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LEARNING THE MEANING OF THE SACRAMENTS OF THE CATHOLIC CHURCH THROUGH METAPHORICAL THINKING

A DISSERTATION

Submitted to the Faculty of

Montclair State University in partial fulfillment

of the requirements

for the degree of Doctor of Education

by

CHRISTOPHER WILLIAM PARKER

Montclair State University

Montclair, New Jersey

2015

Dissertation Chair: Dr. Mark Weinstein

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MONTCLAIR STATE UNIVERSITY

THE GRADUATE SCHOOL

DISSERTATION APPROVAL

We hereby approve the Dissertation

LEARNING THE MEANING OF THE SACRAMENTS

OF THE CATHOLIC CHURCH

THROUGH METAPHORICAL THINKING

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ABSTRACT

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Title of Dissertation: Learning the Meaning of the Sacraments of the Catholic Church through Metaphorical Thinking

Directed by: Dr. Mark Weinstein

ABSTRACT

This study examines a teaching method to help fifth-grade students understand the meaning of the symbols of the sacraments of the Catholic Church. The method implements physical objects in the classroom followed by the development of metaphors to ascertain the meaning of those objects. First, possible metaphors were explored dialogically in class. Then, through individual metaphorical thinking, students create their personal metaphoric statements for each sacrament. The study shows that students given the treatment, on average, scored higher on assessment questions related to the meaning of the sacraments than the control group. Fifth-grade students in the Roman Catholic Archdiocese of Newark Confraternity of Christian Doctrine (CCD) program historically score below a desired level on questions about the personal meaning of the sacraments in ways deemed appropriate by the church according to The Assessment of Catechesis/Religious Education (ACRE). The sacraments are metaphoric. Therefore, it makes sense that these fifth-graders may improve their scores with a method that employs metaphorical thinking. The literature on pedagogies using metaphor tends to focus on subjects such as science and math. The literature, however, does not reach out

to areas of study such as CCD religious education. Furthermore, the methods suggested in the literature do not incorporate group dialogue, semiotic objects, and the writing of spontaneous metaphors in one treatment. Since the sacraments are metaphoric, and the symbols are actual objects, it follows that in students' search for meaning they should experience semiotic objects from which to generate metaphor. In the development of metaphor, the literature supports making a connection between one domain of thought to another. This cross-domain mapping involves cognitively connecting one concept, like the emotional effect of a sacrament, to the object that, in this case, is the symbol of a sacrament. The foundation of my method follows Abrahamson's implementation of semiotic objects and spontaneous metaphors with students. Abrahamson demonstrates that his treatment helps students learn the meaning of complex ideas. This dissertation includes a description of the treatment, and the quantitative instruments used.

LEARNING THE MEANING OF THE SACRAMENTS

OF THE CATHOLIC CHURCH

THROUGH METAPHORICAL THINKING

By Christopher William Parker

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General Introduction

The road to the completion of this dissertation has been a long one paved with many obstacles, and lined with so many supporters along the way who have made the journey possible. I cannot name every single person, or this acknowledgment might be longer than my dissertation itself. Suffice it to say, that without the academic, moral, emotional, psychological support of many people, this dissertation would not have been possible. Thank you to all who have uttered an encouraging word, offered a prayer, lent a hand. I will always be grateful for each one of you.

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Dedication

This dissertation is dedicated to survivors of traumatic brain injury (TBI), particularly the many veterans who suffer from TBI, and the families, friends, and professionals who help survivors reach beyond their perceived limits; to those who enable and empower TBI survivors *not* to be defined by disability. The hope of this dissertation is that it will inspire and open up the avenue of metaphor for TBI survivors challenged with aphasia so they can find comprehensible ways to talk about things for which they may have trouble finding words. This dissertation is also dedicated to exploring broader ways of thinking and communicating.

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Chapter 1: Introduction

Meaning in most faith systems is connoted in symbol, myth and metaphor (Avis, 1999). Likewise, what the seven sacraments of the Catholic Church mean is metaphorically portrayed through rite, which includes physical objects and experiences (Classuck, 2006). A sacrament is a symbolic rite, and metaphor is part of the language and meaning subsumed within the sacramental symbolism (Barth, 1977). Therefore, I reasoned that it should be possible to interpret meaning from the symbols by thinking metaphorically (Avis, 1999; Fiumara, 1995) . Fifth-grade students are usually of an age of ten years which is an age of metaphoric competency (Knowles, 2006). However, fifth-grade students in the Roman Catholic Archdiocese of Newark Confraternity of Christian Doctrine (CCD) program historically score below a desired level on The Assessment of Catechesis/Religious Education (ACRE) on questions about the personal meaning of the sacraments in ways deemed appropriate by the church. To say it another way, "ways deemed appropriate by the church" is the meaning of the sacraments as articulated in the Catechism and thus the CCD textbooks, as all CCD textbooks stay within the *Protocol for assessing the conformity of catechetical materials with the Catechism of the Catholic Church* (Classuck, 2006; Conference, 1997; Vatican, 1993). The reason fifth-grade students were cited was that the ACRE is primarily administered to fifth-graders and this assessment indicated a lack in understanding (Learning, 2013). The main problem this study addresses, then, is a possible deficiency in the pedagogy of the Catechism on the sacraments in the Archdioceses of Newark's CCD program in that students do not seem to metaphorically draw the connection between sacramental symbols and meaning. I

developed a method to address this problem in the Catholic Archdiocese of Newark of fifth-grade students understanding the meaning of the sacraments in ways considered appropriate by the church. Given the archdiocesan need to improve learning in this arena, I sought to answer three primary research questions which were; 1) does a treatment of metaphorical thinking help students to understand the sacraments? 2) Does a metaphorical thinking treatment on the sacraments help them to relate personally to that meaning in ways considered appropriate by the Church? 3) Is thinking metaphorically about the meaning of the sacraments related to better understanding of them?

To address these questions, my method employs metaphorical thinking and semiotic objects because recent literature on metaphor in teaching suggests that this helps students understand meaning and new concepts (Abrahamson, Gutierrez, & Baddorf, 2012; Cameron, 2002; Chiu, 2001; Diehl, 2010; Groth, 2005; Jakobson, 2007; Kilhamn, 2008; Willox et al., 2010). I utilized the method of a previous study to create a new method which incorporates semiotic objects, metaphorical thinking, and dialogue (Abrahamson, 2009). In dialogue, students and teachers discuss and mediate fresh understanding by way of problem solving within a relevant context (Brown, 1989; Lave, 1991; Reznitskaya, 2012; Rogoff, 1990). Metaphorical thinking is a way of building a construct of understanding based on that which is already known in the mind of a child (Abrahamson, 2009). Semiotic objects in my study are objects used to think metaphorically about a sacramental symbol, which provides an actual somatic experience with smell, touch, and sight.

In addition to the problem of these fifth-graders understanding the meaning of the sacraments within this community of the Catholic Church, there is also a gap in the literature addressing metaphorical thinking. First, there is a gap in measuring the connection between the level of metaphorical thinking evidenced by a student's writing and their understanding of a concept. Obtaining an answer to one of my questions ("Is thinking metaphorically about the meaning of the sacraments related to better understanding of them?") depends upon a way to measure the "strength" or metaphoricity of a metaphoric statement. Dunn (2011) has addressed the "strength" of a metaphor, or metaphoricity, yet no one has measured the connection between metaphoricity and student knowledge. My study explores the use of metaphor in teaching a topic in religious education and my method combines several teaching tools, which is more than the current literature employs.

There is also a gap in the Philosophy for Children (P4C) literature on metaphor (Fisher, 1997, 2000; Lipman, 1978). Mentioned sparsely in the P4C literature, metaphorical thinking, should be explored further. One reason is that the philosophical literature on metaphor is part of the "metaphoric method" of forming hypotheses (Shibles, 1971). Moreover, root metaphors are the foundation for world hypotheses (Pepper, 1961, 1966, 1973). Learning to use metaphor in philosophical dialogue may be worth further exploration in the P4C curriculum.

Since the meaning of the sacraments is metaphorically presented, I engage students in a method to help them understand the meaning of that metaphorical symbolism. The method involves students experiencing sacramental symbols and writing

metaphor(s) about their sensory and emotional responses to these symbols. Thinking metaphorically may help students understand the metaphorical meanings of the sacraments. I employ writing metaphor in my method because objects, symbols, or experiences, while metaphoric, are not themselves metaphor because they are not figures of speech (Soskice, 1985). Also, symbols themselves, have been shown as ineffective in helping fifth-graders understanding sacramental meaning as shown by the ACRE.

Procedure

The control and treatment samples met once a week in an after school program in a classroom in the St. Cassian grammar school in Montclair, NJ, where most of that parish's CCD program take place. I employed the actual treatments over a seven-week period in the course of a 26-week semester (see Appendix F). The treatment group received four once-a-week workshops on extended-metaphor and symbols, while the control group received training as suggested by the textbook on the same curriculum subject, without my method. Then, both treatment and control groups were administered the ACRE.

To answer Research Question 1, I taught students how to write metaphoric poems. Then I introduced them to one sacrament at a time, followed by the physical experience of one or two sacramental symbols (semiotic objects). We then dialogically discussed the vocabulary of the symbol. We connected that language, metaphorically, to the likely or expected emotional outcomes, or effects, of that sacrament. After four weeks of working with each sacrament and writing metaphoric poetry for each one, the students were then administered the ACRE assessment.

The ACRE 2001 consists of eight faith study areas of knowledge which serve as the appropriate foundation to the level of religious education and grade level of the students (Convey, 2010). Study Area 3 contains 9 items, or questions, with the objective to discover if students know about the Church's liturgical life in terms of liturgical feasts, seasons, symbols, religious practices, and concepts of prayer. Students are required to take the entire ARCE test (Part 1 and Part 2). In my analysis however, I narrowed the applicable questions in that Study Area to only the sacramental questions. Based on item descriptions of those questions in the literature, I then put the sacramental item questions in Study Area 3 into two categories: meaning and knowledge. Meaning questions are those defined as such by the National Catholic Educational Association in the ACRE computer assessment report (Learning, 2013). Questions, which query more factual knowledge about the rite of the sacraments I refer to as knowledge questions.

I employed the Dunn (2011) method of measuring Gradient semantic intuitions of metaphoric expressions to measure the metaphoricity of the extended-metaphor of each student's poetry. I then compared each metaphoricity score to the student's score on the questions related to the meaning of the sacraments in the ACRE.

Data analysis and assessment. After employing my method, I was interested to see if engaging students in my approach had helped them to understand the sacraments, as per Research Question 1. To approach this question, I analyzed the results to five chosen questions in the ACRE (Association, 2001a; Learning, 2013). I determined the mean scores of the treatment sample, and the control sample, to see if there was a statistically significant difference between the two scores.

To address Research Question 2, I analyzed the ACRE scores on items, designated by the Church, to be about personal meaning of the sacraments. I analyzed the scores for the students in the treatment sample. I then compared the treatment scores to the control sample responses to those same questions. Five questions selected for this study related to the sacraments. Three out of the five questions were identified by the ACRE assessment report on St. Cassian School's CCD program in 2013 as meaning questions (Learning, 2013).

To answer Research Question 3, I ranked students, according to their metaphorical thinking, as evidenced by their extended-metaphor poetry. To do this, I employed the Dunn (2011) method of measuring gradient semantic intuitions of metaphoric expressions. I applied the Dunn system to written poetry by each student who completed the assignment. Only data from eleven students was, necessarily analyzed, out of a total of thirty-six who received the treatment.

I implemented the Dunn system to discover if the treatment of teaching students to write metaphor poems through a dialogical approach would lead to the students thinking metaphorically, as measured by the metaphoricity of their poetry writing. I employed the Dunn gradient system to see if this intervening variable equated to a better understanding of the meaning of the sacraments, as evidenced by the items addressing meaning of those sacraments in the ACRE.

An independent-samples t-test compared the number of correct answers to sacrament knowledge plus meaning questions in treatment and control sample students. There was not a significant difference in the means for the treatment sample and the

control sample. As a result, I cannot exactly say that I am sure my treatment helped students to improve their knowledge of the sacraments. There may be a chance that it did however, and the data suggests that other studies with larger samples may provide different results.

However, to address Research Question 3, I conducted a descriptive analysis of the positive linear association between two variables. One variable was a student's level of metaphorical thinking suggested by the metaphoricity scores of writing by each student in the treatment sample. The second variable was a student's ability to correctly answer the three ACRE, meaning questions. I measured metaphorical thinking by the level of metaphoricity evidenced in students' writing using the Dunn formula (2011). A descriptive analysis of the positive linear association between these two variables suggests that the higher the metaphoricity score on their sacrament metaphoric statements, the higher the score in learning the meaning of the sacraments. A scatterplot summarizes the results (Figure 1).

Summary

I developed a method to solve a problem in the Catholic Archdiocese of Newark of fifth-grade students having difficulty understanding the meaning of the sacraments in ways considered appropriate by the church. In the method, I employ metaphorical thinking and semiotic objects to teach about the meaning of the sacraments. The literature suggests that metaphorical thinking helps students understand meaning and new concepts (Abrahamson, 2009). Metaphorical thinking is a way of building a construct of understanding based on that which is already known by a student. My treatment students

scored higher on the questions about the sacraments in the ACRE than the control groups. I also measured metaphorical thinking by the metaphoricity evidenced in student writing (Dunn, 2011). Data suggests that the higher the metaphoricity score, the higher the score in answering questions pertaining to the meaning of the sacraments. Based on these findings, I suggest the Archdiocese first conduct a larger scale study in order to then, determine if the Archdiocese should adjust their curriculum when teaching the sacraments by presenting this method to archdiocesan catechists. There is also a gap in the literature on utilizing metaphor in learning because most studies involve teaching subjects in science and math. Furthermore, these studies utilize a minimum number of learning techniques. Dunn (2011) has addressed the "strength" of a metaphor with metaphoricity. The literature, however, does not explore measuring the connection between metaphoricity and student knowledge. I also suggest that metaphorical thinking may be a useful tool in philosophical dialogue. This may be an area for further studies.

In Chapter 2, Theoretical Framework and Metaphorical Thinking in Teaching, I will present the literature review relevant to my study. I first discuss the literature that supports metaphor as implemented in this study, which includes literature on the sacrament as metaphor and on a discussion of extended-metaphor. I also look at the literature defining metaphor, and I explore what is sometimes confused with metaphor. Then, I move into a discussion of metaphor and thinking. Next, I go on to discussing the literature on philosophy and metaphor. I review literature on the metaphoric domains of thought and metaphorical thinking in philosophical dialogue. This includes Pepper (1961, 1966, and 1973) on Root Metaphor and Shibles (1971) on metaphorical method in

philosophy. Subsequently, I review the empirical studies that employ metaphor in education. This includes the Abrahamson study (2009), which serves as a model for my method. I follow this with a review of the Dunn (2011) literature on measuring metaphoricity.

Chapter 2: Theoretical Framework and Metaphorical Thinking in Teaching

In this chapter, I discuss the bodies of literature that informed my study. I review the literature on the theory of metaphor in general, and on the metaphorical nature of the meaning of the sacraments of the Catholic Church. Moreover, I review the literature on metaphorical thinking and the relationship of metaphorical thinking to philosophical inquiry, and on the use of metaphor in education. Metaphor has been widely explored in the literature as a root to analogical thinking in philosophy and faith. Some of the literature refers to this as metaphorical thinking (Fiumara, 1995; Glicksohn, 1998). There was groundbreaking work on metaphor in the 1980s and 1990s done by the American cognitive linguist George Lakoff (Lakoff, 1994; Lakoff & Johnson, 1980; Lakoff & Nunes, 1997, 2000). Since then, there has been a resurgence of literature defining how metaphor operates as a tool of thought. More recently, there is research on how metaphor can help in the teaching of ideas in science and math. These empirical studies use metaphor as a learning tool in three ways. One way is through metaphor provided by the teacher. The second is through metaphor created by the student. The third uses extended-metaphor provided through texts, visuals, classroom environment, and dialogue. In addition to empirical studies, there has also been at least one piece of literature on how to measure the metaphoricity of a metaphoric phrase (Dunn, 2011). The literature does not, however, address learning a topic and comparing an assessment of that learning to the metaphoricity level of a student metaphoric statement.

Metaphor as being valuable to thinking or as a linguistic trick has been a topic of dispute in the literature since Aristotle (Aristotle, 1924, 2009; Black, 1962; Bosell, 1953;

Gadamer, 1993; Hobbes, 1960; Johnson, 1998; Locke, 1849; Murray, 1937; Ortney, 1979; Quine, 1961; Richards, 1965; Ricoeur, 1978; Searle, 1979). There has also been a great deal of earlier literature arguing for metaphor as an educational tool (Arendt, 1968; Brook, 1972; Bruner, 1996; Carey, 1989; Dewey, 1958, 1980, 2004; Elgin, 1996; Freire, 2001; Gardner, 1988; Greene, 1978, 1988, 2001; Hamrick, 1989; Jacob, 1922; Jakobson, 1985a, 1985b; Langer, 1942, 1953; Lipman, 1978, 1980, 1985, 1986; Nussbaum, 2001; Oliver, 1994; Vygotsky, 1962). I do not discuss this literature here either as the recent thought is on how metaphor is an important learning and thinking tool. But on occasion I make reference to some of these sources when appropriate. As well, the dialogical method employed in my study, is loosely structured on the curriculum of Philosophy for Children (P4C). However, I do not review, in detail, the literature of P4C addressing poetry or metaphor (Fisher, 1997, 2000; Lipman, 1978). The literature on Community of Inquiry (CI) is also outside of the scope of my study (Gregory, 2008; Kennedy, 1994; Lipman, 1991; Lipman, Sharp, & Oscanyan, 1980).

In short, while there has been a recent development in the study of metaphor and metaphorical thinking there is room for further studies that address the use of metaphor in teaching topics other than math or science. There is also a need for studies that examine how somatic experiences, dialogical discussion, and metaphoric writing can be combined to serve new teaching methods. Finally, there is a need for studies that compare the metaphoricity level of student writing to their learning objectives.

The Theory of Metaphor

The metaphor is a figurative or non-literal expression considered to be within the linguistic category of tropes. A trope is a figure of speech that uses words in the non-literal language. The metaphor is one such trope, but there are several other tropes (See Appendix C for more on tropes). For instance, a simile, which adds *like* or *as* to the metaphoric phrase, is also a trope. Words or phrases, in metaphor, may are changed, from everyday use to a new context that then evokes meaning. Take, for example, the metaphoric phrase, "A mighty fortress is our God" (Luther, 1958). There are two domains of thought positioned within this metaphor: "God," which is in an *intangible* domain (Nireburg, 2004), and "mighty fortress" which is in a *physical* domain (Nireburg, 2004).

The term metaphor is, often applied to an object, symbol, or activity that has a metaphoric function. However, while objects, symbols, or activities may be metaphorical, they are not strictly metaphors because they are not figures of speech, which require language. Therefore, for this paper, I define metaphor as a sentence or phrase with metaphoric content. Additionally, various linguistic constructs such as allegory and satire, are often confused with metaphor. Because they are not figures of speech per se, they are not a metaphor. There are also many other figures of speech, or tropes, which are not metaphor.

The trope that is the closest in form to metaphor is simile. (See Appendix C for a discussion of other figures of speech, as well as non-linguistic ideas that as are sometimes confused with metaphor.) Though often confused, the functions of simile and metaphor

are quite different. Whereas metaphor equates one thing with another in some sense ("A mighty fortress is our God,") simile draws comparisons between two things ("Our God is like a mighty fortress"). For this reason, in the literature metaphor is often seen as stronger than simile (Aristotle, 1924; Avis, 1999; Bain, 1888; Black, 1955, 1970, 1979; Coleridge, 2003; Davidson, 1979; Murray, 1931; Ricoeur, 1978; Searle, 1979; Soskice, 1985; Swinburne, 1992). Similes do however involve metaphorical thinking (Black, 1970; Cameron, 2002; Chiu, 2001; English, 1997). In fact, a students' use of simile can be measured for metaphoricity (Dunn, 2011). Furthermore, because my students often produced similes as part of the treatment workshops, I included my students' use of simile in the data for this study.

It is important for this study to understand the parts of a metaphor. Furthermore, it is important to understand how those parts function. Metaphors are tools for mapping between two different domains, called Tenor and Vehicle (Friedman, 1993). Sometimes in the literature the two parts of the metaphor, Tenor and Vehicle go by different names. (See also Appendix C, Dichotomies of Metaphor.) However, for this study I will use Tenor and Vehicle. To define, the Tenor, like a voice, is what the poet is speaking of. On the other hand, the Vehicle is how the poet transports further meaning into the metaphor. To illustrate this point here is an example: "My twenty-nine year marriage is a rose with thorns" (Parker, 2014a). In this metaphorical statement, the Tenor is the phrase, *my twenty-nine year marriage*, and the Vehicle is the phrase, *a rose with thorns*.

The literature also gives us another way to look at the Tenor and Vehicle: through the concept of domains. The Nireburg/Raskin (2004) system of metaphorical domains

includes *mental, social, intangible,* and *physical* domains. In the example given above, there happen to be two domains. The Tenor, or marriage, is a social construct, so it is in a *social* domain. The Vehicle, the rose, is an object, so the domain of the Vehicle is *physical*. There is a definite separation or distance between these two domains: *social* and *physical*. Though simple, this single-metaphor tells us a lot about a particular marriage and, by implication, about marriage in general. In this case, the metaphor sets up what, is called a cross-domain separation between Tenor and Vehicle.

The separations between domains used in Tenor and Vehicle in metaphors can also be small separations or large. When Tenor and Vehicle are in the same domain, a short bridge is required to cross between the two. When Tenor and Vehicle are in two different domains of thought, this requires a longer conceptual bridge to traverse between the two, otherwise known as cross-domain mapping (Gentner, 1983). In the case of the "twenty-nine year marriage is a rose with thorns" metaphor, the poet is the cartographer. The poet has mapped the ideas he wants to convey. To accomplish this requires metaphorical thinking. And now to cross the bridge reading it, you are doing metaphorical thinking as well (Dunn, 2011; Gentner, 2008).

In essence, cross-domain mapping, or transference, between Tenor and Vehicle forms a concept of an idea. Ricoeur (1979) adds to this point that a metaphorical transference of meaning may be what Aristotle dubbed *epiphora*. Epiphora is a reduction of "the logical distance" between two things (Ricoeur, 1979, p 145). That means we move logically from understanding two things as being unrelated—distant from each other in meaning—to understanding them as being in kinship, their meanings inter-

related (Aristotle, 1924; Ricoeur, 1979). Cross-domain mapping involves crossing a distant bridge between Tenor and Vehicle in a metaphor or moving the items in each domain from a distance to closeness in meaning.

Finally, an *extended-metaphor* is the extension of one metaphorical comparison carried thematically through an entire poem, allegory, or educational experience (Becker, 2002; Carter & Pitcher, 2010; Diehl, 2010; Gentner, 2002). In one example of extended-metaphor as an educational experience, the process of teaching a topic in mathematics was, presented metaphorically, by conceptually forming table designs out of ceramic tile formats. (See example in Appendix A.) Moreover, a math lesson employed illustrations, narratives and methods of table design as the extended-metaphor (Carter & Pitcher, 2010).

Sacrament as metaphor. The sacraments of the Roman Catholic Church involve metaphoric objects, symbols, and activities. A sacrament is a Christian rite of sensorial symbolic stimuli mediating understanding about some aspect of religious meaning. There are seven sacraments and a few metaphorical symbols for each sacrament. Three main categories divide the seven sacraments: sacraments of initiation, healing, and service. Sacraments of initiation include Baptism, Eucharist, and Confirmation. Sacraments of healing include Reconciliation and Anointing of the Sick. Sacraments of service include Holy Orders and Marriage (Conference, 1994).

In most faith systems, meaning is connoted in symbol, myth and metaphor (Avis, 1999). Likewise, the meanings of the Catholic sacraments are metaphorically conveyed, through rite, which includes physical objects and ritualistic experiences.

Therefore, the meaning of these sacraments has, traditionally, been revealed metaphorically by their very nature of being presented as physical objects and ceremonies. It is important here to point out that the sacraments are not one single metaphor each but are, in fact, extended-metaphors (Carter & Pitcher, 2010). In my study, the method includes the following basic steps resulting in extended-metaphor. First, there was a discussion on the sacraments. Then the student's physically experienced the symbols and then metaphorically wrote about the meaning of the sacrament, creating extended-metaphor statements. In essence, we created extended-metaphors having the students elaborate on a sacramental symbol that already generates metaphor for which we continued to approach understanding of meaning through extended-metaphor poetry. The Sacrament of Baptism, for example, has the symbol of water and as a Vehicle for the forgiveness of original sin and entering into a new faith community. Through words spoken in the rite of Baptism, in the presence of water at the baptismal font and through the baptized going through a process of having water poured over her head, the metaphor is then extended. Biblical references to baptism also suggest water in a river. My method employs the extension of the water metaphor as cloud formations.

The metaphorical symbols and rites of the sacraments employ physical objects to serve as representations of concepts and doctrines of the Catholic faith. Avis (1999) suggests that figures of speech such as metaphor bring us into contact with objects or what William Carlos Williams referred to as "the thing" in order to reach for meaning in something else (Guimond, 1969). In the case of the students' curriculum in my study,

that "something else" would be concepts and doctrines of the Catholic faith. The thing, therefore, would be the symbolic object used within the extended-metaphoric process of a sacrament. I reasoned that since a sacrament is a symbolic rite, and metaphor is part of the language and meaning that is subsumed within the sacramental symbolism (Barth, 1977), then it should be possible for students to interpret meaning from those symbols (Avis, 1999) as presented in their texts and classroom experiences. Since the meaning of the sacraments is metaphorical, I engaged students in a method to help them think metaphorically about the sacraments.

Metaphorical Thinking. When it comes to concepts and experiences of religious faith, metaphorical thinking and expression are particularly important to student learning. The metaphor is important to our experiences of faith because, within our experiences, meaning can be tacit, rather than explicit[1]. Tacit knowledge is not detailed; explicit knowledge is detailed. Still, that which is tacit requires interpretation if it is to become cognitively meaningful. Metaphorical thinking allows us to interpret tacit, emotional, and somatic experiences, in a way that is sensed and communicated, examined and

[1] By examining too closely details of a situation or object, Polanyi (1983) says its "meaning is effaced" (p. 18). Polanyi brings to our attention the pianist who is temporarily paralyzed by paying too much attention to her fingers (Polanyi, 1967). On the other hand, explicit knowledge is detailed. Therefore, explicit language may be expressed in systematic and formal language by way of data, scientific formulae, manuals, data or specifications (Nonaka, 2001).

shared, through poetry and dialogue[2]. Kuhn has equated Polanyi's "tacit knowledge" with metaphorical thought. What this means is that metaphor is an important part of thinking and not just a poetic exercise (Fiumara, 1995; Kuhn, 1970; Lakoff, 1994; Polanyi, 1967).

We draw implicit (rather than explicit) comparisons through metaphorical thinking between the specific qualities of an object and an idea. Implicit comparisons may occur when the qualities of an object are, conceived of in a separate domain than the thought, to which it is being compared. The metaphorical thinker may poetically sense and analogically develop the unique connections between unrelated objects and experiences. The metaphorical thinker is then able to synthesize new mental constructs (Caldwell, 2009).

Our explicit theories may in fact, originate in the implicit domain, even though we may not even be mindful of implicit, metaphorical thinking. Theories, for instance, derived from empirical data may also have implicit modeling as their root (Fiumara,

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[2] The literature suggests that in a dialogic classroom, students and teachers employ reasoned discourse to engage in the collectively generated knowledge of that classroom. Some of the more traditional pedagogies are decontextualized. These traditional approaches may separate knowledge from the details and actions of an experience (Son, 2009). On the other hand, dialogue, is a community of practice that is interactive. Utilizing a dialogical approach, students discuss and teachers can mediate fresh understanding by way of problem-solving within a relevant context. Dialogue, therefore, is a meaningful contextualized approach that considers students meaning-makers (Brown, 1989; Lave, 1991; Reznitskaya, 2012; Rogoff, 1990).

1995). Our implicitly generated theories, or models, may be of considerable importance to *identify* potential links, or root metaphors, to the real world (Fiumara, 1995). Here "links" refers to the cross-domain mapping between Tenor and Vehicle from which a concept emerges in metaphor. "Identify" is the word used here rather than "define," or even "indicate," because, in metaphor, we *identify* instead of assert, *display* instead of speak literally. In other words, in metaphor, two or more parts of a whole agree, in some way, even in contradiction with our natural life experiences (Arbib, 1986; Fiumara, 1995). In metaphor, then, the literal meaning of a term succumbs to its new connoted meaning. That is because we do not depend upon the standard lexemic meaning of a metaphorical phrase. If we did, the metaphor might not make any sense.

Within our sacramental experiences, there are both the physical objects and our beliefs that we may hold but may be unable to articulate (Polanyi, 1967). Our inarticulate beliefs are our tacit knowledge of the meaning of those objects. This meaning is, more felt than thought. However, through metaphorical thinking, the meaning we cannot articulate may then, be brought closer to being shared. The meaning students make of a sacrament may be inarticulate, but through the rite, meaning is implied and even understood. So we have tacit knowledge that we are unable to say. This leads to implicit knowledge that is implied or understood. Metaphorical thinking can assign language to these tactic and implicit cognitions and bring them closer to a kind of meaning spoken in dialogue and understood. Our tacit, felt meanings remain as part of the metaphor. However, now we have given that tacit meaning a root metaphor that allows us to think about it for instance, by hypothesizing (Pepper, 1961, 1966).

Metaphorical Thinking in Philosophical Dialogue.

