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Assessing Quality in Mixed Methods Research: A Case Study Operationalizing the Legitimation Typology

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ASSESSING QUALITY IN MIXED METHODS RESEARCH: A CASE STUDY OPERATIONALIZING THE LEGITIMATION TYPOLOGY

by

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Quality in mixed methods research (MMR) has been an ongoing topic of discussion over the past two decades. One of the obstacles of assessing quality in a MMR study is developing credible inferences from the integration of quantitative and qualitative approaches (Plano Clark & Ivankova, 2016). Some researchers have designed a variety of strategies for assessing quality of a mixed methods study as a whole (Teddlie, & Tashakkori, 2003; Onwuegbuzie & Johnson, 2006; Tashakkori, & Teddlie, 2003), but there is no general consensus among researchers on which methods to use. The aim of this intrinsic, exploratory case study was to investigate how researchers assess quality of a MMR study, particularly using the legitimation typology, and ultimately, operationalize the legitimation typology to increase its applicability in MMR. Individual semi-structured interviews were conducted with the co-developer of the legitimation typology, researchers who had applied the legitimation typology to their empirical study, and mixed methods scholars who have written about or share knowledge on the legitimation typology. Data analysis revealed eight themes: (1) role of validity in MMR, (2) importance of integration, (3) value added to discordant data, (4) versatility of the legitimation typology, (5) role of colleagues/mentors in MMR, (6) researchers' application/interpretations of legitimation types, (7) clarifications to the legitimation typology, and (8) researcher recommendations. Based on these findings, several recommendations to the current 2017 legitimation typology are proposed.

Keywords: legitimation, validity, mixed methods research, quality

DEDICATION

The completion of this thesis (and the continuation of graduate school) would not have been possible without those who were furthest in distance, yet closest to my heart—my parents, Rayden, and my dearest friend, Melanie. Their support throughout this journey has been more than I could have ever imagined. Thank you!

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CHAPTER I: INTRODUCTION

Problem Statement

Should researchers implementing a mixed methods design only validate the quantitative and qualitative strand independently of one another? Or, should researchers instead validate each strand independently, but also apply standards that assess the quality of the overall mixed methods design as a whole? This is a prevalent question in the field of mixed methods research (MMR) as it continues to develop as the "third methodological movement" (Collins, Onwuegbuzie, & Johnson, 2012, p. 850). While quantitative and qualitative research have distinct methods for assessing validity/trustworthiness, there appears to be some ambiguity when assessing quality within a mixed methods design. Some researchers have created frameworks for assessing the quality of a MMR study (Teddlie & Tashakkori, 2003; Tashakkori & Teddlie, 2006; Onwuegbuzie & Johnson, 2006), yet it is uncertain whether these models of quality are being implemented. The original 2006 legitimation typology is one example comprised of nine domains that has been used to evaluate the way researchers generate quality inferences of the mixed methods design from the integration of the quantitative and qualitative strands (Onwuegbuzie & Johnson, 2006).

Several researchers have claimed that the current legitimation typology is still in its initial stages and will continue developing, whereas others claim that it will remain incomplete (Onwuegbuzie & Johnson, 2006). Some researchers believe that quality standards in MMR could be both helpful and detrimental to the field (Creswell, 2015; Ivankova & Kawamura, 2010). They believe that quality standards carry a degree of bias as they incorporate a researcher's pragmatic views (Creswell, 2015; Ivankova & Kawamura, 2010). Nonetheless, considering the growth of MMR in the social and health science and education fields, it is imperative that we use a typology/framework for assessing quality in MMR (Creswell, 2015). Doing so will result in

credible inferences and conclusions that are grounded in the mixed methods design, not solely the quantitative or qualitative design.

Purpose and Research Questions

The aim of this intrinsic, exploratory case study was to investigate how researchers are assessing quality of a MMR study, particularly using the legitimation typology, and ultimately, refine the legitimation typology to extend its reach in the mixed methods literature.

This study addressed the following central question:

> **RQ1:** How can the legitimation typology be operationalized to expand its applicability and increase the overall rigor of quality in MMR?

The following sub-questions specifically explored quality in MMR from the perspectives of different researchers in the field:

> **RQ2:** What clarifications can the researchers who created the legitimation typology provide?
>
> **RQ3:** What are the perspectives of mixed methods researchers who have used the legitimation typology in their research studies?
>
> **RQ4:** What are the perspectives of mixed methods researchers who have written about or share knowledge on the legitimation typology and overall methods of assessing quality in MMR?

Rationale for a Qualitative, Intrinsic, Exploratory Case Study Design

Merriam and Tisdell (2015) clearly note that qualitative research is implemented when researchers are particularly interested in exploring how people interpret their experiences, how they create their world, and what meaning they give to their experiences. Creswell and Poth (2018) describe qualitative research as a process where researchers first generate assumptions and use theoretical frameworks to inform the "research problems addressing the meaning

individuals or groups ascribe to a social or human problem" (p. 8). Qualitative research tends to be viewed as an iterative process where researchers engage in data analysis by identifying patterns connected to examples of a phenomenon and then develop a general sense of the phenomenon as a whole informed by those patterns (Levitt, Bamberg, Creswell, Frost, Josselson, & Suárez-Orozco, 2018). This qualitative study explored *how* quality is assessed in mixed methods research, particularly using the legitimation typology, and indirectly explore *why* only a select few researchers were using this typology to assess quality.

A case study in qualitative research can be used to develop a thorough understanding of a particular issue or problem within a case (Creswell & Poth, 2018). A researcher's goal is to study a case (or cases) within a real-life setting (Yin, 2014). The case (or cases) must be studied within a bounded system, bounded by a time or place. For this study, the case was bounded to the legitimation typology. I used a purposeful sampling approach by selecting researchers who had created the typology, implemented the typology in a MMR study, and researchers who had written about or share knowledge on the typology. This study was an exploratory case study, as it explored quality in MMR, particularly using the legitimation typology, in greater detail with no predetermined outcomes (Creswell & Poth, 2018). Finally, this case study was also intrinsic in nature, as it focused on the case itself, quality in MMR using the legitimation typology, and explored its features from the perspective of different mixed methods researchers (Grandy, 2010; Creswell & Poth, 2018).

According to Stake (1995, 2006), multiple sources of data collection and analysis should be implemented in a case study. For this study, I used documents such empirical articles from researchers who implemented the legitimation typology and individual semi-structured interviews to further explore this topic. For the data analysis portion, I found that Yin's approaches were too structured and positivistic, while Stake was on the opposite continuum, too

constructivist to align with my epistemological stance (see Researcher Reflexivity below). Due to this, I decided to analyze the data primarily using Merriam's (1998) approach. First, I made sense of the data by "consolidating, reducing, and interpreting what people have said and what the researcher has seen and read" (Merriam, 1998, p.178), then I used in vivo and initial codes, which helped to develop categories. From those categories, I used Yin's (2014) pattern matching approach to formulate overarching themes.

Researcher Reflexivity

Creswell and Poth (2018) state that reflexivity is the way researchers position themselves. Probst and Berenson (2014) state: "Reflexivity is generally understood as awareness of the influence the researcher has on what is being studied and, simultaneously, of how the research process affects the researchers. It is both a state of mind and a set of actions" (p. 64). In other words, this suggests that qualitative research is an analytical process that impacts and changes both the participants and the researchers to a certain degree (Merriam and Tisdell, 2015).

As a graduate student in the Quantitative, Qualitative, and Psychometric Methods program at the University of Nebraska-Lincoln (UNL), it is of utmost importance that research studies are conducted at a high caliber, demonstrating adequate evidence for validity and quality, among other factors. After taking several research methodology courses, I became intrigued with MMR and methods of assessing quality of the overall study considering mixed methods' uniqueness in incorporating a quantitative and qualitative component. After reading a corpus of mixed methods research studies I realized that many researchers were validating each strand independently from one another; very rarely were researchers addressing the quality of the mixed methods study as a whole. I explored different methods/frameworks for assessing quality in MMR, but the legitimation typology stood out to me the most. I found value in the legitimation typology and appreciated the list of legitimation types a researcher could choose from that were

most pertinent to their study. It seemed like an ideal typology to use as it heavily focuses on assessing the validity/quality of each independent strand and the integration of both, resulting in the overall mixed methods study. Nonetheless, after careful analysis of the typology I also believed some legitimation types presented in the original 2006 version could benefit from further explanations and clarifications. Therefore, my aim was to explore the 2006 legitimation typology within the context of a researcher's empirical study. From this synthesis I gathered support from participant interviews on ways to change or add to the current 2017 legitimation typology with the intention of encouraging researchers to implement higher standards of validity in MMR.

Paradigmatic Stance. Postpositivism is a paradigmatic framework that is focused on taking a scientific approach to research (Creswell & Poth, 2018, p. 23). While positivism is focused on strict interpretations and measurements of cause and effect, postpositivism helps a researcher to understand a phenomenon based on the cause and effect probability of an event occurring or not (Creswell & Poth, 2018). Postpositivism implements survey research and qualitative methods such as interviewing and participant observations (Taylor & Medina, 2011). For these reasons, it is seen as a modified scientific method for the social sciences (Taylor & Medina, 2011, p. 4). Postpositivist researchers typically follow a series of logically related steps to answer their researcher questions, while also knowing that multiple perspectives from participants may arise (Creswell, 2007). Therefore, I believed that conducting a qualitative case study using semi-structured interviews would be the best method at exploring how researchers assessed quality of their mixed methods study, more specifically, using the legitimation typology. I was aware that participants in this study may have multiple perspectives, but overall, the aim was to compare and contrast these perspectives. Postpositivism has also been described as using multiple sources of data for the analysis phase, using computer programs for data

analysis, and encourage the use of validity approaches, which was consistent with elements in this study (Creswell, 2007). Although I have also been exposed to quantitative research training, qualitative research played an essential role in uncovering the phenomena of quality of MMR using the legitimation typology among researchers. Several quality standards that are critical to this paradigm are objectivity, validity, and reliability, all of which were fundamental components in conducting this study (Taylor & Medina, 2011).

Definition of Key Terms

Commensurability legitimation: Refers to the extent to which the researcher generates meta-inferences based on a third viewpoint that encompasses both quantitative and qualitative perspectives (Onwuegbuzie & Johnson, 2006). This viewpoint has a deeper understanding of worldviews and engages in "Gestalt switches" from quantitative and qualitative perspectives (Onwuegbuzie & Johnson, 2006, p. 59). The third viewpoint is meant to go beyond the information that is provided from either a solely quantitative or qualitative design and is developed through "cognitive and empathy training" (Onwuegbuzie & Johnson, 2006, p. 59).

Gestalt switching: Refers to the iterative process of switching between the quantitative and qualitative lens to formulate a third viewpoint and ultimately develop meta-inferences grounded in a mixed worldview (Onwuegbuzie & Johnson, 2006, p. 59).

Conversion legitimation: Refers to the degree to which quantitizing and qualitizing data leads to interpretable results and meta-inferences (Onwuegbuzie & Johnson, 2006).

Quantitizing: Refers to transforming qualitative data such as interviews or participant observations to numerical values (Onwuegbuzie & Johnson, 2006).

Qualitizing: Refers to converting quantitative data to narrative descriptions such as narrative profiles, words, and themes (Teddlie & Tashakkori, 2006, p. 17; Onwuegbuzie & Johnson, 2006).

Inside-outside legitimation: Refers to the extent to which a researcher correctly and appropriately depicts the insider and outsider's perspectives (i.e., *emic* and *etic* viewpoints) in understanding or explaining a phenomenon (Onwuegbuzie & Johnson, 2006). The *emic* viewpoint relates to the insider's or group member's perspectives, and the *etic* viewpoint corresponds to the researcher-observer who takes the role of the "objective outsider" (Onwuegbuzie & Johnson, 2006, p. 58).

Legitimation: Term coined by Onwuegbuzie and Johnson (2006) that refers to validity, or quality in MMR. This term captures a "bilingual nomenclature," as it addresses validity in quantitative studies and quality in qualitative studies (Onwuegbuzie & Johnson, 2006, p. 48)

Meta-inferences: Refers to the synthesized inferences based on the results from the quantitative and qualitative phases of a mixed methods study (Teddlie & Tashakkori, 2006).

Mixed methods research: Refers to a research design that integrates both quantitative and qualitative research (with no particular preference to one strand) and guides a researcher into further exploration of the research question(s) and purpose(s) that could not be adequately explained using one specific method.

Multiple validities legitimation: Refers to the extent to which a researcher validates the quantitative and qualitative strands separately of each other, and validates the whole mixed methods study to develop high quality meta-inferences. This legitimation type is critical as it assesses the validity of each individual strand (i.e., quantitative, qualitative, and mixed methods) to allow for robust meta-inferences (Onwuegbuzie & Johnson, 2006).

Paradigmatic mixing legitimation: Refers to the extent to which a researcher examines how his/her integrated epistemological, ontological, axiological, methodological, and rhetorical beliefs are expressed in the quantitative and qualitative approaches (Onwuegbuzie & Johnson, 2006).

Political legitimation: Refers to the extent to which the researcher has addressed how consumers of mixed methods research will benefit by implementing both a quantitative and qualitative component to generate high quality meta-inferences (Onwuegbuzie & Johnson, 2006, p. 59).

Sample integration legitimation: Refers to developing generalizations or meta-inferences based on the quantitative and qualitative sample(s) (Onwuegbuzie & Johnson, 2006, p. 56).

Sequential legitimation: Refers to the extent to which researchers have minimized potential problems in a sequential design that could arise from reversing the sequence of the quantitative and qualitative strands to generate meta-inferences (Onwuegbuzie & Johnson, 2006, p. 58). In other words, if the order in which the quantitative and qualitative phases occurred leads to different results, this lends itself to a sequential legitimation threat (Onwuegbuzie & Johnson, 2006).

Weakness minimization legitimation: Refers to the extent to which the weakness of one method is compensated by the strengths of the other method (Onwuegbuzie & Johnson, 2006, p. 58).

CHAPTER II: LITERATURE REVIEW

Validity in quantitative research can be divided into four distinct categories: *internal, external, construct*, and *statistical conclusion validity* (Shadish, Cook, & Campbell, 2002). Quality in qualitative research primarily focuses on *trustworthiness* or how to accurately depict participants "lived experiences" (Lincoln & Guba, 1985). In MMR, validation refers to the rigorous methodological procedures that have been implemented in a study (Plano Clark & Ivankova, 2016, p. 163). This also encompasses assessing quality and verifying that the inferences are accurate (Plano Clark & Ivankova, 2016). Assessing the quality of a MMR study is more complex as it involves applying validity/trustworthiness criteria to the quantitative and qualitative phases as well as integration, throughout all stages of the research design including the research questions, units of analysis, sampling strategies, and analytic framework, not just the data collection phase (Tashakkori & Teddlie, 2006). Usually, determining what represents quality in MMR is dependent upon the interpretation of different audiences such as academic journals, funding agencies, publishers, and professors (Plano Clark & Ivankova, 2016). The challenge lays in obtaining credible findings grounded on participant data and creating reliable and transferable inferences that integrate quantitative and qualitative components (Collins et al., 2012).

Validity in Quantitative Research

Validity aims to "approximate the truth of an inference" (Shadish, Cook, & Campbell, 2002, p. 34). Shadish, Cook, and Campbell (2002) posit that when researchers claim something is valid, they are examining whether the inferences are true based on the data that was collected to support their claims (Shadish, Cook, & Campbell, 2002). This evidence can be based on empirical findings or convergence of the findings between theories or past findings (Shadish, Cook, & Campbell, 2002). Since assessing validity relies on human judgements, which may be

incorrect, we can never be completely certain that inferences from an experiment are true or that other inferences have been undoubtedly falsified (Shadish, Cook, & Campbell, 2002, p. 34). Nevertheless, validity is a critical aspect of all research studies in aiding researchers to approximate the truth of their inferences in a study.

Shadish, Cook, and Campbell (2002) developed a validity typology widely implemented in quantitative research that is used to evaluate the validity of the inferences developed from the results of a study (Johnson & Christensen, 2017). The validity typology encompasses four validity types: internal, external, construct, and statistical conclusion validity (Shadish, Cook, & Campbell, 2002). Each validity type has distinct purposes and depend upon the study, some validity types may be more prevalent at the expense of reducing the strength of another validity type. For example, implementing a randomized experiment typically helps the internal validity, but decreases external validity (Shadish, Cook, & Campbell, 2002). Threats to validity can affect or lead to incorrect inferences about covariance, causation, and constructs, whether causal relationships are true within varying subsamples of the population, settings, treatments, and outcomes (Shadish, Cook, & Campbell, 2002, p. 39). Therefore, by understanding the threats to validity a researcher can anticipate the threats and criticisms of the inferences from their experiment thereby reducing the likelihood of these threats (Shadish, Cook, & Campbell, 2002). A description of each validity type and potential threats will be discussed in further detail.

Internal validity. Internal validity refers to making inferences about whether a causal relationship exists between two variables (Shadish, Cook, & Campbell, 2002). Threats to internal validity are alternative explanations that cannot be attributed to the experiment. For instance, a researcher might find that the relationship between two variables is not causal and the results could have occurred without the treatment and still lead to similar results as those from the treatment condition (Shadish, Cook, & Campbell, 2002). There are nine internal validity threats

that can help explain why the causal relationship between two variables may be incorrect: *ambiguous temporal precedence, selection, history, maturation, regression, attrition, testing, instrumentation*, and *additive and interactive effect of threats to internal validity* (Shadish, Cook, & Campbell, 2002).

Ambiguous temporal precedence. Refers to uncertainty about which variable occurred first, thus making it difficult to infer which variable is the cause and which is the effect (Shadish, Cook, & Campbell, 2002).

Selection. Refers to the differences in participant characteristics that may cause the observed effect across multiple treatment groups (Shadish, Cook, & Campbell, 2002; Johnson & Christensen, 2017).

History. Refers to the occurrence of unplanned event(s) during the implementation of the treatment that may cause the observed effect (Shadish, Cook, & Campbell, 2002; Johnson & Christensen, 2017).

