 10 million iterations, and compared the characteristics of the networks generated based on the estimated model to the statistics of the observed networks.

Interview Analysis

A total of 251 pages of transcripts were obtained in English, with 73 pages from researchers and 178 pages from clinicians. Examining the richness of the data and influenced by an institutional logics' perspective, the researchers of this study conducted an interpretative analysis (Reay & Jones, 2016) of institutional logics. Therefore, researchers sought to uncover all interviewee's responses connected to the logics of science and logics of care. To perform the logics analysis, two scholars from the research team examined the transcripts for statements that reflected the logics of science and care. Following Lammers and Proulx (2016), we reasoned that those logics would appear as statements or arguments (claims, grounds, warrants, or backings) about professional work; they may also be statements in defense of a position about professional work or an act of sense-giving, explanation, or theorizing. Two researchers examined and categorized the text to obtain "the underlying meanings and thus identify patterns of behaviors and beliefs associated with particular logics" (Reay & Jones, 2016, p. 449). Once they coded all the texts, themes were developed after the research team agreed upon categories.

Findings

Network Analysis of Ties Between Participants

We answered RQ1 using data collected from each participant about the other members of the Center with whom they worked and the frequency with which they were in communication. The communication network contained 139 ties (Figure 1), and, on average, each participant had 11.12 communication ties (SD = 8.08).

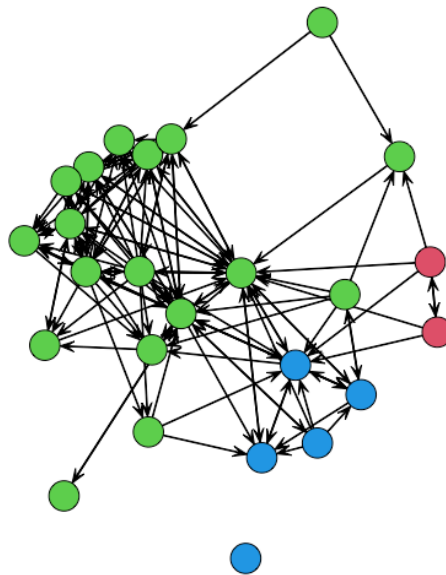


Figure 1. *The communication network includes researchers (in blue), clinicians (in green), and administrators (in red).*

Table 1 presents the results of the ERGM predicting the likelihood of a participant mentioning frequent conversations with other participants.

Table 1. ERGM Results.

	Estimate	Std. Error	p-value
Edges	-5.257	0.703	***
Reciprocity	1.418	0.360	***
Popularity (<i>gwodeg.fixed.0.5</i>)	0.607	0.797	
Activity (<i>gwodeg.fixed.0.5</i>)	1.553	0.846	.
Triadic closure (<i>gwesp.OTP.fixed.0.5</i>)	1.755	0.367	***
Unit Homophily	0.445	0.154	**
Null Deviance: 831.8 on 600 degrees of freedom			
Residual Deviance: 485.6 on 594 degrees of freedom			
AIC: 497.6; BIC: 524			

Note. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

The GoF test determined that the observed network's statistics were well explained by the ERGM, lying within 95% of the confidence interval (Figure 2).

