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Urban School Counseling Impact: An ABA Reversal Single Subject Time-Series Analysis of Academic, Suspension, and Attendance Data

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URBAN SCHOOL COUNSELING IMPACT: AN ABA REVERSAL SINGLE
SUBJECT TIME-SERIES ANALYSIS OF ACADEMIC,
SUSPENSION, AND ATTENDANCE DATA

by

Katherine L. N. Colles

A dissertation submitted to the Graduate College
in partial fulfillment of the requirements
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URBAN SCHOOL COUNSELING IMPACT: AN ABA REVERSAL SINGLE SUBJECT TIME-SERIES ANALYSIS OF ACADEMIC, SUSPENSION, AND ATTENDANCE DATA

Katherine L. N. Colles, Ph.D.

Western Michigan University, 2014

While there is a dearth of longitudinal outcome research on comprehensive school counseling program impact (Carey & Dimmitt, 2006; Carey, Dimmitt, Hatch, Lapan, & Whiston, 2008; Gysbers, 2001; Whiston, 2002) on indicators of importance to school systems (Borders, 2002; Lapan, 2001), school counseling research primarily studies program components (Borders, 2002; Herr, 1979; Whiston, 2002; Whiston & Sexton, 1998) and component outcomes (Hughes & James, 2001; Schmidt, 1984, 2000; Sink, 2002). Grounded in a historical review of the school counseling field and pertinent related research, this research investigated the school counseling program impact of one kindergarten through eighth grade urban school serving a majority African American student population that was recruited based on convenient and purposeful sampling procedures. The school counseling program impact was investigated using a novel ABA reversal single subject time-series analysis of archived attendance, suspension, Michigan Educational Assessment Program (MEAP), and Adequate Yearly Progress (AYP) school district data.

This investigation found a statistically significant decrease in school-wide daily and weekly suspension percentages and a promising upward trend in MEAP reading

proficiency percentages for sixth, seventh, and eighth grade students during the implemented school counseling program years. These findings are discussed based on the disproportionately higher suspensions and lower academic achievement of African American students. Limitations of this investigation are discussed and implications for future research and practice are recommended.

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If I have seen further it is by standing on the shoulders of Giants. (Newton, 1676)

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Katherine L. N. Colles

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CHAPTER I

INTRODUCTION

A school's primary responsibility is to educate children (Franklin & Gerlach, 2007; Green & Keys, 2001). While working to fulfill this duty, schools also provide the majority of mental health services for children and adolescents (Adelman & Taylor, 2010; Franklin & Gerlach, 2007). Many children and families, particularly those from lower socioeconomic backgrounds, receive their only mental health services through schools (Adelman & Taylor, 2010; Borders, 2002; Yeh, 2004).

Mental health professionals employed by kindergarten through 12th grade schools often include school psychologists, school social workers, and school counselors (Ferguson, 1963; Forrest, 2004). School psychologists' primary duties have historically pertained to the testing process for evaluating student eligibility for school-based special educational supports (Ferguson, 1963; Sandoval, 1993) and school social workers have traditionally provided services primarily to students receiving special educational support (Ferguson, 1963; Weist, Evans, & Lever, 2003). Although the role of school counselors has changed over the years, they currently have the responsibility of servicing the academic, social and emotional, and career-related needs of all students in schools (American School Counseling Association, 2005, 2012; Gysbers, 2004; Lapan, 2001; Paisley & McMahon, 2001; Whiston, 2002).

This research investigated a school counseling program's impact on school level variables of a kindergarten through eighth grade school using an ABA reversal single

subject time-series analysis of archived school data. The school counseling program impact on the school system was analyzed using key school indicators that were measured by the school as dependent variables. This research investigated one school counseling program's impact on the school variables of attendance, suspension, Michigan Educational Assessment Program (MEAP) proficiency, and Adequate Yearly Progress (AYP) attainment status using an ABA reversal single subject time-series analysis.

Historical Background of the Research Issue

School Counseling as Vocational Guidance

School counseling began with the first high school guidance program implemented by Jesse B. Davis, a Detroit, Michigan, school principal, in 1889 (Bauman et al., 2003; Brewer, 1942; Coy, 1999). By implementing guidance services in all English classes, Davis mandated guidance services be embedded within the educational program of the school. Some, however, reported this first program began in 1908 or 1912 when Davis worked for the Grand Rapids, Michigan, school system (Herr, 1979; Minkoff & Terres, 1985). According to Minkoff and Terres (1985), the first city-wide guidance department was also credited to Davis in Grand Rapids, Michigan, in 1912. During these later years the guidance program focused on "vocational and moral guidance in the schools" (Herr, 1979, p. 2).

The field of school counseling began in the early 1900s as vocational guidance (Gysbers, 2002; Parsons, 1909). Some attributed the need for vocational guidance within the United States to increasing urbanization and industrialization (Aubrey, 1982; Aubrey & Lewis, 1988; Bauman et al., 2003; Ginn, 1924; Gysbers & Moore, 1981). During

these beginning years there was a dual purpose of the vocational guidance movement: to better prepare White male students for the workforce and to assist these students in finding direction within education and future employment (Brewer, 1937; Ginn, 1924; Gysbers, 2002). The initial purpose of the vocational guidance field was to better prepare exclusively White male students (Ginn, 1924; Landy & Perry, 1964). Because of pervasive institutional racism embedded within educational systems, vocational guidance further oppressed youth by “rigidly labeling, classifying, categorizing, and sorting students in schools” (Aubrey, 1982, p. 199). Ginzberg (1964) stated:

We know that many people will be taken care of, will receive the right advice, because they have the right parents or they were born into the right sub-group in the society . . . from the point of view of the democracy, counselors ought to pay particular attention to those other people . . . the farm youth, Negro youth, and youth from families with low incomes . . . that need special attention for special reasons. (p. 31)

From the very beginning, vocational guidance historically advocated White, middle-class, elitist beliefs and values contributing to students being pushed out and dropping out of schools (Aubrey, 1985; Landy & Perry, 1964).

Even though Davis is credited with the first school and city wide guidance program, the vocational guidance movement is widely credited to Frank Parsons, known as the “Father of Guidance” (Brewer, 1942; Ferguson, 1963; Ginn, 1924; Herr, 1979, 2001, 2002; Parsons, 1909). Under the direction of Meyer Bloomfield, Parsons became the director of a vocational school in the early 1900s (Savickas, 2009). The purpose of

this school was to assist White male youth in choosing a career (Bidwell, 1934; Brewer, 1937; Ferguson, 1963). Although this school is known as the Vocational Guidance Bureau (VGB), Bidwell (1934) described the school as being one department within the VGB. Founded in either 1905 (Bidwell, 1934) or 1908 (Savickas, 2009), the purpose of the VGB was to assist students leaving public school education with career choices (Bidwell, 1934; Brewer, 1937; Herr, 1979; Parsons, 1909; Savickas, 2009). Even though Parsons is widely credited with founding the VGB, some credit the conceptual idea behind the school to Bloomfield and not Parsons (Savickas, 2009).

In 1908, Parsons wrote *Choosing a Vocation*, which outlined his ideas regarding the vocational guidance field (Brewer, 1937; Ferguson, 1963; Ginn, 1924; Parsons, 1909; Rudy, 1965). During this time Parsons began working with the Boston Public Schools through his role at the VGB (Ginn, 1924; Rudy, 1965; Savickas, 2009). Shortly thereafter, Boston Public Schools hired a vocational director to provide counseling and guidance services to graduating students to assist with school to work transitions. Parsons and the VGB services were no longer utilized by Boston Public Schools.

Preliminary vocational guidance national conferences were held in Boston and New York and the founding meeting of the National Vocational Guidance Association (NVGA) was held in Grand Rapids, Michigan, in 1913—further promoting the Vocational Guidance movement (Gysbers, 2002; Minkoff & Terres, 1985; Savickas, 2009). The early years of the vocational guidance movement emphasized vocational education, in which classroom teachers were recruited and trained to provide such instruction (Brewer, 1937; Ginn, 1924; Herr, 1979; Savickas, 2009). During these early

years the vocational guidance movement particularly focused on matching student traits with life-long work roles (Bloomfield, 1916; Coy, 1999).

Educational and Personal Counseling Influences on Vocational Guidance

During the 1910s and 1920s the vocational guidance movement was influenced by the Child Study Movement and the work of Arnold Gesell (Ferguson, 1963; Gesell, 1921, 1923, 1925; Herr, 1979; Rudy, 1965). During this time a greater emphasis was placed on mental health, child development, measurement, and education (Brewer, 1918, 1937; Johnson, 1972). Gysbers and Moore (1981) described the guidance movement during the 1920s as having a clinical emphasis, grounded in counseling skills and techniques, and utilizing a service approach. During the 1920s the vocational guidance movement was continually influenced by shifting educational emphases.

Under the leadership of John Brewer (1918, 1937), the focus of vocational guidance changed to educational guidance and personal concerns. Brewer (1937) questioned if education should be viewed as guidance or if there should be a field of educational guidance. According to Brewer (1919, 1937), moral and ethical guidance, as determined by the time and those in power, was critical to student development. The vocational guidance movement also began including personality trait and individual aptitude measurement (Brewer, 1942; Minkoff & Terres, 1985), which continued through and beyond the 1940s. The early historical priorities of school counseling programs have continuously been linked to, and influenced by, school reform movements and the zeitgeist of the times (Gysbers, 2001; Herr, 1979, 1999, 2002; Minkoff & Terres, 1985; Whiston, 2002).

During the 1930s academic guidance was central to the vocational guidance movement (Brewer, 1942; Herr, 1999; Minkoff & Terres, 1985). Even though counseling continued as an important function, counseling services were primarily used as a means of successfully implementing academic guidance programs. As a result of the mental health or hygiene and child guidance movements of earlier decades, a clinical model of guidance services strengthened during the 1920s and 1930s and continued during the 1940s and 1950s (Ferguson, 1963; Gysbers & Moore, 1981; Rudy, 1965). Personal counseling was central to professional practice and theories during the 1930s (Gysbers, 2001), and the guidance movement was heavily influenced by the work of Carl Rogers during the 1940s and 1950s (Herr, 1979). The individual developmental nature of the guidance movement was also emphasized during the 1940s (Ferguson, 1963; Mathewson, 1962; Rudy, 1965). The role of school-based personal counseling and educational and vocational guidance programs was strengthened during this time (Bell, 1939; Bennett & Hand, 1938; Ferguson, 1963; Gysbers & Moore, 1981; McKown, 1934; Rudy, 1965).

Vocational guidance during the 1930s continued focusing on academic content, vocational matters, and personal counseling, which became referred to as pupil personnel work (Ferguson, 1963; Myers, 1935). A central value of pupil personnel work was the coordination and documentation of academic content, vocational programs and services, and personal counseling. Another value of this work was ensuring that primarily White male students received personalized direction and guidance in the educational process. The label of pupil personnel work continued throughout the 1940s, 1950s, and 1960s and

was renamed pupil personnel services during the 1960s (Ferguson, 1963; Gysbers & Moore, 1981; Stripling & Lane, 1966). Even though the label of pupil personnel work and services were maintained for decades, educational, vocational, and personal guidance fields began dividing during the 1940s. During this division, providing counseling services continued to be a central school counselor role and was no longer primarily used as a technique for implementing vocational and educational guidance (Ferguson, 1963).

Early Legislative Influence on Guidance Movements

Even with an emphasis on mental health services, there was a strong legislative emphasis on vocational services. In 1920, 1934, and 1936 there was a series of legislative acts to financially support vocational-related guidance services (Herr, 1979). In 1936, An Act to Provide for the Further Development of Vocational Education was passed and in 1946 the Vocational Education Act was passed (Gysbers, 2001). This legislation provided funds for federal and state offices, supervision, and support for vocational counselors in schools.

Another critical piece of legislation influencing education was the *Brown v. Board of Education* Supreme Court decision of 1954 seeking to racially desegregate all public school systems (Blanchett, Mumford, & Beachum, 2005; Henderson, 2004; Pickren, 2004; Rudy, 1965). This ruling legally mandated all public schools racially desegregate, as segregation violated the United States Constitution. This legislation additionally sought to extend vocational guidance services to all students (Ginn, 1924; Rudy, 1965). Critically important to the success of *Brown v. Board of Education* was the lesser known *Mendez v. Westminster* case of 1946 that succeeded in legally desegregating schools

between White and Mexican American and Latino/a children in southern California (Aguirre, 2005; Moll, 2010). According to Aguirre (2005), “the Mendez case was a test case for the NAACP in its attempt to overturn *Plessy v. Ferguson*” (p. 326). *Mendez v. Westminster* of 1946 was the precedent for desegregating schools between White and Latino/a children throughout the southern United States, legally desegregating schools for Native American and Asian children within California, and paved the way for dismantling segregation within other institutions such as housing (Aguirre, 2005; Moll, 2010).

With the Soviet Union’s launching of the first space satellite in 1957, there was concern for the United States’ space supremacy and the potential inability to compete with the Soviet Union’s science technology (Herr, 2001, 2009; Minkoff & Terres, 1985). The lack of math and science rigor in secondary schools and the low number of students entering college and university hard science programs were specific concerns resulting in the National Defense of Education Act (NDEA) of 1958. NDEA influenced the school guidance movement by prioritizing the training of school guidance counselors (Baker, 2001; Coy, 1999; Ferguson, 1963; Gysbers & Moore, 1981; Herr, 1979, 2001, 2009; Minkoff & Terres, 1985; Poppen & Thompson, 1974; Rudy, 1965; Whiston, 2002).

Herr (2001) stated that under NDEA, “identification and counseling of scientifically talented students” (p. 238) was now the purpose of the guidance movement. The NDEA prioritized support for secondary school testing programs to identify academically outstanding students (Herr, 2009; Minkoff & Terres, 1985; Rudy, 1965). NDEA additionally provided funds to develop counseling programs in secondary schools,

increased the numbers of secondary school counselors, and provided further training to current secondary school counselors. NDEA Title V-A passed in 1964 providing funds to train and expand elementary school counseling positions (Minkoff & Terres, 1985). As the focus of school counseling programs during this time was the identification of scientifically talented students, the focus again shifted to serving a select group of students identified by educational systems as being college bound. A consequence of NDEA legislation, funding, and resulting school counseling training was a renewed focus on personal counseling, a psychological framework for school counseling programs, and a greater separation of roles between school counselors and classroom teachers (Herr, 1979). Through legislative mandates, the federal government has influenced school counseling program philosophy and implementation more than any other organizational structure or system (Herr, 1979).

School Counseling Becomes a Profession

During the 1940s the educational, vocational, and personal guidance movements became more clearly defined and divided. This division was most apparent in professional organizational development. For example, the American Personnel and Guidance Association was created in 1952 (Ferguson, 1963; Rudy, 1965). The National Vocational Guidance Association, which originally formed in 1913 and was a founding division of the American Personnel and Guidance Association (APGA), began issuing professional school counseling certificates in 1945 (Minkoff & Terres, 1985). In 1953 the Division of Counseling and Guidance of the American Psychological Association changed its name to Counseling Psychology.

The school counseling field attained professional status by forming the American School Counseling Association (ASCA) in 1952 (Bauman et al., 2003; Minkoff & Terres, 1985). The ASCA, formed at the same time as the APGA, was renamed the American Counseling Association in 1953 and was the fifth division to join the APGA (Bauman et al., 2003; Minkoff & Terres, 1985). Prior to joining the APGA, school counselors were represented by the National Vocational Guidance Association. School counselors believed they were no longer best served and represented by the National Vocational Guidance Association for two reasons: (a) school counselors' roles and services involved more than vocational and educational matters, and (b) the role of counseling was becoming increasingly central to the educational process within many schools (Minkoff & Terres, 1985). The school counseling profession continued growing as states developed and implemented counseling certification standards coinciding with increased federal funding opportunities for training and implementation. Ohio was the first state to issue a certificate, the Pupil Personnel Service Certificate in Guidance and Counseling, in 1955 after the ASCA was formed (Coy, 1999). By 1957, 12 states offered school counselor certificates (Brewster, 1958; Rudy, 1965).

The NDEA act of 1958 provided funds to expand school testing programs, school counseling programs, and for training new and currently employed school counselors (Herr, 1979; Poppen & Thompson, 1974; Romano & Kachgal, 2004; Rudy, 1965). The expansion of school counseling programs gained additional support from Conant's report on American education, *The American High School Today* (Conant, 1959; Ferguson, 1963; Herr, 1979) and the 1960 White House Conference on Children and Youth

(Ginzberg, 1960). The continual expansion of school counseling programs during this time was purported to equalize educational systems (Rothney & Roens, 1950; Rudy, 1965). The 1959 Conant report recommended that high schools have one school counselor for every 250 to 300 students and called for developing and evaluating counselor training program standards (Bauman et al., 2003; Conant, 1959; Ferguson, 1963; Herr, 1979, 2002; Poppen & Thompson, 1974). The latter began during the 1960s (Stripling, 1965). The counseling process and individual and group counseling services also became central school counselor roles during the 1960s (Ferguson, 1963; Gysbers & Moore, 1981; Stripling & Lane, 1966). As the number of school counselor training programs and positions rapidly increased in both elementary and secondary schools (Baker, 2001; Ferguson, 1963), a “counselor-clinical-service,” approach to guidance was continually adopted during the 1950s through 1970s (Gysbers & Moore, 1981, p. 3).

School Counseling Influenced by Sociopolitical Values and Legislation

The school counseling profession has historically been influenced by educational reform (Gysbers, 2001; Whiston, 2002), civil rights policies (Blanchett et al., 2005; Herr, 1979; Rudy, 1965), national defense (Herr, 2001), workforce preparation (Bauman et al., 2003; Brewer, 1937; Coy, 1999; Parsons, 1909), and the national economy (Barton, 1994; Gysbers, 2001; Herr, 2001, 2002; Whiston, 2002). Since the 1960s the school counseling field has continually changed focus with the zeitgeist of the times and social concerns continually impact school counselor roles and functions. During the 1960s there was an emphasis on the growing concern with the increasing numbers of students dropping out of high school, known as “social dynamite” (Barton, 1994, p. 3) and with

youth unemployment. The focus of school counselors shifted away from primarily attending to the most scientifically and mathematically gifted students and those identified as college bound (Barton, 1994; Herr, 2009).

Vocational legislation including the Manpower Development and Training Act of 1962, Vocational Education Act of 1963, Vocational Education Act of 1968, and the Career Education Incentive Act of 1978 were passed (Barton, 1994; Herr, 1979, 2009; Hoyt, 1984, 1985; Minkoff & Terres, 1985). These legislative acts sought to increase all students' employability, not only that of the identified college bound. As two out three high school students were not pursuing postsecondary education, education was widely criticized for failing to prepare most students (Barton, 1994). With the passing of Civil Rights legislation a greater emphasis on the school to work transition of students from underrepresented racial groups was purported (Barton, 1994; Herr, 1979). Rather than promoting academic excellence and achievement for underrepresented racial groups of students, however, this attention was primarily focused on academic tracking and accommodations for post high school work roles (Barton, 1994; Blanchett et al., 2005).