Maturation. Refers to developmental or natural changes occurring during the implementation of the treatment that may cause the observed effect (Shadish, Cook, & Campbell, 2002; Johnson & Christensen, 2017).

Regression. Refers to participants/units in the study who initially obtain extreme scores, but typically regress to the mean on subsequent tests/administrations. These effects can sometimes be inaccurately attributed to the effect of treatment (Shadish, Cook, & Campbell, 2002; Johnson & Christensen, 2017).

Attrition. Refers to the loss of participants in a study due to naturally occurring phenomenon such as death, or for known (or unknown) reasons to the studies. If attrition results in a difference of group composition then this can yield differences on the dependent variable (Shadish, Cook, & Campbell, 2002; Johnson & Christensen, 2017).

Testing. Refers to changes on a participant's test scores on a second administration due to prior exposure of the test that may cause the observed effect (Shadish, Cook, & Campbell, 2002; Johnson & Christensen, 2017).

Instrumentation. Refers to changes in the way the dependent variable is measured that may cause the observed effect (Shadish, Cook, & Campbell, 2002; Johnson & Christensen, 2017). Instrumentation relates to changes in an instrument, whereas testing refers to changes in the participant (Shadish, Cook, & Campbell, 2002).

Additive and interactive effect of threats to internal validity. Refers to the presence of two or more threats to internal validity that can also produce an interactive effect resulting in an increased bias of the study (Shadish, Cook, & Campbell, 2002; Johnson & Christensen, 2017).

External validity. External validity is the extent to which the causal relationships can be generalized to distinct samples of the population, settings, treatments, and outcomes (Shadish, Cook, & Campbell, 2002). There are five external validity threats that can help explain why the causal relationship between two variables may be incorrect: *interaction of the causal relationship with units, interaction of the causal relationship over treatment variations, interaction of the causal relationship with outcomes, interactions of the causal relationship with settings*, and *context-dependent mediation* (Shadish, Cook, & Campbell, 2002). Four of these external validity threats (i.e., interaction of the causal relationship with units, interaction of the causal relationship over treatment variations, interaction of the causal relationship with outcomes, and interactions of the causal relationship with settings) examine whether a cause-effect relationship can be generalized among different units, treatments, outcomes, and settings, while context-dependent mediation is the extent to which a mediator is explaining the causal relationship in one context, but not in another context of the study (Shadish, Cook, & Campbell, 2002).

Construct validity. Construct validity is the extent to which a researcher has accurately operationalized and identified how constructs will be measured (Shadish, Cook, & Campbell, 2002). Johnson and Christensen (2017) recommend using instruments related to the measured construct with evidence of reliability and validity data and also ensuring the measure is intended for the proposed sample.

Statistical conclusion validity. Statistical conclusion validity infers whether the predicted cause and effect covary and the magnitude of their relationship (Shadish, Cook, & Campbell, 2002). Threats to statistical conclusion validity can lead to Type I and Type II errors and an overestimation or underestimation of the magnitude of the covariation between the independent and dependent variables (Shadish, Cook, & Campbell, 2002).

Summary of Validity in Quantitative Research

The validity typology developed by Shadish, Cook, and Campbell (2002) originated from Campbell's (1975) work defining internal and external validity. Internal validity asked, "did in fact the experimental stimulus make some significant difference in this specific instance?" (Campbell, 1957, p. 297; Shadish, Cook, & Campbell, 2002) and external validity asked, "to what populations, settings, and variables can this effect be generalized?" (Campbell, 1957, p. 297). Later, Campbell and Stanley (1963) revised internal validity to ask whether the inferences of "the experimental treatments make a difference in this specific experimental instance" (p. 5) and external validity asked, "to what populations, settings, treatment variables, and measurement variables can this effect be generalized" (Campbell & Stanley, 1963 p. 5) (Shadish, Cook, & Campbell, 2002). In 1979, construct validity and statistical conclusion validity were added to the typology (Cook & Campbell, 1979; Shadish, Cook, & Campbell, 2002) and since then, this typology has been cited numerous times. Forty years later, researchers continue to rely heavily

on this typology in quantitative research to reduce threats and develop causal inferences grounded in 'truth.'

Trustworthiness in Qualitative Research

There has been much debate about what is considered validation in qualitative research. Lincoln and Guba (1985) developed alternative terms to Shadish, Cook, and Campbell's validity typology that were rooted in naturalistic research. Trustworthiness is the qualitative scholar's analogous term to indicate a process to assess the overall integrity of the research, and terms such as *credibility, authenticity, transferability, dependability,* and *confirmability* are used in replacement of the quantitative validity terms *internal validity, external validity, reliability, and objectivity* (Lincoln & Guba, 1985). There exist many frameworks to address trustworthiness in qualitative research (Lincoln & Guba, 1985; Eisner, 1991; Lather 1991; Lather, 1993; Angen, 2000; Whittemore, Chase, & Mandle, 2001, Richardson & St. Pierre, 2005; Lincoln, Lynham, and Guba, 2011), each taking similar yet distinct approaches. Maxwell's (1992, 1996) validity typology closely reflects Cook and Campbell's (1979) typology. Maxwell's (1992, 1996) typology is divided into *descriptive validity, interpretive validity,* and *theoretical validity*.

Descriptive validity. Maxwell (1992; Johnson & Christensen, 2017) defines descriptive validity as the extent to which a researcher has accurately reported what they saw or heard, and the accuracy of the inferences generated from the data. Descriptive validity is dependent on theory since the foundation of observations and descriptions are also based on theory (Maxwell, 1992). A threat to descriptive validity is when two observers (i.e., researchers) describe different accounts of the same situation (Maxwell, 1992). Therefore, when observers agree on observations it increases the likelihood of credible findings (Maxwell, 1992; Johnson & Christensen, 2017).

Interpretive validity. Qualitative research is not solely focused on providing valid descriptions of the events, people, and behaviors that have occurred in a study, it is also concerned with providing accurate meanings to events, people, and behaviors that are being studied (Maxwell, 1992). Thus, interpretive validity is the extent to which the researcher has accurately reported the meaning to the unit of analysis (Maxwell, 1992; Johnson & Christensen, 2017). Interpretive validity is grounded in participants' personal accounts and the language they used to provide meaning (Maxwell, 1992). This is also referred to as the emic perspective, where the researcher aims to "get inside the heads of participants, look through their eyes, and see and feel what they see and feel" (Johnson & Christensen, 2017, p. 301). One method of addressing interpretive validity is by conducting member-checks with participants to ensure the researcher's interpretation is consistent with what the participant expressed (Johnson & Christensen, 2017). Some researchers suggest using several descriptions/phrases directly obtained from the participant or framed in a similar manner (i.e., low-inference descriptors) (Johnson & Christensen, 2017).

Theoretical validity. Descriptive and interpretative validity center around the truthfulness of a researcher's description of the participant's account and the accuracy of a researcher's interpretation of the account, while theoretical validity refers to the degree to which a theoretical explanation is consistent with the data in a research study (Maxwell, 1992; Johnson & Christensen, 2017). A theory is comprised of two components: (1) the concepts explained by the theory and (2) the relationships predicted to exist among the concepts (Maxwell, 1992). More broadly stated, "theory development moves beyond 'just the facts' and provides an explanation of the phenomenon," therefore, theory tends to be more abstract and less focused on the description and interpretation of participant's accounts (Johnson & Christensen, 2017, p. 301). One way to strengthen theoretical validity is through extended fieldwork, where a researcher

immerses him/herself in studying participants and their settings to generate a better understanding of the phenomenon (Johnson & Christensen, 2017). This validity most closely resembles construct validity based on Cook and Campbell's (1979) definition (Maxwell, 1992).

Trustworthiness Strategies in Qualitative Research

Based on prior frameworks to assess trustworthiness in qualitative research (Lincoln & Guba, 1985; Eisner, 1991; Lather 1991; Lather, 1993; Angen, 2000; Whittemore, Chase, & Mandle, 2001, Richardson & St. Pierre, 2005; Lincoln, Lynham, and Guba, 2011), Creswell and Miller (2000) developed nine strategies for researchers to employ when assessing the trustworthiness of qualitative data. These strategies are categorized into three groups: researcher's lens, participant's lens, and reader's or reviewer's lens (Creswell, 2016). Creswell and Poth (2018) recommend researchers engage in at least two validation strategies.

Researcher's lens. The researcher's lens is defined as the degree to which a researcher verifies the accuracy of a qualitative narrative (Creswell & Poth, 2018). Three validation strategies that fall under this group are: *corroborating evidence through validation of multiple data sources, discovering case analysis or disconfirming evidence,* and *clarifying researcher bias or engaging in reflexivity* (Creswell & Poth, 2018, p. 260-261).

Corroborating evidence through validation of multiple data sources. This validation strategy is the extent to which the researcher uses multiple data sources to provide further support on a theme or participant perspective (Creswell & Poth, 2018). First, the researcher collects data using multiple sources (e.g., individual interviews, focus group interviews, documents) and as the data is collected the researcher triangulates the findings to aid in the interpretation (Creswell & Poth, 2018).

Discovering case analysis or disconfirming evidence. If findings are not consistent with a coding pattern or themes, a researcher should also report this negative case analysis (Creswell

& Poth, 2018). Doing so will reinforce further analysis of the phenomenon under study (Creswell & Poth, 2018).

Clarifying researcher bias or engaging in reflexivity. Considering the subjective nature of qualitative research, it is critical for researchers to discuss how their biases, values, and experiences may interfere with the study (Creswell & Poth, 2018). Doing so will allow a reader to understand the researcher's perspectives (Creswell & Poth, 2018).

Participant's lens. The participant's lens refers to the participant's role in the validation process of qualitative research (Creswell & Poth, 2018). Three validation strategies that fall under this group are: *member-checking or seeking participant feedback, prolonged engagement and persistent observation in the field,* and *collaborating with participants* (Creswell & Poth, 2018, p. 261-262).

Member-checking or seeking participant feedback. One way of ensuring that a researcher has accurately interpreted the data, analyses, interpretations, and conclusions of a study is by conducting member-checks (Creswell & Poth, 2018). Lincoln and Guba (1985) claim that member-checks are "the most critical technique for establishing credibility" (p. 314). Member-checks can be done through interviews, asking participants to examine transcripts or asking them to review rough drafts based on the researcher's interpretations, or reviewing preliminary analyses of descriptions and themes through focus groups (Creswell & Poth, 2018).

Prolonged engagement and persistent observation in the field. Extended engagement in the study with participants, gatekeepers, and exposure to the setting and culture can help researcher's make decisions that are grounded in critical features of the study. This strategy is consistent with field-work validation (Creswell & Poth, 2018).

Collaborating with participants. This validation strategy encourages researchers to engage with participants such as developing data collection protocols and improving the

interpretations and data analyses (Creswell & Poth, 2018). Participant involvement can be on a continuum and a researcher should decide the best ways of engaging and working with participants (Creswell & Poth, 2018).

Reader's or reviewer's lens. The reader's or reviewer's lens extends to individuals beyond the researcher such as the reader or the reviewer who may also be involved in the validation process (Creswell & Poth, 2018). Three validation strategies that fall under this group are: *enabling external audits, generating a rich, thick description,* and *having a peer review or debriefing of the data and research process* (Creswell & Poth, 2018, p. 262-263).

Enabling external audits. Researchers can recruit an external consultant or auditor to examine the accuracy of the findings, interpretations, and conclusions and whether they are supported by the data (Creswell & Poth, 2018). To establish credibility, the consultant should not have any prior exposure to the study (Creswell & Poth, 2018).

Generating a rich, thick description. Developing rich, thick descriptions allows the reader to determine whether findings can be transferred from one sample to another based on common features (Creswell & Poth, 2018). This can be viewed as a form of external validity in which the reader decides whether the results can generalize to another group of participants, treatment, settings, or outcomes based on rich and detailed descriptions.

Having a peer review or debriefing of the data and research process. The extent to which a researcher recruits someone with prior exposure or familiarity of the phenomenon to challenge aspects of the study (Creswell & Poth, 2018). Lincoln and Guba (1985) define this role as the "devil's advocate," who asks questions about the study such as the methods employed, interpretations, and conclusions (Creswell & Poth, 2018).

Summary of Trustworthiness in Qualitative Research

Trustworthiness in qualitative research is much more debatable, with differing viewpoints from many researchers stemming from a variety of paradigms (O'Cathain, 2010). As noted, there are various perspectives and terms used to assess the trustworthiness of qualitative research, however, Maxwell's (1992, 1996) approaches most closely resemble Cook and Campbell's (1979) validity typology. More recently, Creswell and Miller (2000) developed nine validation strategies for researchers and they encourage the use of at least two strategies for a qualitative study that is grounded in credible and defensible findings.

Quality in Mixed Methods Research

There has been much discussion about quality in MMR for the past two decades beginning with Caracelli and Riggin's (1994) attempt at evaluating quality in MMR. Quality in MMR has received much attention from many agents such as administrators in charge of funding MMR studies, policymakers, professionals, and lay people interested in determining whether the findings are credible and trustworthy, research methodologists who strive to improve the quality of MMR and its applicability, researchers who strive to design studies that show clear evidence for validity and reliability, and evaluators who are interested in using a model/framework to assess the quality of a mixed methods study that is simple to follow (O'Cathain, 2010). Considering the role of these individuals, quality in MMR acts as a domino effect impacting many agents within and outside of the research community. In general, there exist three approaches to assess quality in MMR: *the generic research approach, the individual components approach,* and *the mixed methods approach* (O'Cathain, 2010).

The generic research approach assesses the full mixed methods study using generic tools from quantitative and qualitative research (O'Cathain, 2010). Eleven tools have been developed to evaluate the quality of quantitative and qualitative research studies (Katrak, Bialocerkowski,

Massy-Westropp, Jumar, & Grimmer, 2004). These tools were "developed for generic use across all study designs including monomethod qualitative studies and monomethod quantitative studies" (O'Cathain, 2010, p. 5). However, some researchers argue, however, that these tools are too generic and may not address specific mixed methods quality issues (Katrak et al., 2004; O'Cathain, 2010). The individual components approach ensures that the appropriate quality criteria of each specific methodology (i.e., quantitative and qualitative) are met (O'Cathain, 2010). Nevertheless, there are two issues that arise when using set quality criteria for a quantitative research study and a qualitative research study: (1) determining whether to apply the criteria to each methodological approach or to each method used and (2) the assumption that each method is linked to distinct paradigms (O'Cathain, 2010). Bryman, Becker, and Sempik (2008) conducted an exploratory study to investigate whether the same criteria should be used for both quantitative and qualitative research, more specifically, whether quantitative criteria should be applied to qualitative research. Results demonstrated that 76% of the sample (226 researchers) agreed that different and separate criteria should be used for the quantitative and qualitative components (Bryman et al., 2008; O'Cathain, 2010).

Although Bryman and colleagues (2008) found that researchers tend to favor separate and different criteria for a mixed methods study, others argue that mixed methods goes beyond the quantitative and qualitative components (Creswell & Plano Clark, 2007). Meta-inferences are drawn from the whole mixed methods study, not solely from each component (Tashakkori & Teddlie, 2008). Consequently, some researchers have taken the mixed methods approach to develop quality frameworks for a mixed methods study (Tashakkori & Teddlie, 2003; Tashakkori & Teddlie, 2008; Teddlie & Tashakkori, 2009; Onwuegbuzie & Johnson, 2006; Leech, Dellinger, Brannagan, & Tanaka, 2010; O'Cathain, 2010; Curry & Nunez-Smith, 2015; Johnson & Christensen, 2017). Tashakkori and Teddlie (2003) developed one of the most in-

depth models for assessing the quality of MMR as it introduced the concept of *inference quality*, which is a combination of design quality (methodological rigor) and interpretive rigor (truthfulness of conclusions from study) (O'Cathain, 2010). Since then, researchers have been building on the Tashakkori and Teddlie models (Dellinger & Leech, 2007; Onwuegbuzie & Johnson, 2006) or have established different mixed methods approaches to assess quality (Creswell & Plano Clark, 2007; O'Cathain et al., 2008; O'Cathain, 2010).

Basis for Legitimation Typology

In MMR, meta-inferences are the interpretations of quantitative and qualitative results and their integration to answer the study's research question(s) (Teddlie & Tashakkori, 2009). To assess the quality of the quantitative and qualitative data collection and results, a researcher commonly applies distinct methods to each strand (Plano Clark & Ivankova, 2016). Doing so will limit threats to validity when integrating both strands. As noted, other researchers highlight the importance of evaluating the integration of both, quantitative and qualitative strands, which leads to high quality inferences. The term inference quality was developed to encompass issues related to internal validity and credibility in MMR (Tashakkori & Teddlie, 2003). Inference quality refers to how accurately researchers draw conclusions, both inductively and deductively, in a mixed methods study and is divided into two major components: *design quality* and *interpretive rigor* (Tashakkori & Teddlie, 2003).

Design quality is comprised of four criteria: design suitability, design adequacy/fidelity, within design consistency, and analytic adequacy (Tashakkori & Teddlie, 2008). These set criteria specifically refer to the quality of the design as it evaluates whether certain features of the design answer the overall research question(s) of the study and the degree to which certain procedures such as data analysis are implemented (Tashakkori & Teddlie, 2008). Interpretative rigor refers to the degree to which researchers achieve credible interpretations based on the

results. To assess interpretative rigor, a researcher must meet five criteria: interpretive consistency, theoretical consistency, interpretive agreement, interpretive distinctiveness, and integrative efficacy (Tashakkori & Teddlie, 2008). This integrative model of quality that incorporates design quality and interpretive rigor has been fundamental in helping researchers address quality in mixed research. According to some researchers, this model presents inference as an outcome and not a process (Onwuegbuzie & Johnson, 2006) There researchers believe that assessing quality in MMR should be a continuous process that occurs at various stages throughout the research study (Onwuegbuzie & Johnson, 2006). Consequently, Onwuegbuzie and Johnson (2006) developed the legitimation typology comprised of nine legitimation types to assess the quality of meta-inferences of a mixed methods study.