I employed philosophical dialogue in my teaching approach in order both to facilitate my students' metaphorical thinking and to provide a context in which they could further elaborate on meanings they had discovered. I chose this method because metaphorical thinking is also a method of philosophical inquiry. In this section, I present literature which portrays metaphor as a method of philosophical inquiry and as a means by which to discuss meaning and truth (Davis, 1989; Pickstock, 1998; Shibles, 1971; Soskice, 1985). The metaphor is essential to the philosophical dialogue. One reason is that our way of understanding meaning, especially philosophical meaning, depends upon "root metaphor" (Pepper, 1961, 1966, 1973). For instance, the machine is the root metaphor for the hypothesis Theory of Mechanism. Another reason is that metaphorical thinking may be inductive, deductive, tacit, or tensive. Inductive, deductive, tacit and tensive thought are all a necessary part of the philosophical discussion (Fiumara, 1995; Kittay, 1987; Kuhn, 1970; Nietzsche, 1979, 2000; Polanyi, 1967). Depending on the use of single-domain or cross-domain mapping metaphorical thinking may be deductive, meaning coming from the general to the specific, or inductive, meaning moving from specific to general. However, we may efface meaning itself by examining the details of an object or situation too closely (Polanyi, 1983). That is why the tacit—or not as detailed—knowledge such as is present in metaphor may assist in a reach for meaning (Polanyi, 1983). Moreover, Nietzsche (2000) and Ricoeur (1978) also saw tensions existing in our search for truth. This tension is the result of ideas, which do not correspond with each other, very much like cross-domain mapping or tensive,

metaphorical language. Furthermore, metaphorical thinking, like analogical thinking, can be the basis for hypothetical thinking (Arbib, 1986; Hesse, 1966; Heywood, 2002; Lakoff & Nunes, 1997, 2000).

Root metaphor. In trying to understand the world a person may attempt to look for some intimation or "clue" of it. The clue is often present in what the person currently has seen and known. Pepper (1961) calls this basic kind of link a "root metaphor." The Vehicle of a root metaphor is something already in our understanding: that which we do not yet understand is, in some way, something we already understand. That becomes the basis for a "world hypothesis," or hypothetical speculation about a larger domain of meaning, even including the entire world. Thus, constructing root metaphors is a method of understanding through making hypotheses about one's world. Of course, in all fields of inquiry, including philosophy and religion, there come inadequacies in forming hypotheses. Therefore, those hypotheses then need to be inquired, tested, and adjusted.

Pepper talks about four basic world hypotheses, each of which has a root metaphor: Formism, Mechanism, Contextualism, and Organicism. Similarity is the root metaphor for Formism. As mentioned, Mechanism has the Vehicle of the Machine as its root metaphor. The gap between mechanical and electricity categories is a center of inadequacy for the Mechanism world hypothesis. Integration is the root metaphor, Pepper suggests, of the hypothesis of Organicism. Contextualism employs the root metaphor of the Historical Event (Pepper, 1961). One example may be the historic event in the person of the Christ, as God. Through this historic event, an entire system of faith is "revealed" or contextualized (Avis, 1999; von Balthasar, 1982). Pepper's work helps

us understand that each of the seven sacraments contains a root metaphor that is the basis for a wider and more complex understanding of God, from the perspective of the Roman Catholic Church. In my method students give these sacramental root metaphors a structure and a further set of categories through extended-metaphor poems.

My study, however, is not on the philosophy of the root metaphor and its function in the formation of hypotheses. Rather this study is on how the writing of extended-metaphors about the symbols of the sacraments helps students to understand the meaning of the sacraments, as measured by the ACRE assessment. Still, Pepper's theory supports the method I developed for this study. By exploring the metaphorical roots of our hypotheses, we can elaborate their meaning and thus formulate definitive questions. Through the students in my study, definitive questions, in turn, evoke the development of meaning of the sacramental symbols. The students in my study were able to construct theological hypotheses on the meaning of the sacramental symbols through extended-metaphors formed through dialogical conversations.

Fiumara, discussing Kuhn, also supports the idea that metaphor is the ideal guide for developing hypotheses of the world. As he argues, there is practically no contradistinction between metaphorical thinking as a foundation to form world hypotheses and Kuhn's view of forming hypotheses in science (Fiumara, 1995; Kuhn, 1970). We do not formulate hypotheses by following a formula, but rather by involving imaginative thinking to create metaphorical bridges within and among domains. In this way scientific thinking is necessarily metaphorical (Kuhn, 1970; Pepper, 1973). The literature suggests that metaphor is important to hypothesis development in math and

sciences. Hypothesis development, or the formulation of possible meaning, is what I attempted to generate in the extended-metaphor workshops about the sacraments.

Metaphorical method. In my study, I developed a dialogical approach to thinking metaphorically through poetry that was informed by Shibles' theory of the "metaphorical method" of philosophical inquiry (1971, p. 3). Shibles states that some metaphorical method has been in use for centuries. The metaphorical method, however, did not develop further. Shibles suggests this method is useful for many kinds of inquiry and is particularly useful in the philosophical inquiry that he does refer to a "metaphorical method of doing philosophy" (p. 3). Like Pepper, Shibles's philosophical method, is supported by basic root metaphors extended through discourse. Using this metaphorical method, new insights and knowledge, may be suggested through, incongruous juxtapositions, such as those necessary to cross-domain metaphors. The metaphorical method in philosophical inquiry is useful because, through the metaphorical method, we have further access to what is possible to say, and also have a way to articulate that (Shibles, 1971).

Furthermore, we can more clearly see the root metaphors in our systems of knowledge with the metaphorical method. The metaphorical method may also allow us to understand metaphor and perhaps be more adept at perceiving the root metaphors embedded in a concept, such as a sacrament. When students understand metaphor and can perceive the "embedded metaphor" in the Sacraments, they may come closer to understanding the meaning of those sacraments. Additionally, the metaphorical method allows us to create a greater variety of metaphorical systems. And from being able to

explore a wide array of metaphorical systems, entirely new philosophies may emerge. For example, the system of Nietzsche was highly metaphorical. Nietzsche's theory of the world, as constantly overcoming, was perhaps, rendered most successfully in his "tensive" metaphorical language. Ricoeur's (1978) approach to truth observed the tensions existing in our human structure (Atkins, 2014). Of course, cross-domain mapping in metaphor is by nature tensive, in that it is a tension of one thing in one domain meaning something in another domain of thought.

Like Ricoeur's tensive reach for truth, metaphor is not infallible. One reason for this is that metaphors do not assert a meaning but rather allude to a meaning. So while acknowledging the intellectual truth of many metaphors, especially in science and theology, Soskice (1985) does not claim that metaphor is unerring. While metaphors can distort the meaning or truth of reality, some authors suggest that whenever we encounter clear metaphorical utterances we still can hear in them the truth of a real world. So as insufficient and imprecise as metaphors are, they serve as an important doorway to truth (Avis, 1999; Davis, 1989; Pickstock, 1998; Soskice, 1985).

To summarize, the theoretical literature tells us that poetry and philosophy are both based on metaphor and that both are approaches to creating meaning and discovering truth. My study employed a metaphorical method through poetry to evoke philosophical discussions in writing and dialogical inquiry. In the next section, I discuss the empirical literature exploring metaphor to help in the understanding of meaning and provide proven models of metaphor used in various disciplines within education.

Metaphorical Thinking in Education

It is generally accepted that metaphor and analog are similar methods of thinking about and understanding concepts (Piaget, 1968). One reason for this is that the domains of Tenor and Vehicle can consist of what a student already knows through everyday life and what she is supposed to learn in school. Metaphorical thinking helps students to prepare for further knowledge (Schwartz, 2004; Willox et al., 2010).

Metaphorical thinking is a way of building a construct of understanding based on that which is already known, in other words, on a schema (or Vehicle) (Abrahamson, 2009). When attempting to make sense of an unfamiliar circumstance, problem solvers may evoke image schemas and their knowledge of a concept. The first concept may constitute the Tenor of the metaphor and the image schema, linguistically stated, in the Vehicle. Image schemas, are cognitively mediated via metaphorical thinking, building a bridge between idea and situations (cross-domain mapping). When initiated as concrete, image schemas then connect to new cognitive concepts. Metaphorical thinking or image schemas do two things:

1. Concretize the abstract
2. Essentialize the concrete (Presmeg, 1986, 1992).

In short, image schemas are, in essence, metaphorical thinking. In this section, I will refer to image schemas as metaphorical thinking.

A sense–making process is underway in students engaged in metaphorical thinking (Glenberg, 1997; Roediger, 1993). Metaphorical thinking is also evoked through the "embodied," perception-motor activities students are involved in (Rotman,

2000). In my method, students employ perception-motor skills by way of the students' encounters with physical, semiotic objects. These objects are the extended symbols of the sacraments. When a child experiences something new and responds to it in a way consistent with her existing metaphoric image, she goes through a process of assimilation (Piaget & Ihelder, 2000). This assimilation occurs because a student's kinesthetic, visual, and auditory experiential perceptions provide forceful metaphoric images to assist learning. One author suggests that the metaphoric images which generate in the mind of the student are like a set of faded footprints (Jakobson, 2007). They are faded footprints because while these images may be then embossed in the memory and they also assist in finding the path to mathematical concepts. However, another reason is that the metaphors themselves may become dead metaphors. In other words, the images, or Vehicles, are fading footprints because Vehicle images are not the end-results, rather, finding meaning is the result. In finding repeating relationships and patterns, these footprints also help to manifest cognitive structures or pattern images that are also known as the previously-mentioned image schema (Abrahamson et al., 2012). Cognitive structure or pattern images are yet other processes in metaphorical thinking. Presmeg also suggests that students can help make sense of new ideas by way of, or in terms of, already existing ideas, through metaphorical thinking (Presmeg, 1986, 1992, 1998).

The mapping between domains in metaphoric thinking is an especially valuable tool for learning science or math (Abrahamson et al., 2012; Cameron, 2002; Chiu, 2001; Diehl, 2010; Groth, 2005; Jakobson, 2007; Kilhamn, 2008; Willox et al., 2010). Recent literature supports the use of metaphor in education for mathematical problem-solving

and as a pathway for students to interpret knowledge of science (Merrill, 2001). Scientific and mathematical concepts difficult to comprehend may be addressed via metaphor because through metaphor we build what we don't know onto what we do know, which is a way of scaffolding understanding (Anderson, 1998; Merrill, 2001). Metaphoric thinking is useful in learning these disciplines because metaphor functions as a "bridge" between something with which they are familiar, and the new, abstract, or not easily understood concept.

What follows is an examination of several recent empirical studies on knowledge acquisition in science and math through metaphor. The following studies utilized metaphors in three slightly different ways:

1. metaphors provided (Cameron, 2002; Chiu, 2001; Diehl, 2010; Kilhamn, 2008).
2. developed by groups of students (Willox et al., 2010).
3. utilizing spontaneous metaphors (Abrahamson, Berland, Gutierrez, Mookerjee, & Wilensky, 2006; Abrahamson et al., 2012; Groth, 2005; Jakobson, 2007).

In two of the cases, extended-metaphors were provided. As discussed, an extended-metaphor is the extension of one metaphorical comparison carried thematically through a whole poem (Becker, 2002) or educational experience. The extended-metaphors involved in the studies reviewed here are, defined by the researchers as, educational experiences. These extended-metaphors included a metaphor presented via text and extended through images (Carter & Pitcher, 2010; Diehl, 2010; Gentner, 2002).

For example, in Diehl's (2010) study one group of students read just what the authors call "sub-concept labels" (not cross-domain labels) in their text. Specifically,

they only referred to the atom as the atom. In the other group, the students read the sub-concept labels, as well as an extended-metaphor, for example "an atom is like a tile" (Diehl, 2010, p. 771). In my study, the essential sacramental symbols are themselves, part of an extended-metaphor. Similar to the rite and images of the sacraments, Diehl employs pre-arranged metaphors that, are then, extended. For example, in the Diehl study subjects in the extended-metaphor condition read a metaphorical statement such as "a balanced chemical equation is like a mosaic tile planning grid" (p. 779). Participants then wrote down everything that they knew, or thought they knew, about the chemistry concept the metaphor was presenting. They could guess if they had to.

Additionally, subjects in the extended-metaphor condition were, given an elaboration of the metaphorical statement including graphics and a narrative. The graphics and narrative told the story of a mosaic tile business. In this company, packages of mosaic tiles were used to make specific tabletop designs. These elaborations were the concrete referents for undisclosed chemistry concepts. Here is a brief summary of the narrative elaboration:

1. Every year there is a new tabletop design.
2. The new tabletop design and the original use the same planning grid.
3. Every year the original and the new tabletop design utilize the same three types of tiles.
4. These three types of tiles are all different however. They have different colors, shapes, and sizes.

The group using extended-metaphor was, in general, able to write higher-quality inferences about atoms than did the other group. The claim of these authors was that students using extended-metaphor were then able to build more explicit, pre-conceptual models. Metaphors in this Diehl study drew a focused connection between a desired knowledge and a metaphor. Diehl (2010) discovered that a prior understanding of the metaphor allowed students to do inferential thinking, which, in turn, enables a stronger intuitive attainment of knowledge. Participants learned about how atoms bond to form molecules. The extended-metaphor in this study incorporated metaphorical thinking, helping students to build better pre-conceptual models and assist in a stronger intuitive acquisition of knowledge (Diehl, 2010).

In a study by Carter and Pitcher (2010), researchers utilized "water, waves and webs" (p. 579) as an extended-metaphor used through a teaching process about electronics. In two case studies, teachers employing metaphor in separate locations showed that metaphor used in a classroom evokes two different pedagogical results. In one location, metaphors illustrated the similarity between the Tenor and Vehicle. The extended-metaphor Vehicle (water, waves and webs) helps learning because of the similarity of the Vehicle to the Target, which was electronics. In the other location, the extended-metaphor exploited the difference, or cross-domain mapping, between Tenor and Vehicle, when it assisted doctoral students to write better. But this part of Carter and Picher (2010) goes beyond the scope of my study.

Kilhamn (2008) explored using conceptual metaphors for students to learn about negative numbers. Negative numbers are difficult to teach. The instructor applied

extensions of the metaphor "Arithmetic as Motion along a Path" in the study as the foundation for the concept being taught to the students (Kilhamn, 2008). In this case, the thermometer, or number line, was the source domain—or Vehicle—of the metaphor. Lakoff and Nunez (1997) also suggest that conceptual metaphors are necessary to understand fundamental arithmetic. The conceptual metaphors they suggest, however, have non-numeric Vehicles. That is because, in other literature, the abstract conception of higher level mathematics is the result of a layering of metaphor on metaphor, systematically (Lakoff & Nunes, 2000). Metaphor layering means that one metaphor is not enough to convey a complex idea, but building upon other Target/Vehicle systems through extended-metaphor may help students understand concepts. Earlier in this chapter, the layering of metaphor upon metaphor is scaffolding, which I am considering within the process of metaphorical thinking.

Chiu (2001) also conducted a study involving negative numbers. This researcher also concludes that metaphors are important in gaining knowledge of and understanding arithmetic (Chiu, 2001). Chiu examined the way, both newcomers to a mathematical topic, and those referred to as experts on the subject, used the same metaphors in order to gain knowledge of, and find solutions to, problems regarding negative numbers. While both parties used the same metaphors, such as "Sets are containers…Stock market changes are arithmetic computations…Arithmetic is motion along a path," (Chiu, 2001, p. 95) they both used the metaphors in different ways.

There were two dozen participants in the Chui study. Twelve middle school students as well as twelve adults over high school age. Both groups were given the task

of solving a problem that involved computation of arithmetic statements. In the process of completing the task, middle school children used metaphors more than the adults did, to compute, ascertain, and amend mistakes, as well as to substantiate their claims. Then, six arithmetic expressions were articulated by the participants. The adults used metaphors more often than did the middle school children though the adults applied less detail to their metaphors than the children tended to do. The median adult demonstrated a better-assimilated knowledge of arithmetic by way of many metaphors, than did the median child. The author claims the study may suggest that metaphors are important in gaining knowledge and understanding of arithmetic (Chiu, 2001).

In Cameron's (2002) study, researchers identified the leading methods of understanding metaphor. Cameron analyzed teachers' employment of explanatory metaphors with fifth-grade children in a UK schools. Specifically, Cameron analyzed the various teachers' interpretation of metaphors already implemented in a science text. Cameron did this to identify the means by which metaphors may contribute to gaining knowledge of science. This particular study implemented and adapted a Vygostkyian avenue through metaphor in dialogue and discourse, a socio-cognitive approach (Cameron, 2002). This study determined how the metaphor's function of helping children to learn is unsuccessful by way of problems interpreting the metaphor or by the very metaphor selected. This study may demonstrate possible negative aspects of using metaphor in education. However, neither interpretation nor teacher selection is included in my method as the students create their own metaphors to apply to an object and its meaning within the context of a sacrament.

While there has been a great deal of literature about the pedagogical power of metaphor, something not discussed much is the possible value of student co-creation of metaphor in the classroom. Student metaphor co-creation is a method of finding implications, significance, and meaning within discipline concepts. Only one study involved a co-created production of metaphor within a larger group. The method employed the use of metaphor as an activity to foster the attainment of knowledge and more concentrated and permanent learning. The metaphor employed by way of a learner-driven process, utilizing six graduate students co-creating a metaphor. In this case, the metaphor was "capacity-development-as-fire" (Willox et al., 2010). In my study as well, through dialogical discussion, I attempt to help students begin construction of the Tenor and Vehicle of new extended-metaphors. In other words, the Tenor/Vehicle may develop as a co-creation among students.

Earlier in this chapter we discussed how some studies use perception-motor activities students in metaphorical thinking (Rotman, 2000). One study incorporated objects, or semiotic tools, to evoke metaphorical thinking (Abrahamson, 2009). Below I discuss the Abrahamson study that served as a model for my method. In the Abrahamson study, students were able to form a bridge between tacit knowledge and disciplinary procedure. The bridge was collectively built, through a form of dialogue. My study begins with a dialogical approach to begin development of extended-metaphors. As well, my study employs semiotic tools, which will be the symbols of the sacraments. In the subsequent sub-sections of this chapter I review the literature on using objects to evoke

metaphorical thinking and then assessing student process doing so (Abrahamson, 2009; Dunn, 2011).

Metaphor and analogy are similar methods of thinking about and understanding concepts (Piaget, 1968). Students make sense of new ideas in terms of already existing ideas through metaphorical thinking, which essentially scaffolds understanding (Presmeg, 1986, 1992, 1998). Therefore, students learn concepts that are difficult to understand through metaphor (Anderson, 1998; Merrill, 2001). Metaphorical thinking also helps students to build upon knowledge (Schwartz, 2004; Willox et al., 2010). Through metaphorical thinking, students build a construct of understanding based on image schemas already known to them (Abrahamson, 2009). These image schemas are mediated through metaphorical thinking. Image schemas begin as concrete, yet they concretize the abstract (Presmeg, 1986, 1992). Linguistically, one image schema may serve as the Vehicle in metaphorical thinking and concretize the idea in the Tenor. Through cross-domain mapping in metaphorical thinking, the thinker builds a bridge built between ideas and concrete image schemas. Metaphorical thinking then helps students to manifest cognitive structures of image schema, known as pattern images (Abrahamson et al., 2012). In teaching methods, objects are essential to the development of the concrete image schema. Through concrete or "embodied," perception-motor experiences (Rotman, 2000) a sense–making process is underway in the mind of the student (Glenberg, 1997; Roediger, 1993). The objects employed in perception-motor activities evoke metaphorical thinking and a cross-domain map (Abrahamson, 2009; Rotman, 2000), or bridge, is constructed to begin implicit articulation of tacit knowledge through

the disciplinary procedure of experiencing objects and entering into collectively forming metaphors through dialogue. Through exploration of metaphor in dialogue, a Vygostkyian socio-cognitive approach emerges (Cameron, 2002). By way of experiencing something new and responding to it in a way consistent with a student's metaphoric image, she goes through an assimilation process (Piaget & Ihelder, 2000). Knowledge, assimilated by way of metaphor is important in garnering understanding and meaning of a concept (Chiu, 2001). Several studies employ extended-metaphors via text, image, and experience (Carter & Pitcher, 2010; Diehl, 2010; Gentner, 2002). The sacraments are extended-metaphors as well.

The literature tells us that there are at least three educational values to extended-metaphor. First, by using extended-metaphor students build more explicit pre-conceptual models for a topic. For instance, in the Diehl (2010) study, students learned about how atoms bond to form molecules through the extended-metaphor. The metaphor was "a balanced chemical equation is like a mosaic tile planning grid" (p. 779). Text, pictures, and dialogue extended it. Students derived logical conclusions, having received this extended-metaphor, as evidenced by higher-quality inferences in their writing about atoms. Students using extended-metaphor, therefore, built more explicit, pre-conceptual models; pre-conceptual because these students had received no prior knowledge of how chemical equations work. Student's ability to generate pre-conceptual models was essential to my study because forming metaphor helps students do inferential thinking and understand intuitively. The extended-metaphors in my study, as well, incorporated metaphorical thinking, helping students to build better pre-conceptual models and assist

in a stronger intuitive acquisition of knowledge. Secondly, by using extended-metaphor students form more intelligent hypotheses. Like its sister analogical thinking, metaphorical thinking is a part of hypothetical thought. Metaphor assigns shared language to the tactic or implicit meaning (Arbib, 1986; Hesse, 1966; Heywood, 2002; Lakoff & Nunes, 1997, 2000; Pepper, 1961, 1966, 1973). The importance of this to my study is that metaphor, assigning language to the tactic and implicit meaning, allows it to be spoken and understood in a dialogue. However, now we also have given that tacit meaning a root metaphor that allows us to hypothesize (Pepper, 1961, 1966). Furthermore, there is almost no difference between metaphorical thinking in forming hypotheses and constructing hypotheses in science. Not formulated, hypothesis is an imaginative thought process, creating metaphorical bridges between domains (Fiumara, 1995; Kuhn, 1970; Pepper, 1973). Hypothesis development, or meaning, is part of what I help students to generate through my method, which lets students construct theological hypotheses on the meaning of the sacramental symbols through extended-metaphors. Thirdly, students' creation of metaphor helps them find stronger implications, significance, and meaning within a discipline (Willox et al., 2010). For instance, the literature tells us that our explicit theories originate in the implicit domain, even though we may not even be mindful of implicit, metaphorical thinking (Fiumara, 1995). Tacit or implicit thought is part of the process of finding significant personal meaning; the metaphor gives language to the tacit or implicit giving it personal significance (Fiumara, 1995; Kuhn, 1970; Lakoff, 1994; Polanyi, 1967). Fiumara (1995) also tells us that speaking in metaphor requires those who speak and receive the metaphors creating an

"interpersonal significance" (p. 141). Students' ability to find personal and interpersonal significance and meaning related to the sacraments was relevant to my study because I utilized dialogically developed extended-metaphors within a religious education afterschool program. Dialogue also helps produce significance in personal meaning about the Sacraments of the Catholic Church. For all three of these reasons, therefore, my study employed dialogical discussion to help students construct the Tenor and Vehicle of new extended-metaphors related to the Sacraments.

Model for My Study

Next is a review of the study against which I have loosely modeled my study. In the Abrahamson (2009) study, an object helped a student to construct meaning through intuitive inferences. This object and interactions with it afforded a subject a synoptic viewpoint on a topic. Subsequently affirming the student's sense of coherency among what, under other circumstances, might be no more than a chain of linked concepts that are individually meaningful but not coherent. Likewise, in my study students put metaphors together into an extended-metaphor through a form called poetry in order to make meaning coherent. Through the Abrahamson methodology, I garnered understanding of how to approach my study on the topic of metaphorical thinking with students in knowledge acquisition. The Abrahamson study does have a sparse data source, but nonetheless the authors see significance in what their results may suggest. My study has a somewhat larger data source. Through metaphor, object and concept are complementary and assist in the construction of an idea. Linguistically, that would be

understanding Tenor through Vehicle. In other words, a Vehicle, evoked by an object, then objectifies a Tenor concept.

Abrahamson poses that the necessary tool to learning math is an appropriate semiotic object (Abrahamson, 2009; Radford, 2003; Sfard, 2002). The author coins the term semiotic leap which means that the first tacit inference of a concept resonates through appropriation via worldly objects (Abrahamson, 2009). In my study, I use specific symbolic artifacts of the sacraments.

Prior to completely understanding the bridge between the Tenor and Vehicle knowledge, Abrahamson suggests that situational, intuitive inferences are first, objectified by using semiotic objects. Semiotic objects are then, employed within the study environment of the subjects, a class. To assist the student in making their own efforts to scaffold meaning for the targeted knowledge topic, pre-articulated reasoning is evoked through somatic experiences. More specifically emerging, pre-articulated reasoning draws quite a bit from the percipient suggestions of the real world object used in the Abrahamson study (2009). In other words, before the linguistic construction of metaphor there is a somatic experience of an object. From this somatic experience, a Vehicle may be developed. Abrahamson citing philosophy suggests that the student, in making a semiotic leap, is cognitively floating somewhere between the signifier and the signified[3] (de Saussure, 1959), otherwise known as conceptual blending (Fauconnier,

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[3] Semiotic means interpretation of sign and object while working cooperatively to evoke influence or action (Peirce, 1997). More specifically, semiotic means the study of signs. It

2002). Conceptual blending permits this semiotic leap. Conceptual blending, or cross-domain mapping, is part of metaphorical thinking.

Semiotic leaps cognitively take place in situations in which students employ an object in the classroom and use it to support their arguments and understanding of symbolic meaning because their mathematical understandings may be intuitive and unsubstantiated (Abrahamson, 2009). This may be true of curricular religious understandings as well. In short, learners, by perceiving images, symbols, and objects are starting to make semiotic leaps. These kinds of leaps are strong learning tools (Abrahamson, 2009). The perceived object thus serves as a model for concept and

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consists of a type of dualism, which relates the signifier, to the signified. That is, the word or phrase spoken (signifier) is related to a thought or idea (signified) (de Saussure, 1959). The theory suggests that no word is inherently meaningful. Instead, a word is only a "signifier." As a signifier the work only represents something. In order to form a meaningful sign, the "signifier" is cognitively blended with the "signified." The signifier is the thing itself. Semiosis, Saussure thought, affords us an empirical understanding of the way in which physical stimuli represent words and the abstract ideas. In addition to words, Saussure says signifier is like a finger pointing at an object. Note that the pointed finger is, in itself, not the object, just a signifier. We construct a meaning through the interpretation of the signifier. The signified is the concept, the meaning, the thing indicated by the signifier. The signifier, need not be a 'real object' but at least some referent to which the signifier refers. Created in the perceiver, and internal to her is the thing signified. While we do share concepts, we do this by way of signifiers. The signifier is more stable while the signified varies between people and contexts.

meaning. To build meaning for a semiotic object, the student must see the object in such a way that inferences help to suggest a model. These inferences are intuitively obtained and pertaining to the situation. In other words, the object experience needs context. In this way, by linking the ineffable and tacit knowledge of the semiotic object to the explicit meaning, students bridge the gap between semiotic and tacit, the inscribed, and the phenomenological. Intrinsic to such a leap is that it implies cross-domain mapping between the Tenor and Vehicle. Still, as mentioned, the student must bridge the epistemological distance between the formal and the tacit. This of course, leads to metaphor as the linguistic method to assist in building the bridge (Abrahamson, 2009). Thus, by way of intuition, analysis, and inference, the student synthesizes knowledge. This is evoked by dialogical reflection (Schön, 1981). Dialogical reflection is essential to the somatic leap in the Abrahamson study. Likewise, my study fostered dialogical reflection.

In the process of eliciting responses to a symbolic artifact, the teacher may need to decide two things. First, the teacher decides should these intuitions, be fostered and applied to the extended-metaphor, or should they be acknowledged and then detoured? In dialogue, I acknowledged student intuitions and tried to detour any concepts that seemed out of contexts or not applicable. Detouring means to help steer student back on track.

As discussed, this Abrahamson study analyzed metaphor use of eleven-year-old students while they reason real problems in probability. Ten and eleven are the ages of the subjects in my study. Abrahamson transcribed one-on-one clinical tutorial

interviews. Tutorial interviews gathered the idiosyncratic metaphors stated by children in the reasoning process. The instructor presents math problems through the unfamiliar semiotic objects described later in this section. This research may suggest the following two things about how metaphor serves learners through a semiotic focused method. Metaphor then serves as a way to communicate understanding of a knowledge base by way of (a) what it represents, and (b) its meaning; and furthermore as a method of objectifying understanding of a knowledge base. Abrahamson's method helped identify the metaphoric reasoning of students as they were building new ideas for the very first time with objects, context, and dialogue.

The semiotic object. There is much literature reporting on the common presence of student error in examining the probability of possible events brought forth through random compound-event situations, such as flipping a coin four times. As such, the topic selected for the Abrahamson study was the probability of a binomial distribution.

The semiotic object used in Abrahamson's study was a scoop with four small bowls within it. The objects scooped up red and black balls from a mixed up assortment of the two colors of balls of equal size and amount. The random scooping then revealed probability through somatic experience. The context here was the intuitive probabilistic reasoning of middle school or late-elementary students (diSessa, 2007; Ginsburg, 1997; Goldin, 2000).

Abrahamson (2009) explores possibilities that metaphor takes an important role in cultivating learning about mathematics. Communal perspectives of objects and situations develop more successfully with metaphor in mathematical dialogue because of the

discursive nature of metaphor. "By going beyond naming" Abrahamson (2009, p. 60) says, students enable learning, themselves, in these direct and indirect ways:

- Direct: Students state and improve mathematical statements
- Indirect: With metaphor, students can develop schema, idiosyncratically.

In short, to further the learning of mathematics, the researcher developed task-based pedagogical activities. From these activities, Abrahamson was able to identify spontaneous metaphors. In order to understand an unfamiliar phenomenon, and find meaning, metaphors served as a potent discursive tool.

As discussed, metaphors may be a bridge between two perspectives in research. In the first place, metaphors here helped students conceptualize math artifact activities that were goal-oriented. Secondly, metaphors by students served as an experience of image making. Familiar experiences combined with tacit knowledge are the foundations of meaning in mathematics. These familiar experiences are then analogically used.

Students accomplish, in a familiar setting, their analogical reasoning. Reasoning done tacitly opens the door to metaphorical thinking in interesting and unexpected ways. One example may be this: In random compound-event situations such as flipping coins, the number count we perceive through vision is then, compared with proportions. This is because, as a tacit and perceivable reality, proportionality is in our perceptual mechanics. To further give agency to our tacit tools and transform them into mathematic reasoning, we also need the proper environment. Primarily, this environment should be supportive. Armored with the ability to nurture and direct, teachers should be equipped to assist

students in their tussle with analogical connections. Students then get to show others how they see things and are thus more able to develop meaning.

