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# New Frontiers in Logistics Research: Theorizing at the Middle Range

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## NEW FRONTIERS IN LOGISTICS RESEARCH: THEORIZING AT THE MIDDLE RANGE

### ABSTRACT

Logistics has evolved from a description-based discipline to one based upon theoretical grounding from other business disciplines to define, explain and understand complex interrelationships, resulting in the identification of the discipline's primary domain and major concepts – the “what's” of logistics. General theories, however, lack the domain specificity critical to understanding the inner workings within key relationships – the how's, why's and when's – that drive actual outcomes. Middle-range theorizing enables researchers to focus on these inner workings to develop a deeper understanding of the degree to, and conditions under which, logistics phenomena impact outcomes as well as the mechanisms through which such outcomes are manifested. The paper seeks to spur logistics research at the middle-range level by presenting a context and mechanism-based approach to middle-range theorizing, outlining a process with guidelines for how to theorize at the middle range, and providing a template and examples of deductive and inductive middle-range theorizing.

*Keywords: theory; middle-range theorizing; logistics; logistics customer service*

## NEW FRONTIERS IN LOGISTICS RESEARCH: THEORIZING AT THE MIDDLE RANGE

### INTRODUCTION

Logistics as an academic discipline has evolved from a predominantly descriptive discipline to one based upon solid theoretical grounding to define, explain and understand complex interrelationships among phenomena in the logistics domain (Georgi et al., 2010). The prevalent theories used for such grounding have been adopted from other disciplines such as strategic management, marketing, economics, the broader social sciences, and engineering (Stock, 1997). Researchers have successfully applied general theories to develop broad frameworks that identify and define the discipline's primary domain and major concepts as well as promote a better sense of the primary antecedents and outcomes of these concepts (Defee et al., 2010).

However, a "general theory" approach to research limits the depth of insight that can be gained regarding intricate interrelationships among phenomena within the logistics domain. General theories, by their nature, lack specificity and thus remain mute on contextual specifics that are critical to further development of the logistics discipline (Schmenner et al., 2009). While general theories have helped researchers identify the foundational building blocks of the logistics domain (the "what" of logistics), the inner workings among the contexts and mechanisms that drive actual outcomes – the "how, why and when" – remain "black boxes" (Astbury and Leeuw, 2010).

Focusing on these inner workings can enable logistics researchers to develop a deeper understanding of the degree to, and conditions under which, logistics phenomena impact outcomes as well as the mechanisms through which such outcomes are manifested (Weick, 1974,

1989). Such research efforts will enable observation of logistics phenomena across a range of conditions and settings to provide new, testable insights into how and why logistics core concepts influence outcomes in specific conditions. This approach is consistent with the development of what the sociologist Robert Merton called “theories of the middle range” (Merton, 1968). Middle-range theories are built upon years of empirical research on particular problems within a field of study, they allow scholars in a maturing discipline to synthesize and apply the rich accumulation of empirical findings to current problems.

Researchers in management strategy, operations management, and marketing have increasingly emphasized a middle-range approach to investigating business phenomena, including knowledge-based strategies (Hult et al., 2006), inter-firm relationships (Kim et al., 2009), customization and responsiveness (Tenhiälä and Ketokivi, 2012), information processing (Turkulainen et al., 2013), citizenship behaviors and social exchange (Konovsky and Pugh, 1994), and branding (Brodie and de Chernatony, 2009). Ketokivi (2006), for example, takes a middle-range approach to understanding manufacturers’ flexibility strategies within the context of a specific task environment. He notes that “middle-range theorizing [is] the appropriate way of developing managerially relevant theories, because application always occurs in a specific context” (217). While not yet accepted as an established norm in logistics research, calls for middle-range theorizing in logistics are increasing, as evidenced by recent editorials in both *Journal of Business Logistics* (Frankel and Mollenkopf, 2015) and *Transportation Journal* (“[Announcement: Transportation Journal](#)”, 2015).

The purpose of this paper is to spark a discipline-wide discussion on the merits of middle-range theorizing within the logistics discipline, and ultimately to spur research at the middle range. Thus, the paper seeks to contribute to the advancement of knowledge in logistics

in three ways. First, it contributes to the maturation of the discipline by providing direction to *clarify* a unified body of knowledge in logistics that defines theory and practice in the field (Bowersox, 2007). Second, it provides a theoretically rigorous process for grounding new logistics research in existing empirical evidence, countering the prevailing assumption that scholars must justify their research by appealing to highly general theories (Merton 1968). Third, it provides concrete examples of how a middle-range approach can generate new knowledge that is specific enough to substantially impact theory and practice, meeting calls for logistics research to maintain both rigor and relevance (see for example Bowersox 2007; Mentzer et al. 2008).

To this end, a framework for understanding the similarities and differences between general theorizing and middle-range theorizing is presented. Next, a context and mechanism-based approach to middle-range theorizing is explained, then a process with guidelines for how to theorize at the middle range is presented (Pawson and Tilley, 1997; Astbury and Leeuw, 2010). Finally, examples of both deductive and inductive middle-range theorizing are provided in the context of logistics customer service (LCS), due to its centrality within the logistics domain.

## **GENERAL AND MIDDLE-RANGE THEORIZING**

*General theories* apply to a wide range of phenomena by defining concepts and relationships at a high level of abstraction (Hunt, 1983). Such theories are familiar to most logistics scholars; popular general theories used in logistics research include resource-based theory (Wernerfelt, 1984; Barney, 1991), transaction cost economics (Williamson, 1973, 1979), contingency theory (Van de Ven et al., 2013), social network theory (Jones et al., 1997; Krause et al., 2007), and social exchange theory (Emerson, 1976). These theories are general *by design*. In describing transaction cost economics, for example, Williamson (1998) suggested that “any

issue that arises as or can be reformulated as a contracting problem is usefully examined through the lens of transaction cost economizing” (p. 24). This generality is reflected in the logistics literature, with scholars applying transaction cost analyses to such diverse phenomena as logistics strategy (Carranza et al., 2002), the impact of logistics information technology (Esper and Williams, 2003; Bourlakis and Bourlakis, 2005), and the role of third-party logistics providers (Skjoett-Larsen, 2000; Zacharia et al., 2011).