Legitimation Typology. Onwuegbuzie & Johnson (2006) coined the term *legitimation* to refer to validity in MMR with the aim of gaining acceptance in quantitative and qualitative research. The legitimation typology was developed based on the need for expanding the integrative model of design quality and interpretive rigor and is currently used to assess the quality of generated inferences of the mixed methods study (Onwuegbuzie & Johnson, 2006). This typology is grounded on the idea that quality assessment is an ongoing process of evaluation that occurs throughout all stages of the research study beginning with the research purpose to generating high quality meta-inferences (Plano Clark & Ivankova, 2016; Onwuegbuzie & Johnson, 2006). This typology serves as a guide for researchers to understand possible legitimation threats and encourages them to address each threat (if applicable) during the research process (Plano Clark & Ivankova, 2016).

The challenge in implementing the legitimation typology is obtaining results and generating inferences that are “credible, trustworthy, dependable, transferable, and/or confirmable” (Onwuegbuzie & Johnson, 2006, p. 52). Usually this problem is most apparent in

mixed methods research since each strand has its own challenges with representation and legitimation that also leads to problems of integration (Onwuegbuzie & Johnson, 2006). To reduce these problems, the original 2006 legitimation typology outlined nine strategies in a MMR study. The nine-legitimation types are: sample integration, inside-outside, weakness minimization, sequential, conversion, paradigmatic mixing, commensurability, multiple validities, and political legitimation (Onwuegbuzie & Johnson, 2006) (defined in Chapter 1). Even though Onwuegbuzie and Johnson (2006) developed this typology based on Tashakkori and Teddlie's (2008) integrative model of quality, there is uncertainty about whether it is being implemented by researchers and how researchers are interpreting each of the legitimation types.

Chapter Summary

The literature reviewed for this thesis aimed to provide a broad understanding of validity in quantitative research, trustworthiness in qualitative research, and quality in mixed methods research, narrowing the scope to one specific framework—the legitimation typology. It was critical to discuss Shadish, Cook, and Campbell's (2002) validity typology in quantitative research and Maxwell's (1992, 1996) validity typology in qualitative research to provide foundation of their similarities and differences that are grounded in a researcher's paradigmatic stance in qualitative research. Reasons for threats to validity using Shadish, Cook, and Campbell's (2002) validity typology for quantitative research as well as strategies to address trustworthiness in qualitative research (Creswell & Miller, 2000; Creswell & Poth, 2018) were provided to demonstrate how researchers can address some of the issues. Finally, quality in MMR was reviewed particularly highlighting three distinct approaches and focusing on Tashakkori and Teddlie's (2003, 2008; Teddlie & Tashakkori, 2009) model of quality in MMR, which helped pave the way for the 2006 legitimation typology (Onwuegbuzie & Johnson, 2006).

CHAPTER III: METHOD

IRB and Ethical Considerations

Prior to recruiting participants for the study, it was imperative to obtain approval from the Institutional Review Board (IRB) at UNL. Foundational ethical guidelines that were followed when conducting this study as outlined in the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978). This project was approved under the exempt educational, behavioral, and social science category. All documents were submitted to the IRB, which included participant consent form, email invitation, follow-up email, interview reminder email, and three interview protocols (e.g., creators of legitimation typology, researchers who implemented legitimation typology, and researchers who have written about or share knowledge on legitimation typology) (see Appendices A, B, C, D, E, F, and G). Qualtrics was used to obtain informed consent and participants were notified beforehand that they must have access to a computer, Internet, and Skype, and interviews must be conducted in a quiet place. There were no known risks to participants in the study.

Since interviews were conducted via Skype, I provided sufficient information to the IRB on data storage methods. I used an audio recorder to record all interviews and stored all data (e.g., transcriptions and data analysis procedures) using UNL's Box server. In addition, all recordings were deleted from the recorder as soon as they were transferred to UNL's Box server. The primary and secondary investigators of this study were the only personnel with access to this information. It was imperative to obtain and use participant's names to report the findings from the perspectives of those researchers in order to make credible changes to the typology. All of these practices were applied to ensure respect and safety for all participants.

Sample Selection Procedures

This study used a purposeful sampling strategy where I intentionally chose participants on a set of criteria. First, I recruited the authors of the legitimation typology, Anthony Onwuegbuzie and Burke Johnson, to further explore the legitimation typology at its most fundamental level and provide clarifications to each legitimation type. I recruited researchers who had implemented the legitimation typology in their MMR study to learn how these researchers were using and interpreting the legitimation typology in their research. Finally, I also recruited authors who had written about or share knowledge on quality in MMR, specifically, the legitimation typology, such as Nataliya V. Ivankova, Vicki Plano Clark, John W. Creswell, and Michael D. Fetters. Including these participants was important to elaborate on quality in mixed methods as a whole, and then focus on the legitimation typology from an unbiased view. These participants were contacted and recruited via email. Participants did not receive any benefit from taking part in this study, instead their participation would help further discussions and knowledge on achieving higher standards of quality in MMR.

Participant Recruitment Through Document Analysis

To recruit researchers who had implemented the legitimation typology, I conducted a multi-phase search to identify empirical mixed methods articles that explicitly used the legitimation typology. Three major databases were used to collect this information: PsychINFO the *Journal of Mixed Methods Research* (JMMR), and Web of Science. The first phase included PsychINFO searches limited to empirical articles (as the selected methodology) of the past 11 years (2006-2017). This search was restricted to 2006-2017 because Onwuegbuzie and Johnson first introduced the term ‘legitimation’ in 2006. When conducting the first search with the above listed criteria and only ‘legitimation’ as the keyword, there was a total of 321 articles. After reviewing the abstracts and searching for key terms such as ‘legitimation’ and ‘Onwuegbuzie’ in

these articles, it was concluded that researchers were using the term 'legitimation' as variants of the word 'legitimize' or 'legitimate' and not referring to the legitimation typology. Therefore, after learning about the wide use of the term 'legitimation' and its variations, more specific PsychINFO searches were conducted. I conducted multiple searches using the same criteria (e.g., empirical articles from 2006-2017) and used a variety of keywords such as mixed methods AND legitimation, mixed methods AND validity, Onwuegbuzie AND mixed methods, qualitative AND legitimation, quantitative AND legitimation, legitimation AND interviews, and finally, legitimation AND credibility. Variations of the term 'mixed methods' such as mixed research, mixed methods research, mixed-methods, etc. were also used. This search produced a total of 151 articles.

Since the legitimation typology was developed using the inference quality and inference transferability framework established in 2003, another search was conducted extending the dates from 2003-2017. PsychINFO searches were conducted with similar criteria (e.g., empirical articles) from 2003-2017. Keywords that were used included: inference AND mixed methods, quality AND mixed methods, legitimation AND mixed methods, validation framework AND mixed methods, and finally, transferability AND mixed methods. Similarly, variations of the phrase mixed methods were also used. A total of 12 articles resulted from this search.

Overall, combining articles from all the PsychINFO searches produced a total of 484 articles. To determine which articles would appropriately address my research questions, I reviewed all abstracts and applied the following inclusion criteria: (1) articles must be mixed methods empirical studies, (2) must have used the term 'legitimation' in an appropriate context and not used as a synonym for 'legitimate,' (3) this was further confirmed by verifying if the Onwuegbuzie and Johnson (2006) article was cited or any other article by Onwuegbuzie or Johnson that focused on legitimation, and finally, (4) articles must have included mixed methods

terminology or variations of the term. If this information was not clear in the abstract, I proceeded to reading the entire article. From this exhaustive pool, there were four relevant articles that fit all of the above criteria.

Due to a small turnout, a second participant recruitment phase was conducted using the JMMR database. An advanced search using the keyword 'legitimation' between the years 2006-2017 was completed. This resulted in a total of 68 articles. For these articles, I also reviewed all abstracts and applied the same inclusion criteria as the PsychINFO articles. Similarly, if this information was not clear from reviewing the abstract, I proceeded to reading the entire article. From the JMMR search, there were a total of eight relevant articles, but four overlapped with the PsychINFO search, resulting in a total of four new (non-repeating) articles from the JMMR database. This multi-phase search helped me identify researchers who were implementing the legitimation typology to recruit for my study.

From these combined searches (PsychINFO and JMMR), a total of eight (non-repeating) articles fit criteria. The first author of each article was contacted to ask for their participation and whether they would like to schedule an interview via Skype (Microsoft Corp., Redmond, WA). Four participants from this sample agreed to participate. Given the limited sample size, a third participant recruitment phase was conducted using Web of Science. A cited reference search on Web of Science was conducted using the following keywords: 'Onwuegbuzie A' as cited author, 'The Validity Issue in Mixed Research' as cited title, and '2006-2018' as cited years. The timespan was also referenced from 2006 to 2018. This was a variation of a snowball sample since Web of Science was used to extract empirical articles from 2006-2018 citing Onwuegbuzie and Johnson (2006). This search resulted in a total of 164 articles and the same inclusion criteria as the PsychINFO and JMMR articles were applied to determine which articles were eligible for the study. If this information was not clear in the abstract, I proceeded to reading the entire

article. After reviewing abstracts and reading the articles, 13 articles (six within the United States and seven outside of the United States) met inclusion criteria. After contacting eligible participants from this sample, two agreed to participate in the study. Overall, a total of six participants from all three search engines (PsychINFO, JMMR, and Web of Science) who had implemented the legitimation typologies in an empirical study were included in the final sample (see Appendix I). Burke Johnson, one of the creators of the legitimation typology, and Nataliya V. Ivankova, a researcher who shares knowledge on quality in MMR, also agreed to participate in this study resulting in a total sample size of eight participants.

Table 1.

Participants' Role in Study and Contribution to Research

Name	Role	Contribution
Burke Johnson	Creator of legitimation typology	Developed the legitimation typology, has served as associate editor of JMMR, and has written multiple articles and books on research methodology.
Joseph N. Cooper	Researcher	**Cooper and Hall (2016)** conducted a study to understand Black male student athlete's experiences at a Black college/university using questionnaire data and interviews.
Carolina Bustamante	Researcher	**Bustamante (2017)** conducted a study to understand the impact of a professional development program on Web 2.0 technologies for teachers of Spanish by understanding teachers' experiences and their outcome measures on the program.
Judith Schoonenboom	Researcher	**Schoonenboom, J. (2016)** conducted a study that examined

		differences between intact groups such as classes or university departments regarding the use of Blackboard discussion forums by VU University instructors from different departments using a multilevel mixed intact group analysis (MMIGA).
Sherry Dismuke	Researcher	**Martin and Dismuke (2018)** conducted a study to examine writing teacher practices of inservice and preservice elementary school teachers using complexity theory as a theoretical framework
David I. Swedler	Researcher	**Swedler, Pollack, and Gielen, (2015)** conducted a study guided by the Theory of Planned Behavior to examine how personal and workplace factors affect truck drivers' decision-making when engaging in distracted driving.
Marcus Weaver-Hightower	Researcher	**Weaver-Hightower, M. B. (2014)** conducted a mixed methods study to identify influential policy figures.
Nataliya V. Ivankova	Knowledge of quality standards in MMR	Has written numerous articles, books, and serves as associate editor for mixed methods and qualitative journals committees providing knowledge of these topics across disciplines.

Data Collection

For this intrinsic, exploratory case study, I used two sources of data collection: empirical articles demonstrating how researchers implemented the legitimation typology and individual semi-structured interviews.

Document analysis of articles. Initially, I engaged in document analysis to explore how researchers were implementing the legitimation typology. These articles helped me design the interview protocols and examine the similarities and differences of researchers' implementation of the legitimation typology.

Individual semi-structured interviews. Once all documents were analyzed and coded (see 'Document Analysis' section in Data Analysis Methods) I proceeded to conducting the semi-structured individual interviews. Semi-structured interviews were conducted with the first-author of the research studies that had applied the legitimation typology (i.e., Joseph, Carolina, David, Marcus, and Judith). In one case, the first-author recommended I interview the methodologist on the study (i.e., Sherry). It was important that all questions on the interview protocol were answered during the interview, however, the questions were highly flexible and I allowed researchers to discuss emergent topics not fully relevant to this study. Interviews ranged between 30 minutes to a little over two hours, with majority of participant interviews lasting over an hour. Interview protocols were comprised of different questions for the developers of the legitimation typology, researchers who have implemented the legitimation typology, and researchers who have written about or share knowledge on the legitimation typology (see Appendices E, F, & G for interview questions). All interviews were audio recorded and transcribed and I also took notes during the interview process. In addition, member-checking interviews were conducted with all participants after the initial interview to ensure trustworthiness of the data. I wrote summaries after each interview and discussed it with participants during the member-checking interviews. Participants were able to express whether I had accurately captured what they had stated and expanded on some areas as needed. Member-checking interviews ranged between 30-60 minutes, on average these were shorter in length than the initial interviews.

Data Analysis

Document analysis. Articles were coded on the basis of general information, mixed methods characteristics, and legitimation types. The codes that were used were: fields using the legitimation typology, mixed methods design (i.e., convergent, exploratory, or explanatory) and timing (i.e., concurrent or sequential), advanced mixed methods design, mixed methods design used in each field, whether legitimation types were explicitly or implicitly stated, total number of legitimation types addressed per article, legitimation types addressed, stage(s) of integration, and legitimation types addressed by each field. Doing so allowed me to examine how researchers were addressing legitimation types in their study. It is important to note that these documents were not used for additional data analysis such as theme generation.

Individual semi-structured interviews. To analyze the individual interviews, I first used Merriam's (1988) approach by developing categories. I transcribed all interviews and used in vivo and initial codes to begin coding the data. In vivo codes are direct quotes from the participants that help better preserve their perspectives (Saldaña, 2015). I also used initial coding to help synthesize information that might not have been as powerful as a direct quote. Once these codes were developed for each interview, I began to create categories. Merriam (1998) states, "developing categories involves looking for recurring regularities in the data" (p. 133). Therefore, I compared each of the codes per interview to one another and determined which codes could be subsumed into a category. This also reduced the original number of codes to a smaller subset.

Once categories for each individual interview were created, I incorporated Yin's (2014) pattern matching approach. Pattern matching allows you to group summaries or codes into smaller categories or themes. These codes typically identify an emergent theme or explanation in greater detail (Saldaña, 2015). I analyzed the categories from all eight interviews and found

concordance of data by matching similar categories across all participant interviews and developed patterns. These patterns became the overarching themes of the study.

Four participant interviews were coded and analyzed by hand and all eight interviews were coded using MAXQDA 2018 (VERBI Software, 2017) (see Appendix H). I blindly recoded the hand codes using MAXQDA (VERBI Software, 2017) to ensure consistency between both forms of data analysis. In other words, recoding and reanalyzing the hand codes using MAXQDA 2018 (VERBI Software, 2017) served as a validation check. If there were instances where the codes did not match, I compared and reanalyzed the hand codes and software codes and referred to the original interviews and member-checking interviews to determine the final code. When coding the data using MAXQDA (VERBI Software, 2017), I applied the same coding scheme as the hand codes—in vivo and initial coding, then developed categories from these codes (see Appendix H). From the categories, I then engaged in pattern matching to develop themes. From this analysis, saturation was achieved since no new concepts or themes emerged. I used additional tools in MAXQDA (VERBI Software, 2017) such as memoing, color coding, and the code matrix browser.

CHAPTER IV: RESEARCH FINDINGS, DISCUSSION, AND PROPOSED CHANGES TO LEGITIMATION TYPOLOGY

Eight overarching themes emerged from the semi-structured interviews with this sample of researchers: (1) role of validity in MMR, (2) importance of integration, (3) value added to discordant data, (4) versatility of the legitimation typology, (5) role of colleagues/mentors in MMR, (6) researchers' application/interpretations of legitimation types, (7) clarifications on legitimation typology, and (8) researcher recommendations. It should be noted that because the word 'validity' was used throughout the interviews to broadly capture quantitative, qualitative, and mixed methods research, most researchers used the term 'validity,' instead of 'trustworthiness' or 'quality.' However, given the context, it should be apparent which methodology participants were referring to.

Role of Quality in Mixed Methods Research

The role of quality in MMR was specifically asked to Nataliya Ivankova to obtain a general, unbiased view of quality in MMR, however all participants discussed the role of quality in MMR at varying degrees. More specifically, participants discussed in further depth the need to assess quality in a mixed methods study at the quantitative, qualitative, and the mixed methods level. Many participants discussed the role of individually assessing the validity of the quantitative strand and assessing the trustworthiness of the qualitative strand. *Joseph* discussed that one of the roles of each strand (i.e., quantitative and qualitative) in a mixed methods study is to provide sufficient and valid information independent of one another. He noted:

> *"...Separate out each of your sections so you have your quantitative findings and you can write a separate report on that and you have your qualitative findings and you can write a separate report on that. Each of those findings could have stood on their own independently." (Joseph)*

Judith also agreed and described:

> *"One general thing related to validity, that to me is very important, is that the quantitative and the qualitative part, given their role, also have their own validity criteria and they still apply." (Judith)*

Nataliya also discussed the importance of assessing validity/trustworthiness of each individual strand and its effects if not done properly:

> *" ...Once you have the quality assessed at these component levels [quantitative and qualitative] then you can think about the overarching perused method of inferences that builds on the results from the quantitative and qualitative because if you have flaws, if you don't have reliable or strong inferences coming from your quantitative and qualitative, then your overall mixed methods inferences will probably also have flaws." (Nataliya)*

Nataliya explained that not only should a researcher build a strong foundation for the quantitative and qualitative components of a study by ensuring both strands have high quality, but she also argued that researchers should be mindful of the research design they are implementing and addressing validity threats pertinent to that design. For example, *Nataliya* elaborated:

> *"If you are doing an experimental intervention, there are certain criteria that you need to follow to make sure that your intervention is carried out without flaws or if you're doing a qualitative grounded theory study you need to make sure that your sample is really theoretical, or you used a theoretical sample strategy." (Nataliya)*

Sherry, however, added that validating each strand in a mixed methods study does not suffice for validating the whole mixed methods design. *Sherry* stated:

> *"I don't think just having validity for your qualitative, and we mention that [validity] of course in the individual sections on our quantitative and qualitative data, but you are really missing the intent of mixed methods if you do not bring in the different aspects, the legitimation into it." (Sherry)*

Many participants agreed that validity of each strand must be built on a strong foundation in order to develop quality inferences for the mixed methods study. Researchers shared strong views on the role of quality in MMR. Researchers concurred that there must be a methodological intention for conducting a mixed methods study, while also carefully considering the quality of the overall mixed methods design as a whole. If a specific research design is being implemented

(e.g., grounded theory or experimental intervention), as stated by *Nataliya*, researchers should take all necessary steps to ensure all elements are addressed at the specific design level. One recommendation to the field of MMR provided by *Nataliya* is to encourage the development and use of unique terms that capture both, quantitative and qualitative components, instead of using 'validity,' which she described as a quantitative term.