Unparalleled as a means of objectifying knowledge, metaphors are a valuable tool in, a student's, learning because they do pass across many semiotic modalities. Specifically, students express ideas metaphorically linguistically, through speech, gesture, as well as through many different symbolic displays. (See Appendix B Other Figures of Speech.) Moreover, students dig into a sundry of cognitive and epistemic tools and resources. One important form of pedagogical frameworks is indeed an idiosyncratic metaphor. Much of the philosophy of constructivist learning strongly suggests idiosyncratic metaphor as a pedagogical framework (Abrahamson et al., 2006; Makar, 2009; Turkle & Papert, 1991). Metaphor is a way to scaffold, and build foundations for the understanding of mathematical ideas. Furthermore, its use may allow instructors to reach a broader group of students.

In religious education, metaphor, symbol, and artifacts are a method of understanding elements of the knowledge students are desired to learn. As discussed, in making sense of new mathematical or scientific phenomenon, students try to determine what the new phenomena are analogous to, thus recalling familiar experiences to make sense. Most of the religious studies 'phenomena,' or religious education knowledge, is already presented metaphorically. To demonstrate some understanding of this religious knowledge, it would serve students well to use metaphor, the linguistic embodiment of image and analogy. As Abrahamson and others have discussed, metaphor allows the interlocutor to respond to and direct 'the way I see it,' discussing validity and relevance.

One way to embody metaphor linguistically is to give it structure, form, and aesthetics. And one way to give structure and form to metaphorical embodiment of symbol and image and analogy is through poetry. A creative construct of analogy is essential to mathematical reasoning and is a way to come to an understanding of religion curriculum knowledge. In math, the image schema is already present as "traces" to which we apply a mathematical concept. Then appropriate analogous images are schemed. In my study, I attempt to evoke understanding through semiotic symbolism then metaphorically rendering other revelatory analogies.

Writing metaphorical poetry in my study replaces Abrahamson's interviews or their transcription. In this way, students in religious education may be able to promote their understanding and then using this form of verbal discourse as a metaphor is a commerce of communication sharing value with other and self. The metaphorical poems are the product of the treatment. My method needed a way to measure the metaphorical thinking of students. I do this by the way of the metaphoricity of their written poems so that I can then compare that measurement to how they have acquired an understanding of meaning of certain sacraments as evidenced by the ACRE. What follows is a discussion of the literature that demonstrates a qualitative measurement system for metaphoricity.

Measuring Metaphorical Thinking

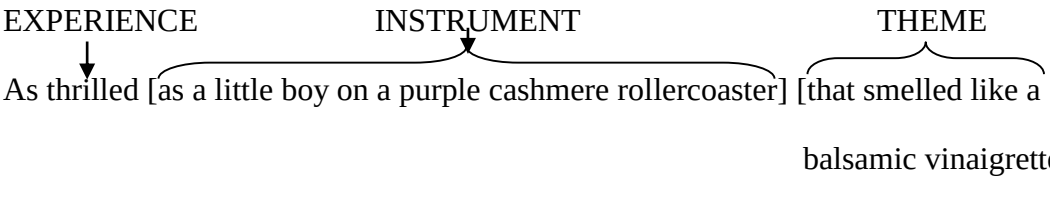
I first worked with the treatment sample, to dialogically, find meaning by meaning-making with extended-metaphor writing. I then measured the metaphoricity, or metaphorical thinking levels, of the extended-metaphor of my students' poetry and compared them to their scores on the questions related to the meaning of the sacraments

in the ACRE. I employed the Dunn method of measuring "metaphor-in-thought" (Dunn, 2011, p. 64) or metaphorical thinking. Dunn has developed a system for measuring the gradient semantic intuitions of metaphorical expressions, which amounts to measuring the metaphoricity or "strength" of the metaphor. Semantics in this study means the meaning of words or phrases in a particular context.

Dunn's basic formula is as follows: metaphoricity = [(# of domains) + (# of mismatches)] x (# case roles). Dunn (2011) calls the mismatches part of the formula function. However, I refer to it in this study as mismatch for clarity. The "case roles" in a sentence are the different participants in a metaphoric event and the event itself. Another term for case role may be the thematic role. The case roles identified in this study are widely explored in the literature. However, Dunn employs this list: *agent, beneficiary, instrument,* and *location, path, destination*, and *purpose, source, theme* (Nireburg, 2004). The sentence becomes metaphoric if any or all of these case roles contain metaphorical material (Dunn, 2011).

To measure the level or density of a metaphoric expression we first break it into its different case roles, and when a case role contains material from the Vehicle domain, the density is increased.





In short, a sentence that does not have case roles with metaphoric content is simply not metaphoric. Below is an example a metaphoric expression with one metaphoric case role, then another with a single lexeme[4] filling that case role; and finally there is a version utilizing two lexemes.

Event

1) Governor Christie is [flirting] with the Democrats. *One case role*

2) Governor Christie is [flirting, and making out with,] the Democrats. *One case role with an added phrase (lexeme)* [not another case role]

Here are two case roles:

3) Governor Christie is [flirting with, [someone else's girlfriend]. EVENT and Beneficiary. *Two different phrases (lexemes).*

This example has the underlying metaphor "Politics is Love." The first has a one-lexeme case role. The second also has just one metaphoric case role but includes two-lexemes. The third, however, has two case roles but contain one-lexeme each. So which one is denser?

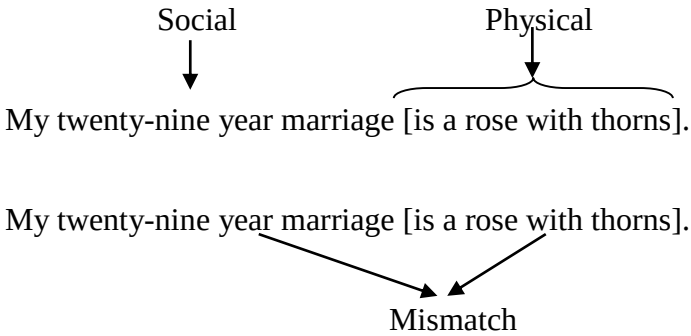
The example above demonstrates how adding more lexemes to a single case role increases density only to a minimal degree. That is why there is only a minor difference between 1 and 2. On the other hand, adding another metaphorical *case role* increases

[4] Lexeme is a unit of lexical meaning. A unit does not mean that the lexeme contains just one word (which it may). Rather the lexeme may exist regardless of its content word count. For instance, *rain cats and dogs, happiness, face the music,* and *jog,* are all lexemes (Crystal, 2003).

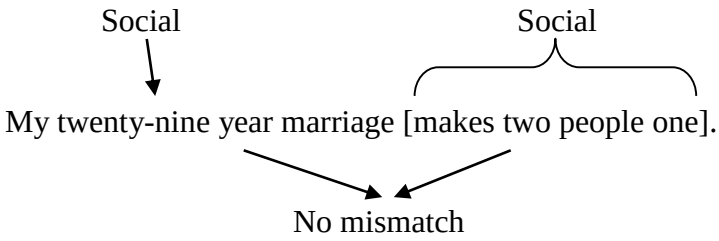
metaphoric density. As such, it reaches a point of saturation. Depending on context, *someone else's girlfriend* in 3 might be a metaphoric reference to, say, an opposing party.

Having identified our case roles, we must then assess the *domains* and *mismatches* of metaphor. We do this because one metaphoric expression may be more metaphoric than another one even if they are of the same case role value. It is the relationship between the domain of the Tenor and the domain of the Vehicle that directly affects the density or strength of an underlying metaphor. Once again, domains are mental, social, intangible, and physical and cross-domain metaphors are stronger than single-domain metaphors. Therefore, there are two possible domain distance values: metaphors in which the Tenor and Vehicle are within the same domain have a value of 1 and cross-domain metaphors have a value of 2.

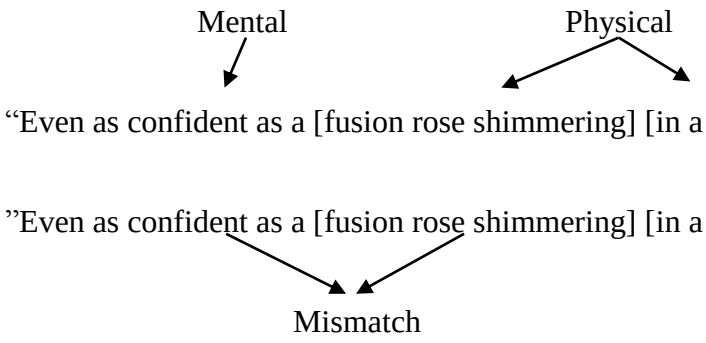
The relationship between Tenor and Vehicle produce metaphoricity only where there is a mismatch between them. When Tenor and Vehicle are both social, for example, there is no mismatch in the metaphoric utterance. Dunn has determined that there are also two scores available for the mismatch between Tenor and Vehicle. Zero, when there is no mismatch or 1 when there is, for instance, when a physical is social. In this system, there can only be, either, a mismatch or not a mismatch, 1 or 0.



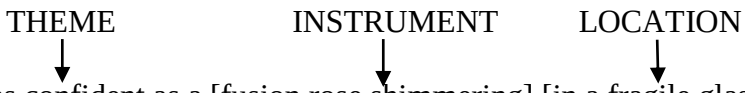
OR



Or as an example from my study:



In this example, there is also a cross-domain value: “Mental is Physical.” That means the domain score is 2, and the score of mismatch is 1. The formula so far ((2 domains) + (1 mismatch)) brings the score of this metaphor to 3. In addition, there are 2 case roles in this metaphoric sentence, which multiplied by 3, yields a final score of 6.



Recall that only case roles with metaphoric content are measured in this gradient system. That is why we will not count “Even as confident as” as a case role because it does not contain metaphoric content, even though it is a *theme* semantic constituent. The lexeme “fusion rose shimmering” does contain metaphoric content and is an *instrument*.

Also, “in a fragile glass” is a *location* and is metaphoric as well. (Remember that what we name a case role was not a measurement in this study, only that they contain metaphoric content.)

Conclusion

I have reviewed the recent literature that studies metaphorical thinking in teaching students to learn new concepts. Appropriate to my study I selected a model that employed semiotic objects, dialogue, classroom environments, and extended-metaphor thus metaphorical thinking to help students understand complex concepts (Abrahamson, 2009). I also reviewed the literature on measuring metaphoricity to score metaphorical thinking (Dunn, 2011). In the next chapter, I will demonstrate how I incorporated the Abrahamson (2009), and Dunn (2011) approaches to learn the following:

1. I wanted to find out if metaphoric thinking helped students learn knowledge of the sacraments by analyzing the five specific questions within the ACRE, which are on the sacraments. I compared the treatment sample mean of correct answers to the mean of the control sample.
2. To see if students understood the meaning of the sacraments after the treatment, I analyzed the three specific questions on the meaning of the sacraments in the ACRE. I compared the mean of the correct answers of the mean of the control sample to the mean of the treatment sample.
3. To discover how much metaphoric thinking students in the treatment sample have done, I measured the metaphoricity of each treatment sample member's two

metaphoric statements on two specific sacraments. I added each student's two metaphoricity scores for a sum score.

4. Finally, I conducted a descriptive analysis of the positive linear association linear association between a student's metaphoricity scores and her ability to answer the three ACRE, meaning questions correctly.

Chapter 3: Method

This chapter discusses the complete method employed in my study, including a discussion of participants, Research Questions, procedure, and data analysis and assessment. First, I will clarify the use of a couple of terms. The assessment instrument used in this study was The Assessment of Catechesis/Religious Education (ACRE) Level 1, Part 1 for fifth-grade, Form 12, 2001, which measured knowledge of sacramental symbols and, other desired faith knowledge. The ACRE literature names the study areas of knowledge as Domains; to avoid confusion with the Domain of thought in metaphor construction, I will henceforth refer to the ACRE domains as Study Areas. For the purpose of this study, I address cross-domain mapping, and meaning-making as metaphorical thinking.

Participants

In this study, the administration in an afterschool, religious education program in the Archdiocese of Newark, NJ, selected two classes of fifth-grade students. These two classes were assigned to me and given the treatment, which focused on the sacraments as described in the textbook, *Church and Sacraments* (Classuck, 2006). This text, was selected by the administration of the St. Cassian CCD program. The text is also supported by the Archdiocese of Newark and stays within the *Protocol for assessing the conformity of catechetical materials with the Catechism of the Catholic Church* (Conference, 1997).

There are two reasons fifth-grade was the selected sample in my study: national testing availability and metaphoric competency. One reason for the fifth-grade sample

was that the ACRE Level 1 is not, administered earlier than grade 5. There are only two other ACRE Level assessments and those are Level 2 for Grade 8 or 9, then Level 3 for Grade 11 or 12 (Association, 2002). The St. Cassian CCD program does not extend past eighth grade, so no further ACRE Levels, other than Level 1 for fifth-grade, are administered in that school. The literature warrants that age 10 is an age of metaphoric competency (Knowles, 2006). Most fifth-grade students in my study are ages 10 or eleven. Participants in this study are 10 years old on average, which is the standard age of fifth-grade students in the United States. This is the second reason for the sample in this study.

Metaphoric or figurative competence is how Knowles and Moon (2006) refer to a student's ability to use and to understand metaphor. As well, the majority of studies on metaphor and students tend toward grammar school age students. Of course, even children younger than age 10 do understand how to pretend and play, plus they recognize and comprehend stories. What this means is that metaphoric competence begins to develop at an age earlier than 10 because younger children are often able to think about imaged worlds. When we create a metaphor, especially when employing cross-domain mapping, we are not being literal but are using imagination. A story is the making of a world that is imaginary. Stories are metaphors, extended. Myths, fables, and parables are considered extended-metaphors in much of the literature (Knowles, 2006; Pramling, 2008). Of course, as discussed earlier, the curriculum in my study—religious education on the Sacraments in the Catholic Church—are also extended-metaphors. Others go on to tell us that very young students have the ability to go beyond the corporeal, the real, the

actual, and apply to it an "as if," stretching the real to the fictional, the possible (Pramling, 2008; Säljö, 2005). Age 10 is a level of metaphoric competency prefaced by the earlier years of this sample in their formation of metaphoric competency through "as if" metaphorical thinking.

Selection. The fifth-grade classes, in my study, were not selected randomly, because there were several units of this fifth-grade class, often chosen by parents based on the students' personal schedules. The administration attempted to arrange fifth-grade classes for my study in order to develop samples for my method groups of about twenty students each. Three more fifth-grade teachers in the same program were asked to cover the same Sacrament curriculum in the same program textbook (Classuck, 2006; DeStefano, 2006a) in a similar time frame, which was January 22 to March 21, 2013, in order to provide a control sample. In short, there were two treatment classes instructed by me and three control classes taught by three other instructors. In the Tuesday treatment group, I had 19 students. The Thursday treatment group had 17 students. One Sunday control group was a class of 10 fifth-grade students. The other Sunday control group consisted of 11 students. Finally, the Thursday control group was a class of 17 students.

The number of actual participants in the study necessarily decreased to 10 control students and eleven treatment students because these samples consisted of students who:

1. submitted Institutional Review Board approved consent and assent forms for inclusion in this study;
2. were also identified by name on the ACRE assessment;

3. and, completed the workshop treatment poems. (Only the treatment sample had these workshops.)

Materials

The textbook used in the control and treatment groups was the 3rd edition of *Church and Sacraments* in the *Faith First* series published by RCK Benziger with Series Editor, Ed DeStefano. This edition reflected the new revision of the Roman Missal introduced to the Catholic Church in the United States in November of 2011[5].

This project also employed an example of an extended-metaphor poem and a schematic of the Tenor/Vehicle links in that extended-metaphor. Then the method implemented semiotic objects to stimulate metaphorical thinking. To further foster, dialogue discussion on metaphor development, this method also provided vocabulary aids (Acree & Arn, 2004; Baugh, 2011; Haack, 2012; Noble, 2013, 2015; Parker, 2015; Parviainen, 2004; Shanken, 1996; Sherwin-Williams, 2000, 2006; Smith, 2013; USPS, 2003; Yahoo, 2012). Vocabulary aids are various small subject area/illustrated vocabulary lists, available to enhance word choice for metaphorical thinking and writing.

The semiotic objects used in this study were either symbols of the sacraments or extensions of those symbols. Semiotic objects, titled such in Abrahamson (2009), are a side product of the term *semiotic leap,* which he also coins. Semiotic leap refers to the first tacit inference of a concept resonating through appropriation via real objects

[5] In 2010 Pope Benedict promulgated the introduction of some translation variations on the Roman Missal for the English speaking American church (Knestout, 2011). These new translations bring the USA Missal closer to the intended meanings carried in the initial Latin.

(Abrahamson, 2009). In my study, I use specific symbolic artifacts of the sacraments which serve as semiotic objects resulting in semiotic leaps which in this context I call metaphorical thinking. Water is used as a symbol in Baptism (Vatican, 1993). The semiotic object for that symbol in my study is a printed sheet of cloud illustrations, which includes captions of the actual scientific name of the cloud formation (USPS, 2003). Using illustrations of clouds extends the metaphor of water. Clothing, worn by a celebrant also served as a semiotic object, especially through the textile color. The color is often a symbol of further meaning. I included the texture of the fabric of the clothing as part of the sensual stimuli of the semiotic object. For instance, in Reconciliation, a purple priest stole was the semiotic object used in the study; in Holy Orders, I employed a priest's chasuble. In the case of the Holy Orders chasuble, the vocabulary aid used to evoke lexemes for the sensation of the cloth of the chasuble was Haack's (2012) fabric dictionary. In a few cases, I presented two semiotic objects representing sacramental symbols to the students. For instance, to aid in student metaphorical thinking regarding the Sacrament of Holy Orders, the chasuble cloth and the chrism used in the rite of Holy Orders, were the semiotic objects. Grape wine (alcohol-free) was incorporated as the semiotic object in the rite of the Sacrament of the Eucharist. The Aroma Wheel and A Glossary of Wine Terms were the vocabulary aids for dialogue and Vehicle development for metaphorical thinking about the Sacrament of the Eucharist (Noble, 2013; Parker, 2015). Different wines can have various flavors and aromas. Wine flavors, are often affected by the aromas of the wine. How one perceives, a flavor and aroma of wine can be articulated using the Aroma Wheel (Noble, 2013, 2015), a standard tool to help in

distinguishing and identifying wines. The outer circumference of the Aroma Wheel provides lexemes for a level of flavor or aroma called precise. The inner circle sections of the wheel provide the broader categories of aroma. We perceive aromas of wine by way of taste or smell. However, wine aromas, are not often perceived by both senses at once. To generate lexemes for wine percipience, students may begin in the center of the Aroma Wheel. They then work their way outward in order to choose the lexeme suggestions to name their perception of the wine (Danzante, 2014). The other vocabulary aid for dialogical discussion and Vehicle development for the Sacrament of the Eucharist was A Glossary of Wine Terms (Parker, 2015). This aid provided, in addition to aroma variations, a more tactile percipient vocabulary such as *wood*, *viscous*, and *unctuous*. Students could use one or both of these vocabulary aids to assist in dialogue and metaphorical thinking. Metaphor is regularly used in common, everyday speech (Lakoff & Johnson, 1980). However, people are often unable to reflect on their use of metaphor or to recognize it as happening (Pramling, 2008). In my method, I provide clear instructions and provide vocabulary aids because to tell participants simply to write metaphors is often not enough to evoke metaphorical thinking.

In some cases, a few symbols used as the semiotic objects are not precisely described in the rite as indicated in the Catechism (Conference, 1994). Instead, they are traditional symbols, which the church literature on teaching the Catechism finds acceptable (Conference, 1997). Furthermore, these traditional symbols, such as the wedding ring and the purple stole of the priest, were more commonly experienced and, therefore, more familiar semiotic objects for most students in my treatment groups.

The Assessment of Catechesis/Religious Education Level 1, Part 1 for the fifth-grade, Form 12, 2001 (ACRE), was the assessment instrument used in this study. ACRE Part 1 measured knowledge of sacramental symbols and, other desired faith knowledge. Part 2 of ACRE contains qualitative questions, but I do not use that data in this study. However, the Discussion chapter in this dissertation further explores the use of this possible data source.

Procedure

The fifth-grade classes met once a week after school in a classroom, in the St. Cassian grammar school, in Montclair, NJ, where most of that parish's CCD program took place. I employed the actual treatments over a seven-week period in the course of a 26-week semester. I conducted one workshop each week in each class. The treatment group received four once-a-week workshops on extended-metaphor and symbols while the control groups received training as suggested by the textbook on the same curriculum subject though without my method. I scheduled makeup classes to cover metaphoric workshops for treatment students who missed one or more of the scheduled workshops. Then, both treatment and control groups were administered the ACRE. The ACRE2001 consists of eight faith study areas of knowledge and understanding meaning which serve as the appropriate foundation to the level of religious education and grade level of the students (Convey, 2010). Study Area 3 contains 9 items or questions. In Study Area 3, I narrowed my analysis to only the sacramental questions. Based on item descriptions of Study Area 3 items in the literature, I categorized the sacramental questions as meaning and knowledge questions. Meaning questions are those defined as such by the National

Catholic Educational Association in the ACRE computer assessment report (Learning, 2013). Meaning questions address the spiritual, emotional, social, and physical effect of the rite of the sacrament. These effects are suggested, metaphorically, by objects, or symbols, employed each sacramental rite. Questions of a more factual nature about the rite, and not the effect, of the sacraments I refer to as knowledge questions.

First, to discover if metaphoric thinking helped the treatment sample to gain knowledge of the sacraments, I analyzed the five specific questions within the ACRE, which are on the sacraments. I then compared the treatment sample mean of correct answers to the control sample mean. Secondly, to learn if treatment sample students garnered some personal meaning of the sacraments deemed appropriate, I analyzed the three specific questions on the meaning of the sacraments in the ACRE. Subsequently, I compared the mean of the correct answers of the control sample mean to the treatment sample mean. Thirdly, to find the level of metaphoric thinking of students in the treatment sample, I used the Dunn formula to measure the metaphoricity of each treatment sample member's two metaphoric statements on two specific sacraments. I then took the sum each student's two metaphoricity scores. Lastly, I conducted a descriptive analysis of the positive linear association between a treatment sample student's metaphoricity scores and their ability, to answer the three meaning questions relevant to the three meaning questions, correctly.

In short, the Research Questions I sought to answer using my method were:

1. Does a treatment of metaphoric thinking help students understand the sacraments?

2. Does a metaphorical thinking treatment on the sacraments help them to relate personally to that meaning in ways considered appropriate by the Church?
3. Is thinking metaphorically about the meaning of the sacraments related to better understanding of them?

To begin answering all three questions, I employed the method of teaching children how to write metaphoric poems. I then introduced them to one sacrament at a time and then had them physically experience one or two sacramental symbols. We then explored the vocabulary of the symbol and connected that language, metaphorically, to the likely or expected emotional outcome of participating in that sacrament. After four weeks of working with each sacrament and writing metaphoric poetry for each one, the students were then administered the ACRE assessment.

In this section, I provide a detailed method in this study. The method is used in all three of my Research Questions descriptions, as each of them asks for using metaphorical thinking to learn about meaning of the symbols of the sacraments. I will first discuss the steps of the treatment with the following summary of method steps in the order of execution. I took the following steps with students in my treatment classes:

1. First, I conducted a workshop on how extended-metaphor and Tenor and Vehicle work.
2. Then, I reviewed textbook rite and effects of a sacrament, two per class period.
3. Next, I facilitated dialogical inquiry to help students to consider Tenor and Vehicle for metaphors by way of vocabulary aids.

4. Then, dialogically, we drew a connection between the two groups of Tenor and Vehicle and formed sentences that generate new meaning, and we referred to this as the start of a poem. (Examples of Tenor/Vehicle lists created by students are in Appendix D.)
5. Students then made their own sentences from the chosen Tenor/Vehicle lists and developed these sentences through extended-metaphor. Similes, were allowed since they are still metaphoric, representing metaphorical thinking.
6. Students' read poems aloud. Then we discussed them, dialogically in the classroom.
7. We started at step 2 and continued to seven, for each of the remaining sacraments.

I securely stored the written work of the student sample. (See section on Data Analysis for more detail.)

Extended-metaphor Workshop

What follows is a description of the extended-metaphor workshop that occurred on the first day of the study in the treatment group. I start with a diagram created by Laurel Jean Becker on the Tenor/Vehicle process for the creation of her extended-metaphor poem "Children of the Vernal Sun" (Becker, 2002). After experiencing and discussing the Becker Tenor/Vehicle list, we then moved onto the extended-metaphor poem, by the same author of "Children of the Vernal Sun," (See Appendix E).

I discussed with the students how the Tenor and Vehicle links in the diagram lead to meaningful sentence formation in the poem. I explained that metaphorical thinking is the process of forming these connections and writing meaningful metaphors. I mentioned

that metaphors are one thing representing something else, such as yellow bonnets on children, which represents the flowers on daffodils.

Lakoff (1980) and others suggest that the vocabulary for the Vehicle may be lacking initially in the thoughts of almost everyone when creating metaphors (Black, 1962; Fiumara, 1995; Koch, 1970, 1973; Lipman, 1978, 1980). That is why for these workshops, we explored the general symbol of the sacrament and researched the vocabulary and language for that symbol so we would reach new specificities and extend the metaphor. Students somatically experienced a semiotic object, representing one or more of the symbols of the sacraments. I employed vocabulary aids for use in dialogically discussing the lexemes for the Vehicle list (Acree & Arn, 2004; Haack, 2012; Parker, 2015; Parviainen, 2004; Shanken, 1996; Smith, 2013; USPS, 2003).

I facilitated the extended-metaphor workshop on the first day of the treatment (Becker, 2002). I then conducted three consecutive once a week classes for both of my treatment classes that covered two of the seven sacraments. Then I facilitated one more class, covering the one sacrament remaining out of the seven. Additionally, I conducted one class that was a make-up workshop for students who had missed one or more of the sacrament workshops due to absence.

In each of the sacrament workshops, I first reviewed with students the rite and effects of the sacrament as presented in the textbook (Classuck, 2006). The rite of a sacrament consists of the narratives, sounds, smells, and visual symbols that point to deeper meanings. The deeper meanings of what we see, smell, feel, and hear in a sacrament are called the effects (DeStefano, 2006b). So, within the category of the rite,

there are symbols, symbols of meaning. These symbols may be objects or substances that have an actual somatic presence in the rite. Sacramental symbols may include Chrism, which is a sensorial stimulus when applied to the body of the participant in a sacrament. Chrism is visual, tactile, and has a specific aroma, which can be different for each sacrament that uses chrism. I used various types of chrism as the semiotic objects for three of the sacrament workshops: Holy Orders, Confirmation, and Healing of the Sick. Of course, there are other semiotic objects for other sacrament metaphoric workshops.

Semiotic objects employed in this study were actual or traditional symbols used in the Rite of a sacrament. First, the students experiences the semiotic object. Subsequently, they then, through dialogical discussion in the classroom, worked to form a Vehicle list for that sacramental workshop. After the students had experienced the semiotic object, I posed questions to begin a dialogical inquiry on the meaning and metaphors for each sacrament. To assist in our dialogic inquiry, I provided the students with vocabulary aids. I introduced some of these above. The vocabulary aids gave students access to language choices, or lexemes, to assist in the inquiry. The aids also helped students to form the Vehicle lists for metaphor development and to evoke metaphorical thinking.

I wrote the Vehicle list on the blackboard as the students verbally suggested lexemes for that part of the extended-metaphor. I rejected no lexemes at first. However, completion of the list, we dialogically discussed Vehicle student choices as plausible. This Vehicle list for the semiotic object of a chrism may have included some of the vocabulary choices from the Flavornet vocabulary aid (Acree & Arn, 2004). However,

the sample considered other student suggestions. In some cases, students added further to their Vehicle list on a sheet of paper. Here is an example of a Vehicle list of student perceptions of chrism aromas: *Christmas tree, pine, butter, herb, wax, almond shell, wood, oil, earth, citrus,* and *brown sugar*.

Students then completed their lists. Next, I moved onto guiding them to discuss, dialogically, the possible emotions experienced by the sacrament recipient. I wrote the vocabulary choices for these selected emotions in the Tenor list on the blackboard. To aid in vocabulary choices for emotions, I directed student attention to the vocabulary aid for this part of the method. The vocabulary aid I employed was a list of emotions, each illustrated with a drawing of the facial expression that that particular emotion suggested (Yahoo, 2012). The students made word choices for the emotions that they may feel as an effect of the sacrament. I then wrote them on the blackboard on the list marked Tenor. For instance, during Reconciliation (Penance), a sacrament of healing, which involves the penitent talking to a priest and acknowledging being sorry for her certain behaviors or thoughts, and then receiving forgiveness, we explored some of the personal emotional and psychological experiences which may be possible in that encounter. Here is an example of the Tenor list of feelings for the Sacrament of Reconciliation: *sad, bad, embarrassed, ashamed, punished, troubled, excited,* and *relieved*. Here too, I invited students to copy the Tenor lists that the class dialogically agreed to on the board or add their additions to the lists on their sheet of paper. Students then had on a sheet of paper a Vehicle list, titled Vehicle, written vertically on the left-hand side of the paper. Also, students wrote a Tenor list, vertically on the right-hand side of the paper. In some cases

this format was not always followed precisely. This however, is not significant. Then I instructed students to draw connections between a choice in the Tenor list and a choice or two in the Vehicle list. Students took a pencil or pen, and chose one selection from their Vehicle list and drew a line directly to their Tenor choice on the other side of the page. This process was similar to the Tenor/Vehicle workshop based on the "Children of the Vernal Sun" extended-metaphor poem (Becker, 2002). Of course, these connections are more often than not, not directly horizontal but rather can go in any selected direction. The Tenor list, in this case, contains mental, social or intangible domain lexemes while the Vehicle list may contain physical domain lexemes (Nireburg, 2004). Because Tenor and Vehicle represented different domains of thought, the students were thus cross-domain mapping, which I am adding to the category of metaphorical thinking. I asked students to make at least one of these cross-domain maps but could make as many as they wanted to.

