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Advancing the use of organization theory in implementation science

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Abstract

Healthcare settings and systems have been slow to adopt and implement many effective cancer prevention and control interventions. Understanding the factors that determine successful implementation is essential to accelerating the translation of effective interventions into practice. Many scholars have studied the determinants of implementation, and much of this research has been guided by the Consolidated Framework for Implementation Research (CFIR). The CFIR categorizes implementation determinants at five levels (characteristics of the intervention, inner setting, individual, processes, and outer setting). Of these five levels, determinants at the level of the outer setting are the least developed. Extensive research in fields other than healthcare suggest that determinants at the level of the outer setting (e.g., funding streams, contracting practices, and public policy) play a central role in shaping when and how an organization implements new

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Appendix A. Supplementary material

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structures and practices. Thus, a more comprehensive understanding of outer-setting determinants is critical to efforts to accelerate the implementation of effective cancer control interventions. The Cancer Prevention and Control Research Network (CPCRN) created a cross-center workgroup to review organizational theories and begin to contribute to the creation of a future framework of constructs related to outer setting determinants. In this paper, we report findings from the review of three organizational theories: Institutional Theory, Transaction Cost Economics, and Contingency Theory. To demonstrate the applicability of this work to implementation science and practice, we have applied findings to three case studies of CPCRN researchers' efforts to implement colorectal cancer screening interventions in Federally Qualified Health Centers.

Keywords

Organizational theory; Implementation science; Colorectal cancer screening

1. Introduction

Numerous cancer prevention and control interventions have demonstrated effectiveness at improving health outcomes (Fernandez et al., 2018). Many of these interventions have had limited impact on population health, however, because they have not been fully implemented within healthcare settings (Kessler and Glasgow, 2011). Factors at multiple levels determine the implementation of effective interventions within a healthcare setting (Aarons et al., 2011). The Consolidated Framework for Implementation Research (CFIR) categorizes these factors, which are often referred to as “implementation determinants”, within the following five domains or levels: (1) the *individuals* who implement and deliver the intervention (e.g., knowledge and beliefs about the intervention), (2) the *inner setting* where those individuals work (e.g., leadership engagement), (3) the *processes* used to implement the intervention (e.g., who was engaged), (4) the *characteristics of the intervention* itself (e.g., complexity), and (5) the *outer setting* that is external to where the intervention is being implemented (e.g., federal and state policies; Damschroder et al., 2009). Determinant frameworks, such as the CFIR, advance efforts to more precisely identify and target the multilevel factors that determine how readily an intervention is implemented and sustained over time (Powell et al., 2017). For example, Leeman et al. (2019) applied the CFIR to guide an assessment of factors influencing Federally Qualified Health Centers' (FQHC) implementation of evidence-based colorectal cancer (CRC) screening interventions (e.g., patient reminders, provider assessment and feedback, patient navigation) and identified multiple implementation determinants such as the relative priority given to increasing CRC screening rates (inner setting) and the availability of grant funding to support CRC screening (outer setting). Frameworks also promote the consistent use of terminology that is needed to replicate and adapt strategies to support implementation in new settings and synthesize findings across studies (Proctor et al., 2013).

Lewis et al. (2018) have called for implementation scientists to progress beyond listing determinants and to also articulate how and why those determinants influence implementation. Theory is a particularly useful tool for explaining how and when determinants influence implementation (Foy et al., 2011). The use of theory to identify

determinants is exemplified in the Theoretical Domains Framework, which was derived by reviewing and consolidating constructs from numerous behavior change theories, and therefore links each determinant to one or more theories that might be applied to explain when and how the determinant influences implementation (Michie et al., 2005). Others have created frameworks that link determinants to theories, for example, the matrices created by the developers of Intervention Mapping (Bartholomew et al., 2016). Across these frameworks, individual-level determinants are the most developed, with far less investment in identifying determinants at the level of the outer setting (Nilsen and Bernhardsson, 2019).