Stages of validation. The stages of validation emerged as a sub-theme to which participants discussed the varying stages of validation in a MMR study at length. This was not a question that was explicitly asked based on the interview protocols, instead it emerged from the interviews. Participants agreed that assessing the quality components of a study should be examined before beginning the study (i.e., during the planning stage) and throughout the study. *Burke* discussed the importance of assessing the quality of the MMR design at the beginning of the study during the planning stages. *Burke* stated:

> *"When you are designing your study, that's the time to think about validation, the quality… the researcher needs to address that [quality] during the planning stages so that they can collect good data in a way that is going to give them good, trustworthy, valid, and legitimate findings." (Burke)*

Burke also described assessing quality of MMR as a continuing process. *Burke* indicated:

> *"You want to think about it [legitimation] as much as you can up front and then continue to think about them [legitimation types] as you build on earlier things you knew and are considering what you are going to do next." (Burke)*

Carolina emphasized that validation should be thought of in the design stage. *Carolina* described:

> *"So as far as that part of the validation in the mixed methods study, yeah, I did start thinking about it prior to the data analysis." (Carolina)*

Burke also discussed the stage(s) of validation for the mixed methods design. *Burke* stated:

> *"So when you are thinking about your qualitative part, you need to think about which of the qualitative strategies need to be used, which of the qualitative validity types need to be used, and then likewise for the quantitative and then as you are thinking about your*

> *overall design with those two pieces and this could come first or it could come after that, you need to think about the mixed." (Burke)*

When discussing this theme in further depth many participants mentioned the importance of developing a strong quantitative and qualitative component. Doing so will allow for a more rigorous and comprehensive MMR study. To help students conceptualize the need for building a strong quantitative and qualitative foundation for their mixed methods study, *Nataliya* advises her students:

> *"I ask my students, and this comes before the framework, to provide a description of quality for the quantitative and the qualitative strand separately like I did in my article because I think it's important to build this foundation to make sure that your study components are done at the highest level of quality and its one way you can be sure that they meet quality standards, scientific standards, and that because you build the inferences based on the results from these two components and quality is applied, the results are more rigorous." (Nataliya)*

Many participants agreed that assessing the quality of a study is a continuous process, beginning with the planning stage and continuing throughout multiple stages of a study such as the implementation of an intervention, data collection, and data analysis. As stated by *Nataliya*, this will not only ensure that quality is assessed at the highest level within each strand but will also produce more rigorous results based on the mixed methods study.

Importance of Integration

The value of MMR, more specifically, the importance of integration was a prevalent theme that was discussed among participants. This theme emerged by asking participants to describe the process of integration they engaged in when developing high quality meta-inferences. Specifically, this question was aimed at researchers who had implemented the legitimation typology in their empirical study. *Joseph* discussed the vital role of integration in his study. *Joseph* responded:

> *"So the quantitative data would give me the 'what,' it would tell me what patterns exist, how salient it is across a larger group of people, but it really doesn't tell me the 'how' and the 'why,' it doesn't give me the process, it doesn't give me that rich qualitative data*

> *from the voices of the participants to help explain how they made sense of the correlations that may appear in a quantitative dataset…" (Joseph)*

Joseph further added:

> *"It [quantitative] was almost too formulaic, it wasn't rich enough when you are talking about the complexity of the human experience. I didn't think survey responses would be able to capture the essence of what I was trying to investigate, however, I also knew that when you are trying to have some level of generalizability, when you are trying to make certain, especially if you are talking about policy reform, you really have to be like 'how does this reach a larger group of people?' because if everything you are basing it off of is qualitative and small sample sizes, you're almost marginalizing the voices of those who weren't included in those studies, so I do think there is value in having quantitative data as it allows you to capture a larger segment of a particular sample, but I also felt like it was critically important for subgroups, whether it be based on race, gender, SES, first-generation stats, sexual identity, unique abilities, whatever the case may be, that it is important that you have some type of qualitative inquiry." (Joseph)*

Joseph clearly articulated how integrating quantitative and qualitative data allowed him to gain a better understanding of the phenomenon he was studying and his participants overall. It was through integration that he was able to not only obtain participant perspectives using surveys, but he was able to follow-up with qualitative interviews, which allowed him to further delve into certain topics.

When asked to provide additional information on the integration process in MMR, *Burke* described, *"Integration is on a continuum that goes from none to a very large amount."* In this case, *Burke* was specifically referring to integration legitimation, which is a new legitimation type that was added to the 2017 legitimation typology. Nonetheless, the underpinnings of the statement are true in that integration can be done at varying degrees in a mixed methods study. One recommendation *Judith* provided to researchers is that integration is determined by a researcher's specific purpose in mixing that originates from the design being implemented. For example, *Judith* explained:

> *"In a triangulation design you could also say 'well, I want to ask some questions in an interview and in a questionnaire to see whether they yield the same results.' This is a comparison, which is your integration and the answer 'yes, they yield the same results' or 'no, they do not,' is not something which then occurs as a coincidence while you are*

> *trying to combine these two strands, no, it's something that you have thought of beforehand." (Judith)*

Marcus also stated:

> *"I think mixed methods gives us a way to really dig in to ways neither one can by itself, neither quantitative or qualitative so I think the integration point is not just methodologically important, but its methodologically important because it has sort of windows that it can open up for the larger sort of political and human implications." (Marcus)*

David also elaborated on the value of integration in MMR:

> *"The benefits from each design for each study were different, but I knew I was getting more in each study because I was using mixed methods to do it… If it wasn't for having both methods, I wouldn't have been able to really draw the inferences. So, the clear benefit is that again, without the interviews we wouldn't have been able to learn more, or we would've had to do another survey, get another population, try to replicate our populations, etc." (David)*

Overall, participants discussed the importance of MMR, specifically how the integration of the quantitative and qualitative studies provided a more in-depth understanding of the phenomena under study. According to *Marcus*, the integration stage is not only "methodologically important," but it also allows researchers to gain insight on the implications of the study and its results.

Purpose(s) of mixing. This sub-theme emerged from the 'Importance of Integration' theme that resulted from asking participants about their process of integration when developing high quality meta-inferences. Participants provided specific examples for their purpose(s) of mixing. When elaborating on integration and the role of mixing data, *Judith* made a distinction between both concepts. *Judith* discussed:

> *"The purpose of mixing is to explain, using the qualitative data, the nonoccurrence of an effect which was the result of the quantitative analysis, so then your purpose of mixing is to explain the nonoccurrence of an effect and the integration is this explanation… So, the integration to me is always the qualitative part and the quantitative part connecting verb, and the whole thing I would call integrated utterances, or the integrated conclusions would be a better term." (Judith)*

To *Judith*, the purpose of mixing data is to understand *how* one data source complemented the other, whereas the integration component allows a researcher to bring meaning or provide an explanation of the results from connecting the two strands (i.e., quantitative and qualitative).

Integration is a critical component to MMR, however, the purpose(s) for mixing data greatly varied among participants. Participants mentioned four purposes of mixing including: *triangulation, crystallization, emergence*, and *elaboration*. Several participants mentioned the role of *triangulation* in their MMR study, which helped them to understand how the quantitative and qualitative strands combined to generate inferences for the mixed methods study. *Joseph* explained that when thinking about the purpose(s) of mixing data, a researcher should ask the following question:

> *"…Is the purpose of mixed methods to corroborate findings or is it more to elucidate and expound upon a particular exploration you are looking at? So, when you think about triangulation, typically you are looking to verify multiple data sources." (Joseph)*

Triangulation. *Judith* described triangulation in similar terms and stated:

> *"In triangulation, one purpose of mixing is indeed to triangulate, it's to compare and to see whether the results are the same…" (Judith)*

Crystallization. *Joseph* defined crystallization as the following:

> *"Maybe I am looking at what they call, crystallization, where I'm not just trying to verify one method to another, but I'm really looking to see from the different methods what the data is telling me, like the idea is that I'm looking for a deeper understanding of the phenomena. So, in crystallization I'm not worried if there was going to be conflict with the findings, I was just trying to see what each of these findings said." (Joseph)*

Therefore, *Joseph* was less concerned about whether each strand complemented or explained the other when mixing the data. Instead, he took the approach of mixing the data to understand what would surface from the mixing process.

Emergence. *Judith* defined something similar but refers to it as an emergent purpose of mixing. She described this in further depth and explained:

> *"… But you also have the purpose of mixing to see what additional outcomes there were…perhaps some emerged because there are also emergent purposes of mixing. It's good to show that when you come across some unexpected results, that you really paid attention to them and that you made a separate purpose of mixing out of it instead of saying 'well, unexpected results, so what?' (Judith)*

Judith elucidated on the significance of emergent purposes of mixing and recommends researchers to further explore why results are unexpected, instead of simply acknowledging the unexpected results but not delving deeper into the topic.

Elaboration. *Sherry* clarified elaboration in MMR and stated:

> *"…A lot of times we saw elaboration. Like one source [quantitative source] would say 'yeah, this is significant,' but then the qualitative sources would just elaborate, enrich, and go deeper, making our findings much richer and much more whole." (Sherry)*

Whether the purpose of mixing is to *triangulate, crystalize, emerge*, or *elaborate*, a researcher should clearly state their purpose of mixing, as each of these purposes have distinct features. Triangulation in qualitative research "assumes that if two or more sources of data, theoretical frameworks, types of data collected, or researchers converge on the same conclusion, then the conclusion is more credible" (Tracy, 2010, p. 843). Triangulation can be seen as replicating the findings within the same setting by using different methods to arrive at the same conclusions (Bloor, 2001; Denzin, 1978). When a researcher engages in crystallization, however, he/she is examining the similarities and differences of the findings using different methods, multiple data sources, multiple researchers, and various theoretical frameworks to determine whether the findings converge, diverge, or whether there is a discrepancy (Sandelowski, 1995; O'Cathain, Murphy, & Nicholl, 2007; Tracy, 2010). Therefore, the researcher does not aim to arrive at an ultimate truth, instead, the researcher is more receptive to an in-depth, yet still "thoroughly partial" understanding of the phenomenon (Tracy, 2010, p. 844). Triangulation and crystallization are terms more commonly used in qualitative research to assess quality, nevertheless, researchers have adapted them to the mixing process of MMR.

Similar to qualitative research where specific themes can emerge from the data unexpected to the researcher, the same can be applied to mixed methods (Greene, Caracelli, & Graham, 1989). In *Judith's* case, she described that the purpose for mixing the data can also be emergent, where the researcher discovers unexpected findings that emerge as a byproduct of mixing the data. Greene, Caracelli, and Graham (1989) labeled the emergence of unexpected findings as *initiation.* Therefore, crystallization has a stronger focus on theoretical frameworks, in comparison to emergence (or initiation). Elaboration refers to a researcher's ability to gain a better understanding of the phenomenon using a variety of different methods, which one single method would not be able to accomplish (Gibson, 2017). Thus, *Sherry*'s purpose for mixing stemmed from the role each strand had in elaborating and further exploring the phenomenon. Overall, *Sherry* and *Carolina* encourage researchers to use various visual displays such as charts and tables to facilitate the mixing phase and conceptualize how the data can integrated.

Value Added to Discordant Data

While there were no specific questions addressing data discordance in any of the interview protocols, this topic emerged from one participant who expressed their struggle in exploring reasons why the data was discordant for their study. My interactions with this participant led me to further explore this topic and therefore, I ensured all participants were asked during the member-checking interviews about their views on discordant data and what steps they would take if it were to arise in their mixed methods study. Apparent from the semi-structured interviews, there exists several purposes for mixing data. In some instances, a researcher may find discordant data through the process of mixing. Discordant data is when a researcher discovers contradictory support between the quantitative results and qualitative findings through the process of mixing (Pluye, Grad, Levine, Nicolau, 2009). Some researchers discussed the challenges in understanding and explaining their results when data discordance

arises. For instance, *Carolina* found that results from the participant surveys did not corroborate with the qualitative interviews. When she realized there was a discrepancy between the quantitative and qualitative strands, *Carolina* explained:

> *"Definitely where I found that the databases [quantitative and qualitative] didn't match that brought the challenge of 'okay, I mixed the data, but it's not confirming. How am I going to explain that?'... So, I think the main thing for me was being able to envision how I was going to make that correspondence between the quantitative scales and the qualitative interviews." (Carolina)*

While *Carolina* described this as a challenge, she also mentioned that discordant data also resulted in several advantages. For instance, *Carolina* mentioned that through the process of mixing she discovered that the quantitative and qualitative strands did not match (i.e., discordant) because there were problems with the wording of items on the questionnaire. Hence, one benefit of discordant data is that it allows a researcher to carefully analyze validity at all stages of the research process from a quantitative, qualitative, and mixed methods approach.

Sherry also agreed that one of the advantages of discordant data is that it reinforces researchers to further assess validity/quality. She stated:

> *"We did find some interesting things like 'Oh, why don't they fit the model?' and we did go back and check and look and gather some more data to find out maybe what it was, and they just had some unique situations, I think, there were reasons why they were outliers." (Sherry)*

Sherry added that while they did not find discordant data in their study, it was important for her and the research team to follow up with participants (e.g., teachers) after their observations to give them the opportunity to share their perspectives and any additional information on what occurred during the observations.

Another advantage to discordant data is that it allows for the purpose of mixing to emerge. Adding to the previous sub-theme of 'purpose of mixing,' *Judith* stated:

> *"...When you have discordance of data, that just means that you have a purpose of mixing that was not originally there, and again it emerged in your study from doing the research." (Judith)*

Judith clarified that discordance of data is itself a purpose of mixing that emerges from the study.

Lastly, another advantage to discordance of data is that it is also a benefit to MMR. *Nataliya* asserted:

> *"In my personal experience people are still afraid of any discordance that emerged, and they don't report on it or avoid reporting it. So, we are not looking at it [discordance of data] as a weakness, but as something that is probably the advantage of mixed methods, to review it and it could relate to quality." (Nataliya)*

Nataliya views discordance of data as a benefit to MMR as it encourages a researcher to achieve higher standards of quality by assessing validity at all levels.

Several recommendations were discussed when presented with data discordance in a mixed methods study. When data is discordant researchers should ask themselves two fundamental questions: (1) Is the data discordant because there might be some threats to validity/quality of the design that need to be addressed? or (2) Is the data discordant because something new actually emerged? Referring to *Carolina's* study, she discovered that the discordance of data was due to an issue with the wording of items on her survey. This further reinforced her to assess validity at all stages of her study. Once this was discovered, the results from the quantitative and qualitative strands were clear. *Joseph* encourages researchers to take a holistic approach when assessing discordance of data by reassessing the ways the data was collected and "*understanding the identities and characteristics of participants*" (i.e., sample). *Nataliya* also recommends researchers to address the two central questions when discordance of data arises and also suggests researchers to reassess the mixed methods study at its most foundational level—individually assessing the validity/quality of the quantitative and qualitative strand.

Versatility of Legitimation Typology

To further explore why participants were drawn to the legitimation typology, they were asked to explain why they decided to use the legitimation typology to assess the quality of their mixed methods study. Moreover, *Burke* and *Nataliya* were also asked what components of the legitimation typology make it unique in comparison to other frameworks. *Burke* clarified:

> *"The legitimation framework is for validating the full mixed methods study, not just each strand. The purpose is to validate each study, the full mixed study." (Burke)*

Understanding this helps researchers gain a better understanding of one of the purposes of the legitimation typology.

Judith mentioned that she used the legitimation framework because it is known and because it is specifically relevant to MMR. She also expanded on this to her particular study and mentioned:

> *"I wanted to have a look to see how relevant they [legitimation types] actually were and not so much to my study but to the type of research that I am describing, in other words, to my model, not to a specific empirical study, but to the model I described for performing a specific type of empirical study." (Judith)*

Thus, *Judith* clarified that her purpose for using the legitimation typology was to investigate how the legitimation types applied or how relevant or important they were to her particular study using the MMIGA model and she focused less on using the legitimation types to assess the overall empirical study. *Sherry* mentioned that the reason she implemented the legitimation typology was to stay true to mixed methods, which meant using a framework to assess quality specific to a mixed methods design and addressing the legitimation types pertinent to their study. *Sherry* also added:

> *"I think these [legitimation types] were the ones that we chose because they just seemed to fit the design well." (Sherry)*

After asking *Carolina* what prompted her decision to use the legitimation typology to assess the quality of her mixed methods study it was clear that she was following guidelines for a

convergent design, which share some similarities with the legitimation typology. *Carolina* elaborated:

> *"…So, at that point I knew I was going to have a convergent design and these strategies [legitimation types; e.g., sample integration and multiple validities] I'm listing there are specific to convergent designs. So, for the data collection for a true convergent design, the same sample has to be used from both sides to make the data merge at the end." (Carolina)*

This was a significant realization because it demonstrated that some legitimation types might be specific to the design (e.g., convergent design).