From each connection, students created their metaphoric phrases or sentences. They could then move onto further Tenor/Vehicle connections on the list and continue to form new sentences, the result of which we defined as a metaphoric poem. Many of the students in the class read their metaphoric poems aloud to the class, and we continued dialogical conversations about each one of them. The discussions included why the metaphors worked, the esthetics of the poetry and feasibility of acceptance for some metaphor choices.

The result was students in the method group had somatic experiences and did metaphorical thinking. Additionally, students in the method developed extended-

metaphor poetry about each sacrament. These poems fostered an understanding of meaning of the sacramental symbols. After the five week period of this method's workshops were completed, students then were administered the ACRE assessment according to the protocols instructed in the ACRE facilitators' guide (National Catholic Educational Association, 2001b).

ACRE Assessment

Eight faith study areas of knowledge serve as the foundation of the 2001 ACRE. The ACRE writers structured their questions into the eight study areas, with two objectives for each study area. The difficulty, number and content of the items of the eight study areas were appropriate to the level of religious education and grade levels of the students (Convey, 2010).

The ACRE 1 test contains a total number of 51 items in Part 1 on Religious Knowledge and 27 statements to respond to in Part 2 on Personal Belief, Attitudes, Practices and Perceptions (Convey, 2010). While Part 2 and Part 1 must be administered (Association, 2001b), Part 1 is what is employed as the instrument in this study. Within Part 1 of the ACRE, I analyze the amount of correct or incorrect answers to items from Study Area 3 in the ACRE 1 instrument entitled Liturgy and Sacraments. Study Area 3, Liturgy and Sacraments, does cite these two objectives which serve to discover if students:

1. Know about the Church’s liturgical life in terms of liturgical feasts, seasons, symbols, religious practices and concepts of prayer.

2. Know and understand the sacraments as signs and instruments of grace (Convey, 2010).

Study Area 3 contains 9 items, or questions. One objective of this part of the ACRE was to discover if students know about the Church's liturgical life in terms of liturgical feasts, seasons, symbols, religious practices, and concepts of prayer. The objective does mention "symbols" which begins to touch on the symbolic nature of metaphor. More relevant to my study was Objective 2 of Study Area 3 on Liturgy and Sacraments which is *know and understand the sacraments as signs and instruments of grace*. The reason I focused on Objective 2, of Study Area 3, Liturgy and Sacraments in ACRE 1, was that the Archdiocese of Newark has regional data from previous ACRE assessments relevant to this particular objective. The Archdiocese found that the body of the fifth-grade students taking the ACRE fell below the national norm in understanding the meaning of the symbols of sacraments (Foer, 2012, 2014).

Based on assessment data received from the assessing agent (Learning, 2013) I further identified questions within Study Area 3 as being either Liturgical or Sacramental. While it was clear which questions were liturgy related, and which were sacrament related, this was not be the case with other questions, such as question 18 which uses the word Liturgical in its query about the symbol used in Confirmation. Therefore, I have positioned this question as Liturgical as the language addresses it as such.

The ACRE assessment queries a Study Area of knowledge on the meaning and definitions of the sacraments. Studying the ACRE assessment result data, I then compared the scores of my treatment sample on questions designated by the Church to be

about the sacraments, to the scores of my control groups, on those questions. There are two main parts to the ACRE assessment. The ACRE assessment Part 1 covered a broad variety of knowledge of the Catholic faith, which the Church desired fifth-grade students to understand and know.

Data on the ACRE assessment results, from the school where I did my study, was provided by Computerized Assessments and Learning in cooperation with the Department of Religious Education at the National Catholic Education Association (NCEA), which is responsible for the ACRE data for Roman Catholic religious educations programs in the United States. Most ACRE schools are provided with these reports. The report provided results for all the fifth-grade classes at St. Cassian School. Each designated class analysis in the St. Cassian report is in to two main sections: Part I: Faith Knowledge and Part II: Affective Statement Summaries. Part I: Faith Knowledge, is further divided into eight study areas of desired knowledge and meaning item categories. These study areas are:

1. God—Father, Son and Holy Ghost
2. Church—One, Holy, Catholic and Apostolic
3. Liturgy and Sacraments
4. Revelation, Scripture, and Faith
5. Life in Church—Personal Morality and Catholic Social Teaching
6. Church History
7. Prayer/Religious Practices
8. Catholic Faith Literacy.

The questions of each item, are randomly[6] distributed throughout the ACRE assessment.

The Study Area of knowledge and meaning relevant to my study is Study Area 3: Liturgy and Sacraments. In my data collection, I extracted the questions, which are liturgy related and focused only on questions, which are about the sacraments. The questions that are in Study Area 3 include nine questions. The NCEA ACRE Report for the St. Cassian School, in the 2013 ACRE assessment lists the item questions within each study area title and provides the assigned number for each question as it appeared in the assessment.

There are nine item questions within Study Area 3. Five of those questions directly address the Sacraments. The NCEA ACRE report provides a brief description of all questions in the report. Two of the sacrament questions, are meaning questions. Two others are definition questions. I have put definition questions, and another sacrament-related question like it, into a category I am calling knowledge.

For instance, item number 47 is a definition question (Learning, p. 79). So I am putting it into the knowledge category. Item 40, however, is related to knowledge of the three main types of the sacraments—initiation, healing, and service—because item 40

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[6] Within ACRE, comprehensible content study areas define items that develop a study area-referenced assessment. The common assumption is that items are selected randomly, from a study area category. However, in reality the random sampling of items does not happen. Instead, specific items judged as quintessential to all the study areas are written by authorities within the content (Convey, 2010).

addresses initiation and is defined as "identify sacraments of initiation" (p. 6). According to the assessment report (Learning, 2013), this also identifies a category. I considered Item 40 a knowledge question, rather than meaning.

Meaning questions. There are three questions in Study Area 3, which addressed meaning of the sacraments. The ACRE assessment report on the performance of my fifth-grade method classes in the subject school directly identified two items as *meaning* questions (Learning, 2013). For doctrinal reasons, item 25 on Holy Communion, was not identified, in the report, as a meaning question. Because of the doctrine of the Catholic faith, the wording of this statement goes beyond meaning and metaphor. (See transubstantiation (Vatican, 1993)). Keeping that in mind, for the purposes of this study I interpret this particular item question as addressing meaning and put it in the Meaning category. Therefore, for the purposes of this study, I will put question 25 into the category of meaning of the sacraments. I paraphrase, the following ACRE items because of copyright restrictions and because these item numbers are parts of a national assessment. Even though there is now a new ACRE version, 70% of the items in the ACRE 2001 remain in the new version (Dahlhoff, 2015).

Meaning of Holy Orders (Learning, p. 43)

Question 23 asks what is the sacrament received by people who are summoned by God through the Church to become a priest or minister? There are four sacraments mentioned as possible answers. The preferred choice is Holy Orders.

Holy Communion: Jesus Christ's Body and Blood (Learning, p. 42)

Question 25 asks about the Eucharist. Out of four choices, the preferred answer suggests that Holy Communion is the body and blood of Jesus Christ (Association, 2001).

Meaning of the sacraments (Learning, p. 42)

Question 33 queries students about the reason why we celebrate the sacraments in the first place. Out of four choices for a response, the preferred answer is that the sacraments are signs of God's love, supernaturally.

Knowledge questions.

Identify sacraments of initiation (Learning, p. 43)

Question 40 queries a category of the sacraments. It asks roughly for the third sacrament which is in the category of initiation which also includes Holy Communion and Confirmation. In this case that would be Baptism.

Definition of Sacrament of Penance (Learner, p. 79)

Question 47 questions the sacrament of Penance, by stating the effect of the sacrament on its participants (Association, 2001).

To summarize**,** having explained the Study Area of Liturgy and Sacraments as one of the eight knowledge study areas in the ACRE assessment, I then narrowed the questions in that Study Area to only the sacramental questions. Then, based on item descriptions of those questions as indicated in the NCEA ACRE report (2013), I then

divide the sacramental item questions in Study Area 3 into two categories for the purpose of my study, those being meaning, and knowledge.

Subsequent to working with students, to dialogically, find meaning, by meaning-making[7] though extended-metaphor writing, I then measured the metaphoricity of the extended-metaphor of each student's poetry and compared the students' metaphoricity scores to their scores on the questions related to the meaning of the sacraments in the ACRE**.** I employed the Dunn method of measuring Gradient semantic intuitions of metaphoric expressions (2011). Semantics in this study means the meaning of words or phrases in a particular context. Here is the formula to "measure" metaphoricity as a result of metaphorical thinking (Dunn, 2011). (See Results chapter and Appendix G, for examples of Dunn system applied to student poems.)

Metaphoricity = [(# of domains) + (# of mismatches)] x (# case roles)

Data Analysis and Assessment

Research Question 1. Does a treatment of metaphoric thinking help students to understand the sacraments? After employing my method in the first part of my study, I sought to see if engaging students in my approach would help them to understand the sacraments. To address this question, I analyzed the results to questions in the ACRE, which are determined by the Church, to be about the personal meaning of, and

[7] Meaning-making is a phrase used in much of the metaphor literature. Meaning-making refers to cross-domain mapping between two different domains of thought and therefore generating meaning (Freeman, 1995). I have previously put cross-domain mapping into the category of metaphorical thinking. I put meaning-making in that category as well.

knowledge about, the sacraments. The ACRE assessment (Association, 2001a) was taken after the five weeks of extended-metaphor workshops. I analyzed five specific sacrament questions within the ACRE to attempt to determine if metaphoric thinking helped the treatment sample, gain knowledge of the sacraments. I compared the control sample mean of correct answers to the treatment sample mean.

The five questions from the ACRE instrument, Study Area 3, on Liturgy and Sacraments, related to the sacraments are items 25, 33, 25, 40, and 47. I calculated the mean for treatment and control samples, scoring each student with a number from 0 to 5 indicating how many of the five questions were answered correctly by the student, according to the ACRE raw data, which indicated what answer was given for each question. (For a description of ACRE, raw data see Measures, this chapter.)

Research Question 2. Does a metaphorical thinking treatment on the sacraments help them to relate personally to that meaning in ways considered appropriate by the Church? I analyzed the three sacramental meaning questions in the ACRE in an attempt to see if treatment sample students garnered some personal meaning of the sacraments in ways deemed appropriate by the Church. I compared the mean of the correct answers of the control sample mean to the treatment sample mean.

Out of the five questions selected for this study that are related to the sacraments—items 25, 33, 25, 40, and 47—item numbers 23, 25, and 33 were specifically analyzed to answer this questions as they were the three questions of *meaning* as identified by the ACRE assessment report on St. Cassian School CCD program in 2013 (Learning, 2013). Item numbers 23, 25, and 33 are questions about the

meaning of Holy Orders, Holy Communion, and all the Sacraments in general, respectively. I analyzed the students' raw data responses to these item questions from the ACRE for my treatment and control samples.

Research Question 3. Is thinking metaphorically about the meaning of the sacraments related to better understanding of them? In order to see how much metaphorical thinking students in the treatment sample had actually done, I measured the metaphoricity of each treatment sample member's two metaphoric statements on two specific sacraments. I added each student's two metaphoricity scores for a sum score. Next, I conducted a descriptive analysis of the positive linear association between a student's metaphoricity scores and ability to correctly answer the three ACRE meaning questions.

To measure the metaphorical thinking of the students, I measured the metaphoricity of their two sacrament meaning poems. In order to measure metaphoricity I utilized the Dunn method of measuring gradient semantic intuitions of metaphoric expressions (2011). In this way, I was able to rank students according to their ability to think metaphorically as evidenced by their extended-metaphor poetry. I collected the poetry written by each student who completed the assignment, at the end of each workshop. Student work was stamp dated. These records were stored in a large binder, with tabs identifying date, sacrament, and class and were then stored in a locked file in a building on the Montclair State University campus. There were eleven student participants in the treatment sample. I measured the metaphoricity levels of their sacrament poems for the sacraments of Holy Orders and Holy Communion.

Item 33 on the ACRE is not on a sacrament specifically, but rather on the meaning of the sacraments in general. Here is how I included that item in this analysis: I took the sum of each student's Holy Orders and Holy Communion metaphoricity scores and compared those sums to the sum of correct responses for item 33. I did not conduct a metaphoricity workshop for the item on the Meaning of the Sacraments, but rather metaphoric workshops were given for all the seven sacraments individually. I included item 33 on the Meaning of the Sacraments because I wanted to see if students who did high level metaphorical thinking on more than one of the sacraments would, more likely, be able to correctly answer item 33 on the general meaning of the sacraments.

Most of the students in the study wrote metaphoric poems on more than one of the sacraments, in fact most had completed at least six different sacramental poems. This study examines primarily the effect of metaphorical thinking on the meaning of the sacraments, which only includes ACRE items 23 and 25, which are about Holy Orders and Holy Communion respectively. So staying within the parameters of this study, I am only using the metaphoricity scores of the poems on these two sacraments. These parameters eliminated students from the study who had not completed one or more of the sacrament poems for Holy Orders or Holy Communion.

Some of the metaphoric sentences students have created are, in fact, similes. As long as the sentences are metaphoric, and not necessarily metaphors they were acceptable for this study. Still the statement had to be either a metaphor, or simile trope for me to consider them valid poem sentences to which I applied the gradient system of intuitive metaphoricity. I define a poem in this as one sentence or phrase with metaphoric content.

Measures

I analyzed data from three variables: knowledge, meaning, and metaphoricity. I assess knowledge of the sacraments through student responses to the five, ACRE items, that ask about the sacraments. Three of those five, ACRE items, are meaning questions as described by ACRE. Metaphoricity is the strength of metaphorical thinking measured through analysis of student writing on those two sacraments. I acquired knowledge and meaning data through treatment and control sample responses to items 40 and 47, 25, 23 and 33 in ACRE. I employ all five of the sacrament questions in the analysis of sacrament knowledge. The knowledge questions include items 40 and 47. Item 40, asks students to Identify sacraments of initiation because it asks for the third sacrament that is in the category of initiation. Initiation includes Holy Communion, Confirmation, and Baptism. The preferred response to this question is Baptism. Then item 47 asks for the definition of Sacrament of Penance by stating the effect of the sacrament on its participants, which is receiving forgiveness (Learning, 2013).

Another variable is meaning questions. These are questions defined as such by the ACRE computer assessment report (Learning, 2013). Meaning questions address the spiritual, emotional, social, and physical effect of the rite of the two particular sacraments. These effects, are metaphorically suggested, by the objects employed in each sacramental rite.

Three meaning items are numbers 25, 23, and 33 (Learning, 2013). Item 25 asks about the Sacrament of Holy Communion. Because of the doctrine of the Catholic faith the wording of this statement is articulated beyond meaning and metaphor (Vatican,

1993). For the purposes of this study only I interpret this particular item question as addressing meaning and put it in the meaning category. Out of the four choices for item 25, the preferred answer is that Holy Communion is the body and blood of Jesus Christ (Association, 2001b). Item 23 is on the meaning of the Sacrament of Holy Orders. The item asks what is the sacrament received by people who become a priest or minister (Learning, 2013)? Out of four sacraments mentioned as possible choices as a response to item 23 the Sacrament of Holy Orders is the preferred choice. Next, item 33 addresses the meaning of the sacraments by asking students for the reason we celebrated the sacraments in the first place (Learning, 2013). There are four choices, and the preferred answer, paraphrased, is the sacraments are supernatural signs of the love of God. Subsequent to collected information through the mean of correct answers for Research Questions 1 and two then employed the analytic technique of a t-test.

For Research Question 3, I calculated the mean of the number of preferred answers by each of the treatment sample students for all three meaning questions. There were eleven student participants in the treatment sample. I have measured the metaphoricity levels of their highest scoring metaphoric sentence from their poems for each of the sacraments of Holy Orders and Holy Communion. I then measured the metaphoricity of the metaphor of each student's written statement for two sacrament metaphoric workshops. To do so, I employed the Dunn (2001) method of measuring Gradient semantic intuitions of metaphoric expressions. Here is the formula to measure metaphoricity as a result of metaphorical thinking (Dunn, 2011).

$$\text{Metaphoricity} = [(\#\text{ of domains}) + (\#\text{ of mismatches})] \times (\#\text{ Case roles})$$

Domains are the four possible thoughts, mental, social, intangible, and physical (Nireburg, 2004). Tenor and Vehicle of a metaphor within the same domain is called single domain mapping. However, when Tenor and Vehicle address different domains such as physical and mental, then that is cross-domain mapping. A single domain gets a one and cross-domain scores a 2. Subsequently, we add an additional score of 1 to the first part of the formula when there is a cross-domain mapping. In single domain mapping, there is no mismatch, so it received a zero. The next part of the formula involves case roles that are the participants in the metaphoric event. To be considered a case role for this formula, the phrase must be metaphoric and contain a participant. Continuing the measurements for Research Question 3, I then conducted a descriptive analysis of the positive linear association between the two variables of meaning and metaphoricity. I did this to see if the higher the metaphoricity score on their sacrament metaphoric statements would mean a higher the score in learning the meaning of the sacraments. I calculated a scatterplot, to summarize, the results (Figure 1).

I acquired student responses to the five sacrament items, employed as the variables of knowledge and meaning from the ACRE raw data. On the ACRE raw data, almost all students indicated by name. Then, below the name is a line of fifty-one numbers, which can range from one to four. The fifty-one numbers represent the student response to the fifty-one items in Part 1 of the ACRE. For anonymity, I replaced student names with the students' randomly generated numbers (StatTrek.com, 2015). The five sacrament items in Domain 3 of the ACRE are all multiple choices questions. For each of those five items, the student marks a small oval; either letter A, B, C, or D label each

of those ovals. On the ACRE raw data, these letters are coded 1, 2, 3, and 4 respectively. I indicated the ten students out of the control sample, and eleven out of the control who were identifiable by name and had completed the IRB approved consent and assent forms. My first purpose was to find the means of the two sample scores (treatment and control) and then to determine the statistical significance between the two scores. Then I measured the two variables of meaning and metaphoricity in just the treatment sample.

Chapter 4: Results

Through my methodology, I collected data in order to respond to my three Research Questions. In brief, I acquired results by addressing the three questions in the following ways:

1. To discover if engaging students in my approach helped them to understand the sacraments, I conducted a t-test comparison of the means of the treatment and the control samples, in their answers to all 5 of the relevant ACRE sacrament questions.
2. Then, to see if engaging students in metaphorical thinking on the sacraments helped them relate personally to the meaning considered appropriate by the Church, I reduced the 5 sacrament questions to just the three ACRE questions on the meaning of the sacraments. I conducted a t-test to compare the treatment and control samples means of correct answers on these 3 items.
3. Finally, to determine if thinking metaphorically about the meaning of the sacraments is related to a better understanding of them, I focused the data to the metaphoricity scores of two poems per student and related them to the amount of correct answers for the three meaning questions. I conducted metaphorical thinking workshops for only the treatment sample. Therefore, only the treatment sample means for correct answers to the three sacrament, meaning questions in ACRE were then, compared, to the sum of the metaphoricity scores of the two sacrament poems. Two of these questions are sacrament specific, whereas one question relates to the meaning of the seven sacraments as a whole.

Research Question 1. Does a treatment of metaphoric thinking help students to understand the sacraments?

I conducted an independent-samples t-test to compare the number of correct answers to the 5 sacrament questions by the treatment and control samples. There was not a significant difference in the scores for the treatment sample (M=4, SD=1) and the control sample (M=3.4, SD=1.17); $t(10)=1.31$, $p = 0.112$. While I cannot say that I am sure my treatment helped students to improve their knowledge of the sacraments, there still may be small possible chance that it did. The data suggests that other studies, with a larger sample, should be conducted.

To answer Research Question 1, I analyzed the data from the ACRE instrument, Study Area 3, on Liturgy and Sacraments. This data was the 5 items related to the sacraments. Items about Liturgy were outside the scope of this study. I scored each of these students with a number from 1 to 5 indicating how many of the 5 questions were answered correctly, according to the ACRE raw data for St. Cassian School, in 2013. That raw data indicated the answer given for each question by each student. Specifically, I identified item numbers 23, 25, 33, 40, and 47.

I selected the students in the control and treatment samples who I identified by name, and who had completed the IRB approved consent and assent forms. Students were all assigned randomly generated numbers for anonymity (StatTrek.com, 2015). In one control class only one student was named—random number 440—out of the fourteen. Because I could not verify whether or not, the other class four students had returned consent and assent letters, I excluded thirteen of the participants of the control

group from the study. The two groups included in data analysis in this chapter then, were the treatment sample, with 11 students, and the control sample, with 10 students.

Research Question 2. Does a metaphorical thinking treatment on the sacraments help students to relate personally to that meaning in ways considered appropriate by the Church?

For Research Question 2, I also conducted an independent-samples t-test, which compared the number of correct answers to the 3 sacrament meaning questions in the treatment and control sample. There was not a significant difference in the scores for the treatment sample (M=2.4, SD=0.68) and the control sample (M=2, SD=0.81); $t(10)=1.44$, $p = 0.09$. As a result, of this data I cannot be sure that my treatment helped students to relate personally to the meaning of the sacraments in ways considered appropriate by the Church. There still may be small possible chance that this treatment did help students to relate personally to the meaning of the sacraments. Further studies with larger samples, may be warranted.

In addressing Research Question 2, I analyzed the raw data from the ACRE for my study groups. I identified the three questions on the meaning of the sacraments. Those questions were numbers 23, 25 and 33; these questions are about the meaning of Holy Orders, Holy Communion and all the Sacraments in general, respectively. Holy Orders, 23, and Holy Communion, 25, were named as meaning question in the Computerized Assessment NCEA ACRE, St. Cassian Parish**,** Newark in 2013 (Learning, 2013).

Research Question 3. Is thinking metaphorically about the meaning of the sacraments related to better understanding of them?

A descriptive analysis of the positive linear association was computed to assess the relationship between (Variable 1) a treatment sample students' metaphoricity scores and (Variable 2) their ability to correctly answer the three meaning questions. A scatterplot summarizes the results (Figure 1). The scatter plot suggests a correlation between higher metaphorical thinking scores and understanding the meaning of the sacraments.

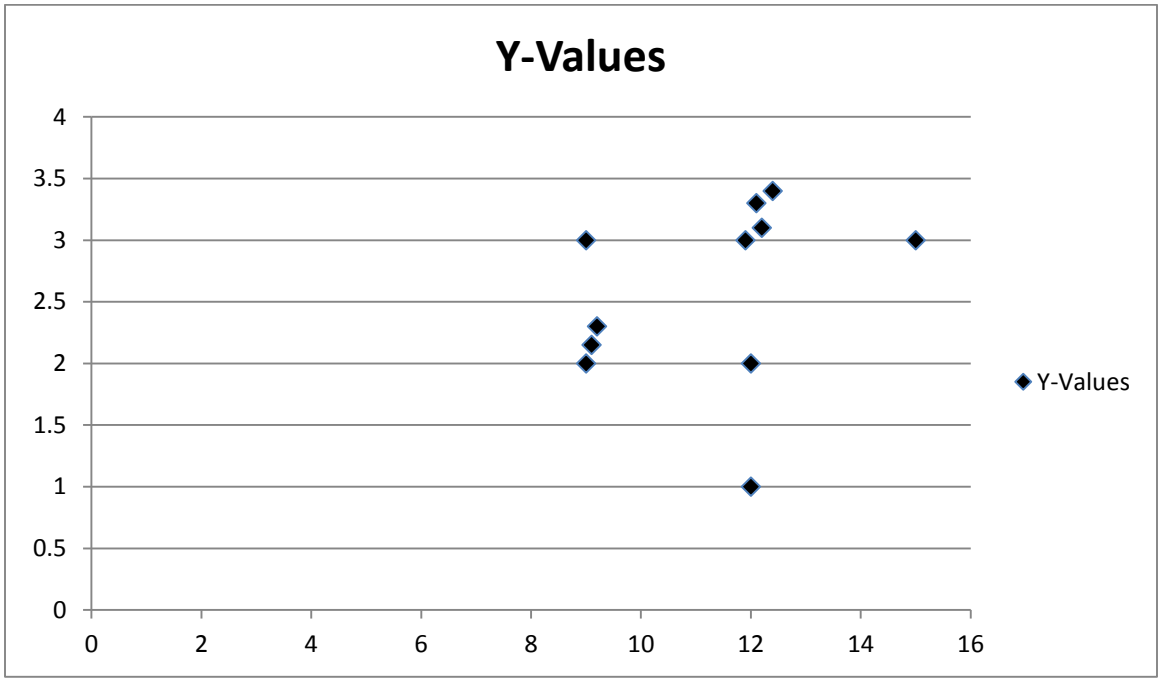


Figure 1. This scatter plot measures the y-value, which is the sum of the three meaning of the sacrament question answered correctly by the treatment sample students. This y-value is in relation to the horizontal x-values line, which is the metaphorical thinking score for the treatment sample students. The scatter plot may suggest an association between higher metaphoric thinking scores and understanding the meaning of the sacraments. To show the amount of scatter

diamonds in each area I manipulated the numbers slightly by adding decimal points of 0.1, 0.15, and 0.2. The only possible scores are 0, 1, 2, and 3. So these decimal additions are insignificant and for visual purposes only.

To compute this descriptive analysis of the positive linear association between the two variables, I have measured the sacrament poems for the sacraments of Holy Orders and Holy Communion, for the eleven student participants from the treatment sample. I measured these poems for metaphoricity because two of the ACRE questions were on the meaning of the sacraments of Holy Orders and Holy Communion. I did not conduct a metaphoricity workshop for the Meaning of the Sacraments specifically but workshops were conducted for all seven sacraments individually. There was one ACRE meaning question number 33 titled Meaning of the Sacraments by Computerized Assessment and Learning (Learning, 2013). I applied the sacrament metaphoricity scores for Holy Orders and Holy Communion to question 33.

In the following section, I will demonstrate how my method did foster metaphorical thinking, and how I measured metaphorical thinking. To do that I will take you through the process for the dialogue and metaphorical thinking for each of the two sacraments analyzed for this research question. We can identify metaphorical thinking then by the metaphorical phrases, or poems, of the students. Here are two examples of metaphorical phrase formation, one for each of the two sacraments analyzed in the scatter plot. Furthermore, I demonstrate how I applied the Dunn (2011) system to these examples.

Sacrament of Holy Orders

Rite. The rite of Ordination of a Priest is part of the Sacrament of Holy Orders. A bishop places his hands on the heads of the candidates for Holy Orders. Likewise, all other priests receiving the rite may do the same. A prayer of consecration is articulated by the bishop who says, in part, "Almighty Father, grant to these servants of yours the dignity of the priesthood." Subsequently, each now ordained priest receives a stole and a chasuble to wear. They put them on. The palms of the hands of the new priests are anointed with chrism while the bishop prays: "The Father anointed our Lord Jesus Christ through the power of the Holy Spirit. May Jesus preserve you to sanctify the Christian people to offer sacrifice to God." For the metaphorical thinking workshops for this sacrament, the semiotic objects chosen to represent two of the symbols are a priest's chasuble as well as the chrism.

Effect. The effects of the Sacrament of Holy Orders include receipt of, what the Catechism describes as a permanent indelible character. This effect is permanent because, even if forbidden from practicing the functions of a priest, an ordained priest, never returns to being a layman. Another effect of Holy Orders is that the ordained, now acts as a representative of Christ, who is Head of the Church, in the triple office of priest, prophet, and king. Other effects include receiving the grace of the Holy Spirit and endowment of other spiritual gifts. In my method, I condensed the effects involving permanence and representing Christ into two effect concepts. The first is Commitment to serve the church. To evoke this effect concept I presented the dialogical query, "How might it feel to make a lifetime commitment?" As in all effect dialogical inquiries, we

employed the vocabulary aid of the emotion sheet. I wrote the dialogical conversation on the blackboard, under the Tenor list. Here are the emotions we discussed: *Meditative, shocked, comforted,* and *cautious*. For the second effect, to share in Christ's priesthood, the question addressed by the group in the dialogical discussion was "How could it feel to share your vocation with Christ?" The emotion sheet was employed as the vocabulary aid (Yahoo, 2012). The further Tenor lexemes chosen by the treatment sample included *blissful, fearless, interested, demure,* and *puzzled*.

Example. What follows is an explanation of subject 293's Tenor/Vehicle cross-domain mapping followed by the subsequent poem. First, the lexemes for textile names, representing the somatic object of the chasuble, followed by lexemes about aromas, representing the somatic experience of the chrism. Participant 293 selected *thrilled* as the lexeme in Tenor and connected the word to two choices from the Vehicle list, *cashmere*, and *mint*. The first part of the first metaphoric sentence reads "I was thrilled; it felt like cashmere wrapped in mint surrounding me…" It is evident in this part of the poem how the Tenor/Vehicle choices worked metaphorically in that phrase. Still, the writer goes on to add more to that sentence and, in addition, writes a second long sentence. There were no further links drawn by this student between Tenor and Vehicle on the blackboard list. Still the rest of the poem does utilize lexemes from the subject's Tenor/Vehicle list, utilized in the remainder of this poem. Furthermore, this poet also added more emotional choices to the poem that were not on the collectively dialogically generated list. This student conducted cross-domain mapping between ideas without drawing lines between them. Furthermore, the student used vocabulary choices not included in the class

dialogue list. Cross-domain mapping without pencil lines and making further vocabulary choices may demonstrate this student understands how to think metaphorically.

Student 293, Sacrament of Holy Orders

(Domain: Mental) (Domain: Physical, case role: Location)

I was thrilled; it felt [like cashmere wrapped in mint surrounding me] while I felt as

(Case role: Destination)

confident [as fusion and cotton mixed together] with me on the outside watching.

Metaphoricity: (2 domains + 1 mismatch) x 2 case roles = Total 6

There are two different domains of thought addressed in the Tenor and the Vehicle of this metaphorical statement resulting in cross-domain mapping, which is part of the process for metaphorical thinking. Tenor and Vehicle in the sentence present these two different domains: "I was thrilled" is in the mental domain and "like a cashmere wrapped…" as well as "a fusion and cotton mixed…" are in the physical domain. Two different domains of thought means there is one mismatch, with the score for that mismatch being 1. Recall, single domain mapping would not have a mismatch and thus would be scored with a 0. While there may be several participants in this metaphoric sentence, two of the participants, or case roles, are within metaphoric content: "cashmere wrapped in mint surrounding me" which I have selected as a *location* case role from the list of nine possible case role titles: *agent, beneficiary, instrument, location, path, destination, purpose, source,* and *theme* (Dunn, 2011; Nireburg, 2004). Furthermore, "fusion and cotton mixed together" I have named as *destination*. As previously discussed, what case role titles these phrases are given does not affect the data of this study. More than one

case role in this student's poem results in a higher metaphoricity score, representing a higher level of metaphoric thinking.