General theories drive research questions focused on phenomena operationalized at a high level of abstraction with little functional context or specificity. For instance, the primary question that drives resource-based theory (RBT) is why some firms can consistently outperform others (Barney, 1991). RBT conceptualizes firms as complex bundles of strategic and non-strategic resources operating in non-equilibrium (evolutionary) factor markets (Barney, 1991; Barney, 2001). Based on this general conception of the world, RBT builds predictions relating resources and firm performance (Wernerfelt, 1984; Barney, 1991). RBT does not examine the specific nature of those resources; indeed, resources have been defined as any tangible or intangible “entity” that firms can use to achieve an advantage, including financial, physical, legal, human, organizational, informational, and relational entities (Hunt, 2000). Thus, while RBT has been used to explain and predict logistics phenomena, the focus of RBT is not on logistics phenomena *per se*. Rather, RBT applies to logistics phenomena only to the extent that these phenomena can be recast under the broader umbrella of “resources” that serve to explain the sustainable competitive advantage of firms (Hunt and Morgan, 1996).

*Middle-range theories*, by contrast, incorporate a level of specificity that restricts their explanation of causal connections to a subset of phenomena operating within a given domain (Merton, 1968). They consolidate well-established empirical findings and hypothetical

statements within a domain of knowledge, and thus “lie between the minor but necessary working hypotheses that evolve in abundance during day-to-day research and all-inclusive systematic efforts to develop a unified theory that will explain all the uniformities of social behavior, social organization and social change” (Merton, 1968, p. 39). Their aim is to predict phenomena by focusing on the specific generative causes (or mechanisms) that produce outcomes within a particular context (Pinder and Moore, 1979; Pawson and Tilley, 1997). As an example, middle-range theorizing would specifically focus on *logistics* customer service, rather than customer service more broadly. It would aim at understanding contexts and mechanisms *within the logistics domain* that drive relevant outcomes of good or bad logistics customer service.

Table 1 presents the main characteristics of middle-range theories. Importantly, middle-range theories are not merely “contextualized” general theories. Where general theories suggest variables and propositions that are not bound by any particular domain, middle-range theories, by contrast, are deeply embedded in their development context (Pinder and Moore, 1979). The formulation of middle-range theories begins with knowledge that has accumulated about a phenomenon within a specific domain (Lindblom and Cohen, 1979; Kim et al., 2009). This knowledge may be deduced from research that was originally motivated by general theoretical frameworks, but may also be derived from more inductive, qualitative observations of practice. In either case, once this knowledge is well established within a domain through repeated observation and testing, it can serve as the starting point for middle-range theorizing. Middle-range theories consolidate either well-tested or well-observed knowledge into theoretical propositions that reflect the body of evidence from the domain itself rather than from the more general body of knowledge from which general theories have emerged (Pinder and Moore, 1979).

Middle-range theories must therefore incorporate contextual accuracy and detail in their formulation (Weick, 1989). Once a set of middle-range propositions has been established, these propositions serve as the theoretical framework for new research on why, how, and when specific relationships operate within the given domain (Pawson and Tilley, 1997)

[Insert Table 1 here]

Figure 1 provides a conceptual summary of the differences between research motivated by general theorizing and middle-range theorizing. General theorizing focuses on conducting research in new areas to extend a theory's generalizability across domains. Middle-range theorizing seeks to consolidate knowledge regarding how, why, and when variables related to a phenomenon of interest generate outcomes within a specific domain; since hypotheses and analyses are contextually specific, generalizability, by definition, is limited.

[Insert Figure 1 here]

Importantly, middle-range theories can operate both in a context of justification or discovery (Brodie et al., 2011). In a context of justification, they provide a basis for researchers to extend knowledge by testing domain-specific hypotheses *deduced* from the accumulated results of general theory testing. In a context of discovery, middle-range theories allow researchers to formulate hypotheses that are *induced* from qualitative observation in the field. Middle-range theorizing thus accommodates both the deductive and inductive aspects of empirical research (Kaplan, 1973), as portrayed in Figure 2.

[Insert Figure 2 here]

## HOW TO THEORIZE AT THE MIDDLE RANGE

The conduct of formal middle-range theorizing is explicit with regard to three essential elements: (1) locating research within a specified domain of knowledge, (2) building directly on



established findings within that domain, (3) focusing on causal mechanisms and the contexts in which they produce outcomes (Pinder and Moore, 1979; Pawson and Tilley, 1997). By combining these elements, middle-range theorizing seeks to produce research grounded in evidence and geared toward understanding when and how actions lead to results (Weick, 1974, 1989). In addition, it enables researchers in a mature discipline to focus on extending knowledge within the domain without repetitively justifying the use of general theoretical lenses. Figure 3 provides a process map for logistics researchers seeking to undertake middle-range theorizing. Details of the process are included in the narrative below.

*[Insert Figure 3 here]*

### **Determining what to focus on in Middle-Range Theorizing (MRT)**

Middle-range theorizing begins by identifying a well-established relationship within a specific domain of knowledge to serve as the research's focus. Such a relationship must have received considerable scholarly attention and established substantial quantitative and/or qualitative empirical evidence accumulated over time (Merton, 1968). Given the attention it has received, a well-established relationship might represent a "core" or "central" tenet of a discipline. Such well-established relationships can be identified in a number of ways. Meta-analysis, for example, could be used to establish that a given relationship is supported by statistical evidence across numerous studies (Goldsby and Autry, 2011). Other techniques for determining a good candidate for middle-range theorizing might include Delphi surveys (Okoli and Pawlowski, 2004) or systematic literature reviews (Hart, 1998). The aim is to identify a relationship for which a substantial body of research clearly establishes the connections between important concepts in the domain.

A well-established relationship forms the central theoretical framework of middle-range research. At this point, explaining the relationship in terms of a more general theory is unnecessary. Instead, the researcher moves directly into either inductive or deductive research to expand domain-specific knowledge of the relationship (Brodie et al., 2011). Inductive research might explore emerging aspects of the relationship or develop extensions to the relationship in new contexts. Deductive research might derive and test specific hypotheses related to mediator and moderator variables.