Another topic that was thoroughly discussed with participants were some of the benefits of the legitimation typology. *Joseph* mentioned that one aspect of the legitimation typology that resonated with him was the idea that paradigms and methods are on a continuum. *Joseph* stated:

> *"Within the article [Onwuegbuzie & Johnson, (2006)] they had a couple of paragraphs where they talked about the fact that scholars should not look at the different paradigms and methods as dichotomous, but rather on a continuum and that really resonated with me, like the way I viewed qualitative and quantitative research I was like 'I don't think these are mutually exclusive.'" (Joseph)*

An additional benefit of the legitimation typology was that the legitimation framework is comprised of many different legitimation types and even though participants acknowledged that not all would fit their study (as that is not the intention), it serves as a *"menu of options,"* as *Marcus* called it. *Nataliya* also elaborated on the ways she uses the legitimation typology (among other quality frameworks in MMR) and its benefit in the classroom:

> *"I like it because it helps students conceptually see what they have to be looking for. It helps you think from the perspective of ensuring at different levels of the design process because it's very generic, so it kind of shows you what to watch for or look for in a study in terms of quality." (Nataliya)*

Nataliya also mentioned another advantage of the legitimation typology was the authors' initiative in advancing the field by using the term 'legitimation.' *Nataliya* asserted:

> *"You use this term 'legitimation' that was advanced by Onwuegbuzie and Johnson, I really like this term because in the mixed methods field, I agree with the need for some unique terms that capture both quantitative and qualitative because when you use validity*

> *it's such a quantitative term so thinking about quality as legitimation process is a good approach." (Nataliya)*

Overall, participants used the legitimation typology for various reasons. Some of these reasons include the legitimation typology fit the overall study design, it is one of the few frameworks used to validate the full mixed methods study, and it shared some characteristics with a convergent mixed methods design. Many participants discussed the value of the legitimation typology and illustrated its benefit in developing mixed methods terminology (e.g., legitimation) that helped advance the field of MMR.

Role of Colleagues/Mentors

The role of colleagues/mentors was a topic that emerged and was discussed at varying degrees within different contexts. *Joseph* mentioned how his graduate training helped build the foundation for his research methodology skills. *Joseph* stated:

> *"My coauthor was the professor for that class, Dr. Jori Hall, and she actually studied under Jennifer Greene, you know, who is obviously one of the mixed methods gurus. So, she did her Ph.D. at the University of Illinois Urbana-Champaign so the way she taught that class was very much, very intentional about understanding how and why you use mixed methods and what are some of the critical questions you need to ask before you say 'hey, I'm going to do a mixed methods study!'" (Joseph)*

It is evident from *Joseph's* statement that in general, Dr. Jori Hall's teachings aided his understanding of mixed methods in multiple ways, specifically, being intentional about carrying out a mixed methods design.

When *Carolina* was asked what prompted her decision to use the legitimation typology she noted that aside from the fact that it fit a convergent design, her decision was also influenced by mentoring. *Carolina* shared:

> *"It came from mentoring. I took the mixed methods course from Dr. Plano Clark, she was my professor, and Michelle was her TA. Dr. Plano Clark really emphasized the parts of validation, so you know, you needed to be very rigorous on the quantitative, very rigorous on the qualitative, and at the point of mixing you needed to make sure that you had all these things accounted for… So, I mainly took guidance from Creswell and Plano*

Clark." (Carolina)

Burke also described colleagues' influence when designing some of the legitimation types, such as paradigmatic legitimation. When elaborating on paradigmatic legitimation, *Burke* noted:

> *"I have put this one in [paradigmatic legitimation] because I think it's important to briefly address it and I also put it in because this is very important to some of the mixed methods researchers such as Jennifer Greene, Donna Mertens, Sharlene Hesse-Biber, to name a few, cause they were in the qualitative movement and they came into mixed somewhat out of the paradigm wars so for them, in fact, Jennifer Greene says that's what makes mixed methods research unique, it's that paradigms and philosophies were important, that's what she says…" (Burke)*

Overall, the role of colleagues/mentors offered guidance to many participants, stemming from their early graduate school training in MMR that served as the foundation to help expand their knowledge and continue incorporating 'best practices' in their current research. *Burke* described his colleagues' influence when developing certain legitimation typologies (e.g., paradigmatic mixing). This allowed for a more encompassing typology that values researchers' perspectives and understanding on MMR.

Researchers' Application/Interpretations of Legitimation Types

Participants were asked to explain how they understood and applied each legitimation type in their study to explore their interpretations and application of the typology. The following are participant interpretations of the legitimation type(s) that were assessed in each participant's empirical study. These interpretations are based on the Onwuegbuzie and Johnson (2006) legitimation typology.

Multiple validities legitimation. Multiple validities legitimation refers to "the extent to which addressing legitimation of the quantitative and qualitative components of the study result from the use of quantitative, qualitative, and mixed validity types, yielding high quality meta-inferences" (Onwuegbuzie & Johnson, 2006, p. 57). When discussing multiple validities, *Joseph* believed that either construct or content validity must be established when addressing this

validity type, but it was not necessary to address both entirely. Nonetheless, he clearly emphasized that an effort to pursue both should be made. Questionnaire data was collected using the Student Athlete College Experiences Questionnaire (SACEQ) as well as semi-structured focus groups and individual interviews with participants (Cooper & Hall, 2016). *Joseph* provided an example from his study:

> *"So when I thought about the multiple validities I thought 'okay, I can talk about how I established content validity and how construct validity was sought after, but I don't know that for sure, as long as I can state that, then validity is accepted in quantitative research, and then qualitatively I did a whole range of things to ensure credibility and trustworthiness like member-checks, subjectivity statements, detailed memos, audit trails, detailed descriptions, rich data…" (Joseph)*

Inside-Outside legitimation. Inside-Outside legitimation refers to "The extent to which the researcher accurately presents and appropriately utilizes the insider's view and the observer's views for purposes such as description and explanation" (Onwuegbuzie & Johnson, 2006, p. 57).When discussing inside-outside legitimation, several participants interpreted it as the emic-etic viewpoints, which is consistent with the upcoming proposed change of renaming this legitimation type to emic-etic legitimation. *Joseph* mentioned that some qualitative methods such as ethnography, grounded theory, or phenomenology require a certain level of depth, more heavily grounded in the insider perspective. For his study, *Joseph* conducted a case study and extracted his interpretations of the data from the focus group and individual interviews, but he was not making on-site observations throughout the day, for example, as that was not pertinent to his research questions. Therefore, while he incorporated multiple methods to better understand his participants, he was not in constant contact with them as a grounded theory or ethnography study. *Joseph* also expressed one challenge of this legitimation type is determining how much data constitutes the insider and outsider perspectives and provided a thorough explanation on his decision for not addressing inside-outside legitimation in his study. *Joseph* stated:

> *"So the participants are the insider, but it's still presented even though I used in-vivo codes and rich descriptions, it's still very much my outsider extraction of what they told me and my interpretation of after analyzing the data their perspective so I still was an outsider even in the presentation of the findings, so it's kind of like an outsider presenting the insider's perspectives as opposed to if it was a true insider-outsider, I would have immersed their perceptions and my perceptions in the findings…" (Joseph)*

Therefore, *Joseph* believed that majority of his data was grounded in the outsider viewpoint.

Paradigmatic mixing legitimation. Paradigmatic legitimation refers to "the extent to which the researcher's epistemological, ontological, axiological, methodological, and rhetorical beliefs that underlie the quantitative and qualitative approaches are successfully (a) combined or (b) blended into a usable package" (Onwuegbuzie & Johnson, 2006, p. 57). There were multiple varying interpretations of paradigmatic legitimation. *Joseph* expressed that for paradigmatic mixing to occur, both the quantitative and qualitative strands needed to be equally weighed. *Joseph* explained:

> *"The paradigmatic mixing to me I felt like I would need to use either a structural equation modeling or a predictive causal-relationship model to kind of, once again, when I'm thinking about positivistic research I didn't think my correlational data was in-depth enough to constitute the core foundation of positivistic research around one true finding and I didn't use, even though I had influences from instruments that had construct validity, it's not like I created an instrument that had construct validity to the extent of other instruments to the field. So in my mind I felt like if I was going to do paradigmatic mixing to that degree, I would have needed to acquire a higher level of construct and content validity with my quantitative instrument and employ more causal relationships or some type of model and then merged that, so I guess in essence I felt like if I was going to do the paradigmatic mixing, then I would need to have QUAL and QUANT be very much equally weighed, as much as possible, within the level of inquiry." (Joseph)*

Joseph believed he needed a more rigorous quantitative component and equally weigh the quantitative and qualitative strands to address paradigmatic mixing.

For *Judith*, she particularly focused on worldviews when interpreting paradigmatic mixing. For example, she explained that simply because a researcher is conducting a quantitative study it should not necessarily dictate that they have an objective view, nor does it imply that a researcher will have a subjective viewpoint for qualitative study. She expressed that she does not

believe a researcher will have different beliefs depending upon whether they research methodology. *Judith* stated:

> *"I find it hard to believe that you would say for example while you are doing the quantitative part 'I believe in an objective world' and then you switch to the qualitative part and now you say, 'I believe in a subjective world and several worlds." (Judith)*

Nevertheless, she acknowledged that several different perspectives and worldviews can emerge when working in research teams, but these might not necessarily be connected to the quantitative or qualitative strands, nor is it likely for these worldviews to switch within one person.

David's interpretation of paradigmatic mixing meant going beyond each method and amplifying the values of both. *David* described:

> *"I have two what could be full studies here, but I want to go beyond just the sum of the parts. I want to make sure I'm getting more than just the sum of the parts when I do this analysis so that's where my legitimation design came from. It's like these data, both quantitative and qualitative, have value and I want to make sure I can go beyond just the value of each individual one." (David)*

Collectively, these participants all had diverse interpretations of paradigmatic mixing demonstrating the need for further clarifications.

Weakness minimization legitimation. Weakness minimization legitimation refers to "the extent to which the weakness from one approach is compensated by the strengths from the other approach" (Onwuegbuzie & Johnson, 2006, p. 57). There was a consensus on participants' interpretations of weakness minimization legitimation. *Judith* summarized that both the quantitative and qualitative strands have specific weaknesses of their own that are compensated by the strengths of the other. *Judith* suggested one way researchers may be able to reduce the weaknesses of one method is by implementing an additional data collection method, such as observations, for example. Nonetheless, she also noted caution as this will not apply in all cases and should ultimately be determined by the researcher dependent upon the study characteristics and a researcher's judgment on the best way to minimize weaknesses and increase the strengths

of their study. *Joseph* also explained a weakness of quantitative research, which could also be a strength, is its emphasis in generalizability. From a sample standpoint, *Joseph* mentioned that qualitative research typically involves smaller sample sizes, whereas quantitative research is able to "*provide more voices."*

Sample integration legitimation. Sample integration legitimation refers to "the extent to which the relationship between the quantitative and qualitative sampling designs yields quality meta-inferences" (Onwuegbuzie & Johnson, 2006, p. 57). Sample integration legitimation was described differently through participant's perspectives. For example, *Joseph* discussed this legitimation type did not fit his study because he believed his sample did not fit a true positivistic criteria. For his study, he used criterion sampling that focused on a particular institution to identify participants that met the study's criteria. Due to this, *Joseph* stated that he did not use true positivistic sampling approaches such as random sampling or non-probability sampling, for example, as his goal was also not to generalize these results nor population transferability. Alternatively, *Sherry* and colleagues addressed this legitimation type in their research study by ensuring that the same sample was used for their quantitative and qualitative strands. *Sherry* also added that even though they had a small sample size, the fact that the same sample was used in both studies (e.g., quantitative and qualitative) allowed them to triangulate data from multiple sources.

Conversion legitimation. Conversion legitimation refers to "the extent to which the quantitizing or qualitizing yields quality meta-inferences" (Onwuegbuzie & Johnson, 2006, p. 57). Many participants also interpreted conversion legitimation similarly, however, some participants discussed potential issues that can arise when converting data from one methodology to another. For instance, *Joseph* discussed the importance of member-checks and peer debriefs, especially in the case of conversion legitimation. He noted that just because something was not

numerically salient in the qualitative data does not mean it is not important or, just because something was numerically salient, or the participant spoke about it at a greater length does not necessarily mean it was significant. A researcher's goal should be to evaluate the validity of that saliency and determine whether it is consistent within the quantitative and qualitative data using member-checks and peer debriefings. *Joseph* provided one example from his study and discussed how he reconciled this:

> *"That's something I had to reconcile with my memos as well as with the member-checks and the peer debriefings because I would say this theme came out very high, but it just meant that they spoke about more at length, it didn't mean that this aspect of their experience wasn't important so for example if I were to ask you 'what is your relationship like with your coach?' one focus group may just say, 'we don't like the coach he only likes us when we're playing well' and that's really what the essence of what they said, but another group may say 'kind of like the coach, we kind of don't' and then they go on a long talk about. It doesn't mean that this first focus group what they said wasn't as salient; it just means that they didn't elaborate on it to the same extent as the second focus group." (Joseph)*

In this example, *Joseph* is referencing two focus groups where one focus group did not provide a lot of detailed information about a particular subject in comparison to the second focus group who discussed the subject matter in greater depth. This did not mean that it was not important for one of the focus groups, it simply meant that when comparing the two, one spoke about the subject at greater length. When discrepancies in converting quantitative and qualitative data occur, in addition to member-checks and peer debriefings, *Joseph* also recommends a researcher to verify through crystallization and triangulation and also become familiar with their *"sample, the research setting, the nature of the research questions, and outsiders,"* since researchers might become *"too close to the data,"* as he stated.

One difficulty *Sherry* discussed when addressing conversion legitimation was determining how to analyze all the data sources side by side in a manner that made sense and what type of statistics to use to analyze the conversion of quantitative and qualitative data. *Sherry* primarily used frequency counts and created narratives to quantitize and qualitatize the

data, which helped with the various data sources. *Sherry* and colleagues decided not to address conversion legitimation in the article due to space constraints, but she also mentioned:

> *"I did it [quantitizing and qualitizing data], I tried it, it made sense, but mathematically and statistically I still… like if I was ever going to actually include it in the article I would need a lot more information on how to weigh it and how to actually do a statistical analysis in this way… I almost felt like I needed an entire class in that, if that makes sense, to figure out the statistical part on how to do it. We just had so many data sources…" (Sherry)*

Conversion legitimation could benefit from clarifications to help researchers better assess this legitimation type in their research studies. More specifically, based on what participant's expressed during the interviews, this legitimation type should incorporate the following suggestions: develop criteria for evaluating the saliency of the conversion, develop methods on ensuring the comparisons between both strands are accurate when converting data, elaborate the conversion process with multiple sources of data, and provide further detail on types of statistical analyses and qualitative methods that can be used to convert data.

Political legitimation. Political legitimation refers to "the extent to which the consumers of mixed methods research value the meta-inferences stemming from both the quantitative and qualitative components of a study" (Onwuegbuzie & Johnson, 2006, p. 57). Political legitimation was one of the least addressed legitimation types among this sample of participants. *Joseph* explained that from a political standpoint he wanted to demonstrate value in both the quantitative and qualitative strands. However, to address political legitimation he believed both strands needed to have been equally weighed, yet his study was mostly a qualitative-dominant mixed methods study and therefore political legitimation was not relevant to his study.

Judith described political legitimation from a different perspective and elaborated on identifying subgroups in her study:

> *"To me it's not so much looking beyond the subgroups but it's the fact that you are identifying these subgroups and then exploring the groups where something is happening, in this case at the university of interest, which increases, I think, the political legitimation*

> *because you are saying 'look we are focusing on this subgroup which is doing something that is good and might form the basis for an intervention.'" (Judith)*

In other words, from *Judith's* perspective, political legitimation intends to inform others, such as a third party, who can benefit from the study.

Commensurability legitimation. Commensurability legitimation refers to "the extent to which the meta-inferences made reflect a mixed worldview based on the cognitive process of Gestalt switching and integration" (Onwuegbuzie & Johnson, 2006, p. 57). Commensurability legitimation was a legitimation type that was not seen as relevant to many participants. *Joseph* described commensurability legitimation as:

> *"Meta-inference where there is this kind of overlap between positivistic and social constructivist ways of thinking… in my mind, commensurability allowed for the latitude for me to say, 'this is a qualitative dominant mixed methods study that is using quantitative data as complementary data to further crystalize and explain or explore a particular phenomenon of interest.'" (Joseph)*

Since *Judith* was interested in examining how the legitimation types were relevant to the MMIGA model, she explained why commensurability legitimation was not relevant for her study:

> *"The problem, I think, in my, as I call it the MMIGA, is here, the quantitative part is just identification of a group of interest and that means that the inferences are mainly based upon the qualitative research that follows. So, it just isn't true in my MMIGA model that the worldview is mixed, but that's because the quantitative part has a very specific role identification of a group of interest." (Judith)*

Judith later goes on to elaborate the relevance of commensurability legitimation by stating:

> *"So it seems to me that perhaps some of these legitimation criteria refer more to a situation in which you have so to speak 'data' from both the quantitative and qualitative component that are somehow in a sort of triangulation procedure and then you can perhaps say well there is some Gestalt switching and integration, but in my case it was just simply not relevant to the type of role that the quantitative part had in my model." (Judith)*

During the member-checking interview, *Judith* provided clarification and described a scenario where a researcher might have quantitative data that is answering a particular research

question, but also have qualitative data that is related to that research question. In this case, she believes a researcher might engage in Gestalt switching since the quantitative and qualitative strands have similar roles in answering the research questions. Consequently, a researcher should be able to compare the answers and engage in some form of switching to develop meta-inferences, however, this was not the case for her study as the quantitative portion was designed to identify a group of interest, not to answer the overarching research question. Overall, *Judith* believes it would be helpful to include examples of Gestalt switching and integration for commensurability legitimation.