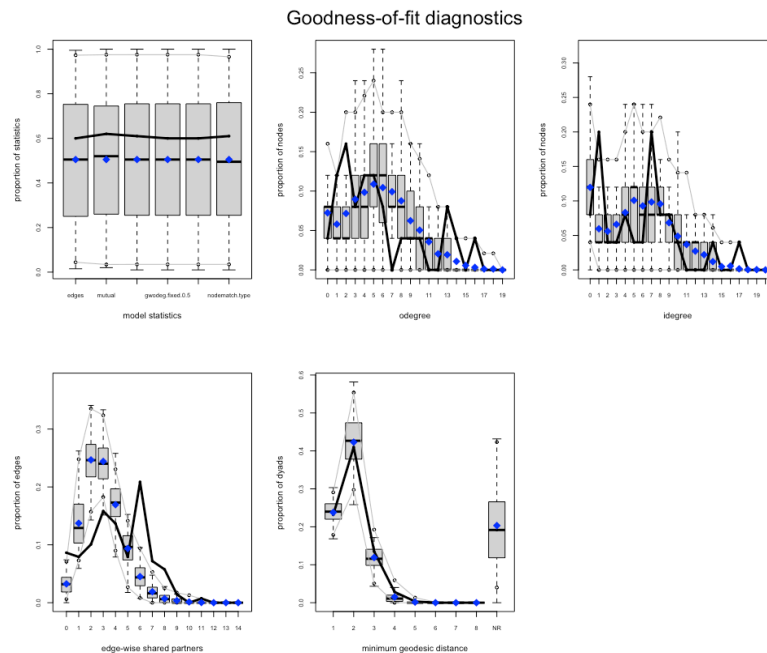


Figure 2. GoF test.

First, we determined the likelihood of an edge in the conversation network. Conversations were less likely to occur than chance since the estimate was negative and significant ($SE = -5.25, P < 0.001$). The reciprocity term indicated that members of the Center agreed on their communication frequency, yielding a positive and significant result ($SE = 1.41, P < 0.001$). This reveals a high level of consensus among the Center members about their interactions. The popularity term was not significant, showing no evidence of central actors receiving most conversations among all center's members ($SE = 0.60, P > 0.10$). In contrast, the activity term was positive and partially significant ($SE = 1.55, P = 0.06$), showing that most clinicians had the same number of conversations with other actors in the network. The triadic closure term was positive and significant ($SE = 1.76, P < 0.001$), showing that members of the Center were likely to interact with colleagues of their colleagues directly. These last two terms suggest that members of the Center were likely to have conversations in a horizontal and open space without gatekeepers. Finally, the last term measured the presence of homophily within the units. As a result, this term was positive and significant ($SE = 0.44, P < 0.01$), demonstrating that members of the Center had most conversations within their respective groups.

Beliefs Held About Translation Medicine Among Researchers and Clinicians

To answer RQ2, we first turn to researchers' and clinicians' statements that reflected the logic of science, then to researchers' and clinicians' statements reflecting the logic of care, and, finally, to statements reflecting bridged logics.

Researchers' View of the Logic of Science

A total of 24 excerpts belonging to this type of logic were obtained. The most prominent themes found were scientific process ($n = 9$), problem solving ($n = 7$), knowledge production ($n = 5$), and innovation ($n = 3$). Each of the theme's features is described below.

Scientific Process

The most prominent theme to emerge in the researchers' accounts of their concept of translational medicine was "science as a process" ($n = 9$). They suggested that translational medicine occurs *because* of their work. For instance, Interviewee 22 stated:

This is how we have found interesting things. For example, arterial hypertension in blood vessels, both in experimental animal models and in clinical studies. This is born, precisely, of this flow of scientific work from the basic to the clinical, and that is what one defines as translational.

Another aspect of the scientific process described by Interviewee 9 is the *length* of the process:

If we want to modify it [referring to a new molecule] from the outside with a drug, we must design, synthesize, and evaluate its experimental physicochemical properties, do tests in vitro, in vivo in animal models, and, later, move on to humans.

A second aspect of the scientific process, according to researchers, is *advocating* for the importance of scientific work in translational medicine. They revealed the underlying belief that their work is underappreciated in the translational medicine process. As Interviewee 7 explained,

In the past, very few clinicians came to ask to the laboratory. The laboratory was a black box, and the clinic is the clinic. What helps us to get to know each other scientifically . . .? Presentations at congresses! We present new technologies at congresses, we talk about the deficiencies of certain technologies, and that opens eyes to clinicians, and they say: "Ohh," I thought blindly that this worked in a way, and this person is showing me that it can have a few mistakes.

A third aspect that emerged was that scientific work is not as well supported as other areas in medicine. In Interviewee 6's view, their work was undervalued:

In Chile, very little support and financing are given to projects; although it is super important to improve medicine for the advancement of basic knowledge, development, and tools for the diagnosis of diseases. We need all scientific areas. I think that the little support we receive is because it is not known everything we do.