### **Exploring the why, how, and when of MRT**

Middle-range theorizing is distinguished from other types of theorizing by its focus on understanding why, how, and when outcomes occur (Astbury and Leeuw, 2010). Logistics management research has tended to focus on establishing *that* an association exists between constructs. For example, logistics capabilities impact performance; or technology-enabled information sharing improves integration; or location within a network impacts access to resources. Middle-range theorizing shifts the focus to unpacking *why and how* constructs are related, and *under what conditions*. Guided by the realist framework of *mechanism + context = outcomes*, middle-range theorizing seeks to illuminate the “black box” represented by the arrow in traditional  $x \rightarrow y$  models (Pawson and Tilley, 1997). To that end, constructs are conceptualized in terms of their potential for change, causal mechanisms linking constructs are described in detail, and specific contexts that enable (or inhibit) the causal flow through mechanisms to outcomes are identified (Pawson and Tilley, 1997).

### **Research design for MRT**

Research design for MRT should likewise be guided by the *mechanisms + context = outcomes* framework. Inductive research might explore new mechanisms to develop an

understanding of their potential to produce outcomes. Inductive research might also offer deeper explanations as to why certain contexts enable or inhibit the ability of mechanisms to impact outcomes. Deductive studies, meanwhile, might focus on collecting and analyzing data to test different combinations of context, mechanisms, and outcomes. In either case, data collection and analysis should aim at establishing relationships among a limited subset of phenomena within a given domain.

### **Theoretical bridging and additional observation emerging from MRT**

Over time, the process of middle-range theorizing from empirical evidence should establish a “catalogue” of widely accepted theoretical concepts and relationships within a discipline. With each successive iteration, the process reduces subsequent researchers’ need to retrace previously established and well-known tenets. This frees them to push the envelope into the unknown. Likewise, middle-range theorizing should promote a diversity of aims. In areas with limited observation it drives basic research; in areas with abundant evidence it consolidates and extends concepts; and in areas with strong understanding it generalizes across domains to connect back to general theory (Pinder and Moore, 1979). Ultimately, middle-range theorizing should establish a strong theoretical foundation within the domain of interest so as to facilitate future extensions across disciplines (Merton, 1968). In addition, middle-range theorizing should generate domain-specific results that enhance the applicability of academic research to practice, as has been advocated by senior leaders in the logistics discipline (Lambert and Enz, 2015).

Over the last 50 years, scholars have accumulated a substantial base of empirical knowledge focused on the practical logistics management problems. Researchers have identified a number of core logistics phenomena and repeatedly tested the relationships linking these phenomena to antecedents and outcomes. Consolidating this knowledge into a body of well-

articulated middle-range theories – and then applying these theories to produce rigorous research on why, how, and when established relationships produce relevant outcomes – has the potential to unleash a new phase of knowledge production in our field. Indeed, researchers in other disciplines, particularly marketing, have already begun to apply middle-range theorizing to enhance their work's rigor and relevance. The following section presents two examples (one deductive and one inductive) to illustrate how researchers in logistics might utilize a middle-range approach to gain new insights into core logistics phenomena.

### **MIDDLE-RANGE THEORIZING ON LOGISTICS CUSTOMER SERVICE (LCS)**

A number of phenomena from the logistics domain that have received significant research focus are strong candidates for middle-range theorizing. One, the concept of LCS, has been substantially researched both theoretically and empirically in logistics (see Table 2). LCS thus exemplifies a concept that could benefit from middle-range theorizing.

*[Insert Table 2 here]*

Although scholarship in this area has its roots in marketing (Sterling and Lambert, 1987; Langley and Holcomb, 1992), LCS has evolved over the decades into a uniquely logistics-centered concept with logistics-specific operationalizations, antecedents, and consequences (Rao et al., 2011). Taken as a whole, this body of research clearly establishes that LCS impacts a number of important outcomes, including customer satisfaction and loyalty, and firm financial performance (Ellinger, 2000; Tracey, 2004; Germain and Iyer, 2006; Richey et al., 2007; Leuschner et al., 2013). Despite this wealth of empirical exploration, the general nature of most LCS research offers limited insight into the specific mix of activities that must interact to produce the specific customer and financial outcomes expected from LCS; neither do researchers

suggest how these interactions might differ across contexts. Middle-range research focuses on addressing why, how, and when questions regarding LCS and its impact on customer and financial performance outcomes could therefore substantially enhance theory and practice.

### **A Deductive Approach to Middle-Range Theorizing on Logistics Customer Service**

Mentzer et al. (2001) provide an example of rigorous middle-range theorizing; they build directly on established findings within the logistics domain to propose and test hypotheses on the causal mechanisms linking LCS to customer satisfaction. Because the broad concept of customer service sits at the intersection of the marketing and logistics disciplines, this research was published in a marketing journal. Yet the focus is clearly on *logistics customer service*. The research begins with a concise review of empirical evidence, derived from general frameworks, indicating the existence of a relationship between LCS and customer satisfaction. The authors move beyond general frameworks by collecting data and using evidence gleaned from their data to move directly into middle-range theorizing on why, how, and when LCS generates customer satisfaction for different customer segments.

Using a combination of interviews and previous service research in logistics and physical distribution, the authors identify nine causal mechanisms within the logistics service quality process. These include personnel contact quality, order release quantity, information quality, ordering procedures, order accuracy, order condition, order quality, order discrepancy handling, and timeliness. These logistics service mechanisms differ from the more general conceptualizations of service quality previously identified in marketing research (e.g. Parasuraman et al., 1985). The authors develop hypotheses focused on the relationships among the various mechanisms and the resultant impact on customer satisfaction. The hypotheses are then tested in three different industry contexts (textiles, electronics, and construction). Their

analyses provide specific insights into the different sets of activities that generate customer satisfaction in different industries. These insights offer implications for LCS segmentation that result in a middle-range theory: a detailed, empirically-grounded account of how LCS operates through a series of mechanistic interactions to generate customer satisfaction. Although the authors do not explicitly describe their research in terms of middle-range theorizing, they nevertheless apply the elements of a middle-range theorizing approach to develop a deductive test of *mechanisms + contexts*.