During the 1970s the Elementary and Secondary Education Act was passed providing further support for school guidance and counseling programs (Barton, 1994; Bauman et al., 2003). This legislation sought to increase school counselor attention to preparing all students for work force transition, life after secondary school, and career guidance (Barton, 1994; Bauman et al., 2003; Herr, 2009). With increasing changes in the labor market and industry globalization, the school counseling field experienced a renewed focus on vocational guidance (Gysbers, 2002), which was again manifest

through career resource-related legislation. Public Law 94-142 was passed in 1974 addressing the educational rights of disabled students, further redefining school counselor roles and functions by extending services to students with disabilities (Gysbers & Moore, 1981; Herr, 1979; Minkoff & Terres, 1985). Public Law 94-142 specifically influenced the role of elementary school counselors by increasing the number of such positions (Gysbers & Moore, 1981).

In 1986 the College Board's Commission on Precollege Guidance and Counseling further supported comprehensive school counseling programs by advocating for program need during the early and middle education years, particularly for students historically discriminated against by schools (Herr, 2002). In 1988 the National Occupational Information Coordinating Committee (NOICC) influenced school counseling program planning and counselor training, while supporting the need for such programs at all educational levels (Herr, 2002). During the 1980s and 1990s, several Carl D. Perkins Vocational Acts and the School to Work Opportunities Act of 1994 were passed, further supporting inclusion of career and vocational matters in school counseling programs (Herr, 2001, 2002). The purpose of these acts was to institutionally embed career guidance in the educational program of all schools, for all students. The 1994 School to Work Opportunities Act provided further support for comprehensive guidance programs (Herr, 2002). According to Barton (1994), "There is little question that, from the sheer magnitude alone, it [career education] has been the largest institutional force in the last three decades in the public school side of preparing youth for the employment world"

(p. 8). Hoyt (1984) outlined how career education is a part of career guidance and how career guidance evolved to be a part of the school counseling movement.

The No Child Left Behind Act (NCLB) currently requires all schools to demonstrate their educational program meets legislative mandates regarding student academic achievement (Dimmitt, Carey, McGannon, & Henningson, 2005; McGlinchey & Hixson, 2004; NCLB, 2002). This legislation also requires school districts, and individual schools within districts, to report how they are meeting NCLB legislative mandates. Satisfying the NCLB legislative mandates is measured by school level student academic achievement, suspension or discipline rates, attendance, and school climate-related factors.

Comprehensive Developmental Program Model

Despite counseling being a central function of the school counselor role and profession and despite vocational guidance being embedded in all educational programs, school counselors still occupied supportive and remedial roles within many schools (Sprinthall, 1971). Beginning in the 1970s, and continuing through the 1980s and 1990s, there was a shift in thinking of school counselors as individual service providers to thinking of an organizational framework of a comprehensive developmental program (Baker, 2001; Green & Keys, 2001; Gysbers, 2001; Gysbers & Moore, 1981; Herr, 1979; Paisley, 2001; Sink, 2002). There was a programmatic shift from providing school guidance services to students to implementing developmentally appropriate comprehensive school counseling programs (Baker, 2001; Green & Keys, 2001; Gysbers, 2001; Gysbers & Moore, 1981; Sink, 2002).

American School Counseling Association National Model

The National Standards for School Counseling Programs were adopted by the American School Counseling Association (ASCA) in 1997 (Campbell & Dahir, 1997; Herr, 2001, 2009; Paisley & McMahon, 2001; Whiston & Sexton, 1998). *The ASCA National Model: A Framework for School Counseling Programs* (ASCA, 2003) provided an organizational structure for school counselors to implement developmentally appropriate comprehensive school counseling programs. The ASCA National Model is currently in the third edition (ASCA, 2012), with the second edition being published in 2005 (ASCA, 2005). All editions (ASCA, 2003, 2005, 2012) were based on four themes reflecting the belief that school counselors are to be school leaders working towards systemic change by collaborating with stakeholders while advocating for students (Bemak, 2000; Bemak & Chung, 2005; Cox & Lee, 2007). All editions included four components providing an organizational structure guiding school counselor duties while working towards implementing comprehensive and developmentally appropriate school counseling programs within unique school and community environments (ASCA, 2003, 2005, 2012).

Need for Research in the Field

There has been a documented need for school counseling research even before the field was a profession. The need for outcome accountability regarding vocational guidance programs dates to the 1920s (Gysbers & Henderson, 2005; Herr, 1979) and there has been historical demand for guidance-based research in education (Brewer, 1937). The school counseling profession has been widely criticized for not

demonstrating effectiveness within schools (Green & Keys, 2001; Herr, 2003; Perry, 1993; Stockton & Hulse, 1983). Thus, there is a well documented need for school counseling research (Borders, 2002; Carey & Dimmitt, 2006; Dimmitt et al., 2005; Green & Keys, 2001; Paisley & McMahon, 2001; Perry, 1993; Whiston, 2002). There is a specific need for school counseling outcome (Borders, 2002; Carey & Dimmitt, 2006; Carey, Dimmitt, Hatch, et al., 2008; Dimmitt et al., 2005; Green & Keys, 2001; Sabella, 2006; Whiston, 2002; Whiston & Sexton, 1998) and longitudinal (Perry, 1993; Rothney, 1958; Sears & Granello, 2002; Sexton, Whiston, Bleuer, & Walz, 1997; Whiston & Sexton, 1998) research.

Some advocate researching the impact of school counseling program components, such as a small group or guidance lesson intervention, on academic achievement or other school system measures (Hughes & James, 2001; Perry, 1993; Schmidt, 1984, 2000; Sink, 2002). Others criticize the exclusivity of school counseling research limited to program components (Borders, 2002; Lapan, 2001; Whiston, 2002; Whiston & Sexton, 1998). There is a specific need for comprehensive school counseling program outcome research (Borders, 2002; Carey & Dimmitt, 2006; Carey, Dimmitt, Hatch, Lapan, & Whiston, 2008; Gysbers, 2001; Lapan, 2001; Perry, 1993; Whiston, 2002; Whiston & Sexton, 1998) on school system level variables (Dimmitt et al., 2005; Lapan, 2001). While advocating for the necessity of school counseling program accountability, Kaffenberger (2012) stated, “Outcome data are the most powerful” (p. 118).

The dearth of school counseling outcome research has been attributed to the lack of research experience of many school counselors (Borders, 2002; Carey & Dimmitt,

2006; Herr, 1979; Paisley & McMahon, 2001; Perry, 1993), counselor educators, field supervisors (ASCA, 2005; Dahir & Stone, 2003; Deck & Cecil, 1990), and the diminished role and number of county and state school counseling directors or supervisors (Gysbers, 2006; Herr, 1979; Sears & Granello, 2002). Additional reasons pertain to the prevalence of evaluation studies, which have been methodologically criticized (Green & Keys, 2001) over experimental research (Border, 2002; Carey & Dimmitt, 2006), and the difficulty of conducting school-based controlled experimental research (Carey & Dimmitt, 2006; Carey, Dimmitt, Hatch, et al, 2008; Herr, 2003).

In response to the need for school counseling research the ASCA developed their first association research committee in 1985 (Minkoff & Terres, 1985). This committee had two primary goals: (a) to assist ASCA members in conducting school-based research, and (b) to assist members in research searches, design, and analysis. The ASCA additionally held a School Counseling Research Summit during the ASCA annual conference in 2003 (Carey & Dimmitt, 2006; Carey, Dimmitt, Hatch, et al., 2008; Sabella, 2006). The purpose of this summit was to identify key research questions, develop a research plan, discuss a national school counseling research agenda, identify researchers and practitioners with whom to collaborate, and disseminate the research based plan.

After the 2003 research summit and annual conference, the ASCA Governing Board, “unanimously passed a motion to explore the feasibility of establishing and maintaining a national research office” (Sabella, 2006, p. 413). This motion led to the establishment of the National School Counseling Research Center (NSCRC) (Carey &

Dimmitt, 2006; Carey, Dimmitt, Hatch, et al., 2008). Sabella (2006) stated, “The NSCRC provides leadership in the development, promotion, facilitation, and dissemination of school counseling research demonstrating the connection between school counseling programs and student success” (p. 413). The Center for School Counseling Outcome Research (CSCOR) serves to coordinate, disseminate, and assist school counselors and school counseling stakeholders with the research process (Carey & Dimmitt, 2006; Carey, Dimmitt, Hatch, et al., 2008; Dimmitt et al., 2005). The CSCOR then established the National Panel for School Counseling Evidence-Based Practice to further develop a school counseling research base to demonstrate the positive impact of school counseling programs based on school district, state, and legislative standards (Carey, Dimmitt, Hatch, et al., 2008).

Statement of the Problem

There is a need for school counseling program outcome research (Borders, 2002; Carey & Dimmitt, 2006; Carey, Dimmitt, Hatch, et al., 2008; Green & Keys, 2001; Gysbers, 2001; Perry, 1993; Sabella, 2006; Whiston, 2002; Whiston & Sexton, 1998). While this need exists, a majority of current research focuses on school counseling program components (Borders, 2002; Herr, 1979; Whiston, 2002; Whiston & Sexton, 1998) and program component outcomes (Hughes & James, 2001; Schmidt, 1984, 2000; Sink, 2002). For example, some research focuses exclusively on individual and group counseling intervention outcomes (Whiston & Sexton, 1998) or on specific guidance lesson outcomes (Borders, 2002). Whiston and Sexton (1998) conducted a review of all school counseling outcome studies investigating program components rather than

comprehensive school counseling program outcomes. Fifty program components outcome studies were identified and then classified into one of the four ASCA service delivery categories (guidance curriculum, responsive services, individual planning, and system support).

The statement of the problem is a dearth of research on comprehensive school counseling program impact on indicators of importance to school systems as measured by school systems. Moreover, there is a dearth of research on the impact of school counseling programs on indicators school systems are evaluated on: student academic achievement and growth of student academic achievement, attendance, and suspension data.

Description of the Study

There is a need for research investigating comprehensive school counseling program impact on school system level variables (Borders, 2002; Carey, Dimmitt, Hatch, et al., 2008; Lapan, 2001). This research investigated the impact of one school counseling program on school level variables using an ABA reversal single subject time-series analysis of archived data. It was proposed that the school counseling program intervention had a significant impact on school system level variables if the following results were found: (a) there was a significant increase in student daily attendance percentage for the single school subject; (b) there was a significant reduction in student daily suspension percentage for the single school subject; (c) there was a significant increase in annual Michigan Educational Assessment Program (MEAP) proficiency percentage for the sixth, seventh, and eighth grade students of the single school subject

for both mathematics and English Language Arts scores; and (d) there was a significant positive change in annual Adequate Yearly Progress (AYP) attainment status for the single school subject.

**Specific Research Questions, with an Accompanying Hypothesis
for Each Question**

Research Question 1: Did the school counseling program positively impact the daily attendance percentage of the single school subject?

Hypothesis 1: The school counseling program had a positive impact on the daily attendance percentage of the single school subject, as measured by archived attendance records.

Null Hypothesis 1: The school counseling program will have had no impact on the single school subject's daily attendance records measured by archived attendance records.

Research Question 2: Did the school counseling program improve daily suspension percentage records for the single school subject?

Hypothesis 2: The school counseling program improved the single school subject's daily suspension percentage records, as measured by archived attendance records.

Null Hypothesis 2: The school counseling program will have had no impact on the single school subject's daily suspension records, as measured by archived attendance records.

Research Question 3: Did the school counseling program have a positive impact on annual MEAP mathematics and English Language Arts proficiency scores for the

sixth, seventh, and eighth grade students of the single school subject, as measured by the single school subject's archived MEAP records?

Hypothesis 3: The school counseling program had a positive impact on the single school subject's annual MEAP mathematics and English Language Arts proficiency scores for the sixth, seventh, and eighth grade students, as measured by archived attendance records.

Null Hypothesis 3: The school counseling program will have had no impact on the single school subject's annual MEAP mathematics and English Language Arts proficiency scores, for the sixth, seventh, and eighth grade students, as measured by archived attendance records.

Research Question 4: Did the school counseling program have a positive impact on annual AYP attainment for the single school subject, as measured by School A's archived records?

Hypothesis 4: The school counseling program had a positive impact on the single school subject's AYP records, as measured by archived AYP records.

Null Hypothesis 4: The school counseling program will have had no impact on the single school subject's AYP records, as measured by archived AYP records.

Definitions of Terms

Comprehensive School Counseling Program

A comprehensive school counseling program is implemented by professionally licensed school counselors, is developmental in nature, and serves all students within a school (ASCA, 2003, 2005, 2012; Baker, 2001; Green & Keys, 2001; Gysbers, 2001;

Gysbers & Moore, 1981; Sink, 2002). Such programs are implemented and structured according to current professional standards (ASCA, 2003, 2005, 2012), in alignment with the *ASCA National Model: A Framework for School Counseling Programs* based on the National Standards for School Counseling Program (Campbell & Dahir, 1997; Herr, 2001, 2009; Paisley & McMahon, 2001; Whiston & Sexton, 1998). These programs reflect the themes of leadership, advocacy, collaboration, and systemic change and include a foundation, management system, delivery system, and accountability components.

Attendance

The attendance data for this investigation represent the daily and weekly percentage of enrolled students in attendance, as recorded and collected by the single school subject's student information management system. This researcher collected daily student attendance numbers for the 2006–2007, 2007–2008, 2008–2009, 2009–2010, and 2010–2011 academic years. The daily student enrollment numbers were also collected for these academic years. Using these collected data, a daily and weekly attendance percentage was calculated. Due to a transient student enrollment, using daily and weekly attendance percentages allow for within and between year comparisons.

Suspension

The suspension data for this investigation represent the daily and weekly percentage of administered suspensions, as recorded and collected by the single school subject's student information management system. Daily number of administered suspensions for the 2006–2007, 2007–2008, 2008–2009, 2009–2010, and 2010–2011

academic years were collected. Using the collected daily student enrollment numbers for the academic years, daily and weekly administered suspension percentages were calculated. Due to a transient student enrollment, daily and weekly administered suspension percentages also allow for within and between year comparisons.

Michigan Educational Assessment Program

The Michigan Educational Assessment Program (MEAP) is a group administered criterion-referenced assessment measuring students' knowledge in English Language Arts (ELA) (reading and writing), mathematics, science, and social studies (Burns, 1998; McGlinchey & Hixson, 2004; Michigan Department of Education, 2009; Michigan Government, 2011a). This investigation analyzed MEAP reading and mathematics content proficiency percentages for three reasons: (a) the school counseling program intervention was to serve sixth, seventh, and eighth grades; (b) these content areas are annually assessed during the sixth, seventh, and eighth grades; and (c) reading proficiency percentages are specifically used for AYP calculation.

Adequate Yearly Progress

Adequate Yearly Progress (AYP) attainment is a function of the No Child Left Behind Act (NCLB) of 2001 seeking to increase state and federal level accountability for student academic achievement by mandating AYP of all Title 1 funded public schools. The AYP attainment criteria is state specific, individually established by states, primarily based on state mandated assessment proficiency measures, and additionally based on non-assessment measures—such as attendance (Adequate Yearly Progress, 2011;

Michigan Government, 2011b; U.S. Department of Education, 2002; Wiley, Mathis, & Garcia, 2005).

Summary

Chapter I, the introduction, presented a historical background for this research. A rationale for investigating comprehensive school counseling program impact on school system variables using an ABA reversal single subject time-series analysis of archived data was also put forth. Additionally outlined was the need for research, statement of the problem, description of the study, and specific questions to be answered.

The remainder of this dissertation is organized as follows. Chapter II reviews relevant literature related to the proposed investigation. Chapter III describes the methodological procedures for this investigation. Chapter IV presents the findings of this research. Finally, Chapter V presents the study summary including a discussion of study results, a presentation of study limitations, and future research implications.

CHAPTER II

REVIEW OF RELATED LITERATURE

The need for school counseling research was advocated long before the field was a profession (Gysbers & Henderson, 2005). Yet, there is still a need for school counseling program research (Borders, 2002; Dimmitt et al., 2005; Green & Keys, 2001; Paisley & McMahon, 2001; Perry, 1993; Whiston, 2002). There is a specific need for school counseling outcome and longitudinal research (Borders, 2002; Carey & Dimmitt, 2006; Carey, Dimmitt, Hatch, et al., 2008; Dimmitt et al., 2005; Green & Keys, 2001; Perry, 1993; Sabella, 2006; Sears & Granello, 2002; Sexton et al., 1997; Whiston, 2002). The need for school counseling program outcome research is widely recognized within the profession (Borders, 2002; Green & Keys, 2001; Gysbers, 2001; Perry, 1993; Sabella, 2006; Whiston, 2002; Whiston & Sexton, 1998). There is also a need for comprehensive school counseling program outcome research on school system level variables (Borders, 2002; Carey & Dimmitt, 2006; Carey, Dimmitt, Hatch, et al., 2008; Dimmitt et al., 2005; Gysbers, 2001; Perry, 1993; Whiston, 2002; Whiston & Sexton, 1998). This chapter will begin with a justification for comprehensive school counseling program implementation and will then review literature documenting comprehensive school counseling programs and related research.

School Counseling Program Justification

Nowhere are comprehensive school counseling programs more critical than in urban schools and for urban students, particularly African American students (Holcomb-McCoy & Mitchell, 2005; Holcomb-McCoy & Lee, 2005; Lee, 2005). There is a long history of educational achievement gaps between majority and racially underrepresented student groups and for students in poverty (Adkison-Bradley, Johnson, Rawls, & Plunkett, 2006; Amatea & West-Olatunji, 2007; Bemak & Chung, 2005; Bruns, Walrath, Glass-Siegel, & Weist, 2004; Cox & Lee, 2007; Kunjufu, 2002; Trusty, Mellin, & Herbert, 2008). According to Amatea and West-Olatunji (2007), in 2004 the Children's Defense Fund reported over 13 million children lived in poverty in the United States. Amatea and West-Olatunji further reported that these 13 million children represent a 12.8% increase from the number of children living in poverty in 2000 and that in 2004 approximately one out of six children in the United States was poor.

The intent of the *Mendez v. Westminster* and *Brown v. Board of Education* court decisions of 1946 and 1954, respectively, was to reduce and then equalize educational system and attainment differences between White and underrepresented racial groups of students. However, the quality of teaching and working conditions in contemporary urban schools is still significantly worse than in suburban and rural schools (Amatea & West-Olatunji, 2007; Lee, 2005; National Center for Educational Statistics, 2006). Children attending urban schools are more likely to be taught by the less experienced teachers who provide a lower quality of teaching (Amatea & West-Olatunji, 2007; Kunjufu, 2002; Lee, 2005). Urban schools are plagued with an approximate 40 to 50%

teacher turnover rate within the first five years of teaching service—perpetuating educational system inequities by creating more stress on the educational system (Kunjufu, 2002). High teacher turnover rates increase the likelihood of having more out-of-field teachers teaching content areas for which they are not certified to teach (Lee, 2005; National Center for Educational Statistics, 2006). Urban school systems are further placed at risk due to disproportionately low average-per-student expenditures, with the lowest five percentile of schools spending approximately \$6,000 per student and the highest five percentile of schools spending over \$16,000 per student (Kunjufu, 2002; Lee, 2005; National Center for Educational Statistics, 2006).