Sacrament of the Eucharist

Rite. In the Rite of the Eucharist or Holy Communion, the essential signs of the sacrament are wheat bread and grape wine. An ordained priest invokes the blessing of the Holy Spirit upon these signs. The priest then pronounces the words of consecration spoken by Jesus during the Last Supper: "This is my body which will be given up for you. . . . This is the cup of my blood. . . ." The bread and wine are thus consecrated to have them become Body and Blood of the Lord (Conference, 1994). Next, the congregation receives the Body and Blood of Christ, by eating the wheat bread and drinking the grape wine. The semiotic object selected for the method of this sacrament was grape wine. For my study, I employed alcohol-free white wine, specifically Fre ® Alcohol-free 2010 Chardonnay, which contains 24 % juice. The alcohol was removed, from alcohol-free wine, before bottling. Each student received a very small sample cup of this wine to sip, smell, and whirl. While experiencing this semiotic object, I initiated dialogue with the question, "What words for the flavor and aroma of this wine may connect to the effects of this sacrament?" The vocabulary aids applied to this part of the method are the Glossary of Wine Terms (Parker, 2015) and the Aroma Wheel (Noble, 2013, 2015). I wrote lexemes such as *herb musk, smooth browning fruit,* and *almond butter* on the Vehicle list on the blackboard. Students built the Vehicle through dialogical metaphorical thinking.

Effects. The Eucharist is the central sacrament of the Catholic faith. The effects as stated in the Catechism are many. I will give a summary of the effects of this sacrament. As in other extended-metaphor workshops on the sacraments in my method, dialogical discussion and metaphorical thinking will query a combination of two of these effects. Effects of the Eucharist as I have interpreted them from the Catechism follow.

The Eucharist is reparation for the sins of the living and the dead and helps obtain spiritual, temporal benefits from God. Receiving this sacrament builds the relationship between the communicant and Christ, reinforcing the unity of the Church and unites us, even now, to the Church in heaven. A pledge of glory with Christ, the Eucharist helps us to sustain strength along the pilgrimage of this life and makes us long for eternal life.

I based the dialogical focus here on the Catechism: "Receiving this sacrament builds the relationship between the communicant and Christ, reinforcing the unity of the Church and unites us, even now, to the Church in heaven." The inquiry topic I employed in the method was "Joined more fully to the community of the church," as suggested by the student textbook (DeStefano, 2006a). The dialogical query I deliver to the class was "How do you feel when invited to a nice meal at a friend's house?" The emotion vocabulary aid (Yahoo, 2012) was used here too to help evoke metaphorical thinking in the dialogical conversations. The class, dialogically, suggested lexemes for the Tenor list such as *shocked, interested, joyful, happy, satisfied,* and *focused.*

Example. In the following example by subject 106, the student's Tenor/Vehicle list may have started the student's metaphorical thinking process. However, the student made further metaphorical thinking or aesthetic choices. The Tenor/Vehicle list of 106

suggests one part of the metaphorical thinking process. For instance, here is the first line from the student's poem: "When I tasted the elegant truffle I felt blissful." In the Tenor/Vehicle list, the emotional lexeme *blissful* is in the Tenor list. The student linked *blissful* by drawing a line to the *elegant truffle*, in the Vehicle list. Elegant truffle is a lexeme from the wine vocabulary aid (Parker, 2015). Elegant truffle is itself a metaphor for a particular perception of wine. The Dunn (2011) measurement below does show that this line does have some measurable metaphoricity.

Student 106, Holy Communion

(Domain: physical, case role: *instrument)* (Domain: mental)



[When I tasted the elegant truffle] I felt blissful.

Metaphoricity: (2 domains + 1 mismatch) x 1 case role = Total 3

Elegant truffle is a metaphor for the perceived flavor/aroma of the semiotic object wine, which of course is not truffle but grape. Tasting, and the truffle itself, fall into the physical domain. The case role, or metaphoric event, is "When I tasted the elegant truffle" for which I have assigned to *instrument*. I do not measure the positioning of the Tenor/Vehicle in metaphor construction. Curiously, the first part of this sentence supports the Vehicle, as it does contain the metaphoric event. Most other student metaphoric sentences begin with the Tenor. Here however, "I felt blissful" I am considering the Tenor in this metaphoric sentence, present in the mental domain. There is cross-domain mapping, or metaphoric thinking in this statement. However, the

presence of only one case role within metaphoric content in this sentence results in a lower metaphoricity score than the previous example.

Chapter 5: Discussion

Metaphorical thinking requires cognitive mapping between different domains. And the literature has shown this to be efficacious in helping students to learn new concepts and meaning in science or math (Abrahamson et al., 2012; Cameron, 2002; Chiu, 2001; Diehl, 2010; Groth, 2005; Jakobson, 2007; Kilhamn, 2008; Willox et al., 2010). My study shows that metaphorical thinking is also useful in learning the desired knowledge of the sacraments of the Catholic Church, as well as further understanding their meaning as deemed appropriate by the Church.

I calculated a descriptive analysis of the positive linear association between two variables, meaning questions on the ACRE and metaphoricity of two sacrament poems. The Figure 1 scatterplot representing this calculation suggests there may be an association between students who demonstrate a higher level of metaphorical thinking and scoring better on the meaning of the sacraments. In other words, the data may suggest that treatment sample students understood the meaning of the sacraments more than the control sample, as assessed by the ACRE. Metaphorical thinking about the meaning of the sacraments does help students relate personally to that meaning in ways considered appropriate by the church. Relating personally to meaning, of course, can be a subjective cognitive approach. The Catechism of the Catholic Church does articulate the way the Church considered meaning of the sacraments appropriate. CCD texts used in this study are also consistent with the Catechism of the church. The ACRE, as well, is consistent with the Catechism. However, the ACRE may not assess how students relate personally to that meaning. So the question remained, how do students relate personally

to the meaning of the sacraments? In my study, students relate personally to the meaning of the sacraments by thinking metaphorically. Each student developed their own metaphoric statements, or poems, by cross-domain mapping ideas. After somatic experiences, students then literally drew their own bridges between a lexeme in the Tenor—the effect—over to a lexeme in the Vehicle—the symbol element. The choice of what Tenor was connected, to what Vehicle was each student's own choice from which they completed their own metaphoric statement or poem. There were, of course, instances of dialogic conversation suggesting Tenor and Vehicle connections. Still, even in these cases, which cross-domain map selected for writing a poem, was the choice of each poet. Students related personally, to the meaning of the sacraments, through metaphorical thinking.

There are other ways, however, in which students may have related personally to the meaning of the sacraments. Another way was through personal somatic experiences with the symbols of the sacraments. Dialogue was also a way in which students personally related to the meaning of the sacraments. There were dialogic conversations in the treatment group classrooms. While discussions were group activities, each student in the class was part of the dialogue and added to it personally in some way. Students developed meaning through metaphorical thinking fostered by dialogic discussion. Each student in the class was personally involved in that dialogue in some way.

Moving on from personally relating to the meaning of the sacraments, my research question 3 asks, "Is thinking metaphorically about the meaning of the sacraments related to better understanding of them?" It is important, however, to define

this question before discussing. We have discussed the *meaning* of the sacraments. However, this question's queries are related to "better understanding' and to "thinking metaphorically." Measuring the relationship between thinking metaphorically and understanding the meaning of the sacraments depends upon being able to quantify both metaphorical thinking and understanding. ACRE provided the assessment of the understanding of meaning, with its three specific meaning questions. Quantifying metaphorical thinking however required a different measurement, a measurement of the metaphoricity in student poems. So I did that using the Dunn formula. What I found from making that comparison was that a higher metaphoricity score is related to a better understanding of meaning. The students with the higher metaphoricity score also scored higher on the mean of the desired correct responses to the meaning of the sacraments as assessed by the three, ACRE items defined as meaning questions. Since reaching any level of metaphoricity requires metaphorical thinking, metaphorical thinking helped them to understand the meaning of the sacraments (Dunn, 2011).

Limitations

One variable possibly impeding my results could have been the limitations of the delivery of my instrument: the ACRE. There was no way to know that students in one group did not already have the ability to score higher on this assessment. This is because no one in the treatment or control groups was administered the ACRE prior to fifth-grade. Moreover, there is no earlier ACRE assessment designed for younger students to predict likely scores on the fifth-grade ACRE. Therefore, it is possible that, the difference in the means of the control and the treatment samples may not be attributable

to the treatment, but rather the fact that students may have had higher scoring ability to begin with. While a possibility, I find it unlikely that more than one or two students in either of the groups would score higher on the ACRE assessment than the data reveals. This is because when I analyzed the bulk data scores of all students taking the ACRE, no class averages were a higher number than the averages suggested by the limited study data. The national measurements of ACRE, available from previous years of the ACRE assessment, also suggest that, in general, students do not score well on the five Item questions analyzed in my study (Learning, 2013). So, while there is ACRE assessment limitation, I still assert that, in general, it is a flaw in the CCD curriculum or curriculum delivery, which is the reason for lower scores in the control groups than in the treatment samples. Future studies should have bigger student samples throughout the Archdiocese or nation.

Another limitation may be in the representativeness of this study. The sample size is small and select. Therefore, there is the question of how well my sample represents the characteristics of a larger target sample. In this case the target sample would be fifth-graders in the Archdiocese of Newark. The Archdiocese of Newark has a large Spanish speaking population and Montclair does not. Montclair also is generally a prosperous community. Things might be different in more inner city parishes. The two fifth-grade samples in my study, control and treatment, are from several municipalities in the area in and around Montclair. The Archdiocesan convocations, or conferences, attended by the catechists whom are teaching throughout the Archdiocese, have English and Spanish speaking sessions. This suggests that there is a cultural and language divide

between English speaking and Spanish speaking groups. English as a second language may not affect the children in fifth-grade classes as much as adults. However, there still may be a sense of difference. Some of the students in my study were English-as-a-second-language students, but the majority was not. A possible limitation may be that my study does not fully address the language and cultural difference within the Archdiocese of Newark. The linguistic representative of analogical thinking through metaphoric thinking may best, be presented, to students in their primary language. A study on a Spanish language and cultural version of this study may be in order.

The p-values may suggest another limitation of this study. P-values for treatment sample responses to ACRE items which arose from Research Questions 1 and 2 were, respectively, $p = 0.11$ and $p = 0.09$. The large *p*-values (>0.05) suggest weak evidence against the null hypothesis. Therefore, I failed, to totally reject the null hypothesis that chance was the cause of my data results. The data did not reach the minimum 95% threshold of certainty. With this set of p-values, I cannot affirm that my treatment helped students to learn the meaning of the sacraments. However, there still may be a small but statistically possible chance that my method did affect student knowledge as assessed with the ACRE. Studies with larger sample may address this limitation.

In an earlier pilot study of my method, my classes included a couple of students identified by their parents on their CCD application forms as autistic. My observations were that, while articulate in many ways, the autistic students present at the time of my pilot study did not seem to understand the metaphoric concept, that being, that one thing

can be something that it is not. A limitation may be that this method may not be as effective with students with certain different cognitive directions.

Discussion of the Literature

Faith systems connote meaning through metaphor, symbol and myth (Avis, 1999). The meaning of the sacraments is presented, metaphorically, through physical objects and experiences. The metaphorical symbols of the sacraments are objects, in the physical Domain, which metaphorically serve as a representation of something else, in the intangible, social, or mental domains. Cross-domain mapping means that two different domains of thought may make up the Tenor and Vehicle of a metaphor (Nireburg, 2004). This is metaphorical thinking. Metaphor brings us in contact with an object to reach for meaning in something else (Guimond, 1969). A sacrament is a symbolic rite, and metaphor is part of the language and meaning that is subsumed within the sacramental symbolism (Barth, 1977). My study shows that it is possible to interpret metaphorical meaning from the symbols of the sacraments (Avis, 1999).

Metaphor is a linguistic trope. The other linguistic tropes are not metaphor. Simile is the trope closest to metaphor. Simile cannot be considered equal to metaphor because is not technically a metaphor. However, similes do involve metaphorical thinking (Black, 1970; Cameron, 2002; Chiu, 2001; English, 1997). My students produced similes and metaphors as part of the method. I have included simile in the data for this study and successfully measured them for metaphoricity using the Dunn system.

Tacit or implicit thought are part of the process of finding meaning in the sacraments and metaphor gives language to the tacit or implicit (Fiumara, 1995; Kuhn,

1970; Lakoff, 1994; Polanyi, 1967). Because a metaphor is comprised of language, it communicates meaning in a way that is shared, and dialogically discussed. While tacit implications may remain within a metaphor students now have given this tacit meaning a root metaphor which may lead to hypothesizing (Pepper, 1961, 1966). Dialogue and metaphorical thinking, were utilized in my method.

Much literature tells us that metaphorical thinking is a valuable tool in learning math or science (Abrahamson et al., 2012; Cameron, 2002; Chiu, 2001; Diehl, 2010; Groth, 2005; Jakobson, 2007; Kilhamn, 2008; Willox et al., 2010). This is because cross-domain mapping, or transference, between Tenor and Vehicle, can help students present an understanding of a complicated idea. Ricoeur on Aristotle suggests this is *epiphora,* or reducing "the logical distance" between two things (Ricoeur, 1979, p. 145). Students then move logically from understanding two things as being unrelated, to understanding their meaning through inter-relatedness (Aristotle, 1924; Ricoeur, 1979). The metaphoric workshops on the sacraments in my study helped to close the logical distance.

Metaphor is also important in philosophical dialogue because philosophies are often rooted in "root metaphor" (Pepper, 1961, 1966, 1973). Metaphorical thinking as inductive, deductive, tacit, or tensive is relevant to philosophical dialogue (Fiumara, 1995; Kittay, 1987; Kuhn, 1970; Nietzsche, 1979, 2000; Polanyi, 1967). Metaphorical thinking is the linguistic version of analogical thinking making it functional in hypothetical thinking (Arbib, 1986; Hesse, 1966; Heywood, 2002; Lakoff & Nunes, 1997, 2000). It is generally accepted that metaphor and analog are similar methods of thinking about and understanding concepts (Piaget, 1968). Metaphorical thinking is also

a philosophical approach (Shibles, 1971); the '"metaphorical method' of doing philosophy" (Shibles, 1971, p. 3). By using metaphorical method in philosophical inquiry we have a tool for extending what is possible to say and communicating the possible (Shibles, 1971). The dialogical discourse used in my method helped students to demonstrate the metaphorical method perhaps for theology, which is a category of philosophy. It is a widely acknowledged pedagogy that a social context, such as dialogue, may help support student reasoning (Newman, 1989; Sfard, 2007; Vygotsky, 1962). My method implemented dialogue and while not analyzed extensively here, I discus it later in this chapter. Further studies in metaphor and dialogue are in order.

In short, concepts difficult to understand may be, implicitly reached via metaphor. This is because metaphor builds what we do not know onto that which we do (Anderson, 1998; Merrill, 2001); thinking metaphorically helps students prepare to acquire further knowledge (Schwartz, 2004; Willox et al., 2010). My method also reinforces how by experiencing something new and responding to it in a way consistent with her existing metaphoric image, a student goes through a process of assimilation (Piaget & Ihelder, 2000). My study shows that metaphorical thinking helps students to concretize the abstract, such as garnering meaning through physical symbols of the sacraments (Presmeg, 1986, 1992). A sense–making process (Glenberg, 1997; Roediger, 1993) sometimes referred to as embodied, metaphorical thinking can be evoked through student involvement in perception-motor activities (Rotman, 2000) or semiotic objects and somatic experiences such as were employed in my study (Abrahamson, 2009).

In the empirical studies I reviewed, metaphors were developed in three ways which were: metaphors provided (Cameron, 2002; Chiu, 2001; Diehl, 2010; Kilhamn, 2008; Nietzsche, 2000) by teacher or text, metaphors developed by groups of students (Willox et al., 2010), and spontaneous metaphors created individually by students themselves (Abrahamson et al., 2006; Abrahamson et al., 2012; Groth, 2005; Jakobson, 2007). Some studies provide extended-metaphors. Extended-metaphors in these studies are educational experiences with text and image (Carter & Pitcher, 2010; Diehl, 2010; Gentner, 2002). My study employs a method involving extended-metaphor and spontaneous metaphors created, via metaphorical thinking, by the treatment sample students. As discussed, the sacraments themselves are extended-metaphorical rites.

While there has been a great deal of literature about the pedagogical powers of metaphor, something not discussed much is the possible value of student co-creation of metaphor in the classroom. In one study student metaphor co-creation was a method of finding implications, significance and meaning within a discipline (Willox et al., 2010). My study as well, explored co-created metaphor through dialogical creation of Tenor and Vehicles relative to the sacraments. Subsequently a few group metaphors were created. This was an efficacious approach in launching students into their own metaphoric thinking.

A focus on semiotic objects was also an effective tool in helping students garner meaning of the symbols of the sacraments. Abrahamson poses that an important tool to learning math is the semiotic object (Abrahamson, 2009; Radford, 2003; Sfard, 2002). What I call metaphorical thinking, Abrahamson refers to as the semiotic leap, meaning a

student's initial tacit thought of an idea which can then be articulated through use of a semiotic object (Abrahamson, 2009). In my study, I use specific symbolic artifacts of the sacraments, as semiotic objects. Making a semiotic leap, a student is mentally floating somewhere between the signifier and the signified (de Saussure, 1959), otherwise known as conceptual blending (Fauconnier, 2002). Conceptual blending permits this semiotic leap. Conceptual blending, or cross-domain mapping, is part of metaphorical thinking. There is a need in the literature to focus on one conceptual label such as metaphorical thinking, by further reviewing the literature and its different names for this concept and making them work together more effectively. My study made a start at realizing the various nomenclatures for metaphorical thinking, but further work needs to be done.

Abrahamson may suggest metaphor serves learners through a semiotic focused method as a way to communicate understanding of a knowledge base including its meaning; and as a method of objectifying understanding of meaning. "By going beyond naming" (p. 60) students learn directly by restating and improving mathematical statements; and indirectly by developing schema, or metaphorical thinking, idiosyncratically. Idiosyncratic metaphor as a pedagogical framework is widely suggested in the philosophy of constructivist learning (Abrahamson et al., 2006; Makar, 2009; Turkle & Papert, 1991). In my study, treatment sample students go beyond naming as well with idiosyncratic, personal metaphoric statements evoked by semiotic objects. Abrahamson and others tell us that metaphor allows students and teachers to generate 'the way I see it.' Similarly, my study allowed treatment sample students to garner personal meaning of the sacrament, which is the way they saw it.

I worked with treatment sample students, to dialogically, find meaning, by meaning-making though extended-metaphor writing. I measured the metaphoricity, or metaphorical thinking levels, of the extended-metaphor of each student's poetry and compared them to their score on the questions related to the meaning of the sacraments in the ACRE**.** I employed the Dunn (2011) method of measuring metaphorical thinking. There is no other literature that tests student metaphoricity using the Dunn method. My study showed the association of metaphorical thinking as indicated with metaphoricity scores and understanding meaning of the sacraments. More studies could be done employing the Dunn system.

Discussion of Other Data Results from ACRE, Part 1

In the analysis of my study, I used the data from the five, ACRE questions defined as sacrament questions. There are eighty-seven items in ACRE, however, and all of them are required. Therefore, there is other data acquired through my study, which is worth discussion. These include the fifty-one questions from ACRE Part 1 described as Religious Knowledge, which students respond to, via multiple-choice possibilities. There are an additional 36 items on ACRE Part 2 described as Personal Beliefs, Attitudes, Practices and Perceptions, which include statements students respond to via a Likert scale. Part 1 or Part 2 items in which treatment sample students scored higher, and in one case, lower in preferred answers than the control groups, are discussed.

Other Data from ACRE, Part 1, Study Area 3

Confirmation. One question on the ACRE, outside the range of my study, number 18, included discussion of the sacrament of Confirmation and furthermore sought

to assess student knowledge of the symbol used in the rite of the Sacrament. Contrary to other data, treatment sample students in my study scored lower than the control groups on this question. A reason for this may have been a possible weakness in my method. Item 18 in the Liturgy and Sacrament Study Area 3 is a Liturgy Symbol at Confirmation. The inquiry concerns the liturgical symbols employed in the rite of the Sacrament of Confirmation (Learning, 2013). The desired response to this type of question is Chrism. Item 18 was named a liturgy question. That is why it was not in the five questions for analysis in this study. In this particular question, the control group's average percentage was 72.5 percent, and the treatment group average was 60.5 percent. This data is an average of all students taking the ACRE, in all the fifth-grade classes at St. Cassian in the spring of 2013. It is intriguing that the classes that were in fact administered the method scored eleven points lower than the control classes. However, treatment students scored substantially higher in other types of sacrament questions than the control groups.

The treatment classes worked with 10 symbols in the course of the seven sacraments metaphorical thinking workshops. In the method, three of the sacraments were administered two semiotic objects, and the rest had one object. The implementation of two semiotic objects may have added some confusion to the group understanding. In the course of the method, students actually examined two different Chrisms for three sacraments and this may have further added to the confusion. The two Chrisms used as semiotic objects in the method had different aromas. As a result, they may have tactically and visually, been perceived as too much alike for the students to draw close affiliation with Confirmation. Future studies may explore if a different semiotic object

employed in an extended-metaphor poetry workshop about the symbol of the Sacrament of Confirmation may correlate with increasing student scores to this question.

Matrimony. If students understand the sacrament of Matrimony through metaphorical thinking they are likely to know what the sacrament is, and what it is not. Metaphorical thinking employed in my method may have given students an edge in garnering meaning from their experience, thus in understanding that Matrimony is not the correct answer to question 47.

There are no questions in the ACRE, Part 1, Study Area 3, Liturgy and Sacraments on neither the Sacrament of Marriage, nor Sacrament of Healing of the Sick. However, my method employed extended-metaphor poems on the symbols of these two sacraments. Therefore, in future studies it might be useful to include the metaphoricity scores of the Sacraments of Marriage in association with item 47 in ACRE Part 1.

Further analysis might employ item 47from ACRE 2001 because one of the multiple-choice options in that item is of Matrimony. However, new studies involving fifth-grade CCD students might administer the new IFG: ACRE 2013, which includes items about the Sacraments of Marriage and of Anointing. Anointing is the new ACRE's lexeme for Healing of the Sick.

Other Data from ACRE, Part 1, Study Area 2

Question 32 in ACRE Study Area 2 may require inductive/deductive thinking to answer it, or, answering the question may depend upon logical reasoning, based the assumption of cause and effect. Student responses to item 32 from the ACRE therefore,

raise further questions. The data focus of my research was ACRE Study Area 3. Item 32 is instead in Study Area 2: Church-One, Holy, Catholic, and Apostolic. Study Area 2 is in an entirely different Study Area than the five questions in ACRE Study Area 3 analyzed in my study. Nonetheless, to administer the ACRE all Study Areas had to be completed. Still, while outside the Study Area 3, item 32 does state a sacrament, Baptism. The question is about the responsibility of the recipient of sacrament of baptism to bring their faith to others (Association, 2001).

Students may have employed inductive/deductive reasoning when answering this question because 32 does not directly address a sacrament, but rather the meaning of having received an effect of a sacrament. Deductive because what are all baptized people called to do can be perceived as a question coming from the general—"all baptized people"—to the specific—"called to do." Or inductive depending also on the perception of the question—"baptized people," specific—to general—"all…called to do." Of course, there may be other ways to address this question as well. This question, because of its search for the meaning of the effect of the Sacrament of Baptism, suggests perhaps, a type of thinking that follows one idea behind another. This may also require logical reasoning, employing cause and effect. While this is outside my Research Questions, future studies may explore how workshops in metaphorical thinking on the sacraments help students make inductive/deductive or logical cause and effect decisions.

Discussion of Other Data Results from ACRE, Part 2

Students may do better with metacognitive awareness when taking part in dialogue. As well, the exercise of conducting metaphorical thinking may help students to be more aware of their cognitive efforts. In addition to Part 1in ACRE 2001, Part 2, is administered, to all takers of the ACRE. Part 2, called Personal Beliefs, Attitudes, Practices and Perceptions, was not analyzed as part of this study. However, Part 2 did provide some interesting data. There are two types of statements in Part 2 that ask for Likert scale responses. Those two types of statements are affective and perceptive. My method uses dialogical group discussions. Therefore, the data may suggest that dialogue leads to different affective and perceptual beliefs than the control samples. Item 16 in Part 2 is in the Reporting Category of Morality (Learning, 2013). The statement in item 16 is about taking the time to consider whether your actions are good or bad. While item 16 does fall into a Moral category, it also may articulate a metacognitive assertion that says something about how students analyze their own thinking.

The results of the ACRE averages for the control sample and treatment sample on question 16 in the affective section of ACRE may suggest a metacognitive advantage for the treatment group. The average of the control class was 67% while the average of the treatment class is 84.5%. Therefore, the treatment group responded with preferred responses 17.5 points higher than the control group average. The national average for CCD fifth-grade students taking the ACRE across the United States was 80%. I think this is worth further study as my study treatment group average was 4.5 points higher than the national score of 80%.

Students Helping

The effect of dialogue on student perceptions about helping each other may also be a result of dialogue. Affective Statement 12 in Part 2 of ACRE in the Reporting Category of Perceptions about Your School/Parish Program asks students if their CCD program motivates them to volunteer. This item follows the same Likert responses as the other perceptual statements mentioned so far. The average of the entire treatment class was 79% and of the control class, 67%. The treatment class is thus 12 points higher than the control average. Again, this data was not part of my study, but the result of the data may suggest further exploration of the effect of dialogue in other CCD programs. The CI curriculum is based on a democratic approach to exploring ideas (Gregory, 2008; Lipman et al., 1980). The ACRE Report categorizes this question as Helping. While the implication of the statement is that within the CCD program students feel encourage to do volunteer work this may be seen as students willing to help others. The control group and national results of ACRE 2001 suggest that outside of a dialogical environment that students feel less encouraged to do volunteer work. While this is only an implication, the treatment response to this statement is interesting. The new IFG: ACRE 2013 may have other measurements for students helping. This may lead to other studies on the effect of CI on the democratic element as some of the IFG: ACRE items may be interpreted from that perspective.

Students Caring

The perception of students 'really caring' about each other may also be a result of dialogic workshops. This is because dialogue can help build community. Dialogue is somewhat like Community of Inquiry in the Philosophy for Children curriculum. Based upon group discourse, CI assists students in the formation of democratic, social, and safe discussion of ideas (Gregory, 2008).

In ACRE Part 2 in the "Reporting Category of Perception about your School/Parish Program," one Affective Statement of interest queried students about how they perceived caring for others in their class. This item uses the Likert scale of Strongly Agree, Agree, Disagree, Strongly Disagree, or omit. The preferred responses are Strongly Agree or Agree. The average of the control class was 63%. The average of the treatment class was 88%. The treatment group scored above the control group's average by 25 points. Furthermore, the treatment group average is also 9 points above the national average of 79%. This may suggest that dialogue type workshops affect student perceptions of students caring about each other. This may lead to further exploration directly utilizing CI.

Implications

The data uncovered by my study may suggest further work on the Perceptions of a Parish CCD program, which uses dialogue in conversation. Some of the literature suggests that approaches like dialogue can help to build community. Therefore, the Perception of students 'really caring' about each other, as indicated by the ACRE, may be a result of dialogic workshops.

Working with metaphor also builds collaboration as a result of the students' particular metaphoric "jargon" (Cohen, 1978; Fiumara, 1995). Metaphor is interpersonal. My study has explored dialogue in CCD programs, but this method may also function within the curriculum of CI. First, the literature does suggest that in supporting the CI interpersonal values (Kennedy, 1994), metaphor can play a role. Jargon, or even slang, in particular professional or cultural milieus is generated because of a bond, which links the users of this language type to each other. Likewise, those who interpret rich metaphors in a group may maintain a similar bond (Cohen, 1978; Fiumara, 1995). My study has employed dialogic metaphorical thinking in its method. The focus of this dissertation was to answer questions regarding students learning the meaning of the sacraments better. Still, the value of dialogical and metaphorical thinking as pedagogical tools to fostering other types of thinking, should be further explored.

My method may function within CI because metaphor also fosters interpersonal dialogue. Metaphor fosters interpersonal dialogue because there is a value assumed by the metaphor provider, and imputed, to the reader/listener(s). This assumed value is part of the economy of metaphoric exchange. And this metaphoric asset is part of what evokes its attribute of "interpersonal significance" (Fiumara 1995, p. 141). To put it in other words, the metaphor creator provides a currency shared with its receiver. This is one reason why I utilized the dialogically developed extended-metaphor within a religious education afterschool program. The facilitator in a CI, using metaphor in her speech, may be putting her participants into a new subset, joined by their own new talk

(Cohen, 1978). As well, the facilitator speaking in metaphor also requires those who will receive the metaphors. When speaker and receiver are present then there is "full metaphoric exchange" (Fiumara, 1995, p 141). Interpersonal significance assigned to a good metaphor may be something to be further explored in CI as this may fall into the whole concept of CI, and interpersonal community of inquiry (Kennedy, 1994).

Dialogic conversations bearing metaphor might have their social pathogens, so there may be some conflict within a CI, which uses metaphor. The literature suggests that in addition to the other suspicions imposed upon the view of metaphor (discussed earlier in Chapter 2) there is the fear of the possible "incivility" which metaphor may generate in philosophical dialogue (Fiumara, 1995). CI is primarily civil (Kennedy, 1994). Metaphor, however, may evoke incivility because this trope type often dwells on the periphery of a discourse deemed necessary to some philosophical dialogue (Fiumara, 1995).

My study focused on the meaning of the sacraments via metaphorical thinking. The discovery is that metaphorical thinking works to help communities of students define meaning metaphorically and thus improve their knowledge in a particular curriculum. Other implications include studying philosophy and the concept of the "root metaphor." Exercising the metaphor within CI philosophical discussions may be important, because metaphor has some basis in the development of hypothesis and theories among groups of students.