Figure 4 demonstrates more specifically how different elements of middle-range theorizing can be applied, beginning with the foundational  $x \rightarrow y$  relationship established through general theorizing. In the case of LCS, the established premise is that improving logistics customer service results in improved firm performance. Previous evidence shows that customer satisfaction mediates the LCS – performance relationship, so Mentzer et al. (2001) explore why, how, and when the relationship between LCS and customer satisfaction holds. To answer why, they postulate that LCS processes (mechanisms) heighten customer satisfaction. Further, they attempt to understand how LCS impacts customer satisfaction by examining the influence of nine separate mechanisms of logistics service quality processes. Finally, the research explores specific contexts (business-to-business vs. business-to-consumer industries and products) when different relationships between the foundational concept and the service quality mechanisms may or may not exist. Subsequent research by Davis-Sramek et al. (2008) adds further dimensionality to the middle-range theory of LCS by considering logistics customer loyalty as a mediator between customer satisfaction and firm performance. As indicated in Figure 4, further research needs to explore mechanisms and contexts related to why, how and when customer satisfaction leads to logistics customer loyalty and then to firm performance.

[Insert Figure 4 here]

### **An Inductive Approach to Middle-Range Theorizing on Logistics Customer Service**

Flint et al. (2005) provide an example of inductive middle-range theorizing that complements the deductive approach adopted by Mentzer et al. (2001). Flint and his colleagues employ grounded theory methodology to develop a theory of logistics customer service innovation (LCS-I). Grounded theory is particularly appropriate method because it specifically aims to generate theories at the middle range (Glaser and Strauss, 1967; Bourgeois, 1979). Due to the lack of empirical research on LCS-I at the time, the authors initially draw on general theoretical perspectives for their conceptual development. They argue, however, that general theories provide few insights for new research on logistics-specific customer service innovation. Therefore, to gain sensitivity to potential theoretical issues, they use these general perspectives and then construct a theory grounded within the logistics context.

The authors conduct 33 in-depth interviews with logistics managers across seven firms. These open-ended, discovery-oriented interviews provide rich empirical data from which the authors derive a robust middle-range theory. The causal process through which logistics service providers arrive at innovative service solutions for their customers is described in four parts – stage setting activities; customer clue gathering activities; negotiating, clarifying, and reflecting activities; and inter-organizational learning activities. Each activity set is grounded in empirical evidence from the interviews; each focuses on a limited set of contextualized phenomena related to LCS innovation. Because the aim in this case is to generate theory, the authors do not propose and test formal hypotheses. Nevertheless, the interviews do indicate that the innovation process works for both dedicated logistics service providers as well as manufacturers that provide

logistics services. Their discussion suggests other contextual factors that might influence LCS-I process.

By undertaking basic research in an area where observations were limited, Flint et al. (2005) have developed a middle-range theory around LCS innovation. Figure 5 provides a template for, and graphical representation of this inductive approach to middle-range theorizing; it demonstrates how the researchers used a qualitative research technique to better understand the mechanisms that explain why and how managers engage in the process of logistics innovation. Qualitative data analysis was conducted to generate deeper insights into how LCS produces value for customers through activities associated with the logistics service innovation process. In addition, potential contextual factors such as industry type and technological capabilities that may influence the LCS → performance relationship emerged. Both the mechanisms and contexts discovered through the inductive qualitative research process resulted in a middle-range theory of logistics service innovation. Researchers have since utilized deductive techniques to test the tenets of this theory, expanding the conceptual framework (Wagner, 2008), and linking LCS innovation to customer loyalty (Wallenburg, 2009) as well as market performance (Grawe et al., 2009). Thus, middle-range theorizing by Flint et al. (2005) has generated new knowledge on another set of mechanisms through which LCS can potentially impact firm financial outcomes. Future research that takes a more explicit *context + mechanisms* approach could clarify what might work for whom and under what service innovation conditions.

[Insert Figure 5 here]

The examples above illustrate how middle-range theorizing can generate new knowledge that is specific enough to substantially impact theory and practice in logistics. Where Mentzer et al. (2001) test specific mechanism-context-performance combinations, Flint et al. (2005) explore



emerging innovation aspects of LCS. Both papers, however, expand understanding of why, how, and when LCS affects performance and set the stage for further research on the LCS-performance link.

A word of caution is warranted. Not all research that has defined a context and/or explores mediators or moderators of main effects can be considered middle-range theorizing. Replications of empirical tests of established general theoretical relationships using constructs that have been operationalized in logistics are not necessarily examples of deductive middle-range theorizing. Nor are all proposals for new frameworks that postulate interesting new relationships examples of inductive middle-range theorizing. Rather, middle-range theorizing, like all good science, must follow strict and purposeful processes and procedures that have been established in the literature. Research claiming to exist at the middle range must demonstrate three elements: clear positioning within a specified domain of knowledge; direct extension/clarification of established findings; and an explicit focus on causal mechanisms and the contexts in which they produce outcomes.

## **CONCLUSION**

Editors of highly impactful logistics research journals, like their peers in marketing and management disciplines, continue to emphasize the need for rigorous and relevant research that generates appropriate and actionable implications for phenomena. Other mature disciplines use middle-range theorizing to build upon the accumulated knowledge generated by previous general theory research. This enhances understanding of the interacting mechanisms that generate specific outcomes in different relevant contexts. After 50 years of rigorous research, the logistics discipline now enjoys a number of foundational phenomena primed for inquiry and exploration

using middle-range theorizing to deepen knowledge of the specific, actionable, processes through which these phenomena generate results – the how's, why's and when's of discovery. For example, opportunities exist to develop more formal middle-range theories around core logistics knowledge in the areas of postponement (Zinn and Bowersox, 1988), integration (La Londe and Powers 1993), and the relationship between logistics and supply chain management (Cooper et al., 1997). The framework and examples provided in this paper should help to clarify the process researchers can undertake to establish and extend such theories.