Sequential legitimation. Sequential legitimation refers to "the extent to which one has minimized the potential problem wherein the meta-inferences could be affected by reversing the sequence of the quantitative and qualitative phases" (Onwuegbuzie & Johnson, 2006, p. 57). Sequential legitimation, along with political legitimation, was one of the least addressed legitimation types within this sample, particularly because it was not relevant to participant's mixed methods study. *Joseph* described that for his particular study he did not implement a sequential mixed methods design, thus it was not addressed in his study. *Judith* explained that the reason sequential legitimation was not relevant was because the quantitative and qualitative strand each had different roles and reversing the sequence would not be logical. For *Judith's* study, the role of the quantitative strand was to identify the group of interest, whereas the role of the qualitative was to explain the process of that group, hence, she needed to first identify the group. Nonetheless, *Judith* described that conducting a study in a reversed way might force a researcher to examine another component that would have probably not been originally examined. *Judith* stated:

> *"The meta-inferences could be affecting, not so much in the sense that for a specific meta-inference you would have a different result, but it could be affected in the sense that you would look at other inferences. So, if you would not know where something of interest is going on you would perhaps focus on something else. (Judith)*

Overall, several researchers discussed the benefits of the legitimation typology and many stated that most of the legitimation types were clear. Nonetheless, interviews with this sample of participants also demonstrated the wide range of interpretations and the need for clarification on specific legitimation types. More specifically, some legitimation types that might benefit from further explanations and examples are conversion legitimation, inside-outside legitimation, and commensurability legitimation. Participants expressed the need for clarifications on which statistical analyses to use when assessing conversion legitimation and how to handle converting data when using multiple data sources. For inside-outside legitimation, participants also expressed similar interests in benefiting from explanations on how much data should constitute the insider and outsider for this legitimation type to be appropriately addressed in a MMR study. Finally, one of the difficulties that was expressed in assessing commensurability legitimation was how to identify whether the "cognitive process of Gestalt switching and integration" apply and the need for examples on "Gestalt switching and integration" (Onwuegbuzie & Johnson, 2006, p. 57).

Clarifications on Legitimation Typology

Burke, one of the developers of legitimation typology, was asked to provide further explanations on each legitimation type. These clarifications would later help when analyzing the similarities and differences among researcher interpretations. Through this interview I learned about the changes he made to the original Onwuegbuzie and Johnson (2006) legitimation typology. This section provides information on each of the legitimation types included in the original legitimation typology (Onwuegbuzie & Johnson, 2006) and the revised typology (Johnson & Christensen, 2017).

Multiple validities legitimation. *Burke* mentioned that multiple validities legitimation is the most important legitimation type because "…*Each part does have to be valid, trustworthy,*

and legitimate." Given this explanation, *Burke* is specifically referring to validity for the quantitative strand (i.e., valid), qualitative strand (i.e., trustworthiness), and mixed methods (i.e., legitimation). *Burke* also emphasized the need for "*good qualitative, good quantitative, and good mixed*," which are grounded on a rigorous assessment of quality for each study. *Burke* added:

> *"The parts [quantitative, qualitative, and mixed methods] as well as the whole have to lead to good inferences, have to be of high quality." (Burke)*

Inside-Outside legitimation. When discussing inside-outside legitimation, *Burke* mentioned in the revised 2017 legitimation typology (Johnson, & Christensen, 2017), inside-outside legitimation maintains the same name, but in upcoming revisions the name will be changed to emic-etic legitimation. This change will be beneficial for researchers to easily associate with the emic (i.e., the insider view) and etic (i.e., the outsider view) perspectives.

Paradigmatic legitimation. There was a minor change to paradigmatic legitimation in terminology to the 2017 revised legitimation typology (Johnson, & Christensen, 2017). This legitimation type is currently known as paradigmatic/philosophical legitimation in the 2017 legitimation typology, but its definition remains consistent with the 2006 legitimation typology. This legitimation type refers to a researcher's philosophical assumptions and it was included because several mixed methods researchers consider it important to state paradigm(s) in their research. *Burke* discussed:

> *"Think about your philosophical beliefs and be transparent about it so the reader knows what is effected, how you frame and think things." (Burke)*

Political legitimation. Political legitimation is now known as sociopolitical legitimation according to the revised 2017 legitimation typology. However, its meaning is also consistent with the 2006 legitimation typology. *Burke* discussed the importance of understanding others' needs, especially those with minimal power, to better depict them in research. *Burke* added:

> *"Always try to be sensitive to the needs of those with minimal power and one thing that it [sociopolitical legitimation] does too is it gives you different perspective too. That forces*

> *you to realize there will be different perspectives on what you say so you can address that in your research." (Burke)*

Commensurability legitimation. In the revised 2017 legitimation typology commensurability legitimation is now known as commensurability approximation legitimation. *Burke* explained this legitimation type was changed from 'commensurability legitimation' to 'commensurability approximation legitimation' because he believes a researcher can never reach full commensurability, nonetheless, it should be a goal. This definition is described as twofold:

> *"The idea of Gestalt switches so what we're saying is, put on your quantitative glasses, put on your qualitative glasses, put on your mixed glasses and move back and forth, back and forth, continually and then you're going to get the mixed viewpoint. The answer, the mixed answer is understanding the differences and having that larger understanding from those differences." (Burke)*

The second part of commensurability approximation legitimation refers to working in research teams. *Burke* elaborated:

> *"Another way is… often mixed methods research is done well in a team of collaborators so if you have a qualitative person and a quantitative person and then, say you're going to be the mixed person, then the commensurability would be the compromises from them [the research team] or the meta-inferences you get from them that they [the research team] say are legitimate." (Burke)*

Burke also added that mixed methods helps researchers understand differences and commensurability approximation legitimation more specifically focuses on the syntheses of the differences, or how different ideas came together from different sources in the study.

Sequential legitimation. When asked about sequential legitimation, *Burke* stated that this legitimation type was altered from the 2006 legitimation typology definition. In the 2006 definition, sequential legitimation referred to obtaining the same results even if a researcher reversed the sequence of the study (e.g., initially quantitative and then qualitative or initially qualitative and then quantitative). In the 2017 revised legitimation typology, *Burke* modified this definition to refer to the integration of the design and study. *Burke* explained:

> *"But now what I have added is this idea that to have a good study you need to appropriately build… with your design and study, you need to think about how following studies will build on earlier studies." (Burke)*

When asked whether sequential legitimation mainly refers to a sequential mixed methods design or whether it can also refer to the priming effects of collecting data for one study before the other, *Burke* explained:

> *"In a specific sense it could refer to a concurrent design, but it's directly focused for sequential designs because sometimes we forget that in concurrent designs things don't happen at the same time. There is some sequencing that is going in there too. So, I change my response, it primarily relates to sequential designs, but if there's sequential components or procedures happening in a concurrent design it certainly applies to that too." (Burke)*

Therefore, when addressing sequential legitimation, researchers should first identify whether they have implemented a sequential mixed methods design and if not, whether they have incorporated sequential components in a concurrent mixed methods design.

Consistent legitimation types. Three legitimation types remained consistent with regard to terminology and definition—sample integration legitimation, weakness legitimation, and conversion legitimation.

The revised 2017 legitimation typology includes two new legitimation types—pragmatic legitimation and integration legitimation.

Pragmatic legitimation. Pragmatic legitimation refers to whether the research study answers the 'so what?' question. *Burke* stated:

> *"And when you read that article do you come away with 'that added something to my understanding to what that title was about' so it has some pragmatic utility or usefulness." (Burke)*

Pragmatic legitimation asks, "was the research purpose met" and, "was the research problem solved" (Johnson & Christensen, 2017, p. 308)?

Integration legitimation. *Burke* decided to add integration legitimation to encourage researchers to integrate and to assess the integration when implementing a mixed methods study.

This definition is also twofold. The first definition of integration legitimation is that integration is present in all legitimation types. The second part is that integration legitimation also has its own type. In other words, *Burke* explained:

> *"…And then number two, we have added a whole type, a separate standalone that says when you evaluate this research if you are a reader or when you are planning this study, you need to address the integration issue. So, a reader can address the degree to which the researcher achieved integration of quantitative and qualitative data, analysis, and conclusions, so it's not just data, its conclusions, its analysis, there's lots of kinds of different integrations." (Burke)*

Burke discussed integration legitimation in terms of the reader and researcher. A reader can determine whether this legitimation type was addressed by examining the degree to which a researcher integrated multiple components of their study. As a researcher, they should be able to justify how they integrated at varying stages of their study such as the quantitative and qualitative data, analysis, and conclusions. If this is done, and the integrated conclusions are justified by the meta-inferences, then integration legitimation has been achieved. This legitimation type will motivate researchers to address integration throughout multiple aspects of their mixed methods study with the aim of developing more credible and reliable meta-inferences.

Researcher Recommendations

Towards the end of all interviews, participants were asked several final questions about quality in MMR such as, what changes (if any) they would like to see incorporated to the legitimation typology, advice for future researchers when using the legitimation typology, and what they thought the future of quality in MMR should look like. Many participants spoke at length about recommendations for researchers and were motivated to continue expanding the field of MMR. As a result, recommendations are divided into three sub-themes: *design, applying the legitimation typology*, and *research community*.

Design. Many researchers provided recommendations on the design, more specifically recommendations for the mixed methods design. On a general level, *Joseph* described the importance of the purpose statement and research questions and their role in the design/method. *Joseph* stated:

> *"Let your purpose statement and research questions guide your methods, not the other way around." (Joseph)*

Joseph further expanded this statement by stating that researchers should clearly write out their questions, which will provide clarity on what they are trying to explore, and from those questions determine which methods are most appropriate. *Burke* also agreed and expressed his mission in educating others on the importance of constructing their design based on their research questions. *Burke* expressed:

> *"I've been on a mission to try to share/spread the message that researchers will often need to construct their design based on their particular questions, research needs, and so forth, rather than think that it can go somewhere and always select a design." (Burke)*

When discussing recommendations specific to the mixed methods design, several researchers also provided suggestions. For instance, *Judith* stated:

> *"Well my general advice would be to be very clear about your purpose of mixing that you have and the specific role of that quantitative and qualitative research have and then you can still consider the legitimation criteria and think about which of them [legitimation types] are relevant to your study and which are not." (Judith)*

Judith emphasized the importance of understanding the role of the quantitative and qualitative strands, but also encouraging researchers, similar to *Joseph*, to go back to their research questions and purpose(s) to determine which legitimation type(s) would apply to the study. When asked what advice *David* would give to researchers when assessing the quality of the mixed methods study, he mentioned:

> *"Think about the whole process of conducting the second method and if you're going to go through with it, what benefit will that add to your total results. Make sure that you are capable of conducting both methods or that you have a steady team capable of*

> *conducting both methods and you are ready to produce that added value that you expect to find by adding the second method." (David)*

In terms of design, *Sherry* also expressed, *"Don't force something to fit, make it a natural fit for your design."*

Overall, the design of a study is critical and as many researchers noted, the purpose statement and research questions should guide the methods and the design. Most relevant to mixed methods, researchers should be clear on their purpose for mixing, paying particular attention to the role of each methodology and legitimation criteria.

Applying legitimation typology. Various suggestions specific to the application of the legitimation typology were provided by participants. *Joseph* provided a series of approaches when implementing the legitimation typology. For example, *Joseph* described that researchers should read through articles and identify the legitimation types that were used in the study by writing memo notes for each of the typology categories. This could include a researcher's thoughts and interpretations on ways the legitimation types might fit in their own study. Another suggestion was to examine the legitimation types and write examples of a study that would address those specific legitimation type(s). This suggestion serves as a way for researchers to become familiarized with the legitimation types. It is important to note that when researchers are developing their study, they should develop the study first, collect and analyze data, and then determine which legitimation types are relevant to this study. Finally, *Joseph* mentioned one idea all researchers should consider:

> *"So, I would say when you're going through these typologies don't automatically dismiss them based on what you are thinking about your study at that moment. Write down what it could potentially look like if you were to adopt it. So almost put yourself in the mind frame of if you are in a class and let's say I'm your professor and I say 'Analay, in class, you're going to have to write out what would a study look like using each of the legitimations' and then force yourself to write that out and once you do that connect all of those potential options back to your ultimate purpose statement and say 'okay what is my purpose, what are my researcher questions, what's feasible, which of these typology*

categories[legitimation types] could map on to what I'm going to do?'" (Joseph)

This process suggested by *Joseph* is beneficial to researchers in understanding each of the legitimation types and their relevance in a study. Doing so will also help researchers reduce confirmation bias. Nonetheless, it is important to note that not all legitimation types will be relevant in a research study, but these are suggestions researchers can engage in to become familiarized with the legitimation types and understand how they can be addressed in a study.

Research community. Several recommendations were provided to students, researchers, professors, doctoral committees, and grant panels. *Nataliya* gave several recommendations to professors, students, and researchers implementing a mixed methods design. For instance, *Nataliya* suggested students/researchers provide a description of quality for the quantitative and qualitative components separately, while also reflecting on their paradigms, to examine how these are applied in a student/researcher's field. *Nataliya* stated:

> *"…Having them [students] think about what quality is at the quantitative level, and what is quality at the quantitative level in terms of research paradigms kind of ties better or aligns better with their backgrounds…" (Nataliya)*

Nataliya later added that encouraging students to reflect on their research paradigms allows them to feel more comfortable with the quality perspectives that exists in their fields.

Nataliya also recommended students/researchers decide which MMR framework(s) fits best with the purpose(s) of their topic and mixed methods design. *Nataliya* explained:

> *"I let them decide, we train, work, and of course we discuss them based on the readings and I give them 3-4 major frameworks that kind of highlight that, and that have been advanced in the MMR literature and I tell them 'well, feel free to choose any, but you have to justify which one and how the one(s) you will fit, or fits most appropriately to the purposes of your specific topic and your mixed methods design as well,' but I always ask because, and this comes before the framework, to provide a description of quality for the quantitative and the qualitative strand separately." (Nataliya)*

As noted, *Nataliya* exposes her students to multiple MMR frameworks and allows students to choose frameworks they consider most appropriate to their research purposes. It is

important to note the emphasis on validating each individual strand (e.g., quantitative and qualitative) before moving on to the MMR frameworks since initially validating each strand provides the foundation and aligns well with multiple validities legitimation. *Nataliya* also encourages students/researchers to use several frameworks to assess the quality of the mixed methods study as long as they can be justified. *Nataliya* added:

> *"I'll ask the students to look to choose a framework or several frameworks if they can justify the need for them and apply them to assessing quality of the overall all mixed methods study and the meta-inferences that they think should emerge or if it's something that emerged from the study, from the research process." (Nataliya)*

While these recommendations were tailored towards *Nataliya's* students, researchers can also apply these suggestions to build a more valid mixed methods study. *Nataliya* also emphasized the importance for students to use mixed methods unique terminology (e.g., frameworks) to inform their committee members and spread education of MMR. *Nataliya* mentioned that quality in MMR is a relatively new concept that developed and will continue to develop throughout time. *Nataliya* stated:

> *"It [frameworks] is very new thinking and when you work on committees specifically…, committee members may not even have this knowledge or understanding, or they may even think 'do we actually need to think about this?' just because it never happened before. That's why bringing this aim and justification helps students use these frameworks in the class, helps them better understand how to apply those frameworks, and also explain them to committee members."(Nataliya)*

Considering that quality frameworks in MMR are relatively new, *Nataliya* highlighted the importance of encouraging students to use, understand, and apply these frameworks to spark conversation on quality in MMR. Doing so will continue to move the field of MMR by informing committee members and ultimately grant committees.

Finally, *Nataliya* also advocates researchers to address the quality of a mixed methods study within a grant proposal. *Nataliya* stated:

> *"I don't see, in my personal review of working on reviewing grants, people talk about any frameworks of assessing quality at the mixed methods level and again maybe it's*

> *because there is no room, maybe it's because you know, you try to not put things that the reviewers might not be too familiar with ..." (Nataliya)*

The reasons why grant proposals do not include a section on assessing quality of a mixed methods study using various frameworks is not known, however, adding this section will reinforce a more thorough examination of potential validity/quality threats before conducting the study. *Nataliya* encourages students/researchers to briefly describe the framework(s) they have used within the grant proposal. Developers of grant proposals should also consider providing space for researchers to address quality frameworks in their study when designing grant applications. *Nataliya* clarified:

> *"I always advise students to put this language in the proposal, but again this language is not understood well by some committee members who are not familiar with the mixed methods field and why we need to use legitimation so probably a more generic term like 'quality' or a phrase like 'quality assurance' could be a more applicable way of describing what you are trying to talk about when it refers to quality of mixed methods studies." (Nataliya)*

Nataliya also encourages students to use more common phrases in MMR to assess quality such as 'quality' for committee members gain a better understanding.

Overall, participants provided a variety of suggestions encompassing the general research community, ranging from students, researchers, professors, dissertation/theses committee members, and grant committees. It is important that researchers consider these recommendations to continue expanding the field of MMR. Moreover, this will further education and discussions on quality frameworks in MMR and increase the applicability of frameworks and mixed methods terminology. Doing so will result in more methodologically valid and rigorous mixed methods studies.

Proposed Changes to Legitimation Typology

This study was able to shed light on the similarities and differences of participants' interpretations for each of the legitimation types based on the Onwuegbuzie and Johnson (2006)

legitimation typology. Since then, Johnson and Christensen (2017) have revised the typology by clarifying some of the legitimation types and including two additional types— pragmatic legitimation and integration legitimation. Based on this study's findings, several recommendations have been suggested to the current legitimation typology.

Conversion Legitimation

When discussing conversion legitimation, several participants were unsure about which statistical analyses they should use and how to convert data using multiple data sources. The current 2017 conversion legitimation type has remained fairly consistent with the 2006 conversion legitimation definition. Conversion legitimation is the degree to which a researcher transforms their data (i.e.., quantitizing or qualitizing) to develop high quality meta-inferences (Johnson & Christensen, 2017). Quantitizing data refers to counting words, whereas qualitizing data refers to arranging quantitative results into words, themes, or categories (Johnson & Christensen, 2017, p. 308). Most participants used frequency counts to quantitize their data but wondered if other analyses should be used to convert data. Some researchers have advised that qualitative data assigned nominal numerical values or ordinal numerical values should only be used as predictors in analysis of variance (ANOVA) or outcomes in logistic regression analyses (Sandelowski, Voils, & Knalf, 2009, p. 215). Inferential statistics such as chi-square, McNemar for repeated measure sequential designs, and logistic regression have also been used by other researchers to quantitize data (Nzabonimpa, 2018, p.7). Aside from the more common descriptive statistics, more research should be conducted on the validity of each of these statistical analyses (e.g., chi-square, logistic regression, and using qualitative numerical values as predictors) when converting data.