There is overwhelming evidence that academic achievement differences still exist between racial majority and underrepresented student groups (Davis, Ajzen, Saunders, & Williams, 2002; Miranda, Webb, Brigman, & Peluso, 2007; Stinson, 2006; Whaley & Smyer, 1998). One of the primary challenges facing urban school counselors is pervasive academic failure and underachievement of underrepresented racial student groups (Blanchett et al., 2005; Holcomb-McCoy & Mitchell, 2005; Holcomb-McCoy & Lee, 2005; Lee, 2005). African American students (Awad, 2007; Fantuzzo, LeBoeuf, Rouse, & Chen, 2012; Whaley & Noel, 2012), and particularly African American male students (Davis, J. E., 2003; Day-Vines & Day-Hairston, 2005; Fantuzzo et al., 2012; Kunjufu, 2005; Mandara, 2006), are especially placed at risk of academic failure and underachievement. Kincheloe and Hayes (2007) reported in the book, *Teaching City Kids: Understanding and Appreciating Them*, “In many urban areas, for example, young black men are twice as likely to end up in prison than at a university” (p. 11).

Some propose that educational inequalities within the United States are fundamental facts due to concentrated poverty (Caldas & Bankston, 1999). While others report the purpose of *Brown v. Board of Education* was not to foster academic excellence or achievement for underrepresented racial groups of students (Barton, 1994). Mental health professionals have a critical role in addressing inequities within educational systems and particularly problems plaguing urban schools (Amatea & West-Olatunji, 2007; Bemak & Chung, 2008; Carey & Dimmitt, 2008; Holcomb-McCoy & Lee, 2005; Murray, 2006; Romano & Kachgal, 2004a). For example, a primary objective of the Wallace-Readers' Digest Transforming School Counseling Initiative (TSCI) is to increase the academic achievement of students from underrepresented racial groups and of poor students by implementing comprehensive developmentally appropriate school counseling programs (Coleman, 2004; Galassi & Akos, 2004; Romano & Kachgal, 2004a; Whiston, 2004). Implementing comprehensive school counseling programs, part of the response to problems in urban school, is believed to reduce educational achievement discrepancies between student groups by impacting the school system holistically.

Comprehensive Developmental Program Models

School counseling programs have continuously been modified and enhanced. Various models of comprehensive developmental programs were developed during the 1970s, 1980s, and 1990s in response to concerns regarding school counselor accountability (Green & Keys, 2001; Gysbers & Moore, 1981; Paisley, 2001). These developmental programs shifted the focus from individual counseling provided by

individual counselors to a developmental program serving all students in a school (Baker, 2001). These models gave systemic direction and provided an organized structure for comprehensive developmental programs (Baker, 2001; Green & Keys, 2001; Gysbers, 2001; Gysbers & Moore, 1981; Sink, 2002). The next section will review three comprehensive developmental program models.

Myrick's developmental model was developed during the 1980s and focused on three components (Myrick, 1987, 1997; Paisley, 2001). The first component focused on programming and services for all students. The second component pertained to the guidance curriculum and the necessity of organization, flexible planning, and sequence. The third component of Myrick's model was a need for an integrated program involving the entire school staff.

Another model was the competency-based guidance model developed in the 1980s (Johnson & Johnson, 1991, 2003). This model was described as, "a total pupil services program developed with the student as the primary client" (Johnson & Johnson, 1991, p. 6). The focus of this model was for all students to gain competencies to be successful at school, in transition to higher education, or in the transition to a work role. This competency-based model was also a comprehensive developmental program approach, which similar to Myrick's (1987, 1997) model, was a sequentially planned program for all students. The difference between Myrick's model and Johnson and Johnson's (1991, 2003) competency based model is the latter's additional focus on competencies acquired by all students.

A third comprehensive guidance program model was initially developed in the 1970s (Gysbers & Moore, 1981) and modified over the next 20 years (Gysbers & Henderson, 2000, 2005). According to Gysbers (2001), this model emphasized “an organizational structure of content (competencies), organizational framework (structural components and program components), and resources (human, financial, and political)” (p. 101). Similar to Myrick’s (1987, 1997) and Johnson and Johnson’s models (1991, 2003), this model was developmental in scope. Unlike Johnson and Johnson’s competency based model, however, this model included further direction regarding additional roles and responsibilities and the implementation of such duties.

All three comprehensive developmental models provided greater direction and structure for comprehensive school counseling programs while fostering flexibility to address the unique needs of individual schools and communities. These models led to a national approach to school counseling program implementation. The school counseling profession gained even greater purpose, direction, and cohesion with the development of the ASCA National Model: A Framework for School Counseling Programs, which was an extension of previous comprehensive developmental program models (ASCA, 2003, 2005, 2012).

American School Counseling Association National Model

The National Standards for School Counseling Programs were adopted by the American School Counseling Association (ASCA) in 1997 (Campbell & Dahir, 1997; Herr, 2001, 2009; Paisley & McMahon, 2001; Whiston & Sexton, 1998). The ASCA *National Model: A Framework for School Counseling Programs* (ASCA, 2003, 2005,

2012) provided an organizational structure for school counselors and leaders working to implement comprehensive and developmentally appropriate school counseling programs.

Currently in the third edition, all three ASCA National Models (ASCA, 2003, 2005, 2012) have been based on four themes of leadership, advocacy, collaboration, and systemic change. These themes reflect the beliefs that school counselors are to be school leaders working towards systemic change by collaborating and teaming with others while advocating for students (Bemak, 2000; Bemak & Chung, 2005; Cox & Lee, 2007). The organizational structure of the ASCA National Model has four components including the foundation, management systems, delivery system, and accountability (ASCA, 2003, 2005, 2012). These components provide an organizational structure for school counselor duties contributing to the implementation of a comprehensive and developmentally appropriate school counseling program within unique school and community environments. The next section will review the Foundation, Management System, Delivery System, and Accountability components of the ASCA National Model (ASCA, 2003, 2005, 2012; Romano & Kachgal, 2004a).

Foundation

The Foundation component of the ASCA National Model is described as the building blocks of a comprehensive counseling program (Anonymous, 2003; ASCA, 2012; Galassi, Griffin, & Akos, 2008; Schwallie-Giddis, ter Maat, & Pak, 2003). The foundation consists of three aspects: program focus, student competencies, and professional competencies. The program focus includes counselor beliefs based on their worldviews, programmatic vision and mission statements and program goals

(Anonymous, 2003; Dimmitt & Carey, 2007). The student competencies primarily include the ASCA student standards pertaining to academic, career, and personal and social development (Galassi et al., 2008; Perusse, Goodnough, & Noel, 2001). Counselors are additionally encouraged to include relevant educational standards complimenting the ASCA student standards. The school counselor competencies are described as the attitudes, knowledge, and skills deemed necessary for school counselors to effectively implement comprehensive and development appropriate school counseling programs according to the ASCA National Standards.

The ASCA National Model recommends that schools have one school counselor for every 250 students (ASCA, 2003, 2005, 2012; Astramovich & Miner Holden, 2002). However, based on a study conducted by the National Center for Chronic Disease Prevention and Health Promotion in which 51 state departments of education were surveyed, Weist and colleagues (2003) reported the school counselor to student ratio of surveyed state departments of education was approximately one school counselor to every 1,000 students.

Management System

The management system components of the ASCA National Model provides assessment tools school counselors utilize to manage their comprehensive school counseling program (ASCA, 2003, 2005, 2012; Anonymous, 2003; Dimmitt & Carey, 2007). Examples of such tools measure school counselor competencies, school counseling program components, and use-of-time. The ASCA National Model also provides recommendations for how school counselors' time should be spent (ASCA,

2003, 2005, 2012; Dahir & Stone, 2003). Although time recommendations between the four model components have been revised with new editions, all editions recommend school counselors spend approximately 80% of their time providing direct and indirect student services primarily through implementing the delivery system component (ASCA, 2003, 2005, 2012). The time recommendations have been further delineated based on the developmental (elementary, middle, or high school) level of the school, the specific services within the delivery system component, and the unique needs of the school community.

The Management Component additionally includes annual agreements between the school counselors and the school administrator responsible for overseeing the school counseling program, creating and maintaining the advisory council, and data usage (ASCA, 2012; Dimmitt & Carey, 2007). School counselors use multiple forms of data while managing and implemented school counseling programs (Dahir & Stone, 2003). Analyzing disaggregated data such as race/ethnicity, gender, and socioeconomic status based on free or reduced lunch status are regularly used (Steward, Steward, Blair, Jo, & Hill, 2008). Studying academic, attendance, and behavioral data are also utilized regarding individual students, student groups, and the school system. School counseling program process, perception, and outcome data are also utilized within this component. The management component additionally includes the use of action and lessons plans for implementing the delivery system components (e.g., in-class guidance lessons and small group activities based on student need). School counselors utilize weekly, monthly, and

annual calendars to communicate to stakeholders how the comprehensive school counseling program is being implemented.

Delivery System

Under the first two editions of the *ASCA National Model: A Framework for School Counseling Programs* (ASCA, 2003, 2005), a school counseling program's delivery system component was divided into four categories: guidance curriculum, individual planning, responsive services, and system support (ASCA, 2005; Dimmitt & Carey, 2007; Gysbers, 2004; Romano & Kachgal, 2004a). Under the current ASCA National Model edition (ASCA, 2012), the delivery system component of a comprehensive developmentally appropriate school counseling program is divided into direct and indirect services. There are three delivery system direct services: the school counseling core curriculum (classroom and small group-based lessons or psycho-educational programs), individual student planning (appraisal and advising), and responsive services (counseling and crisis response) (ASCA, 2012; Gysbers, 2004; Romano & Kachgal, 2004a).

Accountability

The accountability component of the ASCA national model seeks to answer the question, "How are students different as a result of the school counseling program?" (ASCA, 2012, p. 99). This component analyzes collected data for programmatic decision making (Borders, 2002; Carey & Dimmitt, 2006; Dahir & Stone, 2003; Hughes & James, 2001; Lapan, 2001). The accountability component includes a school data profile including annual safety, behavior, attendance, and achievement data and use-of-time

assessment analysis (ASCA, 2012). The time assessments are used to determine if school counselors are spending 80% of their time in direct and indirect student services. This component additionally includes process, perception, and outcome data on school counseling curriculum, small group, and closing-the-gap direct student service activities (ASCA, 2012, p. 101). The results reports are used to disseminate information to school stakeholders and for program evaluation purposes. The accountability component additionally includes four program evaluation and improvement areas: self-analysis of the school counseling program and of the school counselor, an administrator's school counselor evaluation, and a review of program goals. According to Kaffenberger (2012), "Outcome data are the most powerful" (p. 117). The next section will further review accountability within the school counseling field.

Accountability

There has been historical demand for school counseling program accountability (Borders, 2002; Dimmitt et al., 2005; Hughes & James, 2001; Lapan, 2001; Lapan, Gysbers, & Petroski, 2001; Perry, 1993; Whiston & Sexton, 1998). The need for school counseling program accountability stems from, and was further reinforced by, the demand for accountability within education during the 1960s and 1970s (Gysbers & Moore, 1981). Accountability regarding school counseling programs has historically included: (a) documenting the roles and responsibilities of school counselors based on published literature and state and national standards, and (b) documenting time spent in such roles. Accountability research is also referred to as evaluation research (Borders, 2002; Lapan, 2001). The school counseling accountability literature includes evaluation-

based (Carey & Dimmitt, 2006; Gysbers & Moore, 1981; Perry, 1993) and research-based (Carey & Dimmitt, 2006) accountability.

Program Evaluation Research

The need to demonstrate school counseling program accountability by conducting evaluation research will first be reviewed (Carey & Dimmitt, 2006; Gysbers & Moore, 1981; Perry, 1993). Some have described that evaluation studies serve as a measure of achievement, so that stakeholder can make more well informed decisions within a specific educational systems (Carey & Dimmitt, 2006; Gysbers & Moore, 1981). According to Gysbers and Moore (1981), evaluation studies can be process or formative or product evaluative in nature. The results of evaluations studies, although serving an important purpose, are less generalizable than are experimental studies and use less rigorous methodology.

School counseling program evaluation research will next be reviewed. Training school counselors and counselor educators to conduct evaluation studies is insufficient due to confounding variables, such as other school improvement initiatives (e.g., teacher professional development and additional building-wide program implementation), which are often present in educational settings or may be concurrently implemented (Borders, 2002). This suggests the need for conducting experimental studies demonstrating the impact of school counseling programs on variables deemed important to school systems and state departments of education. School counseling program research needs to demonstrate a positive impact on student academic achievement at school and state levels (Borders, 2002; Gysbers, 2001). Others discussed the possible reluctance of school

administrators to engage in school-based experimental research (Perry, 1993). Perry attributed this administrative reluctance to the possible necessity of some students needing to serve as a control group, and therefore not receiving the school counseling program intervention. However, Whiston and Sexton (1998) suggested a possible solution to such reluctance was the use of wait-list control participants in school counseling outcome research, as is widely utilized in counseling outcome research.

Lapan (2001) developed a tool called, “framework for planning and evaluation” (p. 291) to assist school counselors in two evaluation functions. First, this planning and evaluation document was to be used to facilitate counselor documentation of school-based domains directly influenced by the counseling program. Second, this tool was to be used as an accountability measure to track the school counseling program impact on noted developmental domains. This documentation tool included three planning and three evaluation processes describing both the expected or desired results and how these results were to be measured as a function of the comprehensive school counseling program. Additionally, this documentation tool was to outline the duties or roles of the school counseling program and the program elements believed to be found in effective school environments.

Results Based Comprehensive Programs

Results-based research was a focus of school counseling research stemming from the work of Johnson and Johnson (1982, 1991, 2003). Because the field of school counseling is historically linked to school reform initiatives (Herr, 2001, 2002; Lapan, 2001), results-based research initiatives sought to demonstrate the impact of

comprehensive school counseling programs on student academic achievement (Lapan, 2001).

School Counseling Program Outcome Research

There is need for school counseling program outcome research (Borders, 2002; Carey & Dimmitt, 2006; Carey, Dimmitt, Hatch, et al., 2008; Dimmitt et al., 2005; Green & Keys, 2001; Sabella, 2006; Whiston, 2002; Whiston & Sexton, 1998). Some have called for a clearer distinction between school counseling program evaluation studies, as described, and school counseling program research studies (Dimmitt et al., 2005). According to Carey and Dimmitt (2006), the purpose of research study is to add to a growing body of knowledge and to develop additional theories regarding such knowledge. Because of higher methodological criteria used in research studies, the results are thought to be more generalizable. Also, because of current legislation (Carey & Dimmitt, 2006; Carey, Dimmitt, Hatch, et al., 2008; Dimmitt et al., 2005; NCLB, 2002; Whiston & Sexton, 1998), research-based experimental studies are preferred and mandated. Research studies need to demonstrate the school counseling program impact on student academic achievement and on factors identified to positively impact student academic achievement (e.g., attendance and suspension data). School counseling outcome studies will next be reviewed.

Perception Studies

Nelson and Gardner (1998) published a study investigating the outcome of more fully implemented comprehensive guidance programs in the state of Utah. This study was commissioned by the Utah State Office of Education (USOE) and sought to

investigate the impact of more fully implemented programs on Utah's Student Education and Occupation Plan (SEOP). Survey packets were sent to counselors, administrators, and three randomly selected teachers from 193 qualifying schools. Responses were received from 176 schools with fully implemented comprehensive guidance programs.

More fully implemented comprehensive guidance programs were found to more positively impact the SEOP than did less fully implemented programs. Most of Nelson and Gardner's findings, however, pertained to descriptive and perception items. For example, more fully implemented programs were found to have greater perceived program coordination, district support, and high ratings of student assessed factors (e.g., educational and job preparation, student interest in future planning, and availability of career resources). Schools with more fully implemented guidance programs were also found to have a greater percentage of counselors' time spent working directly with students, increased parent involvement, and more students enrolled in science, mathematics, and vocational related courses. Students in the schools with more fully implemented comprehensive guidance and counseling programs also had higher ACT subtest scores in every area than did students in schools with less than fully implemented programs.

Nelson and Gardner (1998) did not report school demographic data and study methodology, other than reporting survey packets were mailed to qualifying schools. Qualifying schools were described as those identified by the USOE as having more fully implemented comprehensive guidance programs. The criteria by which more fully implemented comprehensive guidance programs were identified, however, were also not

reported. Based on these findings, it seems this was a correlational investigation. The relationship between the more fully implemented programs and suspension or attendance data were also not addressed. Finally, possibly confounding interventions concurrently implemented by the schools with the more fully implemented programs, or those with less fully implemented programs, were not discussed.

Perception and Correlational Studies

Lapan, Gysbers, and Petroski (2001) conducted a statewide investigation of the Missouri Comprehensive Guidance Program (MCGP) using student and teacher self-report Missouri School Improvement Program (MSIP) data collected over four academic years. These findings are especially relevant regarding the impact of school counseling programs for multiple reasons. First, the University of Missouri was granted a U.S. Department of Education grant for the development and implementation of school-based counseling, career guidance, and placement programs for all states. Second, between the academic years of 1984 to 1985 and 1997 to 1998 nearly 85% of all Missouri school districts received extensive training to implement the MCGP. Lapan and colleagues analyzed archived self-report MSIP data from 22,601 seventh grade students and 4,868 teachers from 184 schools that were collected between the fall of 1992 through the spring of 1996 (four academic years).

This study investigated the impact of more fully implemented comprehensive guidance and counseling programs on student perceptions of school safety, relationships with teachers, and the relevance and importance of education to their future. The impact of more fully implemented comprehensive guidance and counseling programs on student

reported satisfaction with their own education and grades was also investigated. The implementation status of comprehensive guidance and counseling programs was quantified using teacher self-report MSIP data regarding program characteristics teachers were believed to have knowledge of

time spent in classrooms; students assisted with personal, educational, and career related concerns or planning; consultation with school personnel and parents; individual and group counseling; student referrals to community-based services; and communicating guidance program purpose and goals to school and community stakeholders. (Lapan et al., 2001, p. 327)

Relevant findings regarding the impact of more fully implemented comprehensive guidance and counseling programs will next be reviewed.

There was a significant positive correlation between more fully implemented programs and student reported success and safety based on school level indicators. Students in schools with more fully implemented programs were more likely to self-report having higher grades and feeling safer in schools. Students in schools with more fully implemented programs also reported having better relationships with teachers, being more satisfied with their education, and perceiving their education as important and relevant to their future.