Logistics researchers adoption of middle-range approaches is warranted as the discipline matures with an increasingly unified body of knowledge. Freedom from grappling with general theories that are neither contextually specific nor sufficiently granular to reveal operating mechanisms will open exciting new paths of discovery. Focusing on middle-range theorizing will enable researchers to navigate within established general relationships and explore the side streets and alleys within those relationships; those secondary routes are often not visible from the altitude at which general theorizing resides. Employing the rigorous process described in this paper will enable deeper insight development about those side streets and alleys. This will further shape logistics-specific theory, while also enabling scholars to provide more relevance to actual logistics practices. The two examples highlighted in this paper clearly demonstrate how a middle-range approach can generate new knowledge within the logistics discipline that substantially impacts both theory and practice. Importantly, middle-range theorizing need not be focused on logistics alone; core supply chain management concepts are ripe for such treatment by the broader supply chain management scholarly community.

Finally, a middle-range approach heightens the actionable impact of academic research by focusing on the how, why and when questions in which managers and students are interested

(Lambert and Enz, 2015). Research conducted in a language and context directly accessible to logistics students and practitioners promises to enhance scholars' insight dissemination and feedback solicitation. Ultimately this will inform future work (Mentzer and Schumann, 2006). In discussing the role of theory in logistics and supply chain management, Fawcett and Waller (2011) came to the following conclusion:

As supply chain academics, we can and will make valuable contributions to the world's knowledge base as we design our research for relevance. We must understand the knowledge-production and knowledge-translation difficulties that have always plagued the Academy. We must pursue research that accurately and confidently describes the world around us, explains how key relationships work, prescribes appropriate strategy and behavior, and sets the stage for further inquiry." (5)

This paper supports this contention by providing both a springboard and template encouraging logistics scholars to use middle-range theorizing to identify, articulate, and explore the mechanisms and contexts. Those key how, why and when questions reveal which foundational logistics phenomena impact crucial outcomes for customers, employees, firms and society.

Increasingly over the past two decades, researchers have used both deductive and inductive techniques to explore contexts and mechanisms unique to the logistics domain. Adopting a formal process of rigorous middle-range theorizing will enable researchers to better develop broadly accepted logistics theories. This paper could guide future research and increase interest in exploring new concepts and relationships that deliver on the promise of middle-range theorizing in logistics.

**Table 1: Characteristic Features of Middle-Range Theories**

- 
- Synthesize empirical findings that have emerged through research in a particular domain of knowledge
  - Rely on a limited set of realistic assumptions appropriate for the focal domain
  - Define concepts in a manner that is specific to the focal domain
  - Restrict theoretical propositions regarding the relationships among concepts to the focal domain
  - Make predictions that are specifically relevant to resolving theoretical and practical problems within the focal domain
  - Provide a basis for potential linkages to more general theories that could potentially extend knowledge into other domains
- 

*Based on Merton (1967) & Pinder and Moore (1979)*

**Table 2: Representative Research of the LCS – Performance Linkage**

<b>Study</b>	<b>Context</b>	<b>Operationalization</b>	<b>Major findings</b>
Bienstock et al. (2008)	Purchasing professionals /cross-industry	Separation of logistics process quality and logistics outcome quality	Logistics outcome quality is positively associated with satisfaction with logistics services.
Cater and Cater (2009)	Purchasing professionals/ manufacturing context	Delivery performance	Customer satisfaction is affected by delivery performance.
Dadzie et al. (2005)	Online	Cycle time quality, in-stock availability, and customer responsiveness	Customer responsiveness disconfirmation is positively associated with online customer intended loyalty.
Daugherty et al. (1998)	Buyers of personal products (e.g., grocery, drug, and discount chain stores)	Logistics/ distribution service performance	Customer satisfaction is affected by distribution service performance and intervenes the relationship between distribution service performance and customer loyalty.
Davis-Sramek et al. (2008)	Manufacturer-retailer context in the consumer durables industry	Separation of operational and relational fulfillment service	Both operational and relational fulfillment service influence customer satisfaction.
Ellinger et al. (2000)	U.S.-based manufacturers	Distribution service performance such as timeliness, availability, and the condition of the delivered order (relative to the largest competitors)	Distribution service performance is positively associated with firm performance.
Germain and Iyer (2006)	CSCMP's manufacturer member	Logistics performance (i.e., delivery lead-times, inventory turnover, and on-time deliveries)	Logistical performance predicts financial performance (i.e., ROI, profit, and growth).
Gil-Saura et al. (2008a)	Supplier-retailer and retailer-consumer contexts	Adapted from Mentzer et al. (2001)	Logistics service quality influences customer satisfaction.
Gil-Saura et al. (2008b)	Manufacturing context	Logistics service quality as personnel quality, information quality, order quality, and timeliness	Logistics service quality influences customer satisfaction.
Leuschner et al. (2012)	Health care industry (i.e., hospitals in the blood banking sample)	Delivery performance such as problem and complaint handling, responsiveness and delivery flexibility, lead time, and information quality	Logistic service quality positively affects customer satisfaction. Logistics service quality is a differentiator between primary and secondary suppliers.
Panayides (2007)	Third-party logistics service providers (LSP) in Hong Kong	Logistics service effectiveness (e.g., on-time service delivery, timely response to requests, accurate information delivery to	Logistics service effectiveness positively influences firm performance of the LSP (e.g., profitability, market share, sales growth and

<b>Study</b>	<b>Context</b>	<b>Operationalization</b>	<b>Major findings</b>
Rao et al. (2011)	Online retailers: B2C environment	clients, and willingness to help clients) Online order fulfillment (i.e., available shipping options, item availability, on-time delivery, and order tracking)	volume, and ROI). Logistics service quality positively affects customer's purchase satisfaction.
Richey et al. (2007)	Cross-industry	Logistics Service Quality (LSQ) adapted from Mentzer et al. (2001)	LSQ in terms of order release quantities, order accuracy and condition, order discrepancy handling, and timeliness influences market and financial performance.
Shang and Marlow (2005)	Manufacturing firms in Taiwan	Logistics performance adapted from Stank et al. (1999) and Ellinger et al. (2000)	Logistics performance is positively associated with financial performance.
Stank et al. (2003)	3PL	Relational, operational, and cost performance	Logistics relational performance influences both operational and cost performance, which are positively related to customer satisfaction.
Swink et al. (2007)	Manufacturing plant	Delivery capability	Delivery capability influences both customer satisfaction and market performance.
Tracey (2004)	Manufacturing firms	Delivery service (e.g., on-time delivery, accurate information delivery to clients, order completeness, and frequency of delivery)	Delivery service positively impacts firm performance (e.g., sales growth, return on assets, and market share gain).