Nonetheless, before a researcher determines which statistical analyses are most appropriate for converting data there are several factors that should be considered. First, if a

researcher is considering converting data, they must have a clear reason for doing so while also considering the value it will add in generating high quality meta-inferences (Sandelowski et al., 2009). Secondly, dependent on whether a researcher's MMR design allows for this, it would be beneficial for researchers to conduct the qualitative analysis first followed by the quantitative analysis. Doing so will blind researchers from the quantitative results and reduce bias when analyzing the qualitative findings. Sandelowski and colleagues (2009) posit that a researcher can use the results of a prior quantitative analysis of the quantitative data as a placeholder when quantitizing data to determine whether there is correspondence between the quantitative and qualitative results. However, using quantitative data as a placeholder also presents limitations as it can introduce bias and questions whether converting the data actually took place or whether a researcher was guided by trying to find data convergence (Sandelowski et al., 2009). Due to this, it is not recommended to use quantitative data as a placeholder, but instead analyze the qualitative data first to reduce researcher biases.

Based on participant interviews, when quantitizing data it is critical for a researcher to further examine whether the generated themes were truly important to the participant and not simply spoken about at length with little meaning or significance to the participant, as stated by *Joseph*. A researcher must ensure reliability among their themes when quantitizing the data. One way of doing so can be through member-checks and asking participants to review researcher transcripts. However, it is important to note that when conducting member-checks a researcher should not encourage participants to acquiesce or engage in socially desirable responses. Acquiesce refers to "the tendency to agree with someone rather than disagree" and is culturally based (Dillman, Smyth, Christian, 2014, p. 100), whereas social desirability "is the tendency to provide answers that put one in a good light with the person who asks the question; it is often

motivated by wanting to make a good impression in a social interaction (or avoid a negative one)" (Dillman et al., 2014, p. 99).

Both acquiescence and social desirability are mostly prevalent in interviewer-administered surveys (Dillman et al., 2014) and can also occur in qualitative interviews. Thus, during a qualitative interview, interviewers should not ask leading questions that confirm their beliefs or interpretations, instead they should ask clarifying questions even if it is not consistent with their own interpretations. For example, if a researcher is conducting a study exploring the perspectives of interrogated juvenile offenders in the justice system they should not ask suggestive questions (particularly during the member-checking interview phase) such as, "So you really have a bad view on cops, right?" unless the participant has explicitly stated it. Such questioning may encourage participants to acquiesce or provide socially desirable responses, thus impacting the trustworthiness of the qualitative findings.

When qualitizing data a researcher may use factor analysis or principal component analysis to explore which items load on specific factors/components. Once the constructs have been identified a researcher can qualitatize the data by developing themes. These constructs can become themes and could also help validate the original qualitative findings. For example, a researcher can generate themes based on the factors/components with the highest loadings and compare these themes (i.e., constructs) with the qualitative findings to determine if there is convergence in the data, thus also serving as a validation tool. Although it is possible that not all qualitative themes might be captured from the factor analysis or the principal component analysis, a researcher should further investigate this. Additional qualitative themes may be emergent through the process of crystallization or emerge by using additional questionnaires that may capture some of those themes, however, a researcher should use their judgment to determine

whether including additional surveys to validate the qualitizing process of their data makes sense.

Inside-Outside Legitimation

Some participants discussed the difficulty in determining how much data should constitute the insider (i.e., emic) and the outsider (i.e., etic) perspectives when addressing inside-outside legitimation. While it is difficult to quantify how much data can constitute each perspective since the emic and etic have their own purpose(s) in qualitative research, instead researchers should consider the following when addressing this legitimation type: emic and etic definitions and acknowledging the discrepancies that can arise due to researcher reflexivity. Yin (2010) defined the emic perspective as "attempts to capture participants' indigenous meanings of real-world events" (p. 11) and according to Merriam (2009), from an educational research standpoint, the emic perspective aims to explain the foundations and meanings of a specific culture (Olive, 2014). Whereas, Willis (2007) defined the etic perspective as the "structures and criteria developed outside the culture as a framework for studying the culture" (p. 100). In other words, this definition particularly refers to an outsider's perspectives on the culture they are studying.

Since these two perspectives are highly distinct, Yin (2010) posited that discrepancies between the emic and etic perspectives exist due to researcher reflexivity, research design, and ultimately how researchers reported their study (Olive, 2014). Nevertheless, researchers should not allow their own views and perspectives to guide their findings when addressing inside-outside legitimation and should instead balance both perspectives (Olive, 2014). Even though a researcher may be related to a particular group they are studying and share similarities with them, it is critical for the researcher to acknowledge that differences will also arise as evidenced from Olive's (2014) personal account. Olive (2014) conducted a study examining multiple

frameworks of sexual identity development and found that as a non-heterosexual male many of his past experiences aligned with the sexual identity development frameworks he was examining. However, as he developed his study, he also discovered that certain aspects of his identity development framework were different than other individual's such as the presence of pride in his development and lack thereof in others (Olive, 2014). Therefore, given this example, researchers can balance the emic and etic perspectives is by conducting member-checks throughout the data collection phase, detailing and recording rich descriptions of participant's perspectives, and also asking participants to review interview transcripts (Noble & Smith, 2015). Even though there are no quantifiable criteria that suggests how much data constitutes each perspective, these recommendations serve as guidelines in balancing both perspectives to increase the validity, trustworthiness, and legitimation of inside-outside legitimation.

Commensurability Legitimation

Finally, another legitimation type that was a challenge for some participants was commensurability legitimation. Some researchers expressed that examples of Gestalt switching and integration would be helpful. Johnson and Christensen (2017) revised and renamed this legitimation type to *commensurability approximation*. The revised definition is "the degree to which a mixed researcher can make Gestalt switches between the lenses of a qualitative researcher and a quantitative researcher and integrate the two views into an 'integrated' or boarder viewpoint" (p. 307). This revised definition states that in order for this legitimation type to be met a researcher must have a deep understanding for the quantitative component, the qualitative component, and then be able to switch between these two methodologies with thorough understanding (Johnson & Christensen, 2017). The "Gestalt switching" that occurs will allow for the mixed or integrated perspective that will help researchers understand the phenomenon (Johnson & Christensen, 2017).

Johnson and Christensen (2017) suggested a researcher engage in cognitive and emotional processes of Gestalt switching, role reversal, and empathy (p. 307). However, if a researcher's skills are predominantly stronger in one methodology over the other (e.g., quantitative vs. qualitative), then commensurability approximation may be achieved by having a research team comprised of one leading quantitative, qualitative, and mixed method researcher and integrating each other's ideas and perspectives to formulate high quality meta-inferences that are grounded in the mixed worldview (Johnson & Christensen, 2017, p. 307).

Data Discordance Legitimation

Many participants discussed approaches they implemented when they found data discordance in their study. Two approaches on data discordance emerged through the semi-structured interviews: (a) data was discordant because there was a threat to validity at a specific phase in the study and (b) data was discordant because something emerged from the results that was not originally planned for or thought of, as part of the study. Data discordance or divergence can be described as "conflicting evidence between the qualitative findings and the quantitative results" (Pluye, Grad, Levine, & Nicolau, 2009; Patton, 2002). When this happens, some researchers may overlook or completely dismiss their findings (Patton, 2002), however, reasons for data discordance should be analyzed more thoroughly to gain a better understanding of such. Due to the role of data discordance in MMR and uncovering reasons why it exists, data discordance legitimation should be added to the typology.

Supported from the findings of this study and the literature, I propose data discordance legitimation be divided into three distinct categories: (a) *reconciliation*, (b) *emergence*, and (c) *additional validation (*Pluye et al., 2009). Each category will provide reasons on why data discordance occurred and how to address it. Reconciliation refers to the extent to which a researcher is able to interpret the discordance in a way that makes sense (Pluye et al., 2009;

Trend, 1978). Reconciliation does not lead the researcher to revisit the study design or make changes to it. For example, Padget (2004) conducted the Harlem Mammogram Study to examine the reasons why women (African American women living in New York City) prolong their mammogram when they receive abnormal results (Pluye et al., 2009). The qualitative findings demonstrated that women were usually fearful and frustrated when presented with painful tests and worried while waiting for their results. The quantitative results showed that women who had a history of abnormal mammograms were 2.5 times (29% of the sample) more likely to prolong follow up testing (Padget, 2004, p. 277; Pluye et al., 2009). Padget (2004) found that the reason women were delaying follow up testing (quantitative) was a result of fears and frustrations (qualitative) thus, no further data collection, analyses, or new questions emerged from this (Padget, 2004, p. 277; Pluye et al., 2009).

Emergence refers to new themes, frameworks, and/or perspectives that surface from conflicting quantitative results and qualitative findings (Pluye et al., 2009). Pluye and colleagues (2009) refer to this as initiation, but because the essence of this type of data discordance relates to the emergence of data, renaming it to reflect this is suggested. Differing from reconciliation, emergence can lead the researcher to revisit their study design and result in making changes to it. For example, Moffatt, White, Mackintosh, and Howel (2006) conducted a study to examine whether an intervention centered on welfare rights advice would produce an effect on health and social outcomes among individuals aged 60 and over. The quantitative results demonstrated minor significant differences to establish practical or clinical significance, in which case, the intervention could be interpreted as not having an effect on the outcome measures (Moffatt et al., 2006, p. 1). However, qualitative findings showed that the intervention had a positive effect on individuals (Moffatt et al., 2006). Thus, this prompted researchers to further explore reasons for

this discrepancy by proceeding with additional data collection and analyses (Moffatt et al., 2006).

Additional validation refers to contradicting quantitative results and qualitative findings because of a lack of validity/trustworthiness. The lack of validity/trustworthiness can stem from multiple issues such as problematic designs, inadequate/poor measure(s), diverting from a standardized protocol, and deviating from structured qualitative interviews. This is a revised definition of exclusion divergence as their definition specifically refers to cross-validation, inadequacies of mixed methods design, and a lack of validity in the quantitative or qualitative strands through data collection or results (Pluye et al., 2009, p. 63). For example, in Carolina's study, through the process of mixing she discovered data discordance in her study. The reason for the data discordance was because of issues with the wording of some items from the questionnaire (Bustamante, 2017). This legitimation type will further reinforce a researcher to investigate validity at all levels of their study—at the macrolevel (e.g., quantitative, qualitative, and mixed methods) and the microlevel (e.g., design elements, measures, data collection, and data analysis). If additional validation legitimation is addressed, multiple validities legitimation may also be addressed concurrently, but not vice versa. In other words, if a researcher addresses additional validation legitimation, then multiple validities legitimation will also apply due to the scope of addressing all validity elements of the mixed methods study. However, a researcher can address multiple validities legitimation and not address additional validation legitimation if they did not find data discordance that related to a lack of validity/quality of either strand.

CHAPTER V: CONCLUSION

Summary of Major Findings

The purpose of this intrinsic, exploratory case study was to explore researchers' perspectives on quality in MMR specifically focusing on the legitimation typology. To do this, I interviewed Burke, one of the developers of the legitimation typology, Carolina, Joseph, Judith, Marcus, and David, researchers that have implemented the legitimation typology in a mixed methods study, and Nataliya, a researcher who has written about and shares knowledge on MMR. Eight themes emerged from this study: (1) role of validity in MMR, (2) importance of integration, (3) value added to discordant data, (4) versatility of the legitimation typology, (5) role of colleagues/mentors in MMR, (6) researchers' application/interpretations of legitimation types, (7) clarifications on legitimation typology, and (8) researcher recommendations. Many participants agreed that quality should be assessed during the planning stage of a study. This includes assessing the quality of the quantitative, qualitative, and mixed methods study as a whole.

Several participants discussed the importance of developing a strong foundation of validity/trustworthiness for the quantitative and qualitative strands in order to generate high quality meta-inferences for the mixed methods study. Most importantly, researchers should ensure that they have adequately addressed validity specific to their design. The importance of integration was an emergent theme, particularly among participants who have implemented the legitimation typology in their studies. Participants noted that the integration was the essence of mixed methods and it is through integrating data (i.e., mixing), they were able to develop a better understanding of their data. From this, four purposes of mixing emerged: triangulation, crystallization, emergence, and elaboration. The value added to discordant data was another emergent theme among participants. The challenge many researchers expressed was how to

make sense of the data when the data is discordant and uncover why the data was discordant. For many participants (if not all), discordant data ultimately allowed them to further assess the quality of their study to determine whether the data was discordant as a result of a validity/quality threat or whether it was discordant because there was a new concept or understanding that emerged from the data.

When specifically discussing the legitimation typology, many participants agreed on the value of the framework that allowed them to assess the quality of the overall mixed methods design. Many participants valued the *"menu of options"* in the legitimation typology and understood that the purpose was not to address all legitimation types, but instead to address the types that were most pertinent to their mixed methods study. The role of colleagues/mentors was critical to participant's graduate school training in MMR and leading to further expanding their knowledge of the field, whereas other participants, such as *Burke*, mentioned the influence of colleagues' when developing certain legitimation types.

To explore and understand researchers' interpretations and applications of the legitimation typologies each participant provided explanations and descriptions of their interpretations and use of specific legitimation types pertinent to their mixed methods study. From this study, it was evident that researchers have unique interpretations on some legitimation types that influenced whether they addressed them in their study or not. Many researchers expressed uncertainty on whether their interpretations were consistent with the typology. Based on these findings, some legitimation types that could benefit from changes include conversion legitimation, inside-outside legitimation, and commensurability legitimation. Some researchers stated that examples on how these legitimation types have been addressed in previous MMR studies would be beneficial. During the interview with *Burke*, he provided descriptions and examples on all legitimation types. He also discussed the current and revised 2017 legitimation

typology and recommends researchers to use the revised version when moving forward. While *Burke's* 2017 revisions are helpful for many researchers, further refining the typology and providing additional examples of each legitimation type would also be beneficial to many researchers.

Finally, all participants provided multiple recommendations, specifically focusing on study design elements, applying the legitimation typology, and overall recommendations to the research community (e.g., researchers, professors, theses/dissertations committees, grant panels, and students). For the design recommendation, researchers discussed the role of the purpose statement and research questions in guiding the design of a study. When discussing recommendations for applying the legitimation typology, one participant encouraged researchers to read through each legitimation type and contextualize a study as if certain legitimation types were addressed. This, in turn, can help researchers gain an in-depth understanding on the steps needed to address each specific legitimation type. Finally, recommendations specific to the overall research community were addressed such as motivating students to use mixed methods terminology in their theses/dissertations committees and grant applications. Collectively, these themes helped discover what researchers value most about mixed methods as a whole, narrowing it specifically to quality, and the challenges/clarifications that should be addressed in upcoming iterations of the legitimation typology.

Limitations

At the inception of this study in Fall 2017, most of the literature focused on the 2006 legitimation typology. Consequently, I solely focused on recruiting participants that had used the 2006 legitimation typology. Through my initial interview with Burke Johnson I learned about a revised 2017 legitimation typology. As a result, I decided to conduct a literature search, similar to the searches I conducted at the initial stage of this study, to explore whether researchers had

begun using the revised 2017 legitimation typology. This literature search demonstrated few researchers, if any, were implementing the revised 2017 typology at the time. As a result, I decided to continue the study using the 2006 legitimation typology with the aim of triangulating the findings I collected on the 2006 legitimation typology, while also considering the changes incorporated to the revised 2017 legitimation typology.

Another limitation to this study was that I was only able to interview one of the co-developers of the 2006 legitimation typology, Burke Johnson. Nonetheless, through interviews with Burke Johnson, not only was I able to gain a thorough understanding of the 2006 legitimation typology, but since he developed the revised 2017 legitimation typology, he explained his reasoning behind the changes to the 2006 typology. All interviews and member-checking interviews were audio recorded, however, Burke's member-checking interview did not record. As a result, when referring back to the member-checking interview, I relied on notes taken during the interview.

It should also be noted that through a participant interview I learned that one researcher, Marcus, did not fully meet inclusion criteria for the study as he had not cited or used the legitimation typology in the empirical article we were discussing. Nevertheless, I decided to include him in the sample because he was familiar with the legitimation typology and provided insight on reliability and validity in MMR, particularly reliability in qualitative research.

Finally, at the time data collection occurred I was only able to find five researchers who had used the legitimation typology in their research and one that was familiar with it but had not used it in their personal research at the time. As a result, not all legitimation types have been addressed by each participant. This makes it more difficult to triangulate findings based on researcher's interpretations of legitimation types if only one researcher addressed a specific

legitimation type. Hence, in the future, studies should continue building on these results by using a larger sample size, including multiple interpretations of each legitimation type.

Future Directions

Since this study particularly focused on improving the assessment of quality in MMR using the legitimation typology, future studies should explore how researchers are assessing reliability in qualitative research studies, if at all. There has been much debate on whether reliability in qualitative research can be established—Lincoln and Guba (1985) stated, "Since there can be no validity without reliability, a demonstration of the former [validity] is sufficient to establish the latter [reliability;]." (p. 316). Seale (1999) on the other hand, stated that the "trustworthiness of a research report lies at the heart of issues conventionally discussed as validity and reliability" (p. 266). Therefore, if a measure of reliability in qualitative research is dependent upon the degree of trustworthiness, future studies should explore if and how reliability can be assessed in qualitative research. Doing so will contribute to the limited extant literature and further increase the rigor of MMR.

Implications

Based on the findings of this study, I have suggested several recommendations for a revised 2019 legitimation typology based on the findings from this study. One of the goals of this study is for researchers to better understand the use of the legitimation typology and increase its applicability by clarifying, expanding on, and providing examples on these legitimation types. Evidenced from the data collection phase, few researchers are using the legitimation typology to assess the quality of the overall mixed methods design. Consequently, steps must be taken to encourage researchers to assess the quality of a mixed methods design and this study aims to be one of the first to provide an in-depth understanding of researchers' use on the legitimation typology and propose changes to the current 2017 legitimation typology. Ultimately, this study

aims to increase the applicability of the legitimation typology to assess quality of mixed methods studies and increase the rigor of quality in MMR.