Using data from the same Missouri School Improvement Program (MSIP) database, Lapan, Gysbers, and Sun (1997) investigated the impact of more fully implemented Missouri Comprehensive Guidance Programs (MCGP) on student perceived academic achievement and perceived school climate. This study also investigated the

relationship between more fully implemented MCGPs, students' belief that their school was preparing them well for their future, and the perceived amount of career-related information and sources available to students.

Between 1992 to 1995, 100 students from every MSIP database high school were randomly selected resulting in 22,964 high school student participants from 236 schools. Data were also collected from 434 counselors working at these schools. As with the Lapan, Gysbers, and Petroski (2001) research, this study utilized archived survey data collected through the MSIP. Student reported data were collected using the Secondary Student Questionnaire (SSQ). The study outcome measures were the three variables of SSQ: student self-reported grades, self-assessed education quality for future preparation, and how well students reported liking their school. Also assessed by the SSQ was student perception of school climate factors such as feeling safe at school, perceived behavior of class peers, feelings of belongingness, and if classes were interrupted or the noise level of the school interrupted work concentration. Student perception of career-related information was also assessed by the SSQ. Student demographic characteristics such as sex, racial minority status, and parental education were additionally collected from the SSQ.

School level demographic information including student enrollment, socioeconomic student status measured by free and/or reduced lunch status, and percentage of racial minority students was collected from the same MSIP database. Guidance program implementation status was quantified using school counselor MSIP self-report survey data. The school counselor surveys contained 32 items addressing

classroom and group guidance presentations, individual planning services such as assessment and advising, counseling and consultation work, professional development programming, and system support or program implementation matters. The comprehensive guidance program implementation status was calculated using the means of all school counselor survey data for individual schools. Thus, each of the 236 high schools yielded one implementation value.

Findings regarding student perception of career-related information, the belief that education was preparing students well for the future, school climate, and earned grades will be reviewed. Students attending schools with counselors who reported having more fully implemented guidance programs reported having more career and college-related information than did students attending schools with counselors who reported having less fully implemented programs. Students who reported having more career-related information also reported earning higher grades. Students attending schools with more fully implemented guidance programs additionally reported having more positive school climates and were more likely to report believing their school was well preparing them for their future. Finally, students attending schools with school counselors who reported having more fully implemented guidance programs reported earning higher grades than did students attending schools with school counselors who reported having less fully implemented guidance programs.

Limitations of this study included the use of self-report data from students and school counselors. Because of this limitation, the impact of more fully implemented guidance programs on student academic achievement was limited to students' self-

reported grades. Additional study limitations include the correlational nature of all findings.

Empirical Studies

Sink and Stroh (2003a, 2003b) investigated the impact of more fully implemented elementary school comprehensive guidance and counseling programs (CGCPs) on academic achievement in the state of Washington. These researchers investigated if third and fourth grade students in schools with more fully implemented CGCPs had higher levels of academic achievement than students in schools with less fully implemented CGCPs. Sink and Stroh randomly selected 150 elementary schools. Thirty-one of these schools were excluded from participation for not having a school counselor on staff, 67 schools were identified with an implemented CGCP, and 83 schools were identified as not having a CGCP. The 67 CGCP schools represented the experimental group and the 83 non-CGCP schools served as the control group. The CGCP experimental group had an *N* of 9,816 students and the non-CGCP control group had an *N* of 10,315 students. Academic information from a total of 20,131 students was analyzed, of which 49% were third graders and 51% were fourth graders.

The following three measures were used in this investigation: The Comprehensive Guidance & Counseling Programs and Student Success in Washington State Elementary Schools Telephone Survey (Sink & Stroh, 2003a, p. 10), the Iowa Tests of Basic Skills-Form M (ITBS), and the Washington Assessment of Student Learning (WASL). The telephone survey was created for use in this study to gather counselor background and school information. If a school system was identified by the telephone survey as having

an implemented CGCP, the survey data were then used to assess the implementation status of the CGCP. The ITBS is a norm-referenced test used by Washington State to assess third, sixth, and ninth grade students on basic academic skills. The WASL was reported as a new criterion-referenced test administered to 4th, 7th, and 10th grade students in Washington. Both test were described as being group administered and as having adequate internal consistency and reliability.

The telephone survey was administered by trained school counseling doctoral students. School demographic information (e.g., student enrollment and free and reduced lunch status) was attained from the Washington School Research Center database, where the researchers were employed. ITBS and WASL data and student demographic information (e.g., number of years in current school, gender, and race) were also collected. Multiple multivariate analyses of covariances (MANCOVAs) were run using independent variables of Group (students in CGCP or non-CGCP schools), number of years of enrollment, and gender and dependent variables of WASL or ITBS student achievement measures. The independent variables were investigated for the third and fourth grade students using MANCOVAs.

Third grade students enrolled in schools with more fully implemented CGCPs for more years had significantly higher ITBS scores than third grade students enrolled in schools with less fully implemented CGCPs. Similar findings were found for the fourth grade students. When fourth graders attended a school with a more fully implemented CGCP for more years, these students scored significantly higher on the WASL state assessment than did fourth grade students who attended non-CGCP schools.

Third and fourth grade students attending schools during the first year of a less than fully implemented CGCP (schools with a CGCP, but not fully implemented CGCP), scored lower on both the ITBS and the WASL than did third and fourth grade students attending non-CGCP schools (schools with no CGCP). Over a number of years, however, this lower difference was found to disappear. Thus, for students with lower initial academic performance on both the ITBS and the WASL, even attending schools with a less than fully implemented CGCP, served to eliminate the achievement gap after a few years. This group comparison study using archived data and a newly developed telephone survey by Sink and Stroh (2003a, 2003b) provided support that school counseling programs (CGCP) positively impact the academic performance of third and fourth grade students. Moreover, this study provided evidence for the positive impact school counseling programs (CGCP) can have on academic performance of upper elementary school-aged youth when such programs are fully implemented for as few as four academic years. This study also provided evidence for the positive impact of less than fully implemented school counseling programs on third and fourth grade student academic achievement when such school counseling programs are implemented for as few as four years. This investigation was described as “a first of its kind to document significant differences in academic achievement between students who attended elementary schools with strong comprehensive programs and those without” (Sink & Stroh, 2003a, p. 22).

Variables Impacted by School Counseling Programs

Michigan Education Assessment Program (MEAP) and Adequate Yearly Progress (AYP)

School counseling interventions and comprehensive school counseling programs positively impact student academic achievement (Green & Keys, 2001; Gysbers, 2001; Paisley & Hayes, 2003; Sink & Stroh, 2003a, 2003b). The Michigan Educational Assessment Program (MEAP) and Adequate Yearly Progress (AYP) attainment are two variables used to measure academic achievement in the state of Michigan (Adequate Yearly Progress, 2011; Michigan Department of Education, 2009; Michigan Government, 2011a, 2011b; Michigan State Board of Education, 2002; U.S. Department of Education, 2002). Because this investigation sought to better understanding the impact one school counseling program had on the academic achievement in a single school subject, the next section will review recent relevant literature linking academic achievement gains to school counseling programs and interventions.

Direct Impact on Academic Achievement

School counseling programs and interventions have a plethora of positive impacts (Glosoff & Koprowicz, 1990; Lapan et al., 2001; Lapan et al., 1997; Nelson & Gardner, 1998; Sink & Stroh, 2003a, 2003b; Tobias & Myrick, 1999). This section will review relevant literature specifically regarding the direct impact of school counseling programs and interventions on academic achievement. As noted, seventh grade students attending schools with more fully implemented comprehensive school guidance programs self-reported earning higher grades (Lapan et al., 2001; Lapan et al., 1997). The Lapan,

Gysbers, and Petroski (2001) and Lapan, Gysbers, and Sun (1997) studies concluded that school counseling programs positively impact student self-reported grades.

School counseling programs also positively impact elementary school students' academic achievement (Glosoff & Koprowicz, 1990; Sink, 2008; Sink & Stroh, 2003a, 2003b). As noted, third and fourth grade students attending schools for several years with more fully implemented comprehensive school guidance programs had significantly higher Iowa Test of Basic Skills scores than did third and fourth grades students attending schools without fully implemented comprehensive school guidance programs (Sink, 2008; Sink & Stroh, 2003a, 2003b).

Also as described, a study by Nelson and Gardner (1998) found that Utah high school students attending schools with more fully implemented guidance programs had higher American College Test (ACT) subtest scores in every area than did students attending schools with less fully implemented guidance programs. Nelson, Gardner, and Fox (1998) additionally found that high school students attending schools with more fully implemented guidance programs had higher ACT composite scores.

Research pertaining to counseling, and counseling-related, interventions is also linked to academic achievement. For example, counseling support groups have been found to positively impact student academic achievement. Tobias and Myrick (1999) found that peer led support groups positively impacted student grades. The Student Success Skills classroom guidance and counseling support group program was repeatedly found to positively impact student academic achievement, measured by state academic assessment programs (Brigman & Goodman, 2003; Brigman & Webb, 2007; Brigman,

Webb, & Campbell, 2007; Webb & Brigman, 2007). This classroom guidance and small group program was specifically found to positively impact the percentage of students scoring at proficiency levels for mathematics and reading.

Powell and Jacob Arriola (2003) found that African American students' ability to cope with unfair treatment, such as racial discrimination, is correlated with academic achievement measured by grade point average (GPA). These researchers hypothesized that students who talk with others as a coping mechanism for such unfair treatment will have high GPAs. Counseling programs have also been found to influence the academic achievement of specifically African American males students (Baggerly & Parker, 2005; Caldwell, Sewell, Parks, & Toldson, 2009). Toldson (2008) further reported that emotional factors were linked to improve academic achievement for African American male students. Toldson found that African American male students with higher grades were more likely to report high levels of life satisfaction than were students with lower grades.

Indirect Impact on Academic Achievement

School counseling programs impact academic achievement indirectly by impacting mediating factors (Barna & Brott, 2011; Bryan, 2005; Fitch & Marshall, 2004). This section will review relevant literature regarding the indirect impact of school counseling programs and interventions on academic achievement. For example, there is a correlation between academic achievement and school, family, and community partnerships (Bryan, 2005; Fitch & Marshall, 2004). Bryan (2005) described how school counselors and school counseling programs positively impact school, family, and

community partnerships, which in turn impact academic achievement. Additionally, Barna and Brott (2011) reported that the ASCA National Standards of Personal and Social Development indirectly impact academic achievement through the constructs of behavior, social competence, emotional intelligence, and academic enablers.

The school counselor roles of consultation and collaboration also indirectly positively impact academic achievement by impacting other educational stakeholders, whom in turn directly impact academic achievement (Fitch & Marshall, 2004; Myrick, 1993; Sink, 2008). School counselors indirectly have a positive impact on academic achievement by impacting the following factors found in effective schools: school leadership, academic achievement recognition, parent and community involvement, and students' sense of belonging or measured school climate (Fitch & Marshall, 2004). School counselors also indirectly positively impact academic achievement by specifically impacting school climate through consulting and collaborating with others (Littrell & Peterson, 2001; Sink, 2008). Fitch and Marshall (2004) found a positive correlation between high achieving schools and when school counselors devote significantly more time to the school counseling program management component, particularly adhering to professional standards, coordination, evaluation, and research.

Some, however, question the practicality of studying school counseling programs and improved academic achievement (Brown & Trusty, 2005b, 2005c). Brown and Trusty (2005a, 2005b, 2005c) believe investigating school counseling program impact on improved academic achievement should not be the goal. Further, they believe efforts should be devoted to investigating the impact of specific school counseling interventions,

such as a counseling group or a guidance curriculum, on academic achievement, rather than attempting to investigate the impact of a comprehensive school counseling program.

Suspension

Some student behaviors may negatively impact academic achievement and may lead to student suspensions (Akos, 2000; Muscott, Mann, & LeBrun, 2008).

Interventions implemented based on the ASCA National Academic and Personal/Social Standards reduce problematic behaviors, such as aggression, that may lead to suspensions, which is linked to declines in academic achievement (Barna & Brott, 2011). School counseling programs and interventions have positively impacted student behavior and decreased the number of school suspensions (Akos, 2000; Brigman & Webb, 2007; Glosoff & Koprowicz, 1990; Muscott et al., 2008; Ross & Horner, 2009; Steen & Kaffenberger, 2007). Because this current investigation sought to better understanding the impact one school counseling program had on suspension data in a single school subject, this section will discuss recent relevant literature linking improved behavior to school counseling programs and interventions.

Based on an elementary school-aged student sample, Glosoff and Koprowicz (1990) found that school counseling interventions positively impacted behaviors that may lead to suspensions. Studying school counseling intervention impact on behavior in an elementary school aged population, Akos (2000) found that structured small group counseling interventions indirectly reduced aggressive behavior by increasing empathy in children. Akos reported students' empathy was further developed by their participation in psychoeducational groups intended to teach students skills. Akos further reported that

these newly learned skills changed student attitudes, which improved student behavior. Steen and Kaffenberger (2007) also found that students who participated in counseling groups for personal, social, and academic achievement-related reasons improved their behavior and improved language arts grades measured by parents and teachers.

The Student Success Skills (SSS) classroom guidance and small group counseling program is another example of a school counseling intervention teaching students coping strategies to reduce behaviors that may lead to suspensions. The SSS program has repeatedly decreased student negative behaviors measured by the School Social Behavior Scale (Brigman & Goodman, 2003; Brigman & Webb, 2007; Brigman, Webb, & Campbell, 2007; Webb & Brigman, 2007). Rather than focusing directly on decreasing behaviors that may lead to suspensions, the SSS program focuses on increasing prosocial behaviors.

The Bully Prevention in Positive Behavior Support (BP-PBS) program is a school-wide intervention program with the goal of reducing bullying behaviors by teaching students strategies to address bullying (Ross & Horner, 2009). Ross and Horner investigated the BP-PBS program intervention impact on six elementary school students in three elementary schools. The BP-PBS program reduced problem behavior measured by a School Wide Information System (SWIS) for the six students. The BP-PBS program also reduced problem behavior and increased prosocial responses to problem behavior in the three schools.

The Positive Behavioral Interventions and Supports-New Hampshire (PBIS-NH) is another example of a positive behavioral support program (Muscott et al., 2008).

Muscott, Mann, and LeBrun (2008) investigated the impact of the PBIS-NH program on 29 kindergarten through 12th grade schools and early childhood education programs. A target goal was set for the percentage of students in elementary and secondary schools with either no disciplinary incidences or “one instance of major problem behavior” (Muscott et al., 2008, p. 197). Post implementation of the PBIS-NH program, the goal was met in 73% of the high schools, 75% of the middle schools, and 87% of the elementary schools. Implementing the PBIS-NH program also resulted in math and reading proficiency percentage improvements for some elementary schools and a math proficiency percentage improvement in one secondary school.

Underrepresented racial groups of students have consistently received a higher percentage of school suspensions than would be expected given their percentage of student populations (Arcia, 2007; Eitle & Eitle, 2004; Koaser, 1979; Skiba, Horner, Chung, Rausch, May, & Tobin, 2011; Skiba, Michael, Nardo, & Personson, 2002). This body of research has consistently highlighted that African American students (Mendez & Knoff, 2003; Skiba et al., 2000; Streitmatter, 1986; Townsend, 2000), and especially African American males (Bickel, 1980; Fenning & Rose, 2007; Mendez & Knoff, 2003), are suspended more frequently than would be expected compared to their White peers (Children’s Defense Fund, 1975; Mendez, Knoff, & Ferron, 2002; Skiba, Michael, Nardo, & Personson, 2002). By consulting and collaborating with others, school counselors can positively impact school leadership and school climate, thereby indirectly impacting the disproportionate nature of who gets suspended from schools (Fitch & Marshall, 2004; Littrell & Peterson, 2001; Sink, 2008).

Attendance

There is a relationship between attendance and academic achievement (Steward et al., 2008; Perry, Liu, & Pabian, 2010). Although the purpose of Adequate Yearly Progress (AYP) attainment is academic achievement accountability (Adequate Yearly Progress, 2011; Michigan Department of Education, 2009; Michigan Government, 2011a, 2011b; Michigan State Board of Education, 2002; U.S. Department of Education, 2002), AYP is calculated based on state standardized reading and math test proficiency percentages and attendance percentage in elementary and middle schools (Adequate Yearly Progress, 2011; Michigan State Board of Education, 2002). Thus, this investigation sought to better understanding the impact of one school counseling program on attendance in a single school subject. Recent relevant literature regarding attendance and school counseling programs and interventions will next be reviewed.

There is scant research on the impact school counseling programs and interventions have on student attendance. Tobias and Myrick (1999), however, found that peer-led support groups increased student attendance and that student absenteeism was negatively correlated with student grade point averages (Powell & Jacob Arriola, 2003). Also as described, school counseling programs and interventions positively impact behavior and decrease suspensions, thereby increasing attendance (Akos, 2000; Bridgman & Webb, 2007; Glosoff & Koprowicz, 1990; Muscott et al., 2008; Ross & Horner, 2009; Steen & Kaffenberger, 2007).

Dependent Variable Summary

Having more than one dependent variable when utilizing single subject time-series methodology is pertinent to mitigating against internal validity threats (Heppner, Wampold, & Kivlighan, 2008). The selection of dependent variables should also be theoretically based - the intervention should theoretically impact the dependent variables. This section highlighted recent relevant literature regarding school counseling programs and interventions and academic achievement, suspensions and school behaviors, and attendance. The following highlights the theoretical relevance of the selected dependent variables:

an American Psychological Association (2002) policy briefing statement on the importance of elementary and secondary school counseling programs argued that over 20 years of research demonstrated that school counseling and mental health services can significantly improve student achievement and school attendance, and reduce disruptive behavior. (as cited by Sink, 2008, p. 446)

Urban schools are particularly faced with lower academic achievement (Blanchett et al., 2005; Holcomb-McCoy & Mitchell, 2005; Holcomb-McCoy & Lee, 2005; Lee, 2005) and higher absenteeism (Gruman, Harachi, Abbott, Catalano, & Fleming, 2008; Steward et al., 2008) and suspension rates (Kunjufu, 2002, 2005). Therefore, this investigation utilized MEAP proficiency percentage, annual AYP attainment status, suspension percentage, and attendance percentage data as multiple dependent variables.

CHAPTER III

METHODS

Participants and Settings

This research investigated the impact of one school counseling program on school system level variables. The participant for this research was one urban kindergarten through eighth grade single school subject, which will herein be referred to as School A of the City School District. The school counseling program impact on the single school subject was investigated using an ABA reversal single subject time-series analysis of archived data (Aeschleman, 1991; Barlow, Nock, & Hersen, 2009; Cook & Campbell, 1979; Crosbie, 1993; Huitema, 2011b, 2011c; Kivlighan, 1990; Kazdin, 1980, 1994, 2003; Morgan & Morgan, 2001; Slowiak, Huitema, & Dickinson, 2008). This methodology is also referred to as an interrupted time-series analysis or quasi-experimental analysis. To this researcher's knowledge, this investigation utilized a novel methodology for studying a comprehensive school counseling program's impact on school variables within one school system.