Extensive research conducted outside of healthcare suggests that factors in the outer setting (e.g., contracting practices, consumer demand, and public policy) play a central role in determining an organization's structures and practices (Daft, 2016). Furthermore, many implementation science frameworks identify the important role that outer setting determinants play in intervention implementation and scale-up across a wide range of practice settings (Chambers et al., 2013; Feldstein and Glasgow, 2008; Milat et al., 2015; Moullin et al., 2019; Wandersman et al., 2008). The influence of outer setting determinants on the implementation of healthcare interventions also is evident in a growing body of empirical research (Charif et al., 2017; Keown et al., 2014). We have argued elsewhere that organizational theories offer a highly relevant, but untapped, resource for understanding determinants of implementation at the level of the outer setting (Birken et al., 2017). In addition to describing determinants, organizational theories provide propositions for how and when outer setting determinants influence organizational structure and practices. Here, we report findings from a review of three organizational theories. The application of findings to implementation science is illustrated using examples from the authors' experience implementing CRC screening interventions in FQHCs.

2. Background

2.1. Cancer Prevention and Control Research Network workgroup on organizational theory

The Cancer Prevention and Control Research Network (CPCRN) is a network of eight centers funded by the Centers for Disease Control and Prevention (CDC) and the National Cancer Institute to accelerate the adoption and implementation of evidence-based cancer prevention and control interventions and reduce cancer burden, especially in underserved populations (cpcrn.org). In 2018, the CPCRN created a cross-center workgroup to collaborate on the Organizational Theory in Implementation Science (OTIS) project. Researchers from CPCRN centers at the University of North Carolina at Chapel Hill and University of Washington participated in this workgroup. The aims of the OTIS project are to (1) identify organizational theories that are potentially relevant to implementation, (2) abstract constructs and propositions from each theory related to the outer setting, and (3) consolidate constructs and propositions into a framework. In addition to collaborating on these aims, the CPCRN workgroup developed case studies to illustrate the application of organizational theory to implementation science, building on CPCRN researchers' extensive experience studying the implementation of CRC screening interventions in FQHCs.

CPCRN's long standing focus on CRC screening in FQHCs is consistent with its mission to reduce cancer burden in underserved populations. CRC screening is highly effective at reducing cancer-related morbidity and mortality (Knudsen et al., 2016), and yet less than 40% of FQHC patients are current with recommended CRC screening (US Department of Health and Human Resources, 2016). To address this gap, CPCRN researchers have conducted multiple studies to identify and target the determinants of low CRC screening rates in FQHCs (Liang et al., 2016; Walker et al., 2018; Kegler et al., 2018). This depth of CPCRN expertise provides a rich source of material for developing case studies to illustrate the application of diverse organizational theories to implementation science.

In this paper, we report on constructs and propositions abstracted from three organizational theories: Institutional Theory, Transaction Cost Economics, and Contingency Theory. The purpose of this paper is to demonstrate the applicability of organizational theory to implementation science in the field of cancer prevention and control by applying the abstracted constructs and propositions to a real-world implementation challenge – FQHCs' implementation of evidence-based CRC screening interventions.

3. Methods

The OTIS project team surveyed 18 scholars with expertise at the intersection of implementation and organization science to identify organizational theories and recommendations for seminal articles related to each theory. The survey identified 12 theories, from which we selected three with the goal of providing a diversity of perspectives on the role of organization theory in implementation science. For each of the three selected theories, two workgroup members independently abstracted constructs and propositions related to outer setting determinants from articles identified via the survey. (The list of articles reviewed for each theory is available in the supplementary material.) Reviewers met to compare findings and create a reconciled summary of each theory's constructs and propositions. Members of the workgroup then developed case studies to illustrate the application of the theories to implementation science.

3.1. Findings

Below we summarize abstracted constructs and propositions, and illustrate their application in three case studies that focus on the implementation of CRC screening interventions in FQHCs.