Figure 1. General and Middle-Range Theorizing

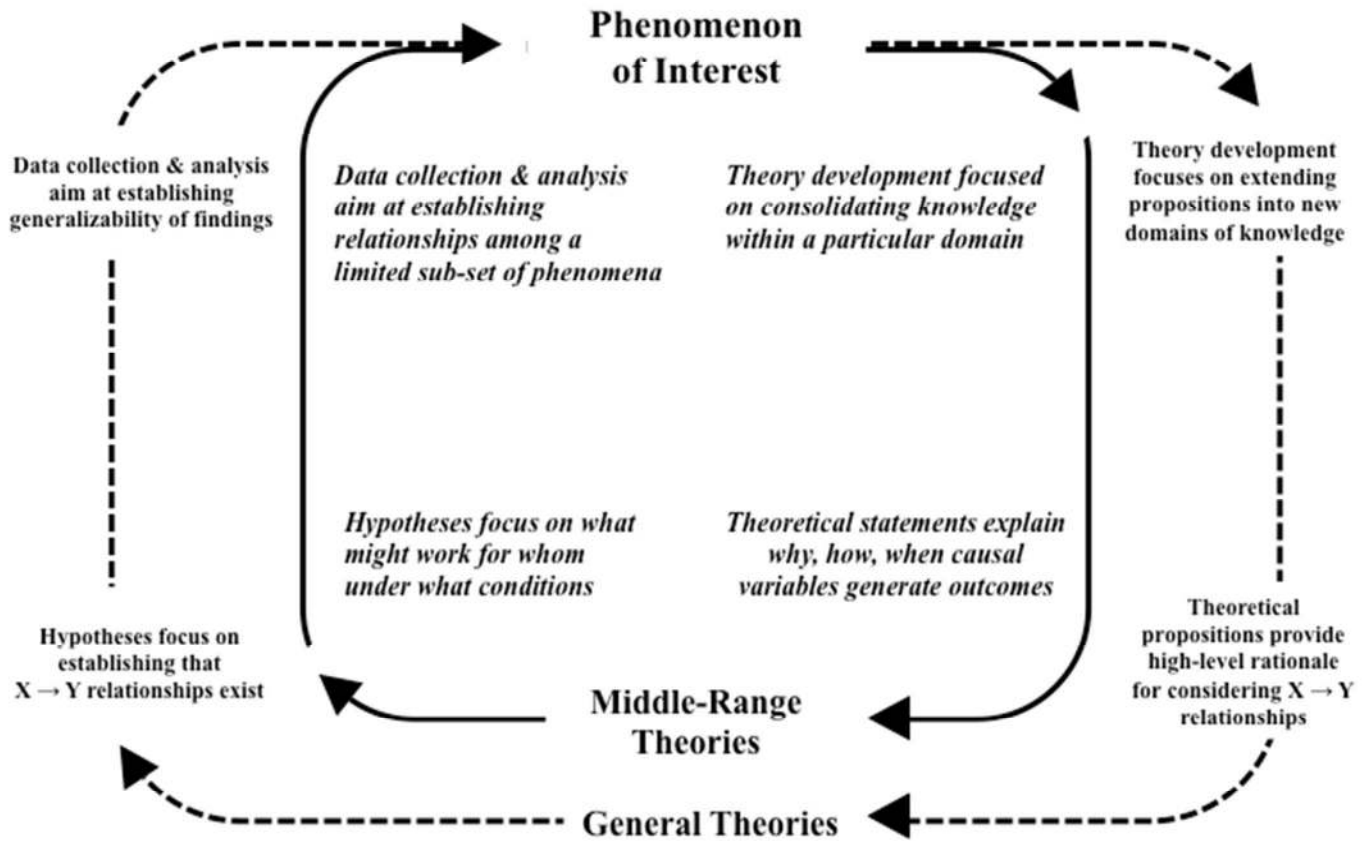
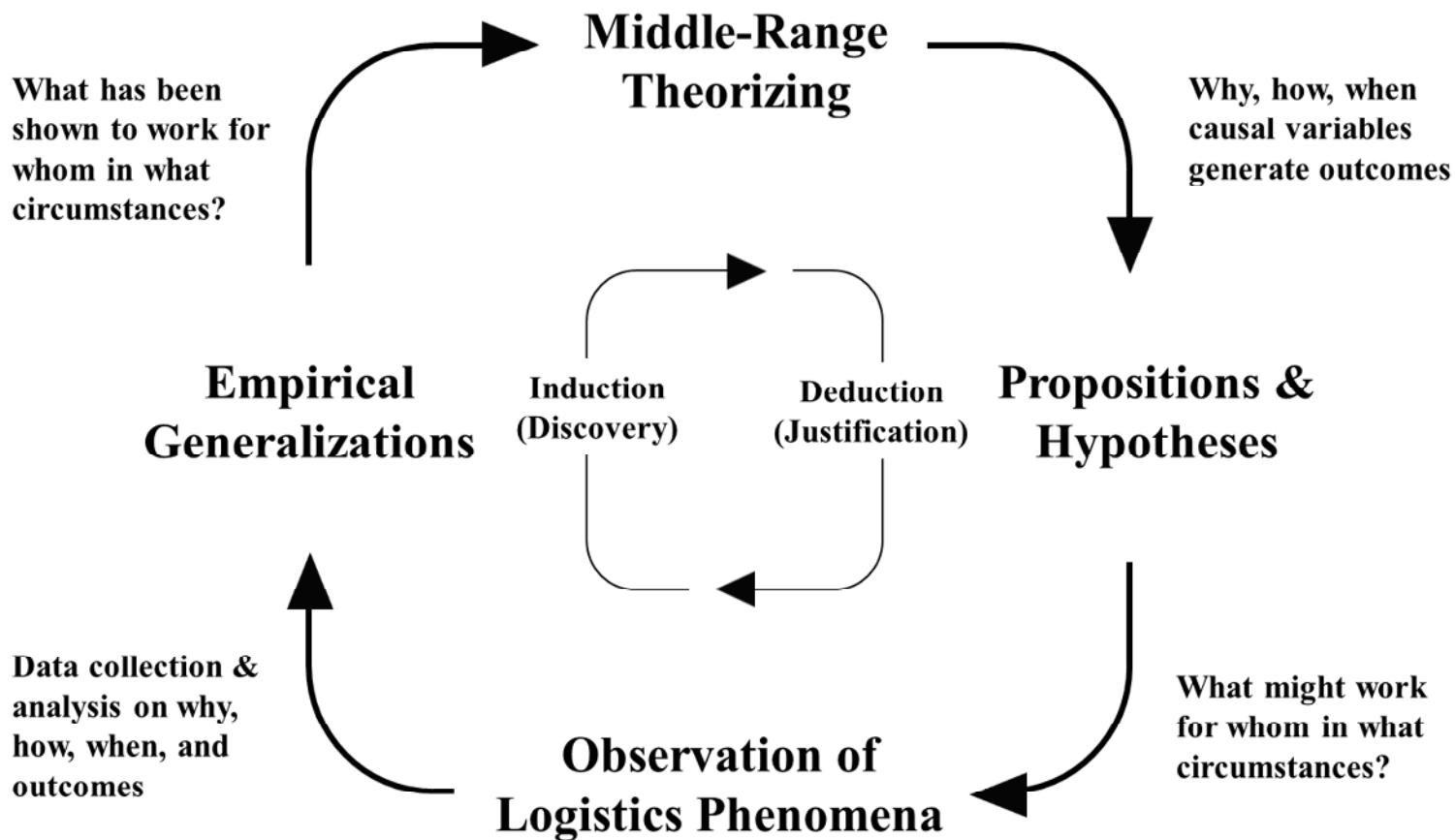