Recruitment of Participants

There are challenges in conducting school counseling school-based research (Perry, 1993). However, utilizing convenience sampling procedures are widely advocated (Murray, Hannan, & Zucker, 1989) and used (O'Brien, 2007; Patsy Tan, 2004; Smith & Palmieri, 2007) when conducting school-based research. Therefore, City School District was identified for recruitment based on convenience sampling procedures.

School A of City School District was selected based on purposeful sampling procedures (Creswell, 2007; Marshall & Rossman, 2006; Sandelowski, 1995), which are also routinely used in educational research (Hoekstra, Korthagen, Brekelmans, Beijaard, & Imants, 2009; Pissanos, 1995; Siegel, 2005). School A was purposefully selected for investigation because the school did not have a school counseling program, then implemented a school counseling program for two academic years, and then withdrew the program. Thus, the resulting change in school variables was readily investigated using an ABA reversal single subject time-series analysis. This condition was ideal for retroactively establishing a baseline analysis before the school counseling program intervention was implemented.

Communication with District Leadership

Discussions with the Deputy Superintendent of City School District were initiated by this investigator in July 2010 to assess the feasibility of this investigation. After discussing the proposed research, the Deputy Superintendent directed this researcher to initiate further discussions with the State and Federal Compliance Officer of the City School District. This investigator then proceeded to contact and subsequently communicate with the State and Federal Compliance Officer of the City School District. The State and Federal Compliance Officer then requested a preliminary research proposal to ascertain the possible acceptability of the proposed research, a redacted copy of which can be found in Appendix A (Preliminarily Submitted Research Proposal). After receiving the Preliminarily Submitted Research Proposal, and after discussing the proposal with this investigator, the State and Federal Compliance Officer of the City

School District further directed this investigator to obtain a “Request to Conduct Research in the City School District” application. Upon approval of this researcher’s dissertation committee to conduct the proposed research and after receiving university Human Subject Institutional Review Board (HSIRB) approval, this researcher pursued obtaining school district approval for conducting this investigation. The university HSIRB approval letter to conduct the research can be found in Appendix B (HSIRB Approved Approval Letter) and the approved application for continuing review can be found in Appendix C (HSIRB Approved Application for Continuing Review). A copy of the HSIRB approved consent form can be found in Appendix D (HSIRB Approved Consent Form) and the site approval letter can be found in Appendix E (HSIRB Approved Site Approval Letter). It should be noted that the City School District required institutional HSIRB approval as part of the district research application.

District Research Application Process

After preliminary discussions were facilitated with City School District leadership, this investigator proceeded with submitting an application to conduct school district research. The district level application was obtained by this investigator, completed, and submitted to the City School District with the following required application materials: (a) \$50 processing fee, (b) a copy of this investigator’s HSIRB approval letter, (c) an HSIRB approved study participant consent form, (d) a complete copy of the study proposal, and (e) nine additional copies of the City School District Research Application. A redacted copy of the completed City School District Application can be found in Appendix F (City School District Research Application –

Redacted). A cover letter was also included in the application packet, which can be found in Appendix G (City School District Research Application Cover Letter – Redacted).

The City School District Research Application packet was initially submitted on March 9, 2012. This investigator received a letter from City School District dated March 21, 2012 communicating that the received research application was not approved. A redacted copy of this letter can be found in Appendix H (City School District Research Application Non-Approval Letter – Redacted). Upon communication with a district representative regarding the status of City School District Research Application, this investigator was urged to re-submit the research application at the beginning of July 2012. Due to school district staff turnover, mandated testing programs, and the spring demands of the academic year, this investigator was told that this later date would be more accommodating for the school district. The City School District research application packet was resubmitted on July 3, 2012. This investigator received a letter dated August 16th indicating that the City School District research application was conditionally approved, pending superintendent approval. A redacted copy of the City School District research application approval letter can be found in Appendix I (City School District Research Application Approval Letter – Redacted). The City School District Superintendent signed the HSIRB approved consent form on August 28, 2012.

Schools Not Included in the Study

Because no additional City School District schools met the methodological criteria for an ABA reversal single subject time-series analysis, all other district

elementary, middle, and high schools were purposefully omitted from study participation. Additional district elementary schools were purposefully omitted due to lacking implemented school counseling programs. Because of having longstanding implemented school counseling programs, all other district middle schools were omitted because they did not meet the methodological criteria for an ABA reversal framework. All district high schools were omitted for two reasons: (a) these schools did not meet the methodological criteria following an ABA reversal framework due to their longstanding implemented school counseling programs, and (b) the developmental age differences of high school students compared to kindergartner through eighth grade students.

Convenience and Purposeful Subject Selection

Conducting school-based school counseling research poses many challenges (Perry, 1993). However, using convenience sampling procedures when conducting school-based research has been advocated (Murray et al., 1989) and utilized (O'Brien, 2007; Patsy Tan, 2004; Smith & Palmieri, 2007). Due to the difficulty in studying school counseling program impact on academic achievement, suspension, and attendance school level variables, this investigation used convenience and purposeful sampling procedures. Through professional ties, this researcher utilized convenience sampling procedures to identify the City School District as a target participant. Convenience and purposeful sampling procedures were further employed to identify School A within City School District as the single school subject.

Setting for the Research

District Setting

District level archived descriptive demographic data were collected including student enrollment, gender, race, and free and/or reduced lunch qualifying status for the study years of 2006 to 2007, 2007 to 2008, 2008 to 2009, 2009 to 2010, and 2010 to 2011. The free and/or reduced lunch service and student racial demographic enrollment data were collected based on Michigan Educational Assessment Program and Adequate Yearly Progress subgroup classifications (Burns, 1998; McGlinchey & Hixson, 2004; Michigan Department of Education, 2009; Michigan Government, 2011a, 2011b) and the preponderance of academic achievement differences in racial and socioeconomic student subgroups (Adkison-Bradley et al., 2006; Amatea & West-Olatunji, 2007; Bemak & Chung, 2005; Bruns et al., 2004; Cox & Lee, 2007; Kunjufu, 2002; Trusty et al., 2008). The district level archived descriptive demographic data are shown in Table 1.

Based on review of school and district archived annual report documents, it was gleaned that the collective elementary, middle, and high school level buildings did not make Adequate Yearly Progress (AYP) for the 2007–2008 academic year. Although some individual elementary and middle schools did make AYP during the 2007–2008 academic year, all of the individual City School District high schools failed to make AYP and were in Phase Five of a school restructuring plan. It was further identified that for the 2008–2009 academic year the collective elementary and high school level buildings again failed to make AYP. The collective elementary, middle, and high school level City

School District AYP attainment status is unknown for the 2006 to 2007, 2009 to 2010, and 2010 to 2011 academic years.

Table 1

City School District Demographic Data by Year

	Academic Years				
	06-07	07-08	08-09	09-10	10-11
Total Student Enrollment	15,025	14,892	14,160	13,701	13,013
Gender					
Male	7,701	7,667	7,268	7,113	6,723
Female	7,324	7,225	6,892	6,588	6,290
Race/Ethnicity					
African American	6,870	6,956	6,522	6,264	5,856
Asian/Pacific Islander	666	632	653	783	801
Hispanic	2,366	2,362	2,242	2,125	2,064
Native American	185	162	172	201	208
Native Hawaiian	< 10	< 10	< 10	10	< 10
White	4,930	4,754	4,564	4,318	4,014
Two or More Races	< 10	< 10	< 10	< 10	66
Free/Reduced Lunch	10,335	9,639	9,896	Omitted	Omitted

Note. This table depicts the mean student enrollment and mean number of male, female, White, African American, Hispanic, Asian and Pacific Islander, Native American, and students qualifying for free and reduced lunch services in City School District for the years of analysis.

School Setting

School A is a magnet-themed school within the City School District, with a visual and performing arts specialization. Because of the magnet designation, students apply to School A for enrollment. Mean annual demographic information including school enrollment, gender, race, and numbers of students qualifying for free and/or reduced lunch services for School A for the 2006–2007, 2007–2008, 2008–2009, 2009–2010, and 2010–2011 academic years is shown in Table 2. Tables 3, 4, 5, 6, 7 display annual enrollment, gender, and racial demographic data by grade contributing to the single school compound unit for the individual 2006–2007, 2007–2008, 2008–2009, 2009–2010, and 2010–2011 academic years. Table 8 shows the professional degree qualifications for School A’s teaching staff for four of the five years of analysis. Although the teacher turnover percentage for the academic years of investigation was approved for data collection by the City School District, these data were not able to be collected.

Table 2

Annual School Demographic Data

	Academic Years				
	06-07	07-08	08-09	09-10	10-11
Total Enrollment	511	560	560	556	557
Gender					
Male	205	219	229	240	236
Female	305	341	331	316	321
Race/Ethnicity					
African American	279	321	326	317	326
Asian/Pacific Islander	24	22	27	29	20
Hispanic	55	57	55	52	65
Native American	< 10	< 10	< 10	< 10	< 10
Native Hawaiian	< 10	< 10	< 10	< 10	< 10
White	148	155	146	152	136
Two or More Races	< 10	< 10	< 10	< 10	< 10

Note. This table depicts the mean student enrollment and mean number of male, female, White, African American, Hispanic, Asian and Pacific Islander, and Native American students enrolled in City School District for the five years of analysis.

Table 3

School Demographic Data, 2006–2007

	Grades								
	K	1st	2nd	3rd	4th	5th	6th	7th	8th
Total Enrollment	71	66	74	50	53	50	50	47	50
Gender									
Male	32	29	27	20	28	22	16	16	15
Female	39	37	47	30	25	28	34	31	35
Race/Ethnicity									
African American	36	39	44	24	29	29	30	26	22
Asian/Pacific Islander	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hispanic	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Native American	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Native Hawaiian	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
White	26	15	25	14	14	15	10	11	18
Two or More Races	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Note. This table depicts the mean student enrollment, number of male and female students, and number of White, African American, Hispanic, Asian and Pacific Islander, and Native American students by grade for School A.

Table 4

School Demographic Data, 2007–2008

	Grades								
	K	1st	2nd	3rd	4th	5th	6th	7th	8th
Total Enrollment	77	76	64	67	64	67	52	47	46
Gender									
Male	29	31	27	26	26	31	21	12	16
Female	48	45	37	41	38	36	31	35	30
Race/Ethnicity									
African American	43	42	38	42	31	39	29	28	29
Asian/Pacific Islander	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hispanic	< 10	< 10	< 10	< 10	< 10	< 10	< 10	10	< 10
Native American	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Native Hawaiian	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
White	27	26	14	20	19	17	14	< 10	< 10
Two or More Races	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Note. This table depicts the mean student enrollment, number of male and female students, and number of White, African American, Hispanic, Asian and Pacific Islander, and Native American students by grade for School A.

Table 5

School Demographic Data, 2008–2009

	Grades								
	K	1st	2nd	3rd	4th	5th	6th	7th	8th
Total Enrollment	69	73	72	61	70	61	60	50	44
Gender									
Male	36	30	26	25	27	25	29	20	11
Female	33	43	46	36	43	36	31	30	33
Race/Ethnicity									
African American	35	44	39	38	45	31	38	27	29
Asian/Pacific Islander	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hispanic	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Native American	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Native Hawaiian	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
White	25	22	24	< 10	18	16	12	14	< 10
Two or More Races	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Note. This table depicts the mean student enrollment, number of male and female students, and number of White, African American, Hispanic, Asian and Pacific Islander, and Native American students by grade for School A.

Table 6

School Demographic Data, 2009–2010

	Grades								
	K	1st	2nd	3rd	4th	5th	6th	7th	8th
Total Enrollment	72	71	68	75	54	57	54	56	49
Gender									
Male	32	37	28	26	20	23	22	30	22
Female	40	34	40	49	34	34	32	26	27
Race/Ethnicity									
African American	34	37	46	45	34	36	26	35	24
Asian/Pacific Islander	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hispanic	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Native American	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Native Hawaiian	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
White	28	21	17	23	< 10	14	15	12	14
Two or More Races	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Note. This table depicts the mean student enrollment, number of male and female students, and number of White, African American, Hispanic, Asian and Pacific Islander, and Native American students by grade for School A.

Table 7

School Demographic Data, 2010–2011

	Grades								
	K	1st	2nd	3rd	4th	5th	6th	7th	8th
Total Enrollment	70	73	68	65	68	56	53	53	51
Gender									
Male	31	32	38	25	24	21	19	20	26
Female	39	41	30	40	44	35	34	33	25
Race/Ethnicity									
African American	37	37	40	45	44	32	33	27	31
Asian/Pacific Islander	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Hispanic	< 10	< 10	< 10	< 10	< 10	< 10	< 10	10	< 10
Native American	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Native Hawaiian	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
White	18	23	18	12	17	10	13	14	11
Two or More Races	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Note. This table depicts the mean student enrollment, number of male and female students, and number of White, African American, Hispanic, Asian and Pacific Islander, and Native American students by grade for School A.

Table 8

Professional Teacher Qualifications

Academic Year	B.A.	B.A. + 15 credits	M.A.	M.A. + 15 credits	M.A. + 30 credits	Ph.D.
2007–2008	7	5	18	0	0	0
2008–2009	7	5	18	0	0	0
2009–2010	12	x	20	x	x	1
2010–2011	12	x	20	x	x	1

Note. The professional teacher qualification information was not collected for the 2006–2007 academic year. For the 2009–2010 and 2010–2011 academic years, the above data were recorded for these combined years, and during these years there were only B.A., M.A., and Ph.D. categories.

School Counseling Program Intervention

This research investigated the impact of one school counseling program intervention on daily attendance percentage, daily suspension percentage, annual MEAP proficiency percentage, and annual AYP attainment status data for a single school subject utilizing archived school district records. The impact of school counseling program interventions have been analyzed using archived data when conducting school counseling research (Lapan et al., 2001). Because of high staff turnover typical of urban schools (Achinstein, Ogawa, & Sexton, 2010; DeAngelis & Presley, 2011; Hunter Quartz et al., 2008), school counseling staffing changes were hypothesized in the targeted single school subject. Because of the retrospective nature of this investigation, descriptive information regarding School A's implemented school counseling program intervention during the academic years analyzed was to be obtained from archived school annual report records. However, no descriptive information regarding the school counseling program

intervention was gleaned from the collected archived school annual report records during the school counseling phase of this study, the 2008–2009 and 2009–2010 academic years the intervention was implemented. Because the school counseling program was not referenced in School A’s annual report, it can reasonably be inferred that the program was a less than fully implemented school counseling program. Based on personal communication (August 5, 2010) with the school counselor implementing the school counseling program, it was learned that the school counselor was part-time and hired to work exclusively with the sixth, seventh, and eighth grade students.

Methodological Paradigm

This research utilized an ABA reversal single subject time-series analysis (Aeschleman, 1991; Barlow et al., 2009; Cook & Campbell, 1979; Crosbie, 1993; Huitema, 2011a, 2011b, 2011c; Huitema & McKean, 2000a; Kazdin, 1980, 2003; Kivlighan, 1990; Morgan & Morgan, 2001; Slowiak et al., 2008). Morgan and Morgan (2001) described a single subject design as being similar to an extreme form of a repeated measures design in that “frequent and continuous measurement of the dependent variable” (p. 122) is assessed. The question regarding single subject research is: Has an aspect of an individual’s behavior significantly changed in relation to previous behavior? This design structure is also referred to as an AB design, or a two-phase experiment. The A phase is analysis of selected dependent variables prior to intervention implementation. The B phase is analysis of the dependent variable after intervention implementation. The ABA reversal single subject time-series analysis is one form of a single subject design

paradigm (Aeschleman, 1991; Barlow et al., 2009; Heppner et al., 2008; Huitema, 2011b, 2011c; Morgan & Morgan, 2001; Slowiak et al., 2008).

The unit of analysis of single subject designs can also vary. The unit of analysis can be a single case or can be a compound unit (Huitema, 2011b, 2011c). A single case could be an individual client, whereas a compound unit could be a group, a classroom, a school system, a city, or a country. Because the composition of a compound unit can fluctuate over time, the number of individuals making up the compound unit can also change over time. This ABA reversal single subject time-series analysis methodology was utilized to study the impact of an implemented urban school counseling program as a school improvement intervention. This research investigated a school counseling program's impact on a school system serving as a compound unit of analysis.

Dependent Variable Selection

According to Heppner, Wampold, and Kivlighan (2008), a time-series analysis is advantageous for two reasons. This analysis yields detection of dependent variable changes over time and before the treatment or intervention is implemented. This analysis also allows researchers to detect dependent variable trends that may occur over time. However, there are concerns with internal validity threats when using time-series analysis designs (Heppner et al., 2008; Huitema, 2011c). To mitigate against such concerns, researchers are encouraged to have more than one dependent variable. Thus, one reason this investigation analyzed multiple dependent variables of attendance, suspension, MEAP, and AYP data. Heppner et al. additionally stressed the need for theory to drive variable selection. The dependent variables of attendance, suspension, MEAP, and AYP

attainment status were selected for investigation because of the prolific focus of these measures within school counseling research (Dimmitt et al.; NCLB, 2002).

Theoretically, the intervention should have an impact on the selected variables.

According to Slowiak, Huitema, and Dickinson (2008), “Experimental control is demonstrated when the behavior on the dependent variables change as the different conditions are introduced” (p. 117). When two dependent variables are included, it can more confidently be concluded that dependent variable changes are not attributed to maturation or other factors in a time-series analysis (Kivlighan, 1990). Finally, the use of time-series designs is underutilized in psychological research (Marcantonio & Cook, 1994).

Data Collection Procedures

School A of City School District was utilized as the single subject compound unit of analysis. School A implemented a school counseling program intervention for the 2008–2009 academic year. The school counseling program was terminated at the conclusion of the 2009–2010 academic year. Continuously accrued dependent variable data were collected and analyzed from School A for the 2006 to 2007, 2007 to 2008, 2008 to 2009, 2009 to 2010, and 2010 to 2011 academic years. Data were collected and analyzed for the two years before the school counseling program intervention was implemented (2006 to 2007 and 2007 to 2008) to establish a retrospective baseline for the dependent measures. Likewise, it was pertinent to collect data from the 2010 to 2011 school year to support the second A phase (A₂) of the ABA reversal methodology.

In addition to the dependent variables selected based on a methodological and theoretical rationale, these variables were selected based on feedback from City School District personnel. Because counseling psychologists can be of value to educational systems by working collaboratively on school-based mental health outcome research (Coleman, 2004; Forrest, 2004; Galassi & Akos, 2004; Gysbers, 2004; Pope, 2004; Romano & Kachgal, 2004a, 2004b; Whiston, 2004; Yeh, 2004), ensuring City School District approval regarding variable selection was critical. As noted, preliminary discussions were facilitated with the City School District's Deputy Superintendent, who directed this researcher to initiate preliminary discussions with the City School District's Federal Compliance Officer. The final decision to collect attendance, suspension, MEAP, and AYP attainment status data as dependent variables from archived City School District records was made based on preliminary discussions with the City School District's Federal Compliance Officer, while being theoretically and methodologically grounded.