3.2. Institutional theory

Institutional Theory explains how environmental pressures lead organizations to adopt similar structures and practices. The theory refers to this as the tendency toward "isomorphism", which is defined as an organization's tendency to resemble other, similar types of organizations in response to the same set of environmental conditions (DiMaggio and Powell, 1983). One example of the theory's application in healthcare is D'Aunno et al.'s (1991) study of a new type of hybrid clinic that provided both mental health and drug abuse treatment. They applied Institutional Theory to describe the environmental pressures within

both the mental health and drug abuse sectors and then explored the relative influence that pressures in the two sectors had on how the hybrid clinics delivered services.

3.2.1. Constructs related to outer setting determinants—As summarized in Table 1, Institutional Theory identifies three types of institutional pressures that promote isomorphism (DiMaggio and Powell, 1983). **Coercive pressures** are the formal and informal pressures that other organizations and entities exert and include, for example, regulations, guidelines, pay-for-performance requirements, and other external mandates or societal expectations. **Mimetic pressures** include the tendency for organizations to model what other peer organizations are doing, particularly when organizations are uncertain of the most effective or efficient practice. **Normative pressures** are “the collective struggle of members of an occupation to define the conditions and methods of their work” (DiMaggio and Powell, 1983). In healthcare, this largely translates to the influence that professional organizations and colleagues have on physicians and other healthcare professionals’ views of how care should be delivered.

3.2.2. Case study—At the Universities of North and South Carolina, CPCRN researchers evaluated the impact of a learning collaborative on CRC screening in FQHCs (Rohweder et al., 2020). Led by the American Cancer Society (ACS), the one-year learning collaborative brought together representatives from eight FQHCs in one state and provided them with the training and tools needed to select, adapt, implement, and sustain evidence-based CRC screening interventions (e.g., patient reminders, provider assessment and feedback; Sabatino et al., 2012). CPCRN researchers involved with the collaborative reflected on how Institutional Theory could be applied to understand, strengthen, and test the mechanisms through which the collaborative increased CRC screening rates. Viewed through the lens of Institutional Theory, this real-world case study illustrates the value of understanding the external pressures (i.e., outer setting determinants) that influence FQHCs’ efforts to improve CRC screening rates.

3.2.2.1. Coercive pressures: Reflecting on Institutional Theory’s application to the case study illuminated multiple ways that the collaborative leveraged coercive pressures. The ACS partnered with the North Carolina Association of Community Health Centers to co-lead the collaborative. This allowed the collaborative to leverage the informal authority these two organizations exert over how care is delivered in FQHCs. The ACS provided funding to incentivize and support FQHCs’ participation in the collaborative. This funding was “coercive” in that it required FQHCs to attend collaborative activities as a condition of funding. Finally, the primary measure used to assess FQHC success was their Uniform Data System data on CRC screening rates, thereby taking advantage of the Health Resources and Services Administration mandate that FQHCs report that data, as well as the potential for additional pay-for-performance incentives.

3.2.2.2. Mimetic pressures: CPCRN researchers’ reflection also revealed multiple ways that the collaborative offered FQHCs a formal mechanism for observing each other’s efforts and progress. The collaborative promoted peer-to-peer learning by requiring FQHC leadership to designate a three-person team and support their attendance at two full-day in-

person meetings and monthly conference calls. Every quarter, one of the conference calls included a graphical display of each FQHC's screening rates compared to their peers. Thus, FQHCs had the opportunity to learn which of their peers were most successful at increasing their screening rates and to copy what those FQHCs were doing.

3.2.2.3. Normative pressures: CPCRn investigators' reflection identified ways that the collaborative engaged normative pressures (i.e., the influence of membership in a professional group). Physician support for CRC screening and use of fecal immunochemical tests (FIT) was critical to the success of the collaborative. As a condition of participation, the Chief Medical Officer or Chief Executive Officer of each FQHC had to sign a Memorandum of Understanding documenting their support for the goals of the collaborative, thereby demonstrating support from a physician leader. In addition to this, future collaboratives might partner with and/or gain the endorsement of physician professional organizations.