Mixed methods research has been classified as "a new field where the terrain is not yet fully formed" (Greene, 2010, p. 2). Many authors would agree with this statement as there continues to be ongoing discussions of what MMR entails, specifically focusing on assessing quality in mixed methods. Since the development of MMR as a field in the late 1980's, MMR has continued to expand in the fields of social and health sciences, as well as education (Ivankova & Kawamura, 2010). With its widespread use, topics such as quality in MMR will further promote ongoing discussions and increase its acceptance. Currently, there are some frameworks that can be used to assess quality in MMR (Tashakkori & Teddlie, 2003; Tashakkori & Teddlie, 2008; Teddlie & Tashakkori, 2009; Onwuegbuzie & Johnson, 2006; Leech, Dellinger, Brannagan, & Tanaka, 2010; O'Cathain, 2010; Curry & Nunez-Smith, 2015; Johnson & Christensen, 2017), however, based on this study it is apparent that few researchers are implementing them, more specifically, the legitimation typology. Consequently, this study aims to encourage the use of the revised 2017 legitimation typology and proposed changes to the current typology to ultimately help researchers achieve higher standards of validity and improve the quality of mixed methods as a whole.

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APPENDIX A: INFORMED CONSENT

Study Title: Validity in Mixed Methods Research: Examining the Implementation of the Legitimation Model

Authorized Study Personnel:
Principal Investigator: Analay Perez, aperez@huskers.unl.edu
Secondary investigator: Wayne Babchuk, PhD, wbabchuk1@unl.edu

Dear Participant,

You are invited to take part in this research study. The information in this form is meant to help you decide whether or not to participate. If you have any questions, please ask. You are being asked to participate in this study because you have either (a) created the model, (b) have written about the model, or (c) have conducted a mixed methods research study implementing the legitimation model.

Purpose: The purpose of this study is to explore how researchers are using the legitimation model in their research studies and provide clarifications on the use of the legitimation model in mixed methods research.

Procedures: You will take part in an individual, semi-structured interview that will take between 30-60 minutes to complete. You may be contacted to participate in a one-time follow-up for member checking. You must have access to a computer with Internet and Skype. A UNL graduate student will conduct these interviews through Skype. It is important that you are in a room/area that is quiet to reduce any outside noise. Interviews will be audio recorded.

Possible risks: There are no known risks to you from being in this research study.

Benefits: You are not expected to get any benefit from being in this study. However, by taking part in this study, you are allowing us to help researchers achieve higher standards of validity and improve the quality of mixed methods as a whole.

Cost: There is no cost to you to be in this research study.

Compensation: There will be no compensation provided for your participation in this study.

Concerns: Your welfare is the major concern of every member of the research team. If you have a problem as a direct result of being in this study, you should immediately contact one of the people listed at the beginning of this consent form.

Confidentiality: Privacy and confidentiality will not be guaranteed, as your names will be

presented in publication. The data (including informed consent and audio files) will be stored electronically through a secure server and will only be seen by the research team for the duration

of the study (approximately 1 year). The only persons who will have access to your research records are the study personnel, the Institutional Review Board (IRB), and any other person, agency, or sponsor as required by law. The information from this study may be published in scientific journals or presented at scientific meetings. First and last names will be used to understand how researchers are addressing validity in mixed methods research using the legitimation model.

Participant Rights: You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study. For study related questions, please contact the investigator(s) listed at the beginning of this form. For questions concerning your rights or complaints about the research contact the Institutional Review Board (IRB):

Phone: 1(402)472-6965
Email: irb@unl.edu

You can decide not to be in this research study, or you can stop being in this research study ("withdraw') at any time before, during, or after the research begins for any reason. Deciding not to be in this research study or deciding to withdraw will not affect your relationship with the investigator or with the University of Nebraska-Lincoln .You will not lose any benefits to which you are entitled.

If you have any questions or concerns, please do not hesitate to contact the primary investigator of the study, aperez@huskers.unl.edu.

Documentation of Informed Consent: You are voluntarily making a decision whether or not to be in this research study. Signing this form means that (1) you have read and understood this consent form, (2) you have had the consent form explained to you, (3) you have had your questions answered and (4) you have decided to be in the research study. If you would like, I can provide you with a copy of this consent form.

_____
Participant Signature

Analay Perez
University of Nebraska-Lincoln Graduate Student
Quantitative, Qualitative, and Psychometric Methods
Educational Psychology Department

APPENDEIX B: EMAIL INVITATION

Hello _____,

My name is Analay Perez and I am a master's student in the Quantitative, Qualitative, and Psychometric Methods program in the Educational Psychology department at the University of Nebraska-Lincoln (UNL). I am currently working on my master's thesis examining validity in mixed methods research, specifically focusing on the legitimation model and am working with Dr. Wayne Babchuk and Dr. Michelle Howell Smith. I am contacting you because (you have created the model, **OR** you have conducted a mixed methods research study implementing the legitimation model, **OR** you have either written or share knowledge about the model). I am conducting a study to explore how researchers are using the legitimation model in their research studies and provide clarifications on the use of the legitimation model in mixed methods research. By taking part in this study, you are allowing us to help researchers achieve higher standards of validity and improve the quality of mixed methods as a whole. If you would like to participate in this study, we would engage in a Skype interview that will take about 30 minutes. You may be contacted to participate in a one-time follow-up for member checking. I would greatly appreciate your time and insight on this topic!

If this is something you would be interested in, please reply to this email and I will send you the informed consent that will include more information.

Again, I appreciate your consideration and look forward to hearing from you!

Best,
Analay Perez
University of Nebraska-Lincoln Graduate Student
Quantitative, Qualitative, and Psychometric Methods
Educational Psychology Department

APPENDIX C: FOLLOW-UP EMAIL

Hello _____,

My name is Analay Perez, a student from UNL's Quantitative, Qualitative, and Psychometric Methods in the Educational Psychology Department. I am contacting you because you expressed interest in participating in the study titled "Validity in Mixed Methods Research: Examining the Implementation of the Legitimation Model." Below is a link that will direct you to the informed consent. Here, you will be provided with more detailed information on the study and you will be asked if you would like to participate in the study.

LINK:

If you should have any question, please feel free to contact me.

I thank you for your time and insight, and look forward to hearing from you soon!

Best,
Analay Perez
University of Nebraska-Lincoln Graduate Student
Quantitative, Qualitative, and Psychometric Methods
Educational Psychology Department

APPENDIX D: INTERVIEW REMINDER EMAIL

Hello _____,

Thank you for taking part in this study. The purpose of this email is to remind about our interview scheduled for **day of week, month day, year** at **time (Central)**. The interview should take about 60-90 minutes to complete and it is important that you have Internet access through a computer, are able to access Skype, and that you are in a quiet space to reduce the amount of outside noise on the recording.

If you should have any questions, or need any assistance, please feel free to send me an email.

Looking forward to our meeting!

Best,
Analay Perez
University of Nebraska-Lincoln Graduate Student
Quantitative, Qualitative, and Psychometric Methods
Educational Psychology Department

APPENDIX E: AUTHORS OF LEGITIMATION MODEL INTERVIEW PROTOCOL

Interviewer: Before we begin, I want to thank you for taking the time to help me learn about your research. This interview will take about 60 minutes. You will be recorded on this recorder (*shows recorder*) so we are able to transcribe this information later on. You may be contacted to participate in a one-time follow-up for member checking. I will notify you via email to schedule a date/time that is most convenient for you. If, at any point, something arises, please feel free to let me know. Do you have any questions?

1) What triggered your decision in creating a model that assesses validity in mixed methods research?

2) Broadly speaking, the purpose of the legitimation model is to validate each strand (e.g., the quantitative and qualitative) to create high quality meta-inferences. Can you go more in-depth about creating high quality meta-inferences and if there exist other alternatives to accomplish this? For example, is addressing only some legitimation strategies, but not all that address your study considered creating high quality meta-inferences?

3) It seems difficult to talk about legitimation without discussing the problem of integration. How can we reinforce the use of validity models in mixed methods research (i.e., the legitimation model), without first addressing problems of integration?

4) Sequential legitimation refers to the extent to which researchers have minimized potential problems in a sequential design that could arise from reversing the sequence of the quantitative and qualitative strands to generate meta-inferences. Is this strategy only specific to a sequential design? Or are you referring to the priming effect of collecting one before the other?

5) Paradigmatic mixing legitimation refers to the degree to which a researcher examines how his/her integrated epistemological, ontological, axiological, methodological, and rhetorical beliefs are expressed in the quantitative and qualitative approaches. How are some ways a researcher could address paradigmatic mixing legitimation in their study? Especially considering how few researchers address their worldviews in a mixed methods study.

6) Commensurability legitimation refers to the extent to which the researcher generates meta-inferences based on a third viewpoint that encompasses both quantitative and qualitative perspectives. In Onwuegbuzie & Johnson (2006) it states that sometimes it is not possible to create a third viewpoint. Therefore, how would someone reading about a study be able to validate whether this legitimation strategy has been met?

7) Can you provide further information on ways a researcher can address commensurability legitimation?

8) It has been around 12 years since you created the legitimation model. How has your views of the legitimation model changed and is there anything you would like to change about the current model?

9) Is there anything else you would like to add?

APPENDIX F: MIXED METHODS RESEARCHERS IMPLEMENTING LEGIITMATION MODEL INTERVIEW PROTOCOL

Interviewer: Before we begin, I want to thank you for taking the time to help me learn about your research. This interview will take about 30 minutes. You will be recorded on this recorder (*shows recorder*) so we are able to transcribe this information later on. You may be contacted to participate in a one-time follow-up for member checking. I will notify you via email to schedule a date/time that is most convenient for you. If, at any point, something arises, please feel free to let me know. Do you have any questions?

1) What made you decide to use to legitimation model over other methods to assess validity in your mixed methods study?

2) Were there certain legitimation types that were unclear as you were going through the model and, if so, how did you handle the situation?

3) The legitimation model addresses problems with integration. How was the process of integration for you when trying to develop high quality meta-inferences?

4) In your article titled _____, you addressed _____ legitimation type(s). Explain how you addressed _____ legitimation in your study. (This question is asked within the context of their study. Ask about each legitimation type that was addressed in the study).

5) Which legitimation type(s) (if any) from the ones you used were the easiest to assess in the study? Why?

6) Which legitimation type(s) (if any) from the ones you used were the most difficult to assess in the study? Why?

7) In a future study, what advice would you give researchers using the legitimation model?

8) Is there anything else you would like to add?

APPENDIX G: MIXED METHODS RESEARCHERS WHO HAVE WRITTEN ABOUT LEGITIMATION MODEL INTERVIEW PROTOCOL

Interviewer: Before we begin, I want to thank you for taking the time to help me learn about the methods used when assessing validity in mixed methods research and more specifically, your perspectives on the legitimation model. This interview will take about 30 minutes. You will be recorded on this recorder (*shows recorder*) so we are able to transcribe this information later on. You may be contacted to participate in a one-time follow-up for member checking. I will notify you via email to schedule a date/time that is most convenient for you. If, at any point, something arises, please feel free to let me know. Do you have any questions?

1) Discuss the importance of validity in mixed methods research.

2) What do you think are some of the best ways to approach validity in mixed methods research?

3) What are some of the ways researchers are addressing validity in mixed methods research?

4) How are researchers addressing validity of the integration in a mixed methods research study?

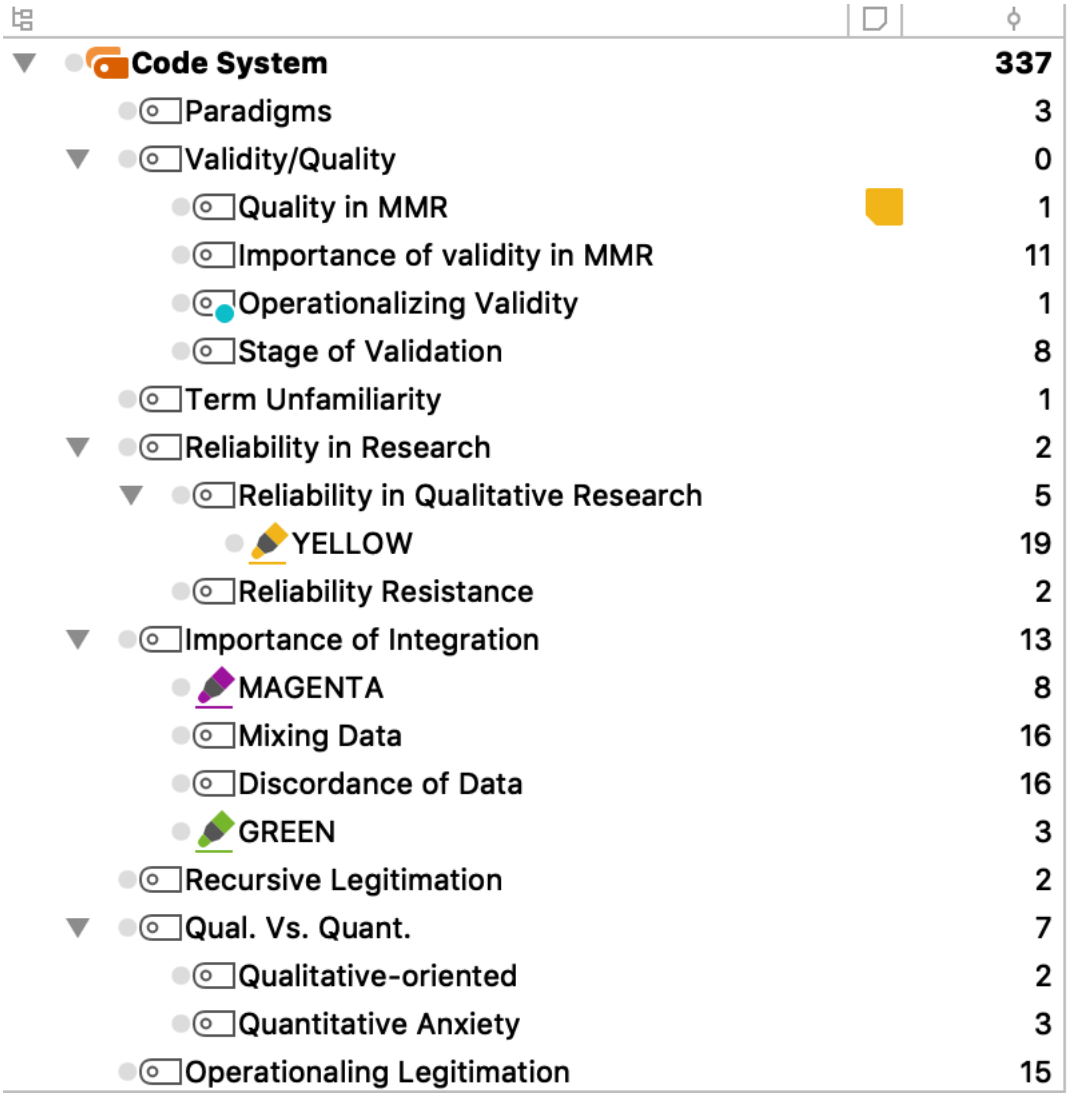
5) Explain the role of the legitimation model in assessing validity in mixed methods research.

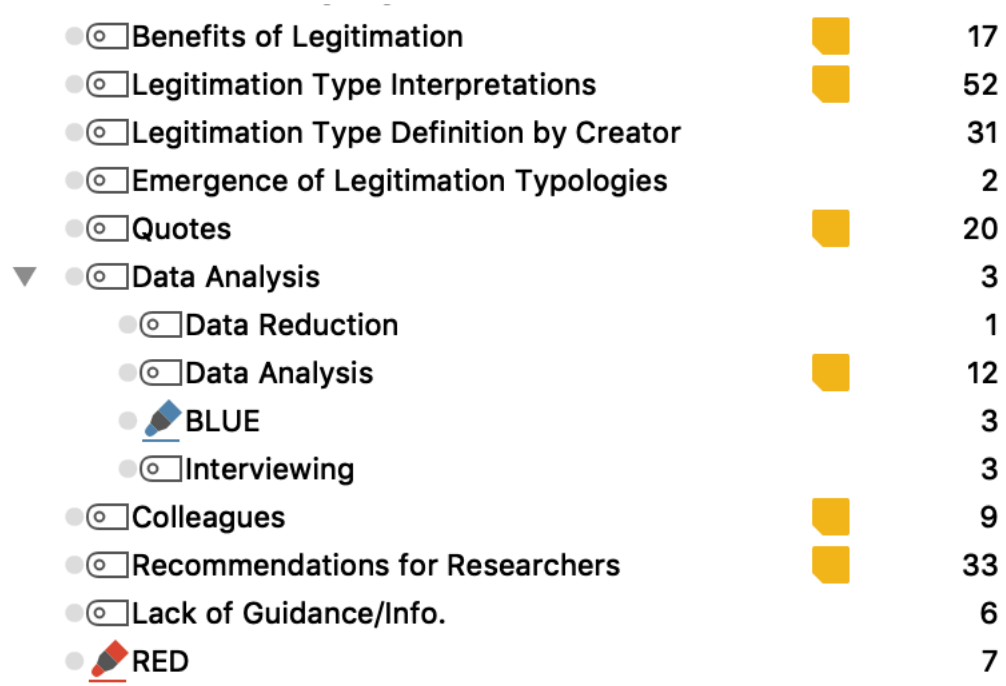
6) What are some strengths and weaknesses of the legitimation model?

7) What do you think the future of validity in mixed methods research should look like?

8) Is there anything else you would like to add?

APPENDIX H: CODING SCHEME USING MAXQDA




Benefits of Legitimation 17
Legitimation Type Interpretations 52
Legitimation Type Definition by Creator 31
Emergence of Legitimation Typologies 2
Quotes 20
Data Analysis 3
Data Reduction 1
Data Analysis 12
BLUE 3
Interviewing 3
Colleagues 9
Recommendations for Researchers 33
Lack of Guidance/Info. 6
RED 7

APPENDIX I: SAMPLE DISTRIBUTION BASED ON DOCUMENT ANALYSIS