With the City School District Superintendent's consent, and as directed by City School District's Federal Compliance Officer and Superintendent of Instruction, archived dependent measure data were collected from, and in, collaboration with City School District identified personnel. Per the HSIRB approved protocol and the approved City School District Research Application, attendance and suspension data were collected from City School District archived databases. The MEAP and AYP attainment status archived data were collected in collaboration with City School District personnel from

the MiSchoolData website housing school district submitted data in the state of Michigan, which is publicly accessible.

Independent Measures

An ABA reversal single subject time-series analysis requires three phases. During the first “A” phase there is no implemented intervention and a baseline is established. The implemented school counseling program treatment intervention was introduced during the “B” phase. For the second “A” phase (A_2) the school counseling program treatment condition intervention was removed. The school counseling program intervention implemented for the single subject of School A of City School District was to be described based on the archived annual staffing, school improvement plan, and school annual report documents produced during the five academic years for this investigation. As noted, the implemented school counseling program was not referenced in any of the City School District and School A collected documents. Because the school counselor (personal communication, August 5, 2010) was part-time and hired to work exclusively with the sixth, seventh, and eighth grade students, it was reasonable to infer that the school counseling program was a less than fully implemented school counseling program.

Instrumentation

Because this research analyzed a single school subject, the measures (data) utilized were continuously assessed by the school system. According to Morgan and Morgan (2001), “Single-participant designs possess unambiguous advantages, if one is interested in the development of behavior in a single organism over time” (p. 122). With

limited funding, school systems need to make decisions regarding how funds will be allocated (Carey & Dimmitt, 2008; Gysbers, 2004). Thus, there is a great need to demonstrate the impact of school counseling programs on school systems. The following pertinent educational measures were the selected dependent variables: daily attendance percentage, daily suspension percentage, and annual standardized academic achievement Michigan Educational Assessment Program (MEAP) proficiency percentage, and Adequate Yearly Progress (AYP) attainment status data.

Reason for Variable Selection

Attendance, suspension, MEAP, and AYP variables were selected for four primary reasons. First, this information is regularly reported as evidence of success regarding meeting school identified school improvement goals (Michigan Department of Education, 2009). Second, this information is currently utilized and assessed for meeting No Child Left Behind (NCLB) legislative educational mandates (Dimmitt et al., 2005; Michigan Department of Education, 2009; NCLB, 2002; McGlinchey & Hixson, 2004). NCLB legislation is particularly concerned with student academic achievement, attendance, and suspension rates utilized when calculating Adequate Yearly Progress (Michigan Department of Education, 2009). Third, these variables are widely investigated in school counseling program impact research (Brigman & Webb, 2007; Gysbers, 2001; Muscott et al., 2008; Powell & Jacob Arriola, 2003; Ross & Horner, 2009; Sink & Stroh, 2003a, 2003b; Tobias & Myrick, 1999). Fourth, because an ABA reversal single subject time-series analysis methodology was utilized in this investigation, these variables were selected because they are continuously measured by school systems.

Daily attendance, daily suspension, annual MEAP academic achievement, and annual AYP attainment status data were methodologically appropriate dependent variable measures for this analysis.

Michigan Educational Assessment Program

Initially funded through Public Act 307 in 1969 and refunded through Public Act 451 in 1976, the Michigan Educational Assessment Program (MEAP) first assessed students during the 1969 to 1970 school year and was mandated for use in 1970 (Michigan Department of Education 2009; Michigan Government, 2011a). The MEAP is a group administered criterion referenced assessment described as measuring students' knowledge in the academic content areas of English Language Arts (ELA) (reading and writing), mathematics, science, and social studies (Burns, 1998; McGlinchey & Hixson, 2004; Michigan Department of Education, 2009; Michigan Government, 2011a). Because School A's school counseling program was to target the sixth, seventh, and eighth grades, this research investigated sixth, seventh, and eighth grade MEAP proficiency data. Students are assessed for ELA and mathematics in sixth, seventh, and eighth grades, social studies in sixth grade, and science in eighth grade. This investigation sought to analyze ELA (reading) and mathematics MEAP proficiency data because these content areas were annually assessed. As science and social studies content data were not annually assessed, these areas were purposeful omitted for analysis.

The MEAP is initially scored using raw scores, converted to scaled scores, and then classified into one of four levels. The levels of MEAP scoring are as follows: Level 1, Advanced and exceeding Michigan standards; Level 2, Proficient or meeting Michigan

Standards; Level 3, Partially Proficient; and Level 4, Not Proficient. The raw and scaled scores needed to achieve the various proficiency standards, or levels, change from year to year, for the specific assessed content areas, and for the assessed grade levels. The raw and scaled score needed for a seventh grader, for example, to achieve a Level 1 is not the same as what an eighth grader needs to achieve a Level 1; however, the proficiency levels remain the same. Therefore, proficiency levels can be compared from grade to grade for individual students and for groups of students, whether such student groups are grade level cohorts or student subgroups. Groups of students can be compared within an individual school, from school to school, or from school district to school district.

The MEAP has adequate reliability (McGlinchey & Hixson, 2004; Michigan Department of Education, 2009; Michigan Government, 2011a). Because this investigation analyzed ELA (reading) and mathematics MEAP proficiency percentages, the internal consistency information for only these content areas will be reviewed. According to the Michigan Department of Education (2009), the median internal consistency of the MEAP as measured by coefficient alphas for sixth grade are as follows: “ELA .89, ELA–Reading .87, and mathematics .88” (p. 137). According to the Michigan Department of Education (2009), the median internal consistency of the MEAP as measured by coefficient alphas for seventh grade are as follows: “ELA .88, ELA–Reading .84, and mathematics .88” (p. 137). According to the Michigan Department of Education (2009), the median internal consistency of the MEAP as measured by coefficient alphas for eighth grade are as follows: “ELA 0.89, ELA–Reading .85, and mathematics .88” (p. 137).

The Michigan Department of Education (2009) also reported the Item Response Theory (IRT) reliability for all MEAP subtests. The IRT reliability for the ELA (reading) and mathematics content areas will next be reviewed. According to the Michigan Department of Education (2009), the sixth grade IRT reliability MEAP scores are “ELA–Reading .81 and mathematics .88” (p. 137). According to the Michigan Department of Education (2009), the seventh grade IRT reliability MEAP scores are “ELA–Reading .80 and mathematics .87” (p. 137). According to the Michigan Department of Education (2009), the eighth grade IRT reliability MEAP scores are “ELA–Reading .80 and mathematics .87” (p. 137). The ELA-Reading IRT reliability scores are lower in all grades than are the internal consistency reliability scores as measured by coefficient alphas for all grades. According to the Michigan Department of Education (2009), the MEAP is equally reliable for all assessed subgroups.

According to the Michigan Department of Education (MDE) (2009), there is “strong evidence for the content validity of the MEAP” (p. 143), which is supported by others (Michigan Government, 2011a). There is also, according to the MDE, evidence of construct validity for the MEAP. However, because the MEAP is currently the only measure used to assess what students individually and in groups are described as knowing based on the MDE Benchmarks and Grade Level Context Expectations (GLCEs), there is currently no criterion validity evidence for the MEAP assessment instrument. According to the MDE (2009), the MEAP is equally valid for all assessed subgroups.

In addition to assessing student knowledge in relation to the MDE Benchmarks and (GLCEs), the MEAP is an ideal measure for assessing the impact of school improvement programs designed to improve student academic achievement and school functioning (Michigan Department of Education, 2009; Michigan Government, 2011a). Some (Burns, 1998) question the reliability and validity of the MEAP for decision making regarding individual students' academic programs, while suggesting that school level MEAP results assess the impact of school improvement programs on the school system. Therefore, using MEAP proficiency data to assess a school counseling program's impact on the school system as a single subject is not only adequate, but may be an example of an ideal use of MEAP assessment data, rather than using these data for academic planning, or tracking of, individual students.

Adequate Yearly Progress

The No Child Left Behind Act (NCLB) of 2001 builds upon the 1965 and the 1994 reauthorization of the Elementary and Secondary Education Acts (Adequate Yearly Progress, 2011; Michigan Government, 2011b; Michigan State Board of Education, 2002; U.S. Department of Education, 2002; Wiley et al., 2005). The purpose of the current NCLB Act is to increase state and federal level accountability for student academic achievement by mandating Adequate Yearly Progress (AYP) of all Title 1 funded public schools. An additional purpose of the NCLB Act is to have all students proficient in reading and math by 2014, as assessed by individual state established standards. AYP is another variable continuously annually calculated by all individual schools and school districts receiving Title 1 funds. As an important academic measure

of all federally funded public schools, AYP attainment status is another variable methodologically suitable for an ABA reversal single subject investigation.

Under the NCLB legislation, each state individually determines the criteria for attaining AYP (Adequate Yearly Progress, 2011; Michigan Government, 2011b; U.S. Department of Education, 2002; Wiley et al., 2005). However, in all states, students must meet state established proficiency standards on state-mandated assessments. The assessment measure utilized in Michigan is the Michigan Educational Assessment Program (MEAP) with proficiency scoring categories as previously outlined. All states must also utilize a non-assessment based measure in determining AYP. For most states, including Michigan, an additional measure used in calculating AYP for middle schools is attendance. The dual standard for attaining AYP, the state-mandated testing (MEAP) proficiency standard and the attendance criteria for middle schools, applies to the school system as a single subject and to all individual subgroups within the school system. A school system could additionally be granted AYP status under a Safe Harbor provision of the NCLB Act if the percentage of a subgroup not meeting proficiency standards is reduced by 10% or more from the previous year.

Attendance

School counseling interventions impact attendance (Steward et al., 2008; Tobias & Myrick, 1999). Attendance percentage in middle schools, in addition to state standardized reading and math school level proficiency percentages, are used to calculate Adequate Yearly Progress (AYP) attainment status (Adequate Yearly Progress, 2011; Michigan State Board of Education, 2002). Within School A of City School District,

daily attendance was recorded by individual classroom teachers using a computer-based record-keeping system linked to the City School District's student management system. For the purpose of this investigation, daily attendance data were collected from archived City School District records.

Suspension

School counseling programs and interventions positively impact student behavior decreasing the number of school suspensions (Akos, 2000; Brigman & Webb, 2007; Glosoff & Koprowicz, 1990; Muscott et al., 2008; Ross & Horner, 2009; Steen & Kaffenberger, 2007). Within School A of City School District, daily administered suspensions were recorded by the School A administrator using a computer-based record-keeping system linked to the City School District's student management system. For the purpose of this investigation, daily administered suspension data were collected from archived City School District records.

Data Analysis

As reported by Morgan and Morgan (2001), "The conventional vehicle for data presentation in single-participant research is the real-time graph, in which dependent variable measures typically appear on the ordinate and independent variables conditions (often depicted across time) typically appear on the abscissa" (p. 124). This method of data representation and analysis has generated criticism (Heppner et al., 2008). Single subject research designs can be analyzed visually and statistically, the latter being pertinent for attaining credibility in the social science field (Huitema, 1986, 2011a; Huitema & McKean, 2000a, 2000b).

All data were visually analyzed through this investigation. The statistical process by which the attendance, suspension, and MEAP data were analyzed utilized ordinary least squares (OLS) regression, an appropriate and parsimonious method to adequately analyze interrupted time-series data (Huitema, 2011c; Huitema & McKean, 2000a, 2000b; Huitema, McKean, & McKnight, 1999). The general process utilized to statistically analyze each of the data sets is as follows. First, an OLS regression full model was fitted to the data set including level and slope change parameters. Second, to determine if the data set was autocorrelated, a Durbin–Watson test and the Huitema–McKean (Huitema & McKean, 2000b) analysis utilizing the conventional lag-1 autocorrelation coefficient r_1 were conducted. Third, the residuals of the initially fitted full model were visually analyzed to determine if there were linearity, homoscedasticity, or normality assumption departures. Because autocorrelation or assumption departures were identified with all statistically analyzed data, correction procedures including weekly pooling of data sets (B. E. Huitema, personal communication, November 29, 2011; J. L. Urschel, personal communication, May 20, 2013) and using a double bootstrap analysis (McKnight, McKean, & Huitema, 2000) were utilized. Fourth, a reduced model using only level change parameters was fitted to the data set. Fifth, to determine which model better fit the data, a model comparison test was conducted. Finally, descriptive and inferential measures of the data set were calculated using the selected model.

CHAPTER IV

RESULTS

Multiple hypotheses were tested to answer the research questions proposed for this investigation. This chapter presents the results of this study as follows. First, each research question is restated, followed by a restatement of the null hypothesis. Next, the statistical analysis and computations used to test the hypothesis are presented with the results. Tables and figures visually displaying results are also included. A conclusion for each research question is then put forth.

Restatement of Research Questions, Null Hypotheses, and Results of Statistical Analysis

Research Question 1

Did the school counseling program positively impact the daily attendance percentage of the single school subject?

Null Hypothesis 1: The school counseling program will have had no impact on single school subject's daily attendance records measured by archived attendance records.

To answer this question the archived daily attendance data were transformed into daily percentages by dividing the daily number of students in attendance by the daily number of enrolled students. Because of an annually transient student enrollment, daily attendance percentages were analyzed rather than daily attendance numbers. These daily percentages were then entered into the six parameter three-phase intervention model

design matrix, found in Appendix J (Daily Attendance Data Six Parameter Three-Phase Intervention Model Design Matrix), that was analyzed using OLS regression (Huitema, 2011b, 2011c; Huitema & McKean, 2000a, 2000b; Huitema et al., 1999).

Using a standard OLS regression procedure, the full model, including level change and slope change, was fitted to the data by regressing the daily attendance percentage dependent variable on the five predictor variables (the other columns of the design matrix). The following is the full regression model equation, the regression analysis output shown in Table 9, the ANOVA output shown in Table 10, and the time-series plot shown in Figure 1. The regression model equation is Daily Attendance Percentage = $95.2 - 0.00138 \text{ Day} + 0.824 \text{ LC}_1 - 0.00192 \text{ SC}_1 + 1.66 \text{ LC}_2 - 0.0133 \text{ SC}_2$.

Table 9

Daily Attendance Full Model Regression Output

Predictor	Coef	SE Coef	<i>T</i>	<i>p</i>
Constant	95.244600	0.245100	388.63	0.000
Day	-0.001378	0.001221	-1.13	0.259
LC ₁	0.824100	0.345800	2.38	0.017
SC ₁	-0.001920	0.001726	-1.11	0.266
LC ₂	1.656900	0.422300	3.92	0.000
SC ₂	-0.013349	0.003648	-3.66	0.000

Table 10

Daily Attendance Full Model ANOVA Output

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Regression	5	183.248	36.650	7.06	0.000
Residual Error	862	4472.069	5.188		
Total	867	4655.318			

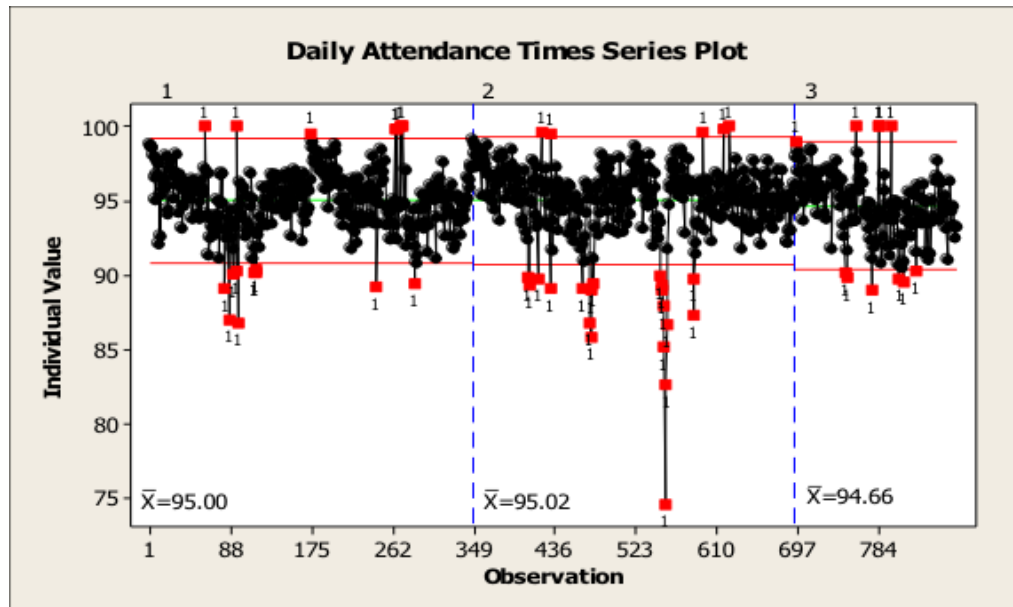


Figure 1. Daily Attendance Time-Series Plot

The Durbin–Watson (D–W) statistic of 0.971747 was obtained when doing the regression analysis. Because autocorrelation is often a concern when analyzing time-series data, the D–W Statistic of 0.971747 was compared with the upper and lower D–W bounds (Huitema, 2011b, 2011c; McKnight et al., 2000). Using standard critical values for the D–W test ($\alpha = .05$), the D–W_{lower} bound of 1.87784 and D–W_{upper} bound of

1.89675 were obtained using 850 observations and 5 parameters from a standard D–W critical values table of 500 > by 50. Because the D–W statistic of 0.971747 is less than the D–W_{lower} bound of 1.87784, it was concluded that the daily attendance data set was autocorrelated (Huitema, 2011b, 2011c).

The presence of autocorrelated data was additionally tested using the Huitema–McKean test (Huitema, 2011b, 2011c; Huitema & McKean, 2000b). The conventional lag-1 autocorrelation coefficient (r_1) was computed on the regression residuals yielding an r_1 of .512727. The test statistic z_{H-M} was then computed using the following equation (Huitema, 2011c, p. 381):

$$\frac{r_1 + (P/N)}{\sqrt{[(N-2)^2 / ((N-1)N^2)]}} = \frac{.512727 + (6/868)}{\sqrt{[(868-2)^2 / ((868-1)868^2)]}} = 15.3367 = Z_{H-M}$$

Because the obtained $Z_{H-M} = 15.3367$ was greater than the critical Z values of 1.645 ($\alpha = .05$) and 2.326 ($\alpha = .01$), it was again concluded that the daily attendance data were autocorrelated.

The daily attendance percentage data were then pooled to reanalyze the data set as weekly attendance data (B. E. Huitema, personal communication, November 29, 2011; J. L. Urschel, personal communication, May 20, 2013). The weekly attendance percentages were then entered into a six parameter three-phase intervention model design matrix, found in Appendix K (Weekly Attendance Data Six Parameter Three-Phase Intervention Model Design Matrix), that was analyzed using OLS regression (Huitema, 2011b, 2011c; Huitema & McKean, 2000a, 2000b; Huitema et al., 1999).

Using a standard OLS regression procedure, the full model, including level change and slope change, was fitted to the weekly pooled attendance data by regressing the weekly attendance percentage dependent variable on the five predictor variables (the other columns of the design matrix). The following is the full regression model equation, the regression analysis output shown in Table 11, the ANOVA output shown in Table 12, and the time-series plot shown in Figure 2.