New IFG: ACRE

I did my empirical study in 2013 and shortly afterwards a new ACRE was introduced for the first time in twelve years. This is the National Catholic Education Association's Information for Growth (IFG) ACRE. The 2013 IFG: ACRE contains 70% of the material in the 2001 ACRE. The eight study areas in the 2001 ACRE, are instead restructured into 6 Study Areas in the IFG: ACRE 2013. The IFG: ACRE 2013 contains a Study Area 2 known as Liturgical Life. This is different than what was the ACRE 2001's Study Area 3 called Liturgy and Sacrament. The objective of the ACRE 2001 study area was to discover if students knew about the Church's liturgical life and also knew and understood the sacraments as signs and instruments of grace (Convey, 2010). The IFG: ACRE 2013 Study Area 2, Liturgical Life has a different set of objectives, to see if students know the paschal mystery of Jesus in the Church's liturgical life as well as the sacraments as signs and instruments of grace (Association, 2013). The IFG: ACRE 2013 does focus on all seven sacraments, unlike the ACRE 2001, which excluded items directly addressing the sacrament of Marriage and Anointing. Specifically IFG: ACRE 2013 seeks to see if fifth-grade religious education students understand the celebration of the sacraments as signs of grace and encounters with Christ. Furthermore, IFG: ACRE 2013 attempts to assess if students understand the sacraments by the three sacramental categories discussed in the literature review. Those categories are Sacraments of Initiation: Baptism, Confirmation, and Eucharist; Sacraments of Healing: Penance and Anointing, Sacraments at the Service of Communion: Holy Orders and Matrimony (Association, 2013). I believe the method I

have presented here, can be conducted with new classes of fifth-grade students in similar afterschool CCD programs with a focus on meaning of all seven sacraments. These new fifth-grade classes, in similar CCD programs, receive the IFG: ACRE 2013, providing a new kind of database.

The implication of my study is that because the IFG: ACRE 2013 is, based on the same Catechism and carries similar study area objectives that my metaphorical thinking workshops on the sacraments may raise these scores as well. My method approach, with some modifications to the semiotic objects, may improve knowledge as well as meaning.

What does this mean for the Archdiocese of Newark?

The Archdiocese of Newark scored below a desired average in the 2012, 2013 and 2014 ACRE on meaning questions about the sacraments. To raise that score, the catechetical office of the Archdiocese may find that a metaphorical thinking approach can help. Although the samples in this study were necessarily small, the data suggests a larger study may be in order. A larger sample may require more teachers trained in the metaphorical thinking method. I will work with the Catechetical Office within the Archdiocese of Newark to develop printed materials and packaged semiotic objects to employ in the method. I suggest the Archdiocese work with me to train a few instructors to employ my method so that a larger sample study be initiated. Once this is complete, the data may suggest that the Archdiocese choose to alter its CCD curriculum by adapting my method for learning about the meaning of the symbols of the sacraments. My study defines a new pedagogical tool in order to raise that average.

Conclusion

Previous ACRE assessments administered to fifth-grade CCD classes in over 200 communities in the Archdiocese of Newark demonstrated that the average response to questions on the meaning of the sacraments was below a desired average. My method was, presented only to my treatment sample and to no one else in the Archdioceses.

The literature has shown that using metaphor can help in student understanding of complex ideas. Metaphorical thinking helps students to "bridge" between what they know, as well as new, abstract, or not easily understood concepts. This bridge between two different ideas can be analogical, and analogy may be perceived linguistically through metaphorical thinking (Gentner, 1993). Metaphorical thinking in my method was, in part, evoked through the perception-motor activities students were engaged in (Rotman, 2000). Students using semiotic objects in this study were more able to form image schemas to concretize and essentialize the abstract meanings of the sacraments (Presmeg, 1986, 1992). Image schemas are a part of metaphorical thinking. Furthermore, through metaphorical thinking a sense–making process was underway in students (Glenberg, 1997; Roediger, 1993). This study demonstrates that students' kinesthetic, visual and auditory experiential perceptions help provide forceful metaphoric images assisting in learning about the sacraments. Of course, the literature could use more studies on metaphorical thinking itself. One suggestion is for further exploration of the literature, and then restricting our metaphoric thinking understanding to one type of language as there so many terms, which suggest the same or similar theories on metaphorical thinking.

I cannot say that the results of my study show that metaphorical thinking helped students to understand the sacraments. However a descriptive analysis of the positive linear association between two variables—questions on the meaning of the sacraments and metaphoric thinking levels—suggest that engaging students in metaphorical thinking on the sacraments helped them relate personally to the meaning of the sacraments considered appropriate by the Church. Therefore, my results suggest that thinking metaphorically about the meaning of the sacraments relates to better understanding of them.

Further studies may start the conversation of using metaphorical thinking in the P4C CI curriculum. A metaphorical method of doing philosophy might include implementation of basic root metaphors. These basic root metaphors may then extend into other areas of discourse. Utilizing metaphorical method in CI may be useful because metaphor and extended-metaphor expand student notions of what is even *possible* to articulated, and then to have a way to articulate that (Shibles, 1971). Metaphorical thinking workshops may help foster more metacognitive skills in students. One reason is that by doing philosophy with extended-metaphor as a tool may further help students see the root metaphors in many domains of knowledge. Furthermore, experience with metaphoric method may help students create new metaphorical systems to do philosophy.

Metaphor through a semiotic focused method is a way to help students objectify understanding of a knowledge base. Subsequently my study shows that metaphors, evoked by semiotic objects, helps students to communicate understanding of a knowledge base by way of what it represents, as well as what it means. A sacrament is a

symbol. Metaphor is part of the language and meaning subsumed within the sacramental symbolism (Barth, 1977). My study shows that engaging students in my method helped them understand the meaning of those metaphors and those metaphors are an important doorway to truth (Avis, 1999; Davis, 1989; Pickstock, 1998; Soskice, 1985).

References

Abrahamson, D. (2009). Orchestrating semiotic leaps from tacit to cultural quantitative reasoning--the case of anticipating experimental outcomes of a quasi-binominal random generator. *Cognition and Instruction, 27*(3), 175-224.

Abrahamson, D., Berland, M., Gutierrez, J., Mookerjee, A., & Wilensky, U. (2006). Leveraging epistemological diversity through computer-based argumentation in the domain of probability. *For the Learning of Mathematics, 26*(3), 39-45.

Abrahamson, D., Gutierrez, J. F., & Baddorf, A. K. (2012). Try to see it my way: The discursive function of idiosyncratic mathematical metaphor. *Mathematical Thinking and Learning, 14*(1), 55-80.

Acree, T., & Arn, H. (2004). Flavornet. Retrieved Oct. 11, 2012, from http://www.flavornet.org/flavornet.html

Anderson, J. R., Reder, L.M., & Simon, H.A. (1998). Radical constructivism and cognitive psychology. In D. Ravitch (Ed.), *Brookings papers on education policy: 1998* (pp. 227-225). Washington, D.C.: Brookings Institute Press.

Arbib, M., Hesse, M.B. (1986). *The construction of reality*. Cambridge: Cambridge University Press.

Arendt, H. (1968). What is freedom? *Between past & future* (pp. 148-149). New York: Viking.

Aristotle. (1924). Rhetoric (W. R. Robers, Trans.). In W. D. Ross (Ed.), *The works of Aristotle* (Vol. 11, pp. 1354-1420). Oxford: Clarendon Press.

Aristotle. (2009). Poetics. Retrieved 2/10/2014 http://classics.mit.edu/Aristotle/poetics.3.3.html

Association, N. C. E. (2001a). Assessment of catechesis religious education level 1 for grade 5. Form 12. In N. C. E. A. Department of Religious Education (Ed.), (2001 Revised ed.). Washington, D.C. : National Catholic Educational Association.

Association, N. C. E. (2001b). *NCEA ACRE, Administration manual* Retrieved from http://ncea.caltesting.org/docs/ACREAdministrationManual.pdf

Association, N. C. E. (2002). *NCEA ACRE interpetation manual*. Washington, DC: National Catholic Educational Association.

Association, N. C. E. (2013). NCEA IFG: ACRE Edition interpretation manual. In N. C. E. Association (Ed.), (2013 ed.). Arlington, VA: National Catholic Education Association.

Atkins, K. (2014). Internet encyclopedia of philosophy. Retrieved 10/4/2014, 2014, from http://www.iep.utm.edu/ricoeur/

Avis, P. (1999). *God and the creative imagination. Metaphor, symbol and myth in religion and theology*. London and New York: Routledge.

Bachelard, G. (1964). *The poetics of space* (M. Jolas, Trans.). Boston: Beacon Press.

Bain, A. (1888). *English, composition and rhetoric* (Enlarged ed.). New York: D. Appleton and Company.

Barth, J. R. (1977). *The symbolic imagination. Coleridge and the Romantic tradition*. Princeton: Princeton University Press.

Baugh, G. (2011). *The fashion designer's textile directory: A guide to fabrics' properties, characteristics, and garment-design potential* (1st ed.). London: Quarto Inc.

Becker, L. J. (2002). Talking poetic turkey: Getting real and readable. Using extended metaphor. Retrieved April, 21, 2012, from http://poetrysocietyofcolorado.org/workshops/workshop-2010/extended-metaphors

Becker, L. J. (2015). *In the heart of a quiet garden*. Georgetown, Kentucky: Fishing Line Press.

Black, M. (1955). *Metaphor* (Vol. 55). Oxford: Blackwell Publishing

Black, M. (1962). *Models and metaphors*. Ithaca: Cornell Univeristy Press.

Black, M. (1970). Metaphors and similes. In A. Ortney (Ed.), *Metaphor and thought* (pp. 31-32). Cambridge: Cambridge Univeristy Press.

Black, M. (1979). More about metaphor. In A. Ortnoy (Ed.), *Metaphor and Thought* (pp. 19-43). Cambridge: Cambridge University Press.

Bosell, J. (1953). *Life of Johnson*. Oxford: Oxford Univeristy Press.

Brook, P. (1972). *The empty space*. Middlesex: Penguin Books.

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher, 18*(1), 32-42.

Bruner, J. (1996). *The culture of education*. Cambridge: Harvard University Press.

Caldwell, B., Dake, D. (2009). Metaphor. *New Art Basics.* Retrieved Oct 5, 2014, from http://www.design.iastate.edu/NAB/home.html

Cameron, L. (2002). Metaphors in the learning of science: A discourse focus. *British Educational Research Journal, 28*(5), 673-688.

Carey, M. A. (1989). *Poetry. Starting from scratch*. Lincoln, Nebraska: Foundation Books.

Carter, S., & Pitcher, R. (2010). Extended metaphors for pedagogy: using sameness and difference. *Teaching in Higher Education, 15*(5), 579-589.

Chiu, M. M. (2001). Using metaphors to understand and solve arithmetic problems: Novices and experts working with negative numbers. *Mathematical Thinking and Learning, 3*(2 & 3), 93–124.

Classuck, P. A., Ellair, S.M., & Lamping, R.C. (Ed.). (2006). *Church and sacraments* (3 ed.). Allen, TX: RCK Benziger.

Cohen, T. (1978). Metaphor and the cultivation of intimacy. *Critical Inquiry, 5*(1), 3-12.

Coleridge, S. T. (2003). *Coleridge's poetry and prose* (Critical ed.). New York: W.W. Norton & Company.

Conference, U. S. C. (1994). *Catechism of the Catholic Church*. Washington, D.C.: United States Catholic Conference.

Conference, U. S. C. (1997). *Protocol for assessing the conformity of catechetical materials with the Catechism of the Catholic Church*. Washington, DC: United States Catholic Conference.

Convey, J. J. (2010). *What do our children know about thier faith? Results from the ACRE assessment*. Washington, D.C.: National Catholic Education Association.

Crystal, D. (2003). *The Cambridge encyclopedia of the English language* (2 Ed.). Cambridge, UK: Cambridge University Press.

Dahlhoff, L. (2015, March 3, 2015). [Copyright restrictions].

Danzante. (2014). The aroma wheel. Retrieved Nov 20, 2014, from http://www.danzantewines.com/aroma-wheel.html

Davidson, D. (1979). What metaphors mean. In S. Sacks (Ed.), *On metaphor*. Chicago, London: University of Chicago Press.

Davis, C. F. (1989). *The evidencial force of relgious experience*. Oxford: Clarendon Press.

de Saussure, F. (1959). *Courses in general linguistics* (W. Baskin, Trans.). New York: Philosophical Library.

Derrida, J. (1982). White mythology: Metaphor in the text of philosophy (A. Bass, Trans.) *Margins in philosophy* (pp. 207-271). Chicago: The University of Chicago Press.

DeStefano, E. (Ed.). (2006a). *Church and sacraments. Catechist guide*. Allen, Texas: Resources for Christian Living.

DeStefano, E. (Ed.). (2006b). *Faith first. Catechist guide* (Legacy/parish ed. Vol. 5). Allen, Texas: Resources for Christian Living.

Dewey, J. (1958). *Experience and nature*. New York: Dover.

Dewey, J. (1980). *Art as experience*. New York: Perigee Books.

Dewey, J. (2004). *Democracy and education*. Mileola, NY: Dover Publications.

Diehl, V., Reese, D.D. (2010). Elaborated metaphors support viable inferences about difficult science concepts. *Educational Psychology, 30*(7), 771-791.

diSessa, A. A. (2007). An interactional analysis of clinical interviewing. *Cognition and Instruction, 25*(4), 523-565.

Dunn, J. (2011). Gradient semantic intuitions of metaphoric expressions. *Metaphor & Symbol, 26*(1), 53-67. doi: 10.1080/10926488.2011.535416

Elgin, C. Z. (1996). *Considered judgment*. Princeton: Princeton University Press.

English, L. D. (1997). Analogies, metaphors, and images: Vehicles for methematical reasoning. In L. D. English (Ed.), *Mathematical reasoning. Analogies, metaphors and images* (pp. 3-18). Mahwah, NJ: Lawerence Erlbaum Associates.

Fauconnier, G., Turner, M. (2002). *The way we think: Conceptual blending and the mind's hidden complexities*. New York: Basic Books.

Fisher, R. (1997). *Poems for thinking*. Oxford. UK: Nash Pollock Publishing.

Fisher, R. (2000). *First poems for thinking*. Oxford, UK: Nash Pollock Publishing.

Fiumara, G. C. (1995). *The metaphoric process: connections between language and life*. London: Routledge.

Foer, E. (2012, September 5). [ACRE, Archdiocese of Newark].

Foer, E. (2014, March 10. 2014). [Poplulation and objectives of cathechisis].

Fogelin, A. (1982). *Figuratively speaking*. New Haven and London: Yale University Press.

Freeman, M. H. (1995). Metaphor making meaning: Dickinson's conceptual universe. *Journal of Pragmatics, 24*((1995)), 643-666.

Freire, P. (2001). *Pedagogy of freedom: Ethics, democracy, and civil courage; Critical perspectives*: Rowman & Littlefield Publishers.

Friedman, N. (1993). "Tenor and vehicle". In A. Preminger, & Brogan, T.V.F. (Ed.), *The new Princeton encyclopedia of poetry and poets* (pp. 1267-1269). Princeton, NJ: Princeton University Press.

Gadamer, H. G. (1993). *Truth and method* (J.Weinsheimer, D.G. Marshall, Trans. 2nd ed.). New York: Continuum.

Gardner, H. (1988). Toward more effective arts education. *Journal of Aesthetic Education, 22*(1), 157-167.

Gentner, D. (1983). Structure-mapping : A theoretical framework for analogy. *Cognitive Science, 7*, 155-170.

Gentner, D. (1993). From metaphor to analogy in science. In A. Ortony (Ed.), *Metaphor and thought* (2nd ed., pp. 447-480). New York: Cambridge University Press.

Gentner, D., & Bowdle, B. (2002). Metaphor processing, psychology of. *Encyclopedia of Cognitive Science* (pp. 18-21). London: Nature Publishing Group.

Gentner, D., & Bowdle, B. (2008). Metaphor as structure-mapping. In R. W. Gibbs, Jr. (Ed.), *The Cambridge handbook of metaphor and thought* (pp. 109-128). New York: Cambridge University Press.

Ginsburg, H. P. (1997). *Entering the child's mind*. New York, NY: Cambridge University Press.

Glenberg, A. M. (1997). What memory is for. *Behavioral and Brain Sciences, 20*, 1-55.

Glicksohn, J., Yafe, T. (1998). Physiognomic perception and metaphoric thinking in young children. *Metaphor and Symbol, 13*(3), 179-204.

Goldin, G. A. (2000). The scientific perspective on structured, task-based interviews in mathematics education research. In A.E. Kelly, Lesh, R.A. (Ed.), *Handbook of research design in mathematics and science education* (pp. 517-545). Mahwah, NJ: Lawrence Erlbaum.

Greene, M. (1978). *Landscapes of learning*. New York: Teachers College Press.

Greene, M. (1988). *The dialect of freedom*. New York: Teachers College Press.

Greene, M. (2001). *Variations of a blue guitar*. New York: Teachers College Press.

Gregory, M. (2008). *Philosophy for Children: A practitioner handbook*. Montclair: The Institute for the Advancement of Philosophy for Children.

Groth, R. E., Bergner, J.A. (2005). Pre-service elementary school teachers' metaphors for the concept of statistical sample. *Statistics Education Research Journal, 4*(2), 27-42.

Guimond, J. K. (1969). *The art of William Carlos Williams; a discovery and possession of America*. Urbana, IL University of Illinois Press

Haack, J. (2012). fabricdictionary.org. Retrieved Oct. 11, 2012, from http://www.fabricdictionary.com/search.php?letter=a

Hamrick, W. S. (1989). Philosphy for children and aesthetic education. *Journal of Aesthetic Education, 23*(2), 55-67.

Henle, P. (1958). Metaphor. In P. Henle (Ed.), *Language, though and culture* (pp. 173-195). Ann Arbor: University of Michigan Press.

Hesse, M. (1966). *Models and analogies in science*. Notre Dame: Notre Dame University Press.

Heywood, D. (2002). The place of analogies in science education. *Cambridge Journal of Education, 32*(2), 233-247.

Hobbes, T. (1960). *Leviathan*. Oxford: Basil Blackwell.

Jacob, C. F. (1922). The psychology of poetic talent. *The Journal of Abnormal Psychology, 17*(1), 231-253.

Jakobson, B., Wickman, P. (2007). Transformation through language use: Children's spontaneous metaphors in elementary school science. *Science & Education, 16,* 267–289.

Jakobson, R. (1985a). Poetry and grammar & grammar of poetry. In K. Pamorka, S. Rudy (Ed.), *Verbal art, verbal sign, verbal time*. Minneapolis: Univeristy of Minnesota Press.

Jakobson, R. (1985b). *Verbal art, verbal sign, verbal time*. Minneapolis: Univeristy of Minnesota Press.

Johnson, M. (1998). Metaphor. In M. Kelly (Ed.), *Encyclopedia of Aesthetics* (Vol. 3, pp. 208-212). New York, Oxford: Oxford University Press.

Kennedy, D. (1994). The five communities. *Analytic Teaching, 15*(1), 3-16.

Kilhamn, C. (2008). *Addition and subtraction of negative numbers using extenstions of metaphor "arithmetic as motion along a path".* Paper presented at the Nordic research in mathematics education, NORMAO8, Copenhagen.

Kittay, E. F. (1987). *Metaphor: Its cognitive force and linguistic structure*. Oxford: Clarendon Press.

Knestout, M. (Producer). (2011, March 5, 2015). The new translations: The new Roman Missal. Retrieved from https://www.youtube.com/watch?v=49m5lf-eP0A

Knight, G. W. (1933). *The Christian Renaissance*. Toronto: Macmillan.

Knowles, M., & Moon,R. (2006). *Introducing metaphor*. London: Routledge.

Koch, K. (1970). *Wishes, lies and dreams: Teaching children to write poetry.* New York: New York.

Koch, K. (1973). *Rose, where did you get that red? Teaching great poetry to children*. New York: Random House.

Kuhn, T. S. (1970). *The structure of scientific revolutions* (2nd ed.). Chicago, Londong: University of Chicago Press.

Lakoff, G. (1994). What is metaphor? In J. A. Barnden, Holyoak, K.J. (Ed.), *Advances in connectionist and neural computation* (Vol. 3, pp. 203-258). Norwood, NJ: Ablex.

Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago: University of Chicago Press.

Lakoff, G., & Nunes, R. E. (1997). The metaphorical structure of mathematics: Stetching out cognitive foundations for a mind-based metaphematics. In L. D. English (Ed.), *Mathematical reasoning, analogies, metaphors and images* (pp. 21-89). Mahwah, NJ: Laurence Erlbaum Aossociates.

Lakoff, G., & Nunes, R. E. (2000). *Where mathematics comes from*. New York: Basic Books.

Lambert, P. (2011). Pratt & Lambert Calibrated Colors IV. In P. Lambert (Ed.).

Langer, S. K. (1942). *Philosophy in a new key: A study in symbolism of reason, rite, and art*. Cambridge: Harvard University Press.

Langer, S. K. (1953). *Feeling and form. A theory of art*. New York: Charles Scribner's Sons.

Lave, J., & Wegner, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, UK: Cambridge University Press.

Learning, C. A. a. (2013). NCEA ACRE, St. Cassian Parish, Newark. Lawrence, KS: Computerized Assessments and Learning, LLC.

Levin, S. R. (1977). *The semantics of metaphor*. London: John Hopkins University Press.

Lipman, M. (1978). *Suki*. Montclair, New Jersey: The Institute for the Advancement of Philosophy for Children.

Lipman, M. (1980). *Writing: How and why*. Upper Montclair: Institute for the Advancement of Philosophy for Children.

Lipman, M. (1985). *Harry Stottlemeier's Discovery*. Upper Montclair, NJ: Institute for the Advancement of Philosophy for Children.

Lipman, M. (1986). *Wondering at the world. Instructional maual to accompany KIO and GUS*. New York: University Press of America.

Lipman, M. (1991). *Thinking in education*. Cambridge: Cambridge University Press.

Lipman, M., Sharp, A. M., & Oscanyan, F. S. (1980). *Philosophy in the Classroom* (2nd ed.). Philadelphia: Temple University Press.

Locke, J. (1849). *An essay concerning human understanding* Retrieved from google books database Retrieved from http://books.google.com/ebooks?id=YxwGAAAAQAAJ

Luther, M. (1958). A mighty fortress is our God. In W. G. Polack (Ed.), *The handbook to the Lutheran hymnal* (pp. 193). St. Louis: Concordia Publishing House. (Reprinted from: Third and Revised Edition).

Makar, K., Rubin, A. (2009). A framework for thinking about informal statistical inference. *Statistics Education Research Journal, 8*(1), 82-105.

Marvell, A. (2013). To his coy mistress Retrieved April 8, 2013, from http://www.poets.org/viewmedia.php/prmMID/16076

Merrill, M. D. (2001). First principles of instruction. *Educational Technology, Research and Development, 50*(3), 43-59.

Murray, J. M. (1931). *Countries of the mind: Essays in literary criticism*. London: H. Milford, Oxford University Press.

Murray, J. M. (1937). *Countries of the mind*. Oxford: Oxford University Press.

Newman, D., Giffin, P., & Cole, M. (1989). *The construction zone: Working for cognitive change in school*. New York, NY: Cambridge University Press.

Nietzsche, F. (1979). On truth and lies in the nonmoral sense (D. Breazeale, Trans.). In D. Breazeale (Ed.), *Philosophy and Truth. Selections from Nietzsche's Notebooks of the Early 1870's* (pp. 77-91). Atlantic Hyland, NJ: Humanities Press.

Nietzsche, F. (2000). On truth and lies in an extra-moral sense. In C. Cazeau (Ed.), *The continental aesthetics reader* (pp. 53-62). London: Routledge.

Nireburg, S., Raskin, V. (2004). *Ontological semantics*. Cambridge, MA: MIT Press.

Noble, A. C. (2013). The aroma wheel. An aid to wine tasters. Retrieved April, 15, 2015, from http://www.piwine.com/media/home-wine-making-basics/The-Wine-Aroma-Wheel-Tasting-Aid.pdf

Noble, A. C. (2015, Jan 19, 2015). [Wine aroma wheel].

Nonaka, I., Toyama, R., Byosière, P. (2001). A theory of organizational knowledge creation: Understanding the dynamic process of creating knowledge. In M. Dierkes, Berthoin Antal, A., Child, J., Nonaka, I. (Ed.), *Handbook of organizational learning and knowledge* (pp. 491-517). New York Oxford University Press.

Nussbaum, M. C. (2001). *Upheavals of thought*. Cambridge: Cambridge University Press.

Oliver, M. (1994). *A poetry handbook*. San Diego: Harcourt, Inc.

Ortney, A. (Ed.). (1979). *Metaphor and thought*. Cambridge: Cambridge University Press.

Parker, C. (2013). From arts venues to percipience to poetic thinking to poetry writing in the Community of Inquiry. In M. B. Glina (Ed.), *Philosophy for, with, and of children* (pp. 41-68). Newcastle upon Tyne, UK: Cambridge Scholars Publishing.

Parker, C. (2014a, March, 2014). [Learning the meaning of the sacraments through writing poetry].

Parker, E. (2012). Angel in the ICU. In T. B. Cecil Murphey (Ed.), *Heavenly company: Entertaining angels unaware* (pp. 47-53). New York, New York: Guideposts Books.

Parker, E. (2014b). Unstoppable. In A. Newmank, & Roy-Bornstein, C. (Ed.), *Chicken soup for the soul: Recovering from traumatic brain injuries: One hundred and one stories of hope, healing, and hardwork* (pp. 320-323). New York: Chicken Soup for the Soul.

Parker, R. (2015). A glossary of wine terms. Retrieved April 10, 2015, from https://www.erobertparker.com/info/glossary.asp

Parviainen, P., Fountain, H. (2004). *Clouds*. New York: Barnes & Noble.

Peirce, C. S. (1997). *Collected papers of Charles Sanders Peirce*. Bristol, UK: Thoemmes Continuum.

Peirce, C. S. (1998). *The essential Peirce* (Vol. 2). Bloomington I.N.: Indiana University Press.

Pepper, S. C. (1961). *World Hypotheses: A study in evidence*. Berkeley and Los Angeles: University of California Press.

Pepper, S. C. (1966). *Concepts and quality*. La Salle, Ill.: Open Court.

Pepper, S. C. (1973). Metaphor in philosophy. In P. P. Wiener (Ed.), *Dictionary of the history of ideas* (Vol. 3, pp. 196-201). New York: Charles Scriber's Sons.

Piaget, J. (1968). *Genetic epistemology* (E. Duckworth, Trans.). New York, NY: Basic Books.

Piaget, J., & Ihelder, B. (2000). *The psychology of the child* (H. Weaver, Trans.). New York: Basic Books.

Pickstock, C. (1998). *After writing: On the liturgical consummation of philosophy*. Oxford: Blackwell.

Polanyi, M. (1967). *The tacit dimension*. London: Routledge and Kegan Paul.

Pramling, N., & Pramling Samuelsson, I. (2008). The prosaics of figurative language in preschool: some observations and suggestions for research. In R. Evans, Jones, D. (Ed.), *Metacognitive approaches to developing oracy. Developing speaking and listening with young children* (pp. 139-149). London: Routledge.

Presmeg, N. C. (1986). Visualization in high school mathematics. *For the Learning of Mathematics, 6*(3), 42-46.

Presmeg, N. C. (1992). Prototypes, metaphors, metonymies and imaginative reationality in high school mathematics. *Educational Studes in Mathematics, 23*(6), 595-610.

Presmeg, N. C. (1998). Metaphoric and metonymic signification in mathematics. *Journal of Mathematic Behaviour, 17*(1), 25-32.

Quine, W. V. O. (1961). *From a logical point of view*. Cambridge: Harvard University Press.

Radford, L. (2003). Gestures, speech, and the sprouting of signs: A semiotic-cultural approach to students' types of generalizations. *Mathematical Thinking and Learning, 5*(1), 37-70.

Reznitskaya, A., Glina, M., Carolan, B., Michaud, O., Rogers, J., Sequeira, L. (2012). Examining transfer effects from dialogic discussions to new tasks and contexts. *Contemporary Educational Psychology, 37*, 288-306.

Richards, I. A. (1965). *The philosophy of rhetoric*. New York: Oxford Univeristy Press.

Ricoeur, P. (1978). *The rule of metaphor* (R.Czerny, K. McLaughlin, & J. Costell, SJ, Trans.). London: Routeldge & Kegan Paul.

Ricoeur, P. (1979). The metaphoric process as cognition. In S. Saks (Ed.), *On metaphor*. Chicago: University of Chicago Press.

Roediger, H. L., & McDermott, K.B. (1993). Implicit memory in normal human subjets. In F. B. J. Grafman (Ed.), *Handbook of Neuropsychology* (Vol. 8, pp. 63-131). Amsterdam, The Netherlands: Eksevier.

Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in social context.* New York: Oxford University Press.

Rotman, B. (2000). *Mathematics as signs: Writing, imaging, counting*. Stanford, CA: Stanford University Press.

Salinger, J. D. (2001). *The catcher in the rye*. New York: Back Bay Books.

Säljö, R. (2005). *Lärande och kulturella redskap: om lärprocesser och det kollektiva minnet [Learning and cultural tools: on process of learning and collective memory.]*. Stockholm, Norstedts: Akademiska.

Schaefer, V. J., Day, J.A. (1981). *A field guide to the atmosphere*. Boston: Houghton Hifflin Company.

Schön, D. A. (1981). *Intuitive thinking? A metaphor underlying some ideas of educational reform (Working Paper 8)*. manuscript. Division of Study and Research, MIT.

Schwartz, D. L., Martin, T. (2004). Inventing to prepare for future learning: The hidden efficiency of encouraging original student production in statistics instruction. *Cognition and Instruction, 22*(2), 129-184.

Searle, J. R. (1979). Metaphor. In A. Ortony (Ed.), *Metaphor and thought*. Cambridge: Cambridge University Press.

Sfard, A. (2002). The interplay of intimations and implementations: Generating new discourse with new symbolic tools. *Journal of Learning Sciences, 11*(2/3), 319-357.

Sfard, A. (2007). When the rules of discourse change, but nobody tells you--making sense of mathematics learning from a commognitive standpoint. *Journal of Learning Sciences, 16*(4), 567-615.