Figure 2. Goals of Middle-Range Theorizing



*Adapted from Pawson and Tilley (1997)*





Figure 3. The Process of Middle-Range Theorizing

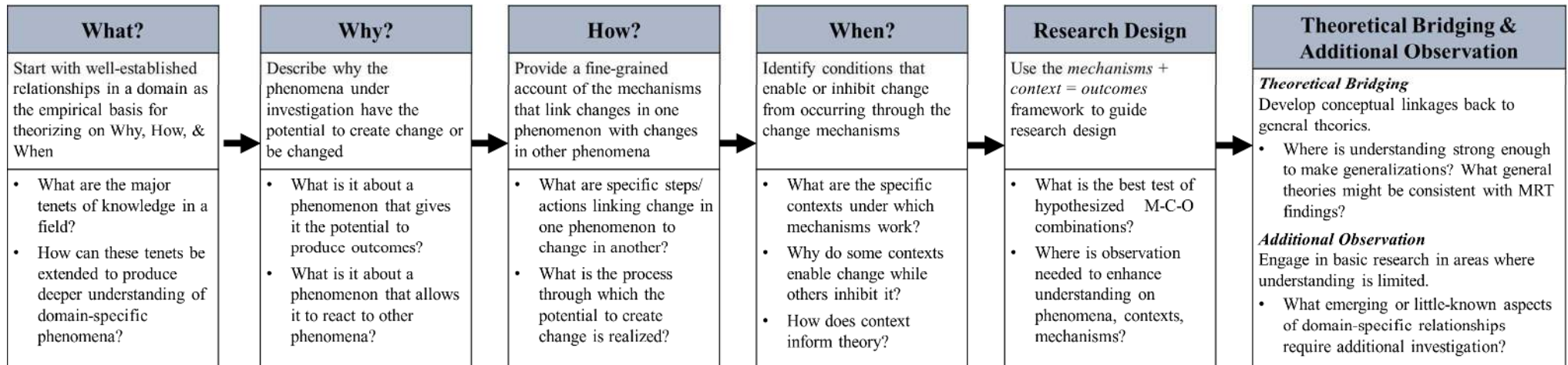


Figure 4. A Deductive Approach to Middle-Range Theorizing