In summary, the researchers described the scientific process as long, detailed, underappreciated, and requiring advocacy to be sustained.

Problem Solving

A second theme related to how researchers conceptualized their relationship with translational medicine was as a problem-solving activity. For example, Interviewee 4 stated that "they see the Center as a source of answers." In this same vein, Interviewee 4 also highlighted the importance of addressing the cause of the disease to solve any health-related problems:

Medicine has advanced to try not only to look for biomarkers for some pathology, but the idea is to try to *solve* the pathology. And that is clearly associated with the fact that we not only need to find the pathology, but rather solve the problem . . .

This same perspective was shared by Interviewee 6, who recognized that "we discover what is the cause of the disease, and when one knows it, we begin to design the drugs. Part of that is discovering the cause of the disease." Similarly, Interviewee 4 added that solving the problem differs from treating the disease:

The secret of this Center was not only to treat the disease, but to find the origin of the disease. Today this has only been done with 10% of the pathologies of human beings. Although the disease is treated; the origin is not going to be sought. You can reach the origin with certain tools.

Thus, in addition to viewing their part in translational medicine as a long, arduous, and underappreciated process, researchers saw their task as problem-solving, distinct from treatment.

Knowledge Generation

A third theme that emerged from the researchers' interview transcripts was translational medicine in terms of knowledge production or generation. In the translational medicine process, researchers assume that they are the producers of knowledge that is passed over to clinicians. For example, as Interviewee 9 suggested, "intuitively, it occurs to me that it is something that goes from basic science to the clinical part, bringing knowledge from the basic part to the patient, in short." This is complementary to Interviewee 6's vision:

I believe that we are the closest to translational medicine, as we are from the laboratory side. We are the ones who generate knowledge to generate tools, whether diagnostic that can be put into practice in the clinic. Then, all the knowledge as basic science passes through us and later it is applied in the clinic. Therefore, I feel that we, as part of the laboratory, are the fundamental tool for all this translational medicine and to be carried out at this Center.

The researchers view translational medicine as *beginning* with their work.

Innovation

A fourth theme found was innovation. Specifically, researchers have used the terms "new" or "frontier" to discuss their role in translational medicine. They viewed innovation as a crucial objective of translational medicine and saw themselves as valuable participants in this process. For example, Interviewee 4 recognized that "we must generate things that are new, novel, obviously in the frontier." Similarly, Interviewee 22 added, "I think this approach between science or frontier knowledge to patients is key." Thus, researchers conceptualize their work as generative and innovative.

The overall view of translational medicine from the point of view of researchers is that the bridge begins with them; it is a long process underappreciated by others that involves problem solving, knowledge generation, and innovation.

Clinicians' Views of the Logic of Science

The interview transcripts revealed that clinicians also recognized the logic of science. A total of 40 excerpts of the physicians' interviews related to the logic of science. Clinicians, however, had a somewhat different view of science compared with the researchers. The most prominent themes identified were the development of medicine connected with the community ($n = 7$), research work ($n = 6$), the center as a training site ($n = 6$), and innovation ($n = 5$). A second order of less frequently mentioned themes was the need for funding ($n = 3$), the generation of new knowledge ($n = 3$), and others ($n = 10$).

Development With the Community

The first category revealed the need for a relationship between translational medicine and people. As Interviewee 12 declared,

It seems super important to me because it connects the researcher with the patient. Scientific findings are often slow to reach clinical practice. It is calculated that, approximately, it would take about 15 years for a discovery to arrive and to be applied to the practice of patients. So, until the discovery of a drug can be a very long time in which it is put into practice.

In this same vein, Interviewee 1 admitted that "In general, translational medicine is one of the central components of the development of medicine today in which the community is involved." Coincidentally, Interviewee 14 added, "Very broadly, one translates something that has been created from technical knowledge, drugs, diagnosis or others; does a whole process of research and development, until you get to the patient."