Table 11

Weekly Attendance Full Model Regression Output

Predictor	Coef	SE Coef	<i>T</i>	<i>p</i>
Constant	95.204800	0.405500	234.77	0.000
Week	−0.006452	0.009397	−0.69	0.493
LC ₁	0.762600	0.567800	1.34	0.181
SC ₁	−0.007220	0.013290	−0.54	0.587
LC ₂	1.466100	0.688500	2.13	0.035
SC ₂	−0.061500	0.028200	−2.18	0.030

Table 12

Weekly Attendance Full Model ANOVA Output

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Regression	5	36.048	7.210	2.42	0.038
Residual Error	179	533.626	2.981		
Total	184	569.674			

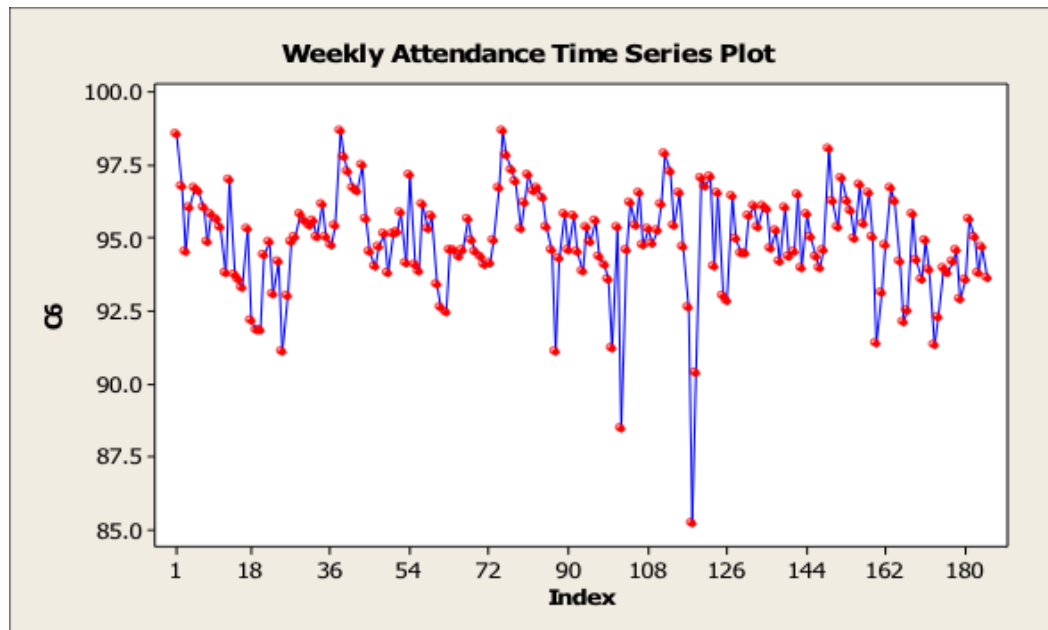


Figure 2. Weekly Attendance Time-Series Plot

The full OLS regression model equation is Weekly Attendance Percentage = $95.2 - 0.00645 \text{ Week} + 0.763 \text{ LC}_1 - 0.0072 \text{ SC}_1 + 1.47 \text{ LC}_2 - 0.0615 \text{ SC}_2$.

The Durbin-Watson (D-W) statistic obtained when doing the regression analysis yielded a D-W = 1.15389. The D-W statistic was analyzed to identify if the pooled weekly attendance data were autocorrelated. The D-W statistic of 1.15389 was compared with the D-W upper and lower bounds (Huitema, 2011b, 2011c; McKnight et al., 2000). Using a standard critical values for the D-W test ($\alpha = .05$), the D-W_{lower} bound of 1.718 and D-W_{upper} bound of 1.820 were obtained using 200 observations and 5 parameters. Because the D-W statistic of 1.15389 is less than the D-W_{lower} bound of 1.718, it was concluded that the weekly attendance data set is also autocorrelated (Huitema, 2011b, 2011c).

Because the pooled weekly attendance data were also autocorrelated, the Generalized Least Squares (GLS) regression double bootstrap analysis was conducted on the daily and weekly data sets to account for the autocorrelated data (McKnight et al., 2000). This analysis was done using the Western Michigan University (WMU) Statistical Computation Lab (J. W. McKean, personnel communication, May 23, 2013). The GLS regression double bootstrap analysis of daily attendance data yielded the parameters shown in Table 13.

Table 13

Daily Attendance GLS Regression Double Bootstrap Analysis Parameters

Parameter	Regression Parameter Estimate
beta 1	95.180229
beta 2	-0.001125
beta 3	0.870021
beta 4	-0.002583
beta 5	1.869351
beta 6	-0.014074

Based on these parameters, the daily attendance GLS Double bootstrap full model equation is Daily Attendance Percentage = $95.180229 - 0.001125 \text{ Day} + 0.870021 \text{ LC}_1 - 0.002583 \text{ SC}_1 + 1.869351 \text{ LC}_2 - 0.014074 \text{ SC}_2$. The t -statistics, df , and corresponding students - t critical values ($\alpha = .05$) are shown in Table 14.

Table 14

Daily Attendance GLS Regression Double Bootstrap t-Statistics, df, Critical Values

<i>t</i> -Statistic	<i>df</i>	Students - <i>t</i> Critical Value
$t(1) = 208.878$	861	1.963
$t(2) = -0.531$	861	1.963
$t(3) = 1.467$	861	1.963
$t(4) = -0.941$	861	1.963
$t(5) = 2.394$	861	1.963
$t(6) = -2.253$	861	1.963

As shown in Table 14, because the $t(5)$ and $t(6)$ t -statistics, or the absolute values thereof, are greater than the students - t critical values, significant effects were demonstrated. However, these significant effects indicate a significant daily attendance increase from phase B, when the counseling program was implemented, to phase A₂ when the counseling program was removed. When the counseling program was removed, daily attendance increased significantly by 1.871%. As also shown in Table 14, the slope decreased significantly from the intervention phase (B) to the A₂ phase, when the school counseling program intervention was removed.

The GLS regression double bootstrap analysis was also conducted on the pooled weekly attendance data to account for the autocorrelated data (McKnight et al., 2000) using the WMU Statistical Computation Lab (J. W. McKean, personnel communication, May 23, 2013). The GLS regression double bootstrap analysis of weekly attendance data yielded the parameters shown in Table 15. Based on these parameters, the weekly

attendance GLS double bootstrap full model equation is Weekly Attendance Percentage = $94.960756 - 0.001235 \text{ Day} + 0.838804 \text{ LC}_1 - 0.017118 \text{ SC}_1 + 1.904978 \text{ LC}_2 - 0.066526 \text{ SC}_2$. The t -statistics, df , and corresponding students - t critical values ($\alpha = .05$) are shown in Table 16.

Table 15

Weekly Attendance GLS Regression Double Bootstrap Analysis Parameters

Parameter	Regression Parameter Estimate
beta 1	94.960756
beta 2	-0.001235
beta 3	0.838804
beta 4	-0.017118
beta 5	1.904978
beta 6	-0.066526

Table 16

Weekly Attendance GLS Regression Double Bootstrap t-Statistics, df, Critical Values

t -Statistic	df	Students - t Critical Value
$t(1) = 146.592$	178	1.973
$t(2) = -0.080$	178	1.973
$t(3) = 0.993$	178	1.973
$t(4) = -0.749$	178	1.973
$t(5) = 1.721$	178	1.973
$t(6) = -1.461$	178	1.973

Because none of the parameter estimate t -statistics are greater than the students t critical values, no significant effects were found. Although significant daily attendance changes were found as a function of the school counseling program intervention being implemented and then withdrawn, these changes were in the opposite direction hypothesized. Thus, the null hypothesis 1 was accepted based on the daily and weekly pooled attendance data GLS double bootstrap analysis. Because the null hypothesis was accepted, descriptive and inferential measures of overall intervention effects were not calculated.

Research Question 2

Did the school counseling program improve daily suspension percentage records for the single school subject?

Null Hypothesis 2: The school counseling program will have had no impact on the single school subject's daily suspension records, as measured by archived attendance records.

Working collaboratively with the City School District, the archived daily number of administered student suspension data was collected, rather than the archived daily number of students suspended. Although the collected archived data facilitated answering the proposed research question, it should be noted that these data may not fully reflect the reality of the school environment.

To analyze the archived daily suspension data, the collected daily administered suspension numbers were divided by the daily number of enrolled students. Daily suspension percentages rather than daily suspension numbers were analyzed due to an

annually transient student enrollment. These percentages were then entered into a six parameter three-phase intervention model design matrix, found in Appendix L (Daily Suspension Data Six Parameter Three-Phase Intervention Model Design Matrix), that was analyzed using OLS regression (Huitema, 2011b, 2011c; Huitema & McKean, 2000a, 2000b; Huitema et al., 1999).

Using a standard regression procedure, the full regression model including level change and slope change was fitted to the daily suspension data by regressing the daily suspension percentage dependent variable on the five predictor variables (the other columns of the design matrix). The following is the full regression model equation, the resulting statistical analysis output shown in Table 17, the ANOVA output shown in Table 18, and the time-series plot shown in Figure 3. The full regression equation is $\text{Daily Suspension Percentage} = 0.0107 + 0.000135 \text{ Day} - 0.0403 \text{ LC}_1 - 0.000087 \text{ SC}_1 - 0.0155 \text{ LC}_2 + 0.000234 \text{ SC}_2$.

Table 17

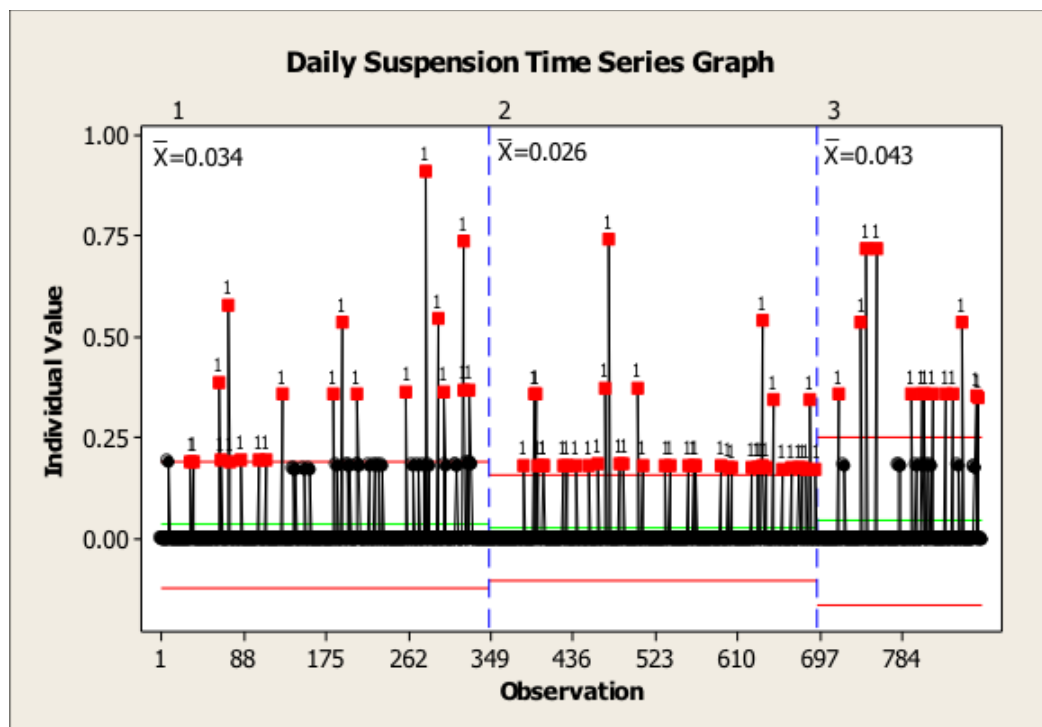
Daily Suspension Full Model Regression Output

Predictor	Coef	SE Coef	<i>t</i>	<i>p</i>
Constant	0.01073000	0.01099000	0.98	0.329
Day	0.00013533	0.00005472	2.47	0.014
LC ₁	-0.04033000	0.01550000	-2.60	0.009
SC ₁	-0.00008709	0.00007739	-1.13	0.261
LC ₂	-0.01553000	0.01893000	-0.82	0.412
SC ₂	0.00023400	0.00016350	1.43	0.153

Table 18

Daily Suspension Full Model ANOVA Output

Source	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Regression	5	0.14291	0.02858	2.74	0.018
Residual Error	862	8.98704	0.01043		
Total	867	9.12995			

*Figure 3. Daily Suspension Time-Series Plot*

The Durbin-Watson (D-W) statistic provided when doing the regression analysis yielded a D-W = 2.00937. To test for the presence of autocorrelated data the D-W of 2.00937 was compared with the upper and lower D-W bounds (Huitema, 2011b, 2011c;

McKnight et al., 2000). Using a standard critical values for the D–W test ($\alpha = .05$), the D–W_{lower} bound of 1.87784 and D–W_{upper} bound of 1.89675 were obtained using 850 observations and 5 parameters from a standard D–W critical values table of 500 > by 50. Because the D–W statistic of 2.00937 was greater than the D–W_{Upper} bound of 1.89675, the daily administered suspension data were concluded to not be autocorrelated (Huitema, 2011b, 2011c).

The presence of autocorrelated data was also tested using the Huitema–McKean test (Huitema, 2011b, 2011c; Huitema & McKean, 2000b). The conventional lag-1 autocorrelation coefficient (r_1) was computed on the regression residuals yielding an r_1 of -0.0049459 . The test statistic z_{H-M} was then computed using the following equation (Huitema, 2011c, p. 381):

$$\frac{r_1 + (P/N)}{\sqrt{[(N-2)^2 / ((N-1)N^2)]}} = \frac{-0.0049459 + (6/868)}{\sqrt{[(868-2)^2 / ((868-1)868^2)]}} = .0580395 = Z_{H-M}$$

Because the obtained $Z_{H-M} = .0580395$ was less than the critical Z values of 1.645 ($\alpha = .05$) and 2.326 ($\alpha = .01$), it was again concluded that the daily suspension data were not autocorrelated.

The daily administered suspension data four in one residual plot was visually analyzed to determine if the data set met the assumptions of linearity, normality, and homoscedasticity. As shown in Figure 4, there were problems with the daily suspension data analysis assumptions—particularly with the assumption of normality and homoscedasticity.

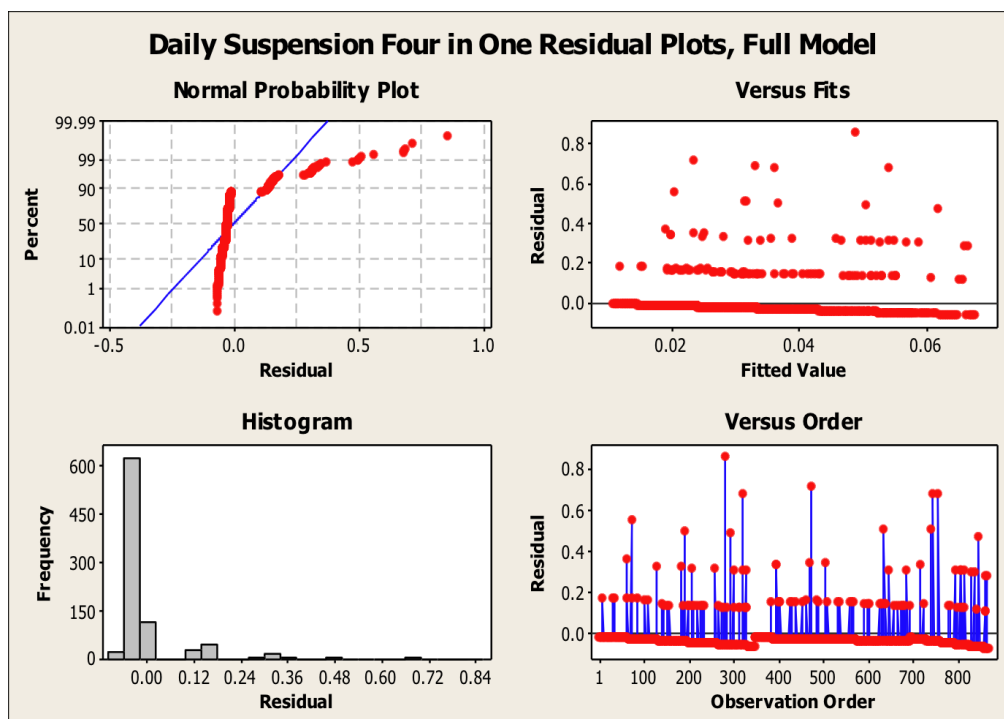


Figure 4. Daily Suspension Four in One Residual Plots, Full Model

The daily administered suspension percentage data were then pooled to reanalyze the data set as weekly administered suspension data (B. E. Huitema, personal communication, November 29, 2011; J. L. Urschel, personal communication, May 20, 2013). The weekly administered suspension percentages were entered into a six parameter three-phase intervention model design matrix, found in Appendix M (Weekly Suspension Data Six Parameter Three-Phase Intervention Model Design Matrix), that was analyzed using OLS regression (Huitema, 2011b, 2011c; Huitema & McKean, 2000a, 2000b; Huitema et al., 1999).

Using a standard OLS regression procedure the full regression model including level change and slope change was fitted to the data by regressing the weekly

administered suspension percentage dependent variable on the five predictor variables (the other columns of the design matrix). The following is the full regression model equation, the regression analysis output shown in Table 19, the ANOVA output shown in Table 20, and the times series plot shown in Figure 5. The full model regression equation is $\text{Weekly Suspension Percentage} = 0.0467 + 0.00304 \text{ Week} - 0.181\text{LC}_1 - 0.00217 \text{ SC}_1 - 0.0686 \text{ LC}_2 + 0.00539 \text{ SC}_2$.