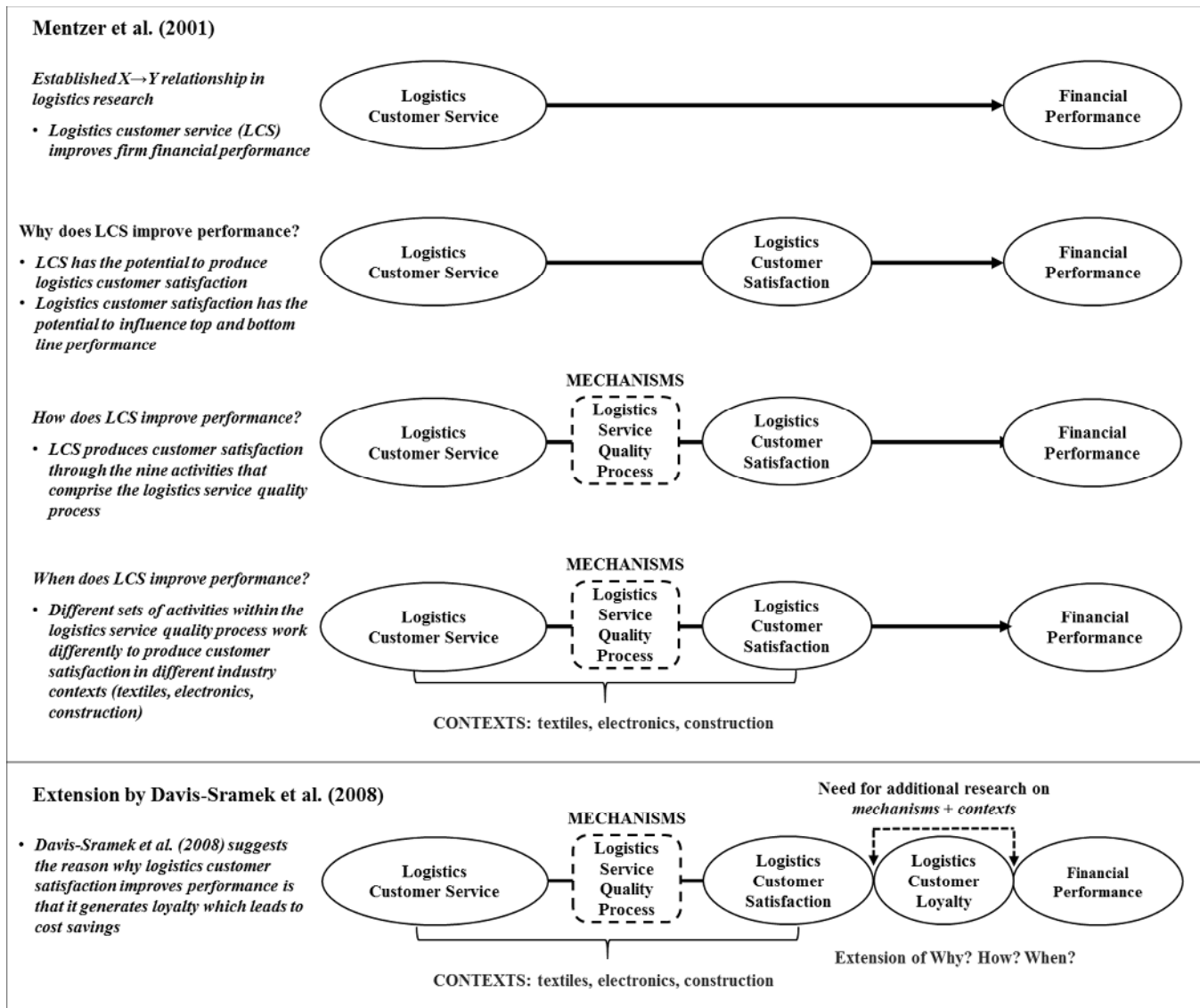
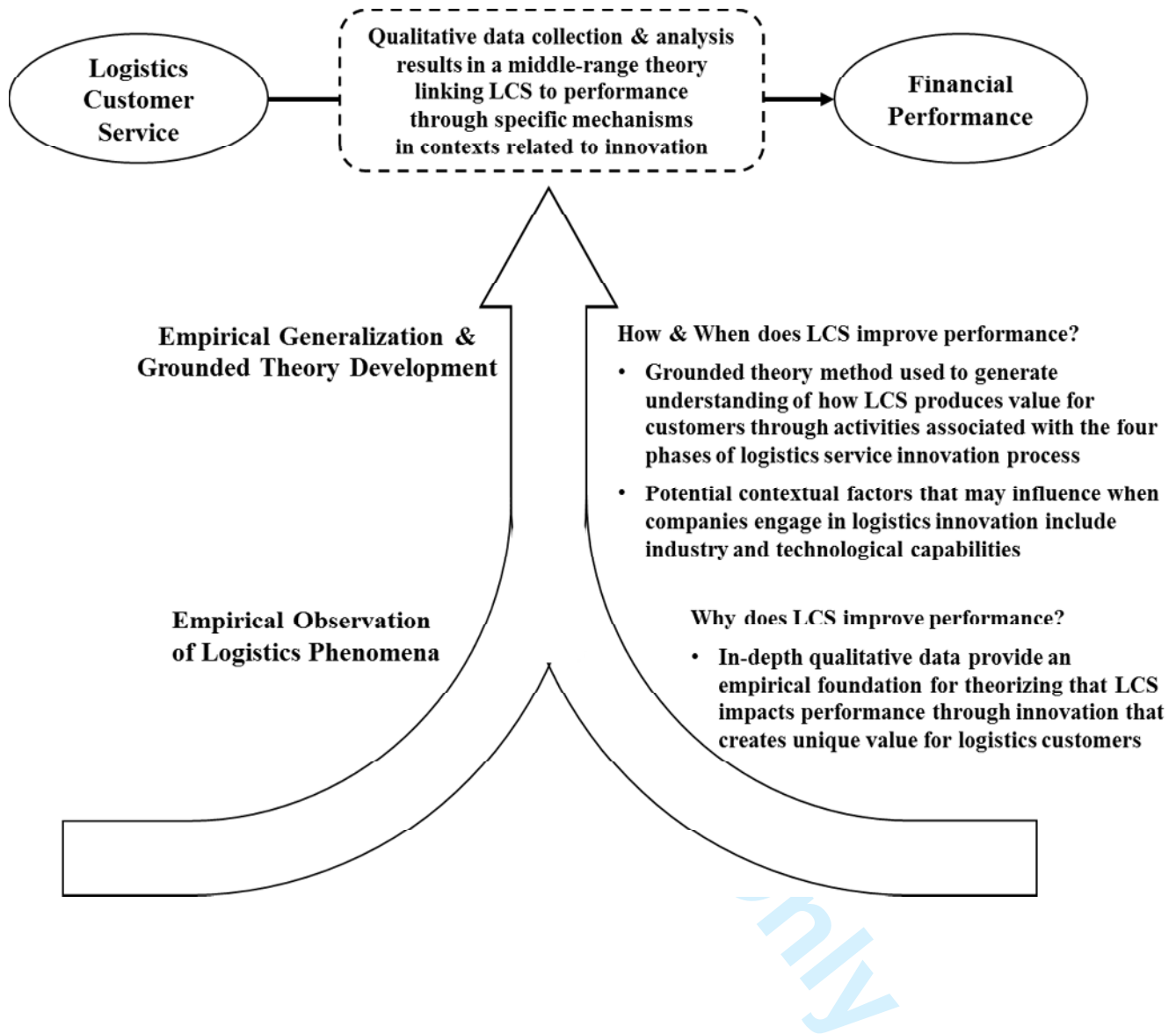


Figure 5. An Inductive Approach to Middle-Range Theorizing



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