In contrast to researchers, clinicians seemed more aware of and concerned about the bridge between translational medicine and the wider community. However, they were also aware of the research enterprise.

Research Work

In this second theme, two main aspects emerged. First, the connection that the Center offers to execute research activities with their patients. As interviewee 14 mentioned, "the Center delivers the platform as a facilitator of an essential component of my research. In return, in my academic publications the Center is recognized." Second, clinicians' work is also related to the purpose of helping patients through research. As Interviewee 1 explained, "it also creates research needs because we receive patients who are unusual or difficult to diagnose. This can generate new research questions that require a solution, from diagnosis to therapy." Thus, rather than seeing the logic of science as beginning with a basic science question, clinicians began with patients' needs.

Training Center

Among the most outstanding themes in clinicians' responses was the recognition of the Center as a training center of excellence. As interviewee 16 declared, "we are interested not only in the acquisition of expert medical knowledge but also, in the development of skills in clinical work to adequately [address] patients' diseases, treatments, and follow-ups."

Innovation

This theme came up as clinicians associated the Center with a medical frontier of modernization. As Interviewee 14 explained,

We have a translational genetic test to diagnose thyroid nodules that is already in the Latin American market. It is basic science that we translated and transformed into a product. We clinically validate it through clinical trials with samples taken from the Center. Therefore, the Center was a part of this and, today patients benefit from this product when there is uncertain diagnosis.

Funding

Another category that emerged was the need for funding to conduct research. As Interviewee 1 mentioned,

Nowadays, a large part of the activity is based on clinical training. Part of the academics' fees are allocated to an investment in research, training human capital, etc., but that cannot be a long-winded story. It must be financed with more permanent sources that do not depend on whether you have an academic grant.

Generation of New Knowledge

Like researchers, this category also surfaced but applied to patients' needs. As Interviewee 18 reflected, "Science has advanced a lot, and we know many things. But probably, there are more things that we do not know than those we do know."

Others

In addition, other aspects that emerged were natural interest in the clinical area ($n = 2$), the concept of integrative medicine ($n = 2$), understanding the cause of diseases ($n = 2$), personalized medicine ($n = 1$), conceptualization of translational medicine as an old tradition with a new face ($n = 1$), the existence of a transfer process ($n = 1$), and the integration of disciplines by translational medicine ($n = 1$).

Researchers' Views of the Logic of Care

Researchers' comments barely evidenced an awareness of the logic of care in their views of translational medicine. A total of 7 excerpts belonging to this type of logic were obtained. The most prominent categories that emerged were benefiting patients ($n = 3$), serving/helping ($n = 3$), and community ($n = 1$).

Benefiting Patients

The predominant way researchers conceptualized translational medicine with the logic of care was its role in benefiting patients. For example, Interviewee 7 stated, "they now do a clinic much more directed toward the patient and it is very favorable for them."

Serving/Helping

Another way researchers described translational medicine through the logic of care was in reference to the way it helps or serves others. For example, Interviewee 4 stated, "I find that any way serves and helps everyone, from page to captain and from basic institution as team."

Community

The final consideration of translational medicine in the logic of care highlights its role within the community. For example, Interviewee 4 mentioned, "You get stronger as a group and as an institution when you hit the ball and say: 'We have this Center today, that is born from the academy and is made available to the community.'"

Thus, while researchers' views echoed those of clinicians, their views of translational medicine emphasized science over care.

Clinicians' Views of the Logic of Care

Not surprisingly, clinicians' comments reflected a well-developed awareness of the logic of care. A total of 40 excerpts were found corresponding to the themes of education ($n = 12$), specialization in rare conditions ($n = 12$), and treating patients ($n = 8$).

Education

The importance of education in patient care was one of the main themes that emerged. As Interviewee 17 explained, "working on educational material is something that could be advanced to have a model that makes a difference in terms of quality of care and that has an educational impact on the patient." Similarly, Interviewee 17 also believed that "the doctor is a teacher, and what we are dedicated to is to especially try to do everything based on recommendations, guides; and not each of us on their own." Furthermore, Interviewee 15 visualized this aspect as a need because

many of my patients take notes. I take a white sheet, and I write the adverse effects for them. Then, patients take the notes with them. I also list them all possible alternatives such as exams, provide them information and whatever they need to know and consider.