As detailed above, Institutional Theory provided a useful lens for explaining how the collaborative may have influenced FQHCs' implementation of evidence-based CRC screening interventions. Future research is needed to test the role that each of the institutional pressures played in mediating or moderating the effects that collaborative strategies had on outcomes.

3.3. Contingency theory

Contingency Theory posits that the most effective way to structure a task is contingent on characteristics of both the task and the task environment. Tasks are defined to include the design, production, and distribution of a good or service (Lawrence and Lorsch, 1967). According to the theory, the structures used to coordinate a task vary on a continuum from programmed (i.e., standardized protocols, rules, hierarchical authority arrangements, and centralized decision making) to unprogrammed (i.e., new professional roles, teams, and communication systems that promote coordination and collaborative, in-the-moment decision making; Schoonhoven, 1981). In Contingency Theory, the task environment encompasses factors both within the organization (inner setting) and external to the organization (outer setting). For purposes of this paper, we address only factors relevant to the outer setting. An example of Contingency Theory's application to healthcare is Schoonhoven's (1981) study of how characteristics of the task environment (uncertainty about patient inflow) determined whether more versus less programmed approaches to coordinating tasks in the operating room would yield better patient outcomes.

3.3.1. Constructs related to outer setting determinants—As detailed in Table 2, Contingency Theory posits that the level of **uncertainty in the task environment** is a central factor determining the most effective means of coordinating a task. Uncertainty refers to the gap between the information needed versus information available to perform a task. Factors that may contribute to environmental uncertainty include changes in the evidence-base for best practice, in technology, in the availability of resources (e.g., healthcare workforce, testing kits), and in customer (e.g., patient or payor) preference and/or demand for the product (Schoonhoven, 1981). When uncertainty is low, and the task is predictable, information-processing needs are low and rules, protocols, practice guidelines,

packaged interventions (e.g., NCI's Research Tested Intervention Programs; rtips.cancer.gov), and other programmed approaches are feasible and will have the greatest impact on effectiveness. When uncertainty is high, unprogrammed approaches to coordination will have the greatest impact on effectiveness. Unprogrammed approaches focus on facilitating communication and real-time decision making and may include transferring decision-making authority to those working on the frontline, creating teams to coordinate care, and providing real-time information to support frontline decision making (Schoonhoven, 1981).

3.3.2. Case study—CPCRn investigators at the University of Washington studied the use of patient navigation in the Colorectal Cancer Control Program (CRCCP), a nationwide program funded by the CDC (Barrington et al., 2020). Almost all CRCCP grantees provide patient navigation as one of the evidence-based interventions they use to increase rates of FIT or fecal occult blood test (FoBT) screening, referral, and follow-up. Although the role of patient navigators varies across programs, it typically involves providing connections to community resources, care coordination, one-on-one education, and social support. Contingency Theory is well-suited to one of the questions CPCRn investigators were addressing – what is the optimal way to structure patient navigation and its implementation?

Patient navigation for CRC screening is a multi-step task that requires a ready and willing patient, an engaged provider, screening kits, laboratory services, communication systems, and if the screening test is positive, gastroenterologists and other resources needed to prepare and transport the patient to colonoscopy. Contingency Theory provides a lens for structuring the coordinating role of navigators contingent on the level of uncertainty related to each aspect of their task.

3.3.2.1. Uncertainty in the evidence-base for best practice: The evidence for the value of CRC screening has been stable as have guidelines for which patients should be screened and when (U.S. Preventive Services Task Force, 2016). This low level of uncertainty suggests that aspects of the navigation task related to educating and reminding patients and providers about CRC screening would benefit from programmed approaches to implementation. These may include distributing patient education materials or developing reminder systems (Powell et al., 2015). Standardized protocols and other programmed approaches may also be developed to refer and enroll patients in cancer screening programs and/or mail them FIT kits. In conditions of low uncertainty, programmed approaches allow organizations to control and standardize care delivery, thereby increasing the probability that effective interventions will be delivered as intended (i.e., with fidelity).