Shakespeare, W. (1872). *The complete works of William Shakespeare* (G. L. Duyckinck ed.). Philadelphia: Porter & Coates.

Shanken, M. R. (Ed.). (1996). *Wine Spectator's ultimate guide to buying wine* (5th ed.). New York: M. Shanken Communications, Inc.

Shen, Y. (2008). Metaphor and poetic figures. In R. W. Gibbs, Jr. (Ed.), *The Cambridge handbook of metaphor and thought* (pp. 295-307). New York: Cambridge University Press.

Sherwin-Williams. (2000). The lasting look of Dutch Boy. Color ideas. In D. B. Paint (Ed.). Cleveland, OH: Sherwin-Williams Company.

Sherwin-Williams. (2006). Dutch Boy colors. The lasting look of Dutch Boy. In D. B. Paints (Ed.). Cleveland, OH: Sherwin-Williams Company.

Shibles, W. A. (1971). *Metaphor*. Whitewater, Wisconsin: The Language Press.

Smith, B. (2013). http://en.wikipedia.org/wiki/List_of_Crayola_crayon_colors. Retrieved January 12, 2013, 2013, from http://en.wikipedia.org/wiki/List_of_Crayola_crayon_colors

Son, J. Y., & Goldstone, R. L. . (2009). Contextualization in perspective. *Cognition & Instructional Science*, *27*(1), 51-89.

Soskice, J. M. (1985). *Metaphor and religious language*. Oxford: Clarendon Press.

StatTrek.com. (2015). Random-number-generator. 2015, from http://stattrek.com/statistics/random-number-generator.aspx

Swinburne, R. (1992). *Revelation, from metaphor to analogy*. Oxford: Clarendon Press.

Turkle, S., & Papert, S. (1991). Epistemological pluralism and the revelation of the concrete. In I. Harel, & Papert, S. (Ed.), *Constructionism* (pp. 1610192). Norwood, Nj: Ablex.

USPS. (2003). Cloudscapes. Retrieved March 21, 2015, from https://about.usps.com/postal-bulletin/2004/html/pb22137/kit-text1a.html

Vatican. (1993). Catechism of the Catholic Church. Retrieved March 13, 2014, from Libreria Editrice Vaticana, 1993 http://www.vatican.va/archive/ENG0015/_INDEX.HTM#fonte

von Balthasar, H. U. (1982). *The glory of the Lord. A theological aesthetics* (E. Leiva-Merikakis, Trans. Vol. 1: Seeing the form). San Francisco, New York: Ingnatius Press & Crossroads Publications.

Vygotsky, L. S. (1962). *Thought and language* (E. Hanfmann, G. Vakar, Trans.). Cambridge: The M.I.T Press.

Willox, A. C., Harper, S. L., Bridger, D., Morton, S., Orbach, A., & Sarapura, S. (2010). Co-creating metaphor in the classroom for deeper learning. Graduate student reflections. *International Journal of Teaching and Learning in Higher Education, 22*(1), 71-79.

Yahoo. (2012). How do you feel? Retrieved April, 9, 2015, from yhoo.it/1Czi2Zr

Appendix A

Diehl Study Description of Atom like a Tile Manipulation

Appendix A: Diehl Study Description of Atom like a Tile Manipulation

Students in the Diehl study were informed about the definition of metaphor in an introduction. As well they were given an example of a metaphor. Furthermore, participants were informed in the introductory instructions that the study was investigating how metaphors can help people learn difficult concepts. Moreover, the instructions informed participants that they would read a metaphor. Following that, they were to write down all that they know about the concept portrayed by the metaphor. If they were not sure, they were to guess.

An episode number was printed on the top of the page of each section of this studies provided metaphor. Subjects were then to read a metaphor statement. For example: "a balanced chemical equation is like a mosaic tile planning grid" (p. 779). Following this, participants were asked to write down everything that they knew, or thought they knew, about the chemistry concept the metaphor was presenting. They could guess if they had to. Still there were two conditions in this study: the metaphor only condition and the elaborated metaphor condition. In the metaphor only condition participants were given only the metaphor statement. In the elaborated metaphor condition, however, subjects were given, in addition to the metaphor statement and elaboration of that statement. The elaboration included graphics and a narrative. The graphics and narrative told the story of a mosaic tile business. In this company, the mosaic tiles were packaged into groups that marketed as ways to make specific tabletop designs. These elaborations were created to be concrete referents for learning chemistry concepts. On the other hand, no chemistry concepts were alluded to in the elaboration.

In “Episode 1” for instance, the metaphor follows the Episode number. Next there appears the narrative part of the elaboration. In this case about a mosaic tile manufacturing company that also had a tabletop design business. The elaboration is briefly summarized here, though on the Episode 1 sheet for Elaboration Metaphor condition the elaboration is much fuller. In short,

1. Every year a new tabletop design is created.
2. The new tabletop design and the original use the same planning grid. This grid is presented.
3. Every year the original and the new tabletop design utilize the same three types of tiles.
4. These three types of tiles are all different however. They have different colors, shapes and sizes.

In addition to Episode 1 there also followed Episodes 2 through 13. Here are three examples of the episode metaphors: (a) A Balanced Chemical Equation is like a Mosaic Tile Planning Grid; (b) A Molecule is Like a Modular Pattern, (c) An Atomic Mass Unit…is like a Dab (p. 779).

Scoring

Subjects were asked to write what they knew and what they thought they knew about a chemistry concept. This was done at the end of each episode. The objective of this part of the method was to measure how subjects related the metaphor in their responses. It was reasoned that because the concrete analogue was isomorphically related to the target domain, participants would be more prepared to learn the targeted

concepts if they applied their knowledge of the target domain to make viable inferences about the target. Isomorphism is a term used in mathematics and biology. Isomorphism is a likeness of one structure to another. Even though the Diehl (2010) study is in chemistry, isomorphic assimilations are drawn between tile structure and molecular structure. Every possible response category that related to the metaphor was written out for each of the elaborations in each episode. For instance, for Episode 1, the metaphor, a "balanced chemical equation is like a tile planning grid" (Diehl, 2010, p. 780) was one elaboration used. And depending on the level of complexity categories were identified as high-level, medium, or low-level. Complexity in this study was defined as "the depth of understanding" necessary for a response to be assigned a category. One low depth level of understanding or low-level classification which resulted from Episode 1 in the Diehl (2010) study follows: "Balanced chemical equations and mosaic tile planning grids are the same on both sides" (Diehl, 2010, p. 780). Here, in turn is one example of a response then categorized as low-level. "A balanced chemical equation is when both chemicals on each side are equal" (Diehl, 2010, p. 780). A medium-level category follows: "Both have equal numbers of tiles/atoms on each side of the grid/equation." Subsequently here is one example of a student medium-level response "A balanced chemical equation compares to the mosaic tile planning grid in that the number…of chemicals must equal the number... of chemicals in the new equation" (Diehl, 2010, p. 780). The high-level category included "Tiles/atoms are recombined to form a new combination." As well, here is an example response: "Balanced chemical equations have the same numbers of ...each substance, just re-organized in a new way" (Diehl, 2010, p. 780).

Three independent raters judged the placement of responses into categories. When the three raters maintained a high level of agreements for each participant's responses to the first three episodes then two out of the three raters recorded every subsequent episode. Discussion resolved disparities. The two raters agree to categories by 92%. When a student response demonstrated an erroneous inference, i.e. a misinterpretation of the metaphor, an additional code was applied. Study 1 failed to be scored in a consistent manner so analysis was not reported. However, in Study 2, the code system was refined and analysis was included therein.

Appendix B

Other Figures of Speech

Appendix B: Other Figures of Speech

Figures of Speech, there are many in the repertoire of grammar. These may include hyperbole, metonymy, catechesis, and oxymoron. Still metaphor seems to have embraced them all as a genre title (Avis, 1999). However, Avis, citing Culler, claims that metaphor is not 'the figure of figures' and not just another figure in the midst of others. A phrase that speaks of a thing by way of suggesting it through another is the figure of speech or trope we call a metaphor. Metaphor is sometimes confused with other categories that are not figures of speech. Because we identify metaphor as a figure of speech we can distinguish it from these other categories. In this section, I divide the metaphor-like symbols, models, allegories, and satires that are not figures of speech, in one category and then I will present the figures of speech as another category. From this, I will be able to identify clearly and define metaphors and extended-metaphors that I use in this study. Then I will discuss the figures of speech, or tropes, that get closer and closer to metaphor but are still not metaphors. By identifying the other figures of speech that are not a metaphor I will clarify what a metaphor, in fact, is.

Differences

Soskice points out that there are few conversations within much of the contemporary literature on the metaphor that recognizes it among other forms of speech, specifically tropes. Writers such as Paul Ricoeur are comfortable with rhetoric and its tropology. However, they have suggested avoiding classifying tropes nonetheless, authors often find it necessary to talk about metaphor by indicating the other figures of speech (Soskice, 1985). However the weakness in focusing too much on the tropology of

a metaphor, according to Ricoeur, is that then there is too much focus on the word and its meaning alone. Ricoeur (1978) refers to this as "hegemony of the word" (p. 44). If we see meaning by way of simply the word, then the interpretation is from simply the use of the deviance of the word's meaning. Of course, interpretation goes beyond variance of word meaning, as discussed elsewhere. However, contrary to Ricoeur (1978) we can still consider the differences in trope types and still not be misled (Soskice, 1985). However, Ricoeur (1978) keeps the tropes out of the conversation about metaphor; Black (1970) has made a great deal of effort to distinguish metaphor from its sister trope, similes. Both of these may suggest that contradistinctions between some selected tropes are, in fact, an enhancement of possibility and intriguing. Here, we will discuss the other possible tropes that may be confused with metaphor. The purpose of this discussion of other tropes is to improve our definition of exactly what a metaphor is by also clarifying what it is not (Black, 1970; Ricoeur, 1978; Soskice, 1985). In that way, we can determine and identify metaphor perhaps more readily. I will also discuss a spectrum of tropes demonstrating a scale of far from being a metaphor to close to metaphor.

The literature since Aristotle does point out that metaphor is on the top of the trope scale, but that simile is close to the top. Going further than metaphor we then arrive at dead metaphor, which means too overused. For this study, I focus on metaphor in the language only because there are metaphoric images that are non-linguistic such as symbols or allegories. Unfortunately, much of the empirical literature implements a loosely focused nomenclature when referring to metaphor, often stating metaphor equally with analog or simile. Since my study is trying to bring a tighter focus to metaphor as

part of a poetry form, specifically extended-metaphor or conceit, I will identify and rate only metaphoric tropes. I will consider metaphoric tropes to be metaphor and simile. In the next section, I form definition and rationale for what is a metaphor and what is not. First we will start with the nonlinguistic cognitive events which, though sometimes confused with metaphor, are by definition not. I do this because much of the literature discusses metaphor as an analogy or symbol.

Non-linguistic. Soskice (1985) argues that the difference between tropes may appertain to cognition, or the reception of them in a context. However, often utilized to describe and name illustrated examples as well as "mental events," analogies, models and symbols are, in these ways, non-lexical and syntactical. Still, in some ways they are also non-exclusive appellations for figures of speech. However, they are different than metaphors, which are in this study and other literature only figures of speech (Soskice, 1985, p 55).

Pictorial and model. Soskice argues that the difference between tropes may appertain to cognition. Therefore, cognition evoked by simile and metaphor differs. The real consideration, however, should be between pictorial or modeled metaphor or simile (Soskice, 1985). The difference between modeling and illustrative is in the epistemological function of each. For instance, the pictorial simile establishes and compares two understood things. The comparison is direct, a to b (Soskice, 1985). Here is an example: "If I compare the sun to a golden ball to compare the two" (Soskice, 1985, p. 60) the result of the author's intention relies on this direct connection. That is

illustrative or pictorial. We may intuitively perceive that this is not rich metaphorically, that it is only a pictorial for a concept.

Then there are modeling metaphors. A modeling metaphor or simile employs a commonly known entity to help us see the conceptual schematic of an idea or situation that is outside of our normal understanding. For instance, "light is waves," "God is our father" (Soskice, 1985, p. 60). Oft times in the theological literature, the words 'metaphor' and 'model' are used synonymously. Metaphor we have defined here as a figure of speech, a trope, in which one thing suggests another. By setting this definition from the very beginning, we can differentiate metaphor from several categories it may sometimes be confused with. Some of the literature, Soskice (1985) suggests, tends to use model and metaphor synonymously. The function of the model is sometimes related to metaphor and, in other cases, they can be identified as something entirely different.

A thing or a situation can be identified as a model when seen as yet another thing or situation. For instance, it could be said that there is a structural analogy between a model railroad caboose and an actual caboose. A model, therefore, may not always be language based, and that is one reason it may not be considered a metaphor (Soskice, 1985).

Symbol. The symbols of the sacraments used in this study, are themselves, not metaphors. That's because a symbol cannot be language based, for instance, the symbol of a cross. As Barth said earlier, a sacrament is a symbol, and metaphor is part of the language and meaning that is subsumed within the sacramental symbolism (Barth, 1977).

Also, a designation often used to depict a type of argument or similarity is an analogy. While analogy and metaphor are used in some of the literature as almost synonymous they are not. And for the purposes of this study we will be using metaphor.

Allegory and satire. Allegory and satire, however, are only different than metaphor through their objective and their sphere of approach. Their sphere of approach usually requires a great deal of the textual content such as a paragraph or story. Allegory and satire differ from metaphor in that metaphor is usually no more than a sentence or, more commonly, a distinctly asserted phrase. Because they use so much of the text, allegory and satire are not tropes. So this separates them from metaphors as well. Moreover, metaphors tend to address one main subject. Subsequently, metaphors usually accomplish this without any further camouflage. Both allegory and satire, however, like metaphor, speak of one thing through the facade of another. However, in allegory and satire this facade is only a guise (Soskice, 1985). Allegory, in its derivation from Greek rhetoric, means "a series of metaphors" or a sustained metaphor (Ferre, 1974, p. 203). Allegories are sometimes considered extended-metaphors. While metaphors can be found in satires and allegories, allegories and satires are not figures of speech. Rather, they are both "forms of prose" (Soskice, 1985, p 56).

Not seen different than metaphor by much of the theological literature, myth too, like allegory and satire, are positioned within literary analysis, storytelling, and writing style. In short, myth too is not a figure of speech (Soskice, 1985).

Tropes closer to metaphor. So far, we have discussed language elements associated with metaphor, but which cannot be considered figures of speech. Central to

the figurative speech are the most interesting tropes that are even more closely related to metaphor: synecdoche and metonym (Levin, 1977; Soskice, 1985).

Synecdoche. Synecdoche, from the Greek for 'taking up together', addresses the entirety of an entity by way of just a part of the same entity. For instance, within cattle the synecdoche 'head' is often used. And for man, especially in a working situation, the word 'hand' represents the human being (Crystal, 2003). Said another way, "the ships opened fire" (Soskice, 1985 p. 57) is an example of synecdoche. Notice it is referring to a more generic term for a more specific one, or a genus rather that a species. Of course, it was guns that opened fire.

Metonymy. From the Greek for 'name change', metonymy is the replacement of one characteristic of an object or situation for the object or situation itself. For instance, a royalty may be referred to as the 'crown'. The theatrical profession is called the 'stage' (Crystal, 2003). A comparison is drawn between metonymy and synecdoche. The metonymy, however, uses a word more auxiliary to represent an entity. For instance, when saying "the White House said yesterday" it is likely the president who has made the statement (Soskice, 1985, p. 57).

Why synecdoche and metonymy are not metaphors. Semantically different than metaphor, synecdoche and metonymy utilize a single word or phrase to be a clear and direct surrogate for another reference. This is unlike metaphor because using a genus for a species or a stand-in term for the complete idea is oblique and 'unpoetic'. That's because metonymy and synecdoche very directly identify the term that is not stated in the phrase or sentence. For instance, when we say "twenty sails entered the harbor"

(Soskice, 1985 p. 57) we don't ask how they got there unattached to boats. These two tropes are mainly ornaments because they serve as an obliquely stated purport. In short, the meaning in a metonymy or synecdoche is directly anchored to what is referenced. In metaphor, meaning can be much more expansive (Soskice, 1985).

We have discussed some of the argument that metaphor is an ornament. We have also concluded that metaphor is much more than that. For instance, a good metaphor should be proposing a whole group of ideas and affectations. Of course the metonymy, for instance, should not do this, or it will not work as defined.

An array of ideas. There are, however, even closer relatives to metaphor amongst the tropes. These may include litotes, oxymoron, hyperbole, zeugma and on an even closer relation with metaphor, as we will discuss, simile (Soskice, 1985).

Litotes. Litotes may deny the opposite to assert something. For instance: "That's no joke" (Soskice, p. 56). "They aren't the happiest couple around." "It isn't very serious. I have this tiny little tumor on the brain" (Salinger, 2001). "The grave's a fine and private place, / But none I think do there embrace" (Marvell, 2013).

Oxymoron. By joining incongruous word concepts, we get the oxymoron. Example: "He's a delightful bore" (Soskice, 1985, p. 56). "Hegel was right when he said that we learn from history that man can never learn anything from history." - G.B. Shaw. "I can resist anything, except temptation." - Oscar Wilde. "Simplicity is not a simple thing." - Charles Chaplin. "Always and never are two words you should always remember never to use." - Wendell Johnson. "The best cure for insomnia is to get a lot of sleep." - W.C. Fields. "Always be sincere, even when you don't mean it." - Irene

Peter. "If I could drop dead right now, I'd be the happiest man alive." - Samuel Goldwyn. "The building was pretty ugly and a little big for its surroundings." - John Steinbeck. "The coldest winter I ever spent was a summer in San Francisco." - Mark Twain. "To lead the people, walk behind them." - Lao-Tzu.

Hyperbole. An exaggeration can form a hyperbole: "He never stops talking" (Soskice, 1985, p. 56). It is clear that the use of these tropes, litotes, oxymoron, and hyperbole is very restricted. There's another reason metaphor is still something else which also remains much more interesting. Still, in coming even closer to the metaphor, we have zeugma and simile.

Zeugma. A figure of speech, the zeugma, uses one word to regulate two disparate constituent concepts while making the two different meanings secured in each case (Shen, 2008). Some examples of the zeugma: "Kill the boys and the luggage!" (Shakespeare, 1872); "He packed his shirts and sorrow"; "She caught an airplane and a husband" (Shen, 2008, p. 300).

Simile. Often the closest competitor of metaphor, similes, when done well, can evoke and coerce several possible meanings. Also a trope, like metaphor, a simile can be recognized in language presenting a comparison that includes the installation of "like" or "as." For example: "the porter is like a great pigeon roosting at this post, fluffing his feathers and pecking the glass at passing offenders" (Soskice, p. xi). Or from poetry by Langston Hughes:

A Dream Deferred

What happens to a dream deferred?

Does it dry up

like a raisin in the sun?

Or fester like a sore—

And then run?

Does it stink like rotten meat?

Or crust and sugar over—

like a syrupy sweet?

Maybe it just sags

like a heavy load.

Or does it explode?

There is a danger in assuming a metaphor can be a statement equal to a simile. If we turn a metaphor's literal meaning into a simile that is the same as shutting the door on what the metaphor originally meant, which was important in the actual way the metaphor worked (Davidson, 1979, p. 37).

On the other hand, Murray seems to think the metaphor is but a condensed or abbreviated simile (Murray, 1931). Bain, Black (1955) suggests, tells us however that the metaphor compares one thing to another via the use of simply a word. It is the situation of being constrained, by way of a word or phrase, that allows us to examine the foibles, uniqueness, and weaknesses in metaphor. However, this is still seeing metaphor only as a comparison, or simile (Bain, 1888; Black, 1955).

In Rhetoric 1406b, Aristotle (1924) as well argues that similes are metaphors but only differing by way of the form of expression. Much of the literature, however, does

not see it this way. Rather they see the difference in meaning as great. Aristotle suggests, "Achilles ran like a lion" is not very different from "the lion rushed" (Aristotle, 1924; Swinburne, 1992). Soskice seems to stand by Aristotle, but with more detail, in suggesting that simile and metaphor are or can be the same.

***Not as rich as metaphors*.** Some of the literature suggests similes are not just metaphors with the addition of "like" or "as". That's because the easy comparison of simile does not suggest the same level of richness in meaning that metaphors evoke through a network of affiliations (Black, 1970; Soskice, 1985). When one transforms a metaphor into a simile, there is then, more constraint placed on the phrase's interpretation and its percipient presentation. The metaphor transformed to a simile has a limitation placed upon it by direct definition. Subsequently, this may not allow for the perception intended and the broader scope of its original metaphoric meaning (Avis, 1999; Goldin, 2000).

Truth-Conditions. Some even illustrate the different "truth-conditions" in metaphor versus that in simile. For instance the formula "a is ϕ" has an entirely different truth-condition than "a is like o" (Searle, 1979; Soskice, 1985; Swinburne, 1992).

Another disparity is that similes convey their form of comparison directly through their dramatic form. Metaphors are elliptic in their comparative method (Avis, 1999; Fogelin, 1982). Avis suggests that further disparity of metaphor and simile might correspond with Coleridge's notions of the strength of Imagination and the gadgetry of Fancy, though 'symbol' seemed to be a more catholic idea for Coleridge (Avis, 1999; Fogelin, 1982).

To treat the literal meaning of a simile as the same as the figurative meaning of the metaphor is a major oversight. That's because this frame of mind abates an interpretive nuance and instead causes it to be all too palpable and glaring. In fact, we tend to start the pursuit of a veiled indication through metaphor when we take it as false. In other words, most metaphorical phrases are indubitably false while most similes are banal truths. In order to create a suitable condition for us to accept a sentence as metaphorical, the writer or speaker makes it unbelievable, through incongruity and confutation, sometimes the absurd (Davidson, 1979).

As with other language structures and styles, the differences in the way they are written may be simple but, as in poetry, speech, philosophy, and theology, the difference in their interpretation meaning and impact can be considerable. In fact, from two distinct psychological realms, Avis claims simile and metaphor also originate from unequal perceptions, thereby also bringing about or eliciting different experiences or perceptions (Avis, 1999).

Of course, a simile is sometimes a figure of speech we still want to use in certain topics. This paper is on metaphor. To simplify things, we must either accept or exclude simile in the data set. I here include simile in the data set. Of course just saying simile uses like or as is not enough. Further study should pursue teaching children how to know when to use metaphor and for what reasons and to what effect. However, we sometimes use metaphor without knowing why exactly it works where it does or even that we actually did use one as they are often a common habit.

My Study: Simile vs. Metaphor

As discussed, metaphor is one amongst tropes which includes simile. Some students did use like or as phrases early in the method process. For this study, we will not further debate the superiority of metaphor to simile because of the network of ideas metaphor can weave. Nor will we discuss simile as superior to metaphor by virtue of it being more direct and accurate (Soskice, 1985). In this study, I accept similes as an example of metaphoric thinking as the simile is the closest to metaphor in the tropes.

The difference: catachresis. Still, one more distinction can be made between the metaphor and simile. We should identify one difference between simile and metaphor because there is at least one thing that through its grammar structure a metaphor can carry out but a simile cannot. Rhetorically, this is called catachresis (Soskice, 1985) from the Greek, katachrēsis which means, misuse.

Catachresis is the provisioning of a word because one is absent in our lexicon. For instance, "the lower part of the mountain came to be called its 'foot' or . . . the narrow base of the wine glass its 'stem'." In other words, catachresis fills a 'lexical gap' (Soskice, 1985, p 61.).

Catachresis may be considered "saying the unsayable" (Soskice, 1985, p. 63). Therefore, catachresis may point towards a similar paradoxical notion, discerning the indiscernible, or knowing that we do not and cannot know.

Conclusion

In this appendix, I have discussed the figures of speech or tropes that may seem to have characteristics similar to metaphor but which, in fact, are not a metaphor. As well, I

have presented the nonverbal symbols and models that cannot therefore be figures of speech. Moreover, there are allegories and satires that because of their size and format may not be considered tropes either but are, rather, text.

We have clarified metaphor to some degree by showing what it is similar to but is, in fact, not. In the next section, I will discuss the dual parts of what metaphor is or does. I break down the tropes I focus on in this study into categories and components to understand metaphor and to garner some understanding of the philosophy, theory, and the value of metaphor.

Appendix C

Dichotomies of Metaphor

Appendix C: Dichotomies of Metaphor

Tenor and Vehicle is the wording I use in this study to name two basic parts of, or the dichotomy of, a metaphor. I am going to discuss here the other names for dichotomies of metaphor as suggested by the literature. These dichotomies may be employed within the metaphor. However, as discussed, for a metaphor to be considered a metaphor it must also be received, or heard, by someone other than its author. So in addition to the instruments for creating metaphor these dichotomies also include parts of the theories defining the perception of a metaphors' receiver. Furthermore, some of these dichotomies also exist outside of a metaphor itself. Recall that there are non-linguistic categories sometimes confused with metaphor, namely model, symbol and analogy. While model, symbol and analogy may sometimes be metaphoric they are not, by themselves, metaphors.

Each one of the following dichotomy sets is an integral part of a metaphoric context, when utilized. My discussion on these dichotomies will include the differences and the similarities between each pair. I will discuss in this section the following metaphoric dichotomies: sign/icon, target/source, frame/focus, ornamental/incremental and tenor/vehicle.

Each dichotomy pair I will call a category. Seeing the difference between categories may help demonstrate theory differences and similarities supporting the

theoretical foundation of my study. The titles for each category will be its two dichotomous names typed together with a slash.

I begin briefly with the Peirce theory of sign and icon. I position Peirce's sign and icon as a foundational theory upon which I structure the other dichotomies. Then, I go onto define the two essential parts of the metaphor and variations on that category's name and concept. I conclude with the (Peirce, 1998) dichotomy categories which may be related to the perception or reception of metaphor.

Sign/Icon

As per Peirce, "Sign is anything which is so determined by something else, called its Object" (Peirce, 1998 p. 478). And Icon is an analogous or concrete representation or signification of an object that represents it (Peirce, 1998). Derived further from Peirce, Henle calls attention to the difference between sign and icon pointing out that metaphor has an iconic element which is 'metaphor imbued'. This means that if you read carefully enough, there is little chance you will find a totally literal paragraph. This is because metaphor is imbued in almost all of our communication and dialogue whether it be commonplace or noteworthy (Henle, 1958; Ricoeur, 1979).

exergue /u sure. In order to dissolve the distinction that exists amidst rhetoric, philosophy and metaphoricity Derrida proposes the term rumistetics. Rumistetics is the combination of two words, *exergue* and *u sure*. Exergue is often thought of as the inscription that is worked into the metal of a coin. U sure, on the other hand is the eventual erosion of said inscription through the friction and mauling caused by continual fingering of the coin in the economy of a society. And this is important because, Derrida

sees a word as if it were a coin (Derrida, 1982). On the notion of word as coin he goes onto state that there are 'inscriptions', or metaphors, are also within the word. As coined 'inscriptions,' they are ground down over time. In other words, we begin employing originally the metaphorically inscribed into our verbal coinage (exergue). Still, over time, being passed around hand to hand, if you will, the exergue is slowly eroded (u sure). This then causes the words to be presented as merely, what Derrida suggests are white words. So many others have spoken of this in various ways but it comes down to 'dead metaphor' meaning its common usage in the daily parole. The presumption may be that these white words were never inscribed as metaphors. However, by tracing the history of a word we may be able to exhume the metaphoricity berthed in the word which now appears like a common white word. So the metaphor is made dead. Put another way, we are working with zombie metaphors we don't recognize as such (in addition to the living metaphors) in philosophy on a regular basis (Derrida, 1982).

Metaphors are so present in philosophical thought that metaphors are the actual blood of philosophy. They circulate and actually provide the way philosophy stays active and alive. Therefore, sometimes concealed within philosophy are metaphors; metaphors camouflaged as white words. If philosophy goes on asserting that is uses nothing but white words it then goes *bloodless*. This is why Derrida poses *metaphorology*, or the convergence of philosophy and rhetoric by way of metaphor. Metaphorology, however, is not the focus of my study but rather.

Metaphor Parts

Target/Source. Comparisons made metaphorically consist of two basic terms, or parts. One belongs to the domain called "target." The other falls in the domain of "source." Shen gives an example for a simile which, while not a metaphor, is a metaphorical comparison. In the simile "education is like a ladder" the word "ladder" is the "source." The word education in the phrase is then, the "target." So the target concept, event or situation then receives a metaphorical statement from its source. Of course what makes it a source is simply the fact that the speaker seeks a metaphorical statement and that is from whence a source comes.

Incorporeal/Concrete. Metaphor helps us to go beyond the banal while at the same time they are embedded in the common experiential schema of most people. This is what Gibbs refers to as the "paradox of metaphor," (Gibbs, 2008, p. 5) which means that there is an incorporeal, or conceptual meaning for one subject emanating from its comparison to a secondary, more concrete subject (Avis, 1999).

Concrete/Spiritual. Within the biblical literature, a limitation of metaphor may be that metaphor is a concrete image coalesced with spiritual fervor (Avis, 1999; Knight, 1933). These are two conflicting domains used to create metaphors for something there is no other language for.

Occasion/Image. From another perspective Avis suggests that metaphor maintains a 'stereoscopic' purpose by way of its melding its two *perceptions* of 'occasion' and 'image' (Avis, p. 96). Metaphoric images and occasions build the experience of, and the rationalization about, the primary subject in terms of and in light

of its secondary Vehicle or image lexeme. An image is an entity appertaining to speech. Going back to Bachelard and Ricoeur, the image is meaning at the dawn of its appearance, just prior to its evanescing from perception (Bachelard, 1964; Ricoeur, 1979). Perhaps this can be thought of as the fading footprints discussed earlier (Jakobson, 2007).