As clinicians consider the logic of care in translational medicine, they see value in imparting knowledge to patients.

Specialization in Rare Conditions

As part of the Center's identity, its specialization in unusual conditions is one of its main characteristics. As Interviewee 2 stated,

at the Center we take a leap beyond endocrinology and define that it can be bone-endocrinology, gynecology-endocrinology, adrenal-endocrinology, thyroid-endocrinology, and andrology-endocrinology. All subspecialties that still does not exist in Chile and we incorporate them.

Similarly, Interviewee 16 observed that the Center sought "patients with complex pathologies" and hoped that the Center would promote "a flow of patients with advanced or complex pathologies." Interviewee 16 saw this prospect as innovative: "a place with a model of care that in the country was not being carried out, or that was present in a very inorganic way." Thus, innovation was conceptualized in a social organizational sense, just as much as a scientific one.

Treating Patients

Considering patient care, their treatment is an inherent action performed by clinicians. In this sense, Interviewee 3 explained that

Pathologies will have to be managed with a specific analysis of each disease. That must be done in a translational way, especially in immunology and oncology. Currently, they are advancing more to specific treatments . . . and that is translational! Medicine must go there.

Similarly, interviewee 18 saw treating patients as core to the mission of the center and translational medicine: "What I envision is that our mission is to provide excellent care to each person who consults for a problem, especially to those who have rare diseases." Interviewee 20 highlighted the human side of the Center: "There are many people who cannot access our consultations due to economic issues, but they can go to the Center." Finally, the mission of caring for patients is also related to the broader idea of welfare. As Interviewee 1 mentioned, "it has to do with the fact that what is investigated, in one way or another, is transferred to actions that can benefit the welfare of the community."

In contrast to researchers' views of the logic of science or the logic of care, clinicians were outward facing: education, rare conditions, and treating patients.

Bridging Logics of Science and Care and Other Logics

In some instances, interviewees' comments reflected bridging ideas about care and science. One example occurred when Interviewee 7 mentioned, "We maintain close contact with the entire Center team for special patients, for new projects." In this example, we can see how the purpose of translational medicine is at once oriented toward research, scientific projects, and the patients. In this way, the concept is co-constituted by the logic of science and care. Interviewee 7, a researcher, also touched upon innovation, observing that

Innovation no longer expects peer evaluation [or] having many papers published. If [. . .] this is a product, it has more impact. We have the example of "Not Mayo," a Chilean product

that imitates mayonnaise but is made up of healthy grains or other things that appear out there in the market that . . . had a tremendous impact and changed people's perception.

This excerpt shows that the two logics co-constitute each other when it comes to translational medicine. The researcher references innovation as one outcome of the process but highlights that, ultimately, the innovation should have a positive outcome for the people. In this way, the logics are bridged.

Considering the bridged logics of science and care, the most prominent conceptualization corresponded to both logics needing each other. An example of this is Interviewee 2's conceptualization, who visualized: "the mission is to create bridges between the clinical area and the basic research area. This is obvious because no one, at this moment, can know everything." Similarly, Interviewee 13 explained an experience at an international translational medicine center:

Once I worked with two researchers. One of them had never had a grant but was a top doctor attending patient; meanwhile, the other one was a full researcher related to grants. However, they both knew they needed each other. There was no prejudice or more merit for one or the other. They were complementary. Clinical work allowed the other to do research, and the one who did research allowed clinical work to be done.

In addition to the bridged logics of science and care, clinicians also revealed a strong link with interdisciplinarity themes. In the words of Interviewee 11, "we have a lot of interdisciplinary contacts. Every day I must talk and communicate with different specialists from many areas. Although these specialists do not attend the Center, we are still constantly contacting them."