3.3.2.2. Uncertainty in technology: CRC screening modalities continue to change, creating uncertainty for both patients and providers. For example, one of the latest technologies involves direct-to-consumer advertising of a stool DNA test designed to be completed at home every three years, as opposed to the annual recommendation for FIT/FoBT tests (Cologuard Test, n.d.). Standardized protocols, education materials, and other programmed approaches still may work, but will need to be reviewed and updated on a regular basis.

3.3.2.3. Uncertainty in the availability of resources: Barrington et al. (2020) identified a high prevalence of barriers related to the availability of the resources needed to navigate patients through the CRC screening process including lack of transportation, childcare, insurance coverage, and colonoscopy providers, among others. Limited and fluctuating access to these resources contribute to an uncertain task environment that requires unprogrammed approaches. As the name suggests, the navigation role is itself an unprogrammed approach to coordination that involves real-time decision making to navigate a complex and uncertain environment. Rather than following standardized protocols, navigators need to assess the distinct needs of each patient, and often in collaboration with other members of the healthcare team, strategize ways to assist patients in overcoming barriers to CRC screening and follow-up of positive CRC screening tests. In this case of high levels of uncertainty, less programmed implementation strategies may be beneficial such as creating a quality monitoring system to identify recurring barriers and a community coalition and/or implementation team to collaborate with the navigators on strategies to overcome those barriers (Powell et al., 2015).

3.4. Transaction cost economics

Organizations transact with other organizations for goods and services. These inter-organizational transactions incur costs, such as negotiating contracts, monitoring adherence to contractual terms, and providing financial incentives or penalties. Transaction Cost Economics explains how characteristics of transactions determine the governance structures that will optimize cost and effectiveness (Shelanski and Klein, 1995). The structures available to govern transactions range on a continuum from no structure, to an informal contract, to more formal contracts, to integration of the production of goods and services within a single organization. An example of the use of Transaction Cost Economics in healthcare is Zinn et al.'s (2003) study of factors influencing skilled nursing facilities' decision making about whether to develop contracts with rehabilitation therapists or to employ them as staff members.

3.4.1. Constructs related to outer setting-level determinants—As summarized in Table 3, Transaction Cost Economics describes three factors that determine the optimal structure for governing transactions: (1) an organization's investment in assets specific to the transaction relationship (**asset specificity**); (2) **uncertainty** about future transactions, (3) and the **frequency** of transactions. The theory posits that more integrated governance structures are optimal when relationship-specific assets, uncertainty about the future, and transaction frequency are higher; less integrated governance structures are optimal when they are lower (Shelanski and Klein, 1995).

3.4.2. Case Study—CPCRN researchers at the University of North Carolina's comprehensive cancer center are conducting a study testing the implementation and effectiveness of a mailed FIT CRC screening intervention. As they started planning the study, the team needed to determine the best structures for governing their transactions with FQHCs. Specifically, they had to decide whether to build FQHCs' capacity to improve CRC screening rates (informal contracting) or create their own system to deliver CRC screening

directly to the FQHCs' patients (integration). In this case study, we explore how Transaction Cost Economics might have been applied to inform that decision.

Building FQHCs' capacity to improve CRC screening requires negotiating a mailed FIT implementation protocol, developing referral systems for diagnostic colonoscopies, training providers and staff, purchasing testing kits, and monitoring and providing feedback on performance. This investment would generate assets within each FQHC (asset specificity), such as providers and staff with the knowledge and resources needed to implement the mailed FIT intervention as well as referral systems for diagnostic colonoscopies. Whether investing in developing assets within FQHCs is worthwhile depends on (1) the frequency of FQHC contacts with patients eligible for CRC screening and (2) the level of uncertainty about future transactions with the FQHC related to implementing and sustaining the agreed upon screening and referral protocols (i.e., fidelity). The first criteria is met by the fact that FQHCs have frequent contact with patients eligible for CRC screening. To assess the second criteria, the research team would need to consider a range of factors they may influence FQHCs' fidelity to the agreed upon screening and referral protocols. The research team might consider the likelihood that third-party payors would sustain current reimbursements and pay for performance incentives for CRC screening, potential threats to the levels of federal funding for FQHCs, anticipated turnover rates among the staff trained, and past experience with FQHCs' implementation of interventions. They might also explore the influence of other external organizations that are working to change FQHCs' screening practices, for example the ACS or the state's Primary Health Care Association.