Here is an example of Occasion and Image from Macbeth:

> Light thicken, and the crow
> Makes wing to the rooky wood;
> Good things of day begin to droop and drowse,
> While's night's black agents to their preys do rouse.
> (Shakespeare, 1872)

Here is an explanation of the example above. The 'occasion', in this paradoxical metaphor of light thickening, is the perception of the day's gloaming or twilight. While the 'image' is the thickening, as if the approach of dusk were a viscous congealing like overcooked oatmeal (Avis, 1999). This may be also seen as a Tenor, which can be an event or 'occasion', and a Vehicle which can be something known in a different domain of thought, or 'image'

Cognitive Reception of Metaphor

Ornamental/Incremental. Avis approaches two competing customs in appraising metaphor by suggesting the words "ornamental" and "incremental" (Avis, p. 98). Ornamental addresses the quality of the rhetoric utilized in order to parlay the metaphor's effect. By "incremental," Avis means the component of metaphor that is the

origin of insight and, at the same time, cannot be conveyed without the ornament. Ornament, on the other hand, may be sometimes considered as inessential and expendable (Avis, 1999). And this has been a long ongoing argument for metaphor. For example, others pose that metaphor has been considered an ornamental trick in Rhetoric and, as such, not Rhetoric's essential tool (Avis, 1999; Richards, 1965). As a result of this traditional thinking about metaphor as an ornamental trick is a paradigm of metaphor. Perhaps as a result this form of speech has been under suspicion for a long time because of it fostering what Murray calls a 'logical taint' (Murray, 1931. p 40). Still ornament is part of the trope but, also how we receive the ornament along with the incremental are parts of the meaning we perceive.

Stimulus/Concept. Nietzsche (2000) suggests, our perceptions are evoked co-dependently between our consciousness and our response to the corporeal. That is, our thoughts evolve within our body and the stimuli the body receives. Therefore, all ideas are the metamorphoses of stimuli and interpretations thereof. In that way our truth is "a mobile army of metaphors" generated in the body prior to the mind grasping it. Therefore the first stage in the metaphoric event is the *stimulus,* the next stage is the *concept.* The very process of forming a concept is essentially metaphorical thinking and metaphorical thinking is the building of bridges between a nerve stimulus evoking a retinal image (first metaphor) to a sound as a signifier (second metaphor) (Nietzsche, 2000, p. 55). Between the two, however, "there is no causality, no correctness, and no expression" (Nietzsche, 2000, p. 58). What we see as truth then is going through a continual metamorphosis. This suggests a sequence of classifications and subsequent

discernments which under almost no conditions correspond with each other perhaps very much like cross-domain mapping (Nietzsche, 2000).

Frame/Focus. For Black the 'focus' is the word used metaphorically. The word in a sentence, which is not being used metaphorically, is called the 'frame.' Therefore, two different thoughts are in the metaphoric duality because frame and focus are structured in one phrase or sentence. The resultant meaning, is evoked by the differences and interaction between focus and frame. Black emphasizes that this is "logical grammar" (Black, 1962). The frame and focus theory highlights just what is seen in a context. In other words, frame and focus looks only at the whole sentence and the word within it (Black, 1962; Richards, 1965; Ricoeur, 1979).

Tenor/Vehicle. In the empirical research of this study I use Tenor and Vehicle as chapter is on tenor and vehicle. The possible reversal of target and source are Tenor and Vehicle. In other words, the actual elicitation of an incident or experience may simply serve as the Vehicle for rendering the substance of a concept, the tenor. In order to approach Tenor/Vehicle I began with target and source in which the target—idea or experience— is then handed a metaphorical statement, or source (Avis, 1999). Tenor/ Vehicle then are the reversal of target and source in that the experience (target) may simply serve as the vehicle for transporting the basic concept, the tenor (source). It may be unfruitful to determine which of these two is foremost and which is of lesser importance as their values seem to float on an equivocal gauge (Avis, 1999). The difference between Tenor and Vehicle that Richards suggests is not exactly the same as Black's look at frame and focus. Contrarily, Tenor and Vehicle select the concept which

is expressed and the image or picture in which it is parceled to the receiver (Black, 1962; Richards, 1965; Ricoeur, 1979).

Incorporeal/Concrete. Incorporeal/Concrete for instance are the conceptual meaning for one subject (incorporeal) evoked by way of an analogy to a physical object (concrete) (Avis, 1999). Furthermore, 'incorporeal' can also mean 'tenor' and then the 'concrete' denotation, the 'vehicle.' Likewise, within a metaphoric event the 'tenor' can also be considered an 'occasion' and the vehicle its 'image' (Avis, 1999). I.A. Richards calls incorporeal meaning its 'tenor' and its concrete superlative the 'vehicle'. So to carry the voice of the concept something has to carry the voice or tenor, that is the vehicle (Richards, 1965). Avis further suggests that the two components of metaphor (tenor and vehicle) should simply be coalesced into what he calls a metaphoric "event" (Avis, 1999, p. 94). I now begin to capitalize Tenor and Vehicle because this is how I address them in my study. This is just another tool to help us analyze the parts of a metaphor while still fusing the two renamed components (Tenor to occasion, and Vehicle to image) as a metaphoric event (Avis, 1999).

To draw the comparison between Tenor/Vehicle and occasion/image in the metaphor event then the 'Tenor' can be its 'occasion' and the survey of the occasion is its 'image', otherwise called the Vehicle (Avis, 1999, p. 94).

In the dichotomy ornamental/incremental "ornamental" stands for the way the metaphor creator uses rhetoric to carry the effect of metaphor. Whereas "incremental" is the carrier of an idea or revelation that requires the ornament to complete its journey

through meaning (Avis, 1999). There is also a close relationship between ornamental/incremental and Tenor/Vehicle.

Different dichotomies include frame/focus which defines receiving metaphor only as the whole sentence and then, subsequently, the word within it which implying that its meanings may change (Black, 1962; Richards, 1965; Ricoeur, 1979). Consequently, Stimulus/Concept suggests that Truth is continually changing with the way language changes its color in the metaphoric event. Stimulus/Concept may propose a series of thoughts which may not fully relate to each other (Nietzsche, 2000). Also, frame/focus and stimulus/concept, are closely related to the process involved in Tenor/Vehicle.

Appendix D

Tenor and Vehicle Lists and Poems for Sacraments

Appendix D: Tenor and Vehicle Lists and Poems for Sacraments

The Sacrament of Baptism

Rite. In this sacrament the participants are brought to a baptismal font. Participants are usually made up of the person to be baptized, sponsors from the family or church to help support the parents, also usually present, the parents of the baptized, who make a commitment as well. The priest or deacon then says "My dear brothers and sisters, God uses the sacramental water to give his divine life to those who believe him"(Vatican, 1993). Then the water is blessed and further narratives of salvation are presented. There is then a verbal renunciation of sin and a presentation of faith. Subsequently, the person to be baptized is immersed in water and the water is poured on her head three times with the celebrant saying the name of the baptized followed by "...I baptize you in the name of the Father, and of the Son, and of the Holy Spirit" (Vatican, 1993). Next the newly baptized is anointed on the top of the head with chrism to demonstrate the presence of the Holy Spirit. Finally, the baptized person is given a white garment and a candle lit from the church Easter candle which stands for a lit flame to keep the faith alive. For this study, water was chosen as the symbol of the sacrament to be used for the Sacrament of Baptism in my method.

The semiotic object for the Baptismal symbol of water was pictures of clouds. These, themselves are extensions of the concept of water, as water exists in atmosphere and weather. To make these tools available to the class I used three visual book stimuli. More specifically, these were one four color photographed book on clouds (Parviainen, 2004), one two-color atmosphere reference book which included cloud formations with

captions (Schaefer, 1981), and a flat of United States Postal Service stamps, illustrating and captioned with the names of cloud types (USPS, 2003).

Having experienced the cloud illustrations, the dialogical inquiry question was "What cloud formation names best represent an emotion on the Tenor list?" Students, referenced their cloud pictures, and dialogically discussed which clouds and why, apply to the Tenor list. The Tenor list was a list of emotional responses to the effects of the Sacrament of Baptism.

Using these cloud pictures as semiotic objects (Parviainen, 2004; Schaefer, 1981; USPS, 2003) we then selected cloud names evoked by the images then added them to the Vehicle list. Now we have a Tenor list of emotions the students dialogically discussed as a possible affective response to an effect of the Sacrament of Baptism and, a Vehicles list which are cloud names, representing the concept of water, which may in some way metaphorically represent the effect emotions on the Tenor list. The students dialogically suggested connections between tenor and vehicle, otherwise Cross Domain mapping. We then discussed sentences which these metaphors may suggest. Finally students moved onto make further Tenor/Vehicle selections, or use those already selected, to write their own sentences or phrase for poems. They are also allowed to extend the tenor or vehicle list from their personal thought.

Effects. What follows is further meaning derived from the effects of Baptism delivered primarily in extended-metaphor as defined by the church through the Catechism and the CCD textbook (DeStefano, 2006a). Through a scripture narrative the relationship is drawn between water and being reborn. Baptism gives a new life to us,

through Jesus, as students of God the Father. In other words we are born again; another metaphor. We become part of the "body of Christ" or part of a larger family of faith; also metaphorical. Acting as temples of the Holy Spirit, baptism (another metaphor here too) gives us the gift of the Holy Spirit and it lives in us. Additionally, Baptism frees us from sin. In other words, everything that separates us from God is washed away (an additional metaphor) and we share in the life of God (Conference, 1994; DeStefano, 2006b; Vatican, 1993).

These effects were then discussed and questioned in a dialogical discussion in my two method classes. For instance, I, as the instructor, raised questions about how it feels to be part of a new group, such as scouts, a club, or sports.

Example. Lexeme lists were developed on the blackboard. Each student hand wrote a Tenor/Vehicle list. Most students drew links between Tenor and Vehicle lexemes. These links were first created in our dialogical discussions; students generally copied these links on their own sheets. Subsequently, students made further links—or changed them completely—as can be seen in further examples in some of the sacrament workshops. Recall that students were permitted to add other Tenor and Vehicle lexemes from their own thoughts or other sources. Here is an example of one, which I have typed up from the handwritten original. For the most part, the example below represents what most students in the method classes had listed. I present this to demonstrate the stages in the method between learning the sacrament rite and effects to actually writing extended-metaphors.

In this Tenor/Vehicle list by subject 106 the Tenor lexemes *lonely* is linked to the Vehicle lexeme *fog*. Here is an example of one metaphoric statement: "I felt relieved as the lonely fog disappeared." Please note that just because a student draws a line between a particular Tenor and Vehicle doesn't necessarily mean they will us it in their writing. They may make another aesthetic choice or not use that Tenor/Vehicle combination at all. For instance the Tenor list word *relieved* is also used in this line but it is not connected with a line on the Tenor/Vehicle lists.

The Sacrament of Confirmation

Rite. A bishop is present and holds his hands over the group of the candidates for this sacrament. The bishop prays asking God the Father or Jesus Christ to bring them the Holy Spirit as Helper and Guide. Then each confirmant with her sponsor behind her approaches the bishop. The sponsor places his/her right hand on the right shoulder of the candidate presenting the candidate, by name, to the bishop. The bishop places his right hand on top of the head of the candidate. Then the bishop makes the sign of the cross on the confirmant's forehead with chrism. As the bishop does this he prays "(Confirmant's name) be sealed with the Gift of the Holy Spirit." The anointing with chrism is a sign that God is calling the confirmant and providing her with the grace to serve the people. By responding "Amen" the confirmed says that she believes what is occurring. "Peace be with you," states the bishop to which the candidates reply "and also with you" (Vatican, 1993).

For the extended-metaphor workshop in my study which includes confirmation, I selected the actual confirmation chrism to serve as the semiotic object. Consisting of a

mix of olive oil and balsam and other incense the chrism is applied, in the sign of the cross to the foreheads of the students in my method. They are allowed to rub it off, feel it with their hands, and lift their hands to their noses to smell the chrism. Students who do not wish to have the chrism on their forehead or even on their hands are allowed to handle the container housing the chrism and smell the chrism directly from there. The inquiry used to start the dialogical discussion is "What words describing the smell of the chrism may metaphorically represent the effects of the sacrament?"

To help support this conversation, I gave students copies of the Acree Aroma list and the Aroma Wheel as vocabulary aids (Danzante, 2014; Noble, 2013, 2015). The words for aromas where dialogically conferred are appropriate. I then applied these words to the Vehicle list on the blackboard. Some examples include *caramel, truffle, vanilla, apricot,* and *almond shell.*

Effects. The effects of the Sacrament of Confirmation, the church says include a sense of the Holy Spirit "burning" within the confirmant as the apostles of Christ felt when they received the Holy Spirit. Confirmation is only given once, and it confers to the confirmant a "mark" of good character which permits the confirmant to declare herself as a member of the church (Conference, 1994). In dialogical inquiry we discuss these three effects and the metaphoric domains in which they may belong. Then questions are raised to begin the dialogical inquiry. In relation to the effect of "full, burning, outpouring of the Holy Spirit" (Vatican, 1993) the students are asked "How does it feel to be filled with the fire of spirit?" To assist the students I provided the vocabulary aid of drawings of faces with captions of the illustrated emotion (Yahoo, 2012). From

this vocabulary aid, and students' own vocabulary, words such as the following were chalked on the board in the Tenor list: *puzzled*, *nervous, surprised, enraged, soothed,* and *withdrawn*. Regarding the effect of receiving a "mark" of good character, the dialogical discussion was initiated with the question, "What is it like to be branded 'of good character?'" Continuing with the emotional faces and captions vocabulary aid students discussed the emotions acceptable for this type of effect as *joyful, anxious blissful, ecstatic,* and *satisfying*. These too were added to the Tenor list. Finally, in dialogically discussing the effect of having the ability to declare yourself as a member of the church the following question was queried: "How does it feel to officially declare your faith?" Examples of the Tenor lexemes selected dialogically included words like *shocked, sparked,* and *strengthened.*

Example. The example of a metaphoric statement written by subject 242 shows that a number of lexemes where selected in the Tenor and Vehicle columns but that time or interest, or the poet's aesthetic choices for this poem restricted Tenor/Vehicle connections to only two words. For instance in the poem "When I was about to have confirmation I felt static earth was spinning like hell smoke, or shocked wood" the poet chose *hell* from the Tenor list and connected it to *smoke* in the Vehicle list. This takes us across domains intangible or mental to physical. In addition poet 242 drew the connection between *shocked,* a mental domain to *wood,* which is a physical domain lexeme. Intuitively it may seem this is a rich metaphor.

The Sacrament of Reconciliation

Rite. Reconciliation, or Penance, can be celebrated individually with a priest, or can be done in community. The priest is traditionally wearing the purple colored stole that we employ as a traditional symbol of Reconciliation. The confessor tells the priest her sins. The Act of Contrition is prayed expressing being sorry for sin and asking the Holy Spirit for assistance in preventing them in the future. The priest then assigns a penance which can traditionally be saying a prayer or performing an act of kindness. This is followed by absolution in which the priest speaks in the name of God. In saying "I absolve you" the church tells us that God says "I forgive you and free you from your sins" (DeStefano, 2006a) . The semiotic object chosen for the method for this sacrament is a priest's traditional purple stole. I presented an actual purple stole to the class. Students touch and examine its color and its fabric texture. The dialogic question for the perception of the stole's texture is "Which fabric type is metaphorical for the sacrament's effects?" The vocabulary aid to assist in dialogical inquiry, in this case, is the fabric dictionary (Haack, 2012) which lists textile names such as these: *Cashmere, chintz, duck, denim,* and *dobby*. The textile lexemes are dialogically discussed, determined applicable, and then placed on the blackboard under the Vehicle listing. Students may also add their own choices of textiles, to the Vehicle list on their own paper.

Another symbol of the sacrament is the color purple, expressed through the stole of the priest that is worn during this sacramental experience. The stole is again used as the semiotic object. This time students specifically examine the color. I initiated a dialogical discussion with the question "What names for the tones of purple

metaphorically reflect the effects of the sacrament?" In order the find other lexemes for purple I employed a vocabulary aid for this part of the method. We looked for further, extended, descriptions of purple, often by way of more metaphor, through color samples (Lambert, 2011; Sherwin-Williams, 2000, 2006). Specifically, I provided fan decks from paint companies used for choosing home decorative paint colors. I suggest the students explore the purple category and find some of the best phrases, names, and metaphors for the color purple, often referred to in this study as lexemes.

Dutch Boy paint purples are captioned with lexemes for variations of the color purple like *brandy flame, boogie-woogie, sapphire glow, violet tulip, lilac splendor,* and *purple mountains* (Sherwin-Williams, 2000, 2006). Of course technically these do not literally say purple; they are suggestive metaphors, lexemes, for particular tones of purple.

Effects. Effects of the sacrament of Reconciliation include an invitation to *rejoin an intimate friendship, to garner peace of mind through spiritual consolation,* and allows us *to restore our fraternity with the family* (Conference, 1994). The effect of "Rejoin an intimate friendship" stimulates a dialogical conversation initiated with the question "How do you feel after making up with a friend you have hurt?" The vocabulary aid to assist with this query remains the emotional face illustrations with captions (Yahoo, 2012). Some of the responses dialogically addressed included *joyful, blissful,* or *guilty.* I wrote words like these on the board under the Tenor column. We then dialogically considered the emotion vocabulary selections possible, in response to the two other effects of this sacrament.

For the effect *peace of mind through spiritual consolation,* students in the method groups are asked, "How do you feel when you accept responsibility and are forgiven?" The emotion vocabulary aid was then accessed and dialogic conversation evoked emotion such as the following for a continuation of the Tenor list on the blackboard: *Disgusted, enraged, joyful, grieving,* and *optimistic.* Subsequently the we address the effect *restores our fraternity with the family,* with the following dialogical query: "How does it feel to come back into a group you left?" The group references the emotion vocabulary and group dialogical discussion permits the addition of emotions such as *relieved, excited,* and *satisfied* to a continuation of the Tenor list.

Example. Below is a discussion, of the Tenor/Vehicle list originally hand written on loose leaf paper by subject 211. The full Tenor list of eight lexemes was linked, individually, to lexemes in the Vehicle list which consisted of both metaphoric variations on the color purple, and types of textile or cloth. As well this student linked one Vehicle lexeme to another: *painted lady lavender* to *oil cloth*. While this lexeme selection was made on the Tenor/Vehicle list, only *painted lady lavender* was used in the third stanza, while *oil cloth* was incorporated in stanza four. Below is the example of an extended-metaphor poem written by subject 211. This poem appears to have enjambment for aesthetic effect. Still, there was no requirement for poetic form, typographically, or in rhyme or meter. The poem includes Tenor or Vehicle lexemes that were not on this list, demonstrating that the student had an idea of how metaphorical thinking may work and opted to precede independent of the community's dialogical list.

Student 221, Reconciliation.

A second chance is like a
frightened kissing cousin in
a room with someone.
A second chance is like
a plum who has been reborn.
Feeling better is like
a painted lady lavender
driving to the great place
called jersey
Not being bothered is like
an innocent paddy-whack
covered in warm oil cloth.

Sacrament of Anointing of the Sick

Rite . This sacrament is reserved to be celebrated by only a priest or bishop. The celebrant meets with and prays with the gravely ill or elderly persons and their family or community. Scripture is then read. Subsequently, the priest or bishop leads in the celebration of the rite of this sacrament which begins with asking the community for a prayer of faith in the scripture as God's word. Next the celebrant silently lays hands on the sick or elderly person asking for God's blessing. Finally the priest or bishop anoints the sick person with oil of the sick. The person's forehead is anointed first with the prayer "Through this holy anointing may the Lord in his love and mercy help you with

the grace of the Holy Spirit." Next, the person's hand is anointed as the celebrant prays "May the Lord who frees you from sin save you and raise you up." There are other possible elements of this rite, which may include the sick person receiving Holy Communion, or *Viaticum*, which is "food for the journey" (DeStefano, 2006a). In my study the semiotic object selected for metaphorical thinking about this sacrament was the official oil of the sick from the Archdiocese of Newark. This oil has an aroma and allows for a viscous tactile experience. In the method I anoint the oil on one hand of each student. If a student declines this semiotic object she is permitted to smell the oil from its container or dip her own finger into it. To engage in dialogical inquiry I ask the question "What aroma words can you apply from your experience smelling the oil that may tie to the Tenors for this sacrament?" To assist in the inquiry, I make available a vocabulary aid which, which in this case is an Aroma list (Acree & Arn, 2004). The lexemes evoked by this dialogical inquiry included *vanilla, pine, thyme, rosemary, mint, cocoa, apricot,* and *baked apple.*

Effect. In short, the effects of the receiving the Sacrament of Anointing of the Sick include *strength, peace* and *courage* as a result of a union with Christ. In addition, the sufferings of Christ give a new meaning to the sacrament recipient's sufferings. I have restated one of these effects as one statement, for instance: *Strengthen the spirit of the sick*. Then, to initiate a dialogical inquiry I pose a question which might be appropriate for fifth-grade students in that it is something they may analogously relate to: "What are the emotions that seem to apply to hoping you will get better from an illness?"

I employed the emotional illustration sheet here as the vocabulary aid to stimulate lexeme choices such as *joyful, enraged, sheepish, surprised, ecstatic,* and *anxious.*

Example. The poem by 122 utilizes words and phrases from the subject's Tenor/Vehicle list. To create this example 122 employed the dialogical metaphorical thinking within the class, followed by the poet's own completion of the process. The Vehicle list included lexemes selected from the vocabulary aid of the Aroma list (Acree & Arn, 2004).

Student 122, Anointing of the Sick.

I felt cautious as the fish filled the aroma air.

The citrus was a relieving aroma.

I was like a palm shell covered by herbs from the wood from the earth.

I felt joyful as I smelled the aroma of the brown sugar pine on the Christmas morning.

I felt disgusted by the odor of the pungent citrus.

The Sacrament of Marriage

Rite. The rite of Marriage usually occurs during a complete of a Mass but it can also take place outside of Mass. After Liturgy of the Word the bride and groom tell all present that they are choosing to marry freely. Furthermore, the couple makes a commitment to love, honor and be faithful to each other until death. They also promise to accept children. Traditionally they give each other a ring to wear as a reminder of their commitment. The priest then asks God to bless the married couple (DeStefano, 2006a). The traditional rite symbol of the ring was selected as the semiotic object for metaphorical thinking in this sacrament. I provided students with gold and a silver rings

which were secured on a small golden chain. Students were invited to pass the ring collection around, see them, feel then, listen to the sound of them clinking together, and even try them on. To evoke dialogical inquiry I posed the question "Metaphorically, which metal color names can be used to draw bridges between the Tenor and Vehicle?" The vocabulary aid in this part of the method was the list and visual sample colors of the Crayola® Metallic FX crayons (Smith, 2013). Some of the lexemes dialogically selected by one class included crayon color names such as *gold fusion, b'dazzled blue, rich ruby, sonic silver, sunburst,* and *emerald* (Smith, 2013). As in each of the sacrament rite Vehicle method sections, each student can add her own lexemes to the Vehicle list from the color list, their own thoughts, or other sources. Once again, the point here is not necessarily to give an accurate name to a metal, but rather to have a somatic experience with a traditional sacramental symbol and then to develop Vehicle parts of a metaphor for the effects (Tenor) of the sacrament. Of course, the completed metaphor says something other than just a metal type.

Effect. The married couple become a sign of Christ's love for the Church and is more closely bonded to each other than to other people. By forming a new family in the Church they are a sign of Christ's love for the Church. In addition, they are a sign of God's love for everyone. Restating the effect of the Sacrament of Marriage from the text book and the Catechism I posted the effect statement *Lifetime commitment to faithful love*. Then, I asked "How do you think it feels to marry someone you love?" to initiate dialogical inquiry. The emotion sheet with illustrations is made available and the

following lexemes were suggested for the Tenor list: *Happy, joyful, ecstatic, anxious, enchanted,* and *blissful (Yahoo, 2012).*

Example. Tenor/Vehicle list drawn by subject 213 presents the dialogical product of the class in answering the inquiry question by way of the vocabulary aid. The list was scribed onto paper by student 213 but additional lexemes were added to one or more of number 213's poems. For instance, in the Tenor/Vehicle link between *Joyful* and *Gold fusion,* 213 wrote "Marriage made me so joyful everything was rich ruby and expensive gold, even though gold could not buy my feeling right now." Below is the full extended-metaphor poems by written by subject 213.

Student 213, Sacrament of Marriage.

I was love-struck and I was wrapped shimmering blush.

Marriage left me feeling ecstatic; the world was tinted b'dazzled blue.

Marriage made me so joyful everything was rich ruby and expensive gold, even though gold could not buy my feeling right now.

Appendix E

Extended-metaphor

Appendix E, Extended-metaphor

I mentioned to students in the treatment groups that we would be writing poetry. I suggested that we would be writing extended-metaphor poetry, like the great poets of today and of the past, such as John Donne and contemporary Laurel Becker. Then I handed each student a copy of the Becker Extended-metaphor diagram for her poem, "Children of the Vernal Sun." I told them that in this poem children *were* daffodils and that this is called a metaphor. Of course children are not plants, I continued, but that metaphorically some things true about children may be similar to some things true about daffodils. I suggested that some things that seem true about children are listed under the Tenor list, on the left hand side of the paper. On the right hand side were the facts we can research or physically experience about daffodils is on the Vehicle list. I pointed out the lines between certain selections in the Tenor list and in the Vehicle list. I started with the first Tenor/Vehicle connection on the list which was *Glowing faces—Yellow flowers.* We agreed in a dialogical discussion that yellow daffodil flowers were metaphoric representations of the glowing faces of children with the glowing faces being an effect of their youth and feelings of happiness and delight. Then I pointed out that a line is drawn as well between the Vehicle lexeme of yellow flowers over to the Tenor list lexeme, bonnets. Reminding them that bonnets are often soft, large brimmed hats that very young children may wear, I then asked if the appearance of daffodil flowers is somewhat like bonnets on the heads of children, only in miniature. They dialogically discussed this inquiry with the treatment sample students and we agreed with that cross-domain idea. The purpose of this exercise was to help the treatment sample to understand extended-

metaphor and the function of Tenor and Vehicle. After experiencing and discussing the Becker Tenor/Vehicle list we then moved onto the extended-metaphor poem, by the same author "Children of the Vernal Sun," below.

Children of the Vernal Sun

While walking in the park behind my home,
I saw the children of last summer's balm.
They reveled under oak whose unseen buds
Lie dormant just beneath its supple wood.
Naive brown eyes among the faces glowed;
On spindly legs they played in drifting snow.
Each planted in rich soil, green stock entwined,
They clustered into three small family lines.
Although March winds worked hard to break them down,
Their yellow bonnets would not touch the ground.
Long lithe green arms that pointed to the sky
Waved as the blustery current passed them by.
My shadow lengthens as I walk toward home
And leave these students here in fertile loam.
Within the prints I leave upon this ground
New passersby will walk, observe, expound,
That whirling white worked vainly to suppress
These efflorescent bulbs their own noblesse.
Spring snows which nearly reached their knees would stun
Less hardy children of the vernal sun. (Becker, 2002)

I read the poem aloud to the students asking them, as they read silently with me, to mark their favorite lines in the poem, with a pencil. After I finished the reading I then invited the treatment sample and other students in the class to find the Tenor/Vehicle connections on the Becker diagram that was relevant to their favorite line choice.

Here is an example.

"Naive brown eyes among the faces glowed"

Tenor Vehicle
Brown eyes | brown center on flowers

Tenor Vehicle

Naïve | yellow flowers

Then I informed them that we would be writing poems in a like manner about the Sacraments. The extended-metaphor workshop using the Becker poem and Tenor/Vehicle diagram was conducted for my treatment group on the first day of my method.

Appendix F

Schedule of Classes and Times

Appendix F: Schedule of Classes and Times

January, 2013

Tues Jan 15 method group 1 & control group B meet
Letters of assent and consent were distributed.

Tues Jan 22 method group 1 & control group B meet Chapter 16 Extended Metaphor workshop

Thurs Jan 24 method group 2 & control group C meet

Sun Jan 27 control group A NO CLASS

Tues Jan 29 method group 1 & control group B meet (Eucharist, wine as semiotic\ object)

Thurs Jan 31 method group 2 & control group C meet (Extended-metaphor workshop)

February, 2013

Sun Feb 3 control group A

Tues Feb 5 method group 1 & control group B meet (Sacraments of Healing)

Thurs Feb 7 method group 2 & control group C meet (Sacraments of Healing Reconciliation)

Sun Feb 10 control group A

Tues Feb 12 method group 1 & control group B meet (Holy Orders & Marriage)

Thurs Feb 14 method group 2 & control group C meet (Holy Orders & Marriage)

Sun Feb 17 control group A NO CLASS

Tues Feb 19 method group 1 & control group B NO CLASS

Thurs Feb 21 method group 2 & control group C NO CLASS

Sun Feb 24 control group A

Tues Feb 26 method group 1 & control group B meet

Thurs Feb 28 method group 2 & control group C meet

March, 2013

Tues March 5 method group 1 & control group B meets (Baptism)

Thus March 7 method group 2 & control group C meets (Baptism)

Sun March 10 control group A

Tues March 12 method group 1 & control group B meet (Confirmation)

Thurs March 14 method group 2 & control group C meet (Confirmation)

Sun March 17 control group A,

Tues March 19 method group 1 & control group B meet (Make Up workshops)

Thurs March 21 method group 2 & control group C meet (Eucharist) Control C ACRE

Sun March 24 control group A ACRE Assessment

Tues March 26 method group 1 & control group B meet ACRE Assessment

Thurs March 28 method group 2 & control group C NO CLASS

April 2013

Thurs April 4 method group 2 & control group C Method 2 (Make Up workshops)

Appendix G

Dunn Metaphoricity Examples

Appendix G: Dunn Metaphoricity Examples

Metaphoricity Scoring Example for Holy Orders and Holy Communion

Holy Orders. Extended-metaphor Vehicles: textile of clothing, scent of chrism.

"The priest feels as blissful as a [gingerbread man] on a [felt fuchsia marshmallow]."

(2 domains + 1 function) x 2 case roles = Metaphoricity Total 6

"As trilled [as a little boy] [on a purple cashmere rollercoaster that smelled like a balsamic vinaigrette]."

(2 domains + 1 function) x 2 case roles (agent, theme) = Metaphoricity total 6

"As confident as a [fusion rose shimmering] in [a fragile glass]."

(2 domains + 1 function) x 2 case roles (theme, location) = Metaphoricity total 6.

Sacrament Holy Communion. Extended-metaphor Vehicle: wine flavor.

"I am an optimistic [piece of sour medicine]."

(2 domains + 1 function) x 1 case role = Metaphoricity total 3