In summary, the logics of science and care were present in the groups studied. While laboratory scientists' beliefs were closer to the logic of science ($n = 24$) than the logic of care ($n = 7$), clinicians had an equal number of beliefs for both of them ($n = 40$). Finally, bridged logics emerged as a new theme, such as interdisciplinary logics.

Discussion

This study focused on the logics of care and science in translational medicine. We sought to advance our understanding of how communication plays a role among translational scholars. Although some researchers have studied the gap between basic scientists and clinicians (Kong & Segre, 2010; Restifo & Phelan, 2011), almost no communication research has considered a network analysis of ties between participants with an investigation of the institutional logics of science and care.

We were guided by two main objectives: (a) to study the communication connections between researchers and clinicians working in a translational medicine center, and (b) to identify the institutional logics of science and care, as well as other emerging logics connected to translational medicine. Considering RQ1, the Center was characterized by a high level of interconnectedness between researchers and clinicians. We observed a strong preference for frequently talking with members of the same unit. Despite this strong homophily within the units, we did not find any gatekeepers or intermediaries among members of different

units. In a completely functional translational sense, we believe this reveals a strong translational conceptualization across both groups' beliefs about the logics of science and care in the translational enterprise. However, we focused on institutional logic analysis to obtain more details.

To pursue this issue, we considered the institutional logics of science and care (Lander, 2016) as beliefs about translational medicine held by the two groups. We found claims about both logics in the statements of the researchers and clinicians, as Dunn and Jones (2010) anticipated. Moreover, clinicians manifested equal numbers of statements about the logic of care and science, while researchers manifested more beliefs about the logic of science than about the logic of care. This is likely because their work and duties are more strongly connected to research, and research is isolated from the public view. We also learned that researchers and clinicians hold different conceptions of the logics of science and care. Under the logic of science, researchers privileged the scientific process and problem solving as main themes, while clinicians prioritized the development of the community, research work, and their training in the Center. For the logic of care, researchers considered their work as benefiting patients and helping and serving people, while clinicians emphasized the importance of their role connected to education and the rare conditions that the Center attended to. Therefore, members of the Center differed in some respects in relation to their duties in translational research, which is expected to happen according to the literature (Kong & Segre, 2010; Llopis & D'este, 2016). Moreover, while researchers viewed their work as the core of translational medicine, felt underappreciated, and in need of advocacy, clinicians held a broader view that included public welfare and the wider community. In that same line, initial explorations have been done, as Restifo and Phelan (2011) declared that a "larger communication gap separate scientists and clinicians from the public" (p. 423). Therefore, although both groups communicate frequently, there are still divisions between them. In this sense, organizational communication combined with health communication still has several challenges ahead. For example, can differences be explained by group size? Or maybe by the status corresponding to each member of the Center? In this study, the role of institutional logic was clear as an organizational communication vehicle to explain the results obtained through network analysis, giving meaning and direction to the translational enterprise. However, the results of this study should be managed with caution, as a deeper exploration of communication aspects is needed. Thus, the extent to which communication may play a role in this specific bridge and others in the translational medicine stages still requires further exploration.

Limitations and Future Research

Although the findings presented are new and interesting, there are several limitations to consider in the next study. First, the number of researchers and clinicians in the sample of this study was small and not equal. Future research should recruit similar numbers of participants to measure communication ties and logics in translational medicine in a more even way. Second, communication researchers should consider incorporating various aspects of interdisciplinary work, such as teams and collaborations, in translational research organizations. Thus far, our study has not examined actual communication between researchers and clinicians. Third, university hospitals are a particular type of hybrid organization that is especially attractive for studying hybrid, intertwined, or bridged logics. Hence, a more in-depth exploration of their competing and bridging logics will provide a clearer picture of their organizational complexity and tensions.

Finally, it is surprising that the research gap of the “Valley of Death” (Seyhan, 2019) is still not connected to the communication discipline. Considering that only one previous study (Silk et al., 2020) has studied a communication connection to translational medicine as part of the process connected to the community, further investigations at earlier phases are still required.

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