The alternative to building FQHC capacity would involve creating a centralized program within the comprehensive cancer center that would mail FIT kits to FQHC patients (i.e., integration). Creating a centralized mailed FIT program would require a substantial investment of resources to hire new staff, develop a patient registry, and establish policies and protocols. However, the research team might decide to make this investment if they determine that FQHCs are unlikely to implement CRC screening protocols as intended (i.e., level of uncertainty is high). The investment in a centralized mailed FIT program may be worthwhile because of the increased control and therefore certainty that protocols will be implemented as intended (i.e., with fidelity) and sustained over time.

4. Discussion

We proposed to draw on organizational theory to expand on CFIR's listing of outer setting determinants and identify propositions to explain how those determinants influence implementation. We also sought to demonstrate the relevance and application of organizational theories to the implementation of CRC screening interventions in FQHCs. As described below, we achieved the purpose of this paper by identifying new outer setting-level determinants and highlighting the theories' relevance and application to implementation science.

We identified several outer setting-level determinants of implementation that expand on those included in the CFIR. Of the three selected theories, Institutional Theory's constructs are most similar to those described in the CFIR. Institutional Theory's construct "coercive

pressures” aligns with the CFIR construct of “external policy and incentives”, which CFIR defines as “policy and regulations (governmental or other central entity), external mandates, recommendations and guidelines, pay-for-performance, collaboratives, and public or benchmark reporting.” Similarly, the construct “mimetic pressures” partially aligns with CFIR’s “peer pressure,” which CFIR defines as “mimetic or competitive pressure to implement an intervention” (Damschroder et al., 2009). The three theories introduce five new constructs that fall within the category of outer setting determinants. Institutional Theory contributes the construct “normative pressures” and Contingency Theory introduces the construct “environmental uncertainty”, which encompasses uncertainty related to the evidence-base for best practice, changes in technology, the availability of resources, and customer preference and/or demand for a product or service. Transaction Cost Economics contributes constructs related to transactions among organizations and the “uncertainty of future transactions”, “frequency of transactions”, and “asset specificity” involved in the transactions.

Each of the three theories offered a distinct set of propositions to explain how determinants influenced implementation outcomes. As a result, each of the theories is applicable to different types of implementation questions. Institutional Theory explains the relationship between outer setting determinants and organizations’ adoption and implementation of new practices. Understanding these relationships can inform the selection and design of implementation strategies so that they leverage, accommodate, or change those pressures. Contingency Theory explains the relationship between outer setting determinants and the optimal ways to structure interventions and/or implementation strategy. In the face of high environmental uncertainty, the theory suggests that interventions may need to be less prescriptive and allow for flexible decision making at the point of implementation and delivery. Implementation strategies may need to prioritize coordination/collaboration among front line providers rather than reinforcing standardized protocols (Leeman et al., 2007). Lastly, Transaction Cost Economics focuses on the inter-relationships among organizations and explains how outer setting determinants influence what types of structures will most effectively govern transactions between one or more organizations. Application of Transaction Cost Economics may be particularly relevant to the decisions that health plans, integrated delivery systems, non-profits and other intermediary organizations make about whether to invest in building practice-level capacity to implement an intervention or to implement it themselves (Leeman and Mark, 2006).

4.1. Limitations

The three organizational theories presented in this paper are complex, classic theories that have evolved over decades. In reducing the theories to their core constructs, we were unable to fully capture all the finer nuances. Furthermore, we reviewed only a portion of the literature available for each of the theories reviewed.

4.2. Implications for implementation science

Greater attention to outer setting determinants has potential to advance implementation science by opening the field to a wider range of research questions and a deeper understanding of the factors influencing implementation. Implementation researchers to date

have given less attention to outer setting determinants as compared to determinants at the other levels of the CFIR (Nilsen and Bernhardsson, 2019). The present review highlights how attention to outer setting determinants might play a central role in (1) designing strategies to scale-up interventions so that they fully leverage environmental pressures (i.e., coercive, mimetic, and normative), (2) selecting intervention structures (programmed versus unprogrammed) contingent on the level of uncertainty in the task environment, and (3) identifying the optimal way for an intermediary organization to structure transactions with FQHCs and other practice settings so that evidence-based interventions are delivered with fidelity. The ultimate goal of this work is to accelerate the broadscale implementation of effective interventions and thereby improve health outcomes, especially among those at greatest risk for health disparities.

5. Conclusions

We demonstrated the potential to identify implementation determinants not available in extant implementation determinant frameworks. In future work, the OTIS project will review a broader range of organizational theories that are relevant to implementation science, expanding the field's predictive ability and ability to guide implementation practice. The goal of this work is to create a theory-derived framework that describes outer setting determinants, propositions for how and why those determinants influence implementation, and guidance on implementation strategies that align with the identified determinants.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Institutional theory: an overview of relevant constructs.

Outer setting determinants with definitions	
Coercive pressures	Formal and informal pressures imposed on an organization by other organizations upon which they are dependent and by cultural expectations.
Mimetic pressures	Pressures for organizations to copy the structures and practices of other organizations in their field, particularly in the context of uncertainty.
Normative pressures	Pressures from members of an occupation or profession (e.g., physicians) within the organization and their desire to define the conditions and methods of their work.
Propositions: How outer setting determinants affect organizations	
Coercive, mimetic, and normative pressures cause organizations to tend toward isomorphism (i.e., to have similar organizational structures and practices).	

Table 2

Contingency Theory: An overview of relevant constructs.

Outer setting determinants with definitions	
Uncertainty in the task environment	Uncertainty refers to the gap between the amount of information needed versus information available to achieve a given level of performance on a task. Factors that may contribute to this gap include fluctuations in the evidence-base for best practice; in technology; in the availability of material, human, and other resources; and in customer preference and/or demand for the product.
Propositions: How outer setting determinants affect organizations	
The level of uncertainty determines the most efficient way to coordinate a task (i.e., means of coordination) with the most efficient means of coordination being contingent on the level of uncertainty and ranging on a continuum of programmed (low uncertainty) to unprogrammed (high uncertainty).	
• Programmed means of coordination: Activities can be specified and codified in advance via (1) rules and programs, also referred to as standardization and (2) hierarchical referral, or centralization of decision making; rules, scheduled meetings, and authority arrangements. • Unprogrammed means of coordination: Activities are not specified in advance, but rather are worked out by organization members via (1) professionalization, (2) new teams, (3) real-time information to inform frontline decision-making, and (4) other strategies to increase horizontal coordination and communication.	

Table 3

Transaction cost economics: an overview of relevant constructs.

Outer setting determinants with definitions	
Transaction costs	Costs associated with transactions between two parties including contract negotiations, monitoring adherence to contractual terms, providing financial incentives or penalties, and losses resulting from supplier noncompliance.
Asset specificity (of transactions between two parties)	The degree to which an organization invests in assets that are specific to the transaction relationship such as human assets (e.g., knowledge, skills) and physical assets (e.g., equipment, supplies).
Uncertainty (of future transactions)	The amount of uncertainty about the other party's actions or about environmental changes that may affect supply, demand, or production costs
Frequency (of transactions)	Frequency with which the transaction occurs.
Propositions: How outer setting determinants affect organizations	
Organizations strive for greater efficiency by implementing governance structures that minimize transaction costs, with governance structures ranging from no contract (i.e., buy it) to vertically integration (i.e., make it). Integrated governance structures are optimal when relationship-specific assets and uncertainty about future transactions are high and transaction frequency is low.	