Table 19

Weekly Suspension Full Model Regression Output

Predictor	Coef	SE Coef	<i>t</i>	<i>p</i>
Constant	0.04671	0.05099	0.92	0.361
Week	0.003041	0.001181	2.57	0.011
LC ₁	-0.18078	0.07138	-2.53	0.012
SC ₁	-0.002167	0.001671	-1.30	0.196
LC ₂	-0.06860	0.08656	-0.79	0.429
SC ₂	0.005386	0.003545	1.52	0.130

Table 20

Weekly Suspension Full Model ANOVA Output

Source	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Regression	5	0.65262	0.13052	2.77	0.020
Residual Error	179	8.43497	0.04712		
Total	184	9.08759			

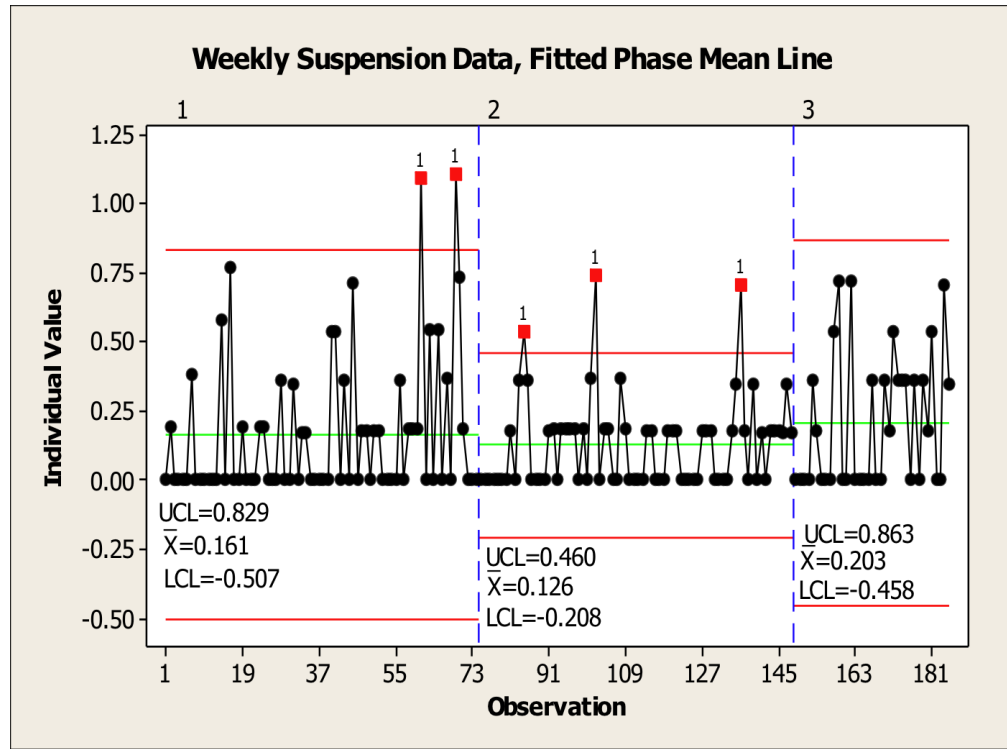


Figure 5. Weekly Suspension Time-Series Plot

The Durbin-Watson (D-W) statistic of 2.06169, obtained when doing the regression analysis, was analyzed to determine if the pooled weekly suspension data were autocorrelated. The D-W statistic of 2.06169 was compared with the D-W upper and lower bounds (Huitema, 2011b, 2011c; McKnight et al., 2000). Using a standard critical values for the D-W test ($\alpha = .05$), the $D-W_{\text{lower}}$ bound of 1.718 and $D-W_{\text{upper}}$ bound of 1.820 were obtained using 200 observations and 5 parameters. Because the D-W statistic of 2.06169 is greater than the $D-W_{\text{upper}}$ bound of 1.820, the weekly suspension data set was concluded to not be autocorrelated (Huitema, 2011b, 2011c).

Autocorrelation was also tested using the conventional lag-1 autocorrelation coefficient r_1 computed on the regression residuals yielding an $r_1 = -0.0310537$. The

test statistic z_{H-M} was then computed using the following equation (Huitema, 2011c, p. 381).

$$\frac{r_1 + (P/N)}{\sqrt{[(N-2)^2 / ((N-1)N^2)]}} = Z_{H-M}$$

Therefore:

$$\frac{-0.0310537 + (6/185)}{\sqrt{[(185-2)^2 / ((185-1)185^2)]}} = 0.018906 = Z_{H-M}$$

The directional test critical Z values are 1.645 ($\alpha = .05$) and 2.326 ($\alpha = .01$). Because the obtained $Z_{H-M} = 0.018906$ is less than the critical values, it was again concluded that the pooled weekly suspension data were not autocorrelated.

The weekly administered suspension data four in one residual plot was visually analyzed to determine if this data set met assumptions of linearity, normality, and homoscedasticity. As shown in Figure 6 this data set is much closer to meeting the assumptions—particularly with the assumption of normality and homoscedasticity. Therefore, the suspension data were further analyzed using the weekly pooled administered suspension data (B. E. Huitema, personal communication, November 29, 2011; J. Urschel, personal communication, May 20, 2013).

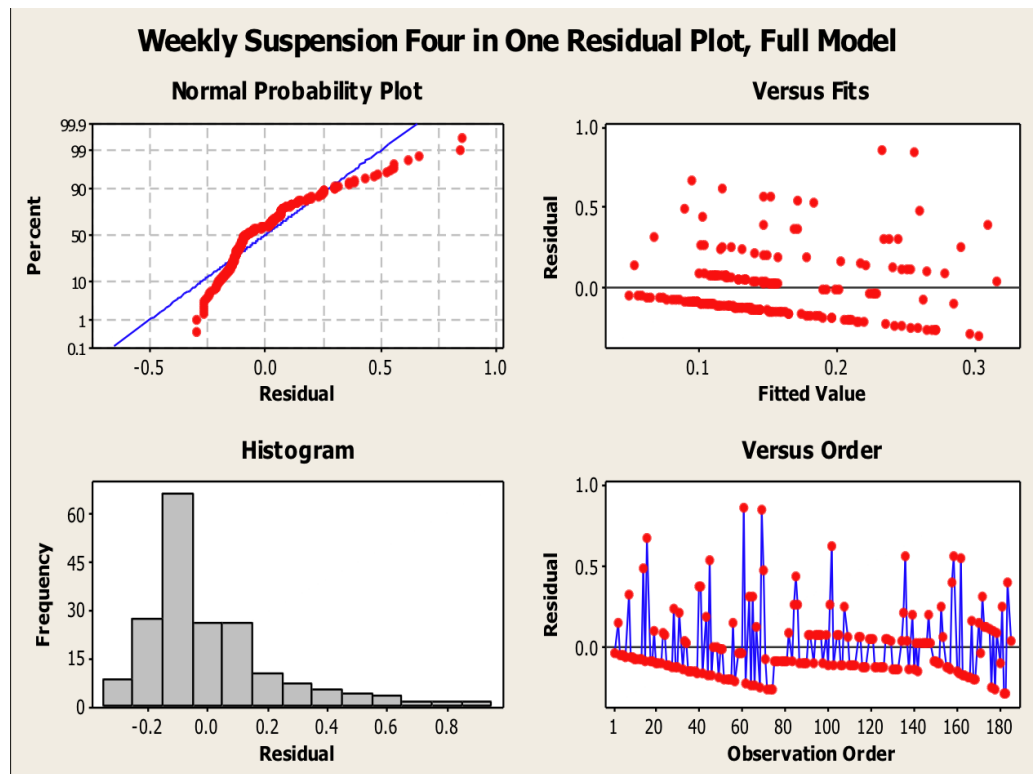


Figure 6. Weekly Suspension Data Four in One Residual Plots, Full Model

A reduced model was then fitted to the data using the intercept and level change parameters, excluding the weekly time and slope change parameters of the full model. The following is the reduced regression model equation, the regression analysis output shown in Table 21, and the ANOVA output shown in Table 22. The reduced regression equation is $\text{Weekly Suspension Percentage} = 0.161 - 0.0349 \text{ LC}_1 + 0.0768 \text{ LC}_2$.

Table 21

Weekly Suspension Reduced Model Regression Output

Predictor	Coef	SE Coef	<i>T</i>	<i>p</i>
Constant	0.16074	0.02576	6.24	0.000
LC ₁	−0.03486	0.03643	−0.96	0.340
LC ₂	0.07683	0.04462	1.72	0.087

Table 22

Weekly Suspension Reduced Model ANOVA Output

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Regression	2	0.14942	0.07471	1.52	0.221
Residual Error	182	8.93817	0.04911		
Total	184	9.08759			

The D–W statistic of 1.94823, obtained when doing the regression analysis, was again analyzed to identify if the pooled weekly suspension data were autocorrelated. The D–W statistic of 1.94823 was compared with the D–W upper and lower bounds (Huitema, 2011b, 2011c; McKnight et al., 2000). Using a standard critical values for the D–W test ($\alpha = .05$), the $D-W_{\text{lower}}$ bound of 1.718 and $D-W_{\text{upper}}$ bound of 1.820 were obtained using 200 observations and 5 parameters. Because the D–W statistic of 1.94823 is greater than the $D-W_{\text{upper}}$ bound of 1.820, the reduced fitted model for the weekly attendance data set was also concluded to not be autocorrelated. Because the fitted full

regression model was also found to not be autocorrelated, this was the expected result (Huitema, 2011b, 2011c).

The full and reduced models were then compared to determine which model more appropriately described the data using the following model comparison F test (Huitema, 2011b, p. 437).

$$\frac{[SS_{\text{reg(Full)}} - SS_{\text{reg(Reduced)}}] / (df_{\text{Reg(Full)}} - df_{\text{Reg(Reduced)}})}{MS_{\text{Res(Full)}}} = F$$

Therefore,

$$\frac{[0.65262 - 0.14942] (5 - 2)}{0.04712} = 3.5597057 = F \text{ test statistic}$$

According to Huitema (2011b), “The obtained F is compared with the critical value of the F distribution based on the numerator degrees of freedom ($df_{\text{Regfull}} - df_{\text{RegReduced}}$) and the denominator degrees of freedom ($N - m - 1$, where m is the number of predictors in the full model)” (p. 437). Thus, using 3 and 179 degrees of freedom, the critical F value ($\alpha = .05$) was 2.65507370. Because the obtained F value of 3.5597057 > the critical F value of 2.65507370, the full regression model of Weekly Suspension Percentage = $0.0467 + 0.00304 \text{ Week} - 0.181\text{LC}_1 - 0.00217 \text{ SC}_1 - 0.0686 \text{ LC}_2 + 0.00539 \text{ SC}_2$ was concluded as a better fit of the weekly administered suspension data.

Descriptive and inferential measures of overall intervention effects were next calculated using parameter estimates and the associated inferential measures of the full regression model. The Overall Level Change, Test for Overall Level Change, the Overall Slope Change and the Test for Overall Slope Change were calculated using the values

shown in Table 23. The overall level change statistic was computed using the individual level change coefficients ($\hat{b} LC_c$), the associated variance estimates ($\hat{\sigma}_c^2$), and the signs for the observed and predicted effects as shown in Table 24. This computation is as follows:

$$\frac{\sum 1/(\hat{\sigma}_c^2)(PS_c)(OS_c) / \hat{b} LC_c /}{\sum 1/(\hat{\sigma}_{LCc}^2)} = \frac{26.325448}{329.73202} = 0.0798389 = LC_{Overall}$$

Table 23

Summary Statistics for Computing $LC_{Overall}$, $Z_{LC_{Overall}}$, $SC_{Overall}$, and $Z_{SC_{Overall}}$

Phases	$\hat{b} LC_c$	$\hat{\sigma}_c^2$	t_c	p_1	Z_c	PS_c	OS_c	$(PS_c)(OS_c) / Z_c $
Level Change (LC)								
A, B	-0.18078	0.0050951	-2.53	0.0060	-2.51214	-	-	2.51214
B, A ₂	-0.06860	0.0074926	-0.79	0.2145	-0.790904	+	-	-0.790904
Slope Change (SC)								
A, B	-0.002167	0.0000028	-1.30	0.098	-1.29303	-	-	1.29303
B, A ₂	0.005386	0.0000126	1.52	0.065	1.51410	+	+	1.51410

Note. This table contains the estimated level-change coefficients, error variances for these coefficients, associated t , z , and one-tailed p -values, predicted signs, observed signs, and products and observed signs times the absolute z -values.

Table 24

Overall Level Change Statistic Commutation Values

Phases	$1/(\hat{\sigma}_c^2)$	$1/(\hat{\sigma}_c^2)(PS_c)(OS_c)/\hat{b} LC_c/$
A, B	196.26700	35.4811480
B, A ₂	133.46502	-9.1557003
	$\sum 1 / (\hat{\sigma}_c^2) = 329.73202$	$\sum 1 / (\hat{\sigma}_c^2) (PS_c) (OS_c) / \hat{b} LC_c / = 26.325448$

According to Huitema (2011b), “this measure [the $LC_{Overall}$ statistic] indicates that the overall effect of introducing [or withdrawing] the condition [the school counseling program] is to change the absolute” (p. 449) weekly administered suspension percentage by 0.0798389%. Based on the average enrollment for the five academic years of this investigation, 0.0798389% yields an approximate annual administered suspension decrease of 44 administered suspensions.

The test statistic for overall level change was next commuted using the following equation based on the individual level change estimates, the associated one-tailed p -values, and the signs associated with the set of predicted and observed level changes:

$$\frac{\sum (PS_c)(OS_c) / Z_c}{\sqrt{C}} = \frac{1.721236}{\sqrt{2}} = 1.2170976 = Z_{Overall LC}$$

The one-tailed p -value, in this case the area above $z = 1.2170976$, is < 0.0096 . Because the $Z_{Overall LC}$ of $1.2170976 > p = 0.0096$, according to Huitema (2011b), “it is concluded that the cumulative evidence for level change associated with the intervention in this study is very strong” (p. 450).

The same computations were calculated to obtain the Overall Slope Change Statistic and the test for the overall slope change. The overall slope change statistic was computed using the individual slope change coefficients ($\hat{b} SC_c$), the associated variance estimates (\hat{O}^2_c), and the signs for the observed and predicted effects as shown in Table 25.

Table 25

Overall Slope Change Statistic Commutation Values

Phases	$1/(\hat{O}_c^2)$	$1/(\hat{O}_c^2)(PS_c)(OS_c)/\sqrt{SC_c}$
A, B	357142.86	773.92857
B, A ₂	79365.079	427.46032
	$\sum 1/(\hat{O}_c^2) = 436507.94$	$\sum 1/(\hat{O}_c^2)(PS_c)(OS_c)/\sqrt{SC_c} = 1201.3889$

This computation is as follows:

$$\frac{\sum 1/(\hat{O}_c^2)(PS_c)(OS_c)/\sqrt{SC_c}}{\sum 1/(\hat{O}_{LC}^2)} = \frac{1201.3889}{436507.94} = .0027523 = SC_{\text{Overall}}$$

The test statistic for overall slope change was next computed using the following equation based on the individual level change estimates, the associated one-tailed p -values, and the signs associated with the set of predicted and observed level changes:

$$\frac{\sum (PS_c)(OS_c)/Z_c}{\sqrt{C}} = \frac{2.80713}{\sqrt{2}} = 1.9849406 = Z_{\text{Overall SC}}$$

The one-tailed p -value, in this case the area above $Z_{\text{Overall SC}} = 1.9849406$, is < 0.0239 .

Because the $Z_{\text{Overall SC}}$ of $1.9849406 > p = 0.0239$, according to Huitema (2011b), “It is concluded that the cumulative evidence for slope change associated with the intervention [the school counseling program] in this study is very strong” (p. 450).

The standardized effect size and the proportion of the total variation in weekly administered suspensions were additionally calculated. The standardized effect size for both pairs of adjacent phases was first calculated using the equation

$$\frac{b LC_c}{\sqrt{MS_{Residual}}} = g_c,$$

where the level change coefficient for phase comparison c is $b LC_c$ and the mean square residual for the model that provides the LC coefficient is $MS_{Residual}$. The standardized effect size, $g_c = -0.8328135$, for the pair of adjacent A and B phases was calculated as:

$$\frac{b LC_c}{\sqrt{MS_{Residual}}} = \frac{-0.18078}{\sqrt{0.04712}} = -0.8328135.$$

The $g_c = -0.8328135$ is the standard effect of implementing the school counseling program intervention in terms of standard deviation units. The standardized effect size, $g_c = -0.3160251$, for the pair of adjacent B and A₂ phases was calculated as

$$\frac{b LC_c}{\sqrt{MS_{Residual}}} = \frac{-0.06860}{\sqrt{0.04712}} = -0.316025.$$

The $g_c = -0.316025$ is the standard effect of withdrawing the school counseling program intervention in terms of standard deviation units. The standardized overall level change statistic effect size, $g_c = 0.3678002$, was computed using the following equation:

$$\frac{LC_{\text{Overall}}}{\sqrt{MS_{\text{Residual}}}} = \frac{0.0798389}{\sqrt{0.04712}} = 0.3678002 = g_{\text{Overall}}$$

The $g_c = 0.3678002$ is the standard effect of implementing and withdrawing the school counseling program intervention in terms of standard deviation units.

Finally, the proportion of the total variation in weekly administered suspensions, $R^2 = 0.0718144$, was calculated with the following equation:

$$\frac{SS_{\text{Regression}}}{SS_{\text{Total}}} = \frac{0.65262}{9.08759} = 0.0718144 = R^2$$

The $R^2 = 0.0718144$ is the proportion of variation in the weekly administered suspension dependent variable explained by the implemented school counseling program intervention.

Because the test for overall level change statistic, $Z_{\text{Overall LC}} = 1.2170976$, was significant, the null hypothesis for question 2 was rejected.

Research Question 3

Did the school counseling program have a positive impact on annual MEAP mathematics and English Language Arts proficiency scores for the sixth, seventh, and eighth grade students of the single school subject, as measured by the signal school subject's archived MEAP records?

Null Hypothesis 3: The school counseling program will have had no impact on the single school subject's annual MEAP mathematics and English Language Arts

proficiency scores, for the sixth, seventh, and eighth grade students, as measured by archived MEAP records.

MEAP English Language Arts. To answer this question the MEAP English Language Arts (ELA) sixth, seventh, and eighth grades reading proficiency percentages were pooled and entered into the six parameter three-phase intervention model design matrix, found in Appendix N (MEAP Reading Data Six Parameter Three-Phase Intervention Model Design Matrix). This design matrix was analyzed using OLS regression (Huitema, 2011b, 2011c; Huitema & McKean, 2000a, 2000b; Huitema et al., 1999).

Using a standard OLS regression procedure the reduced model, excluding the annual time and slope change parameters, was fitted to the MEAP reading proficiency data by regressing the annual MEAP Reading dependent variable scores on the two predictor variables (level change columns of the design matrix). Because of the small number of data points in each phase, a full model could not be fit to the data. The following is the reduced regression model equation, the regression analysis output shown in Table 26, the ANOVA output shown in Table 27, and the time-series plot shown in Figure 7. The reduced regression model equation is MEAP Reading Proficiency Percentage = $59.1 - 8.9 LC_1 + 5.3 LC_2$.

From the regression output it was concluded that there was a non-significant mean phase level change decrease (LC_1 of -0.40) in MEAP Reading proficiency percentage when the school counseling program was implemented. It was also concluded that there

was a non-significant mean phase level change increase (LC_2 of 0.19) in MEAP Reading proficiency percentage when the school counseling program was removed.

Table 26

Annual MEAP Reading Reduced Model Regression Output

Predictor	Coef	SE Coef	<i>t</i>	<i>p</i>
Constant	59.10	15.92	3.71	0.065
LC_1	-8.90	22.51	-0.40	0.731
LC_2	5.30	27.57	0.19	0.865

Table 27

Annual MEAP Reading Reduced Model ANOVA Output

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Regression	2	79.8	39.9	0.08	0.927
Residual Error	2	1013.3	506.6		
Total	4	1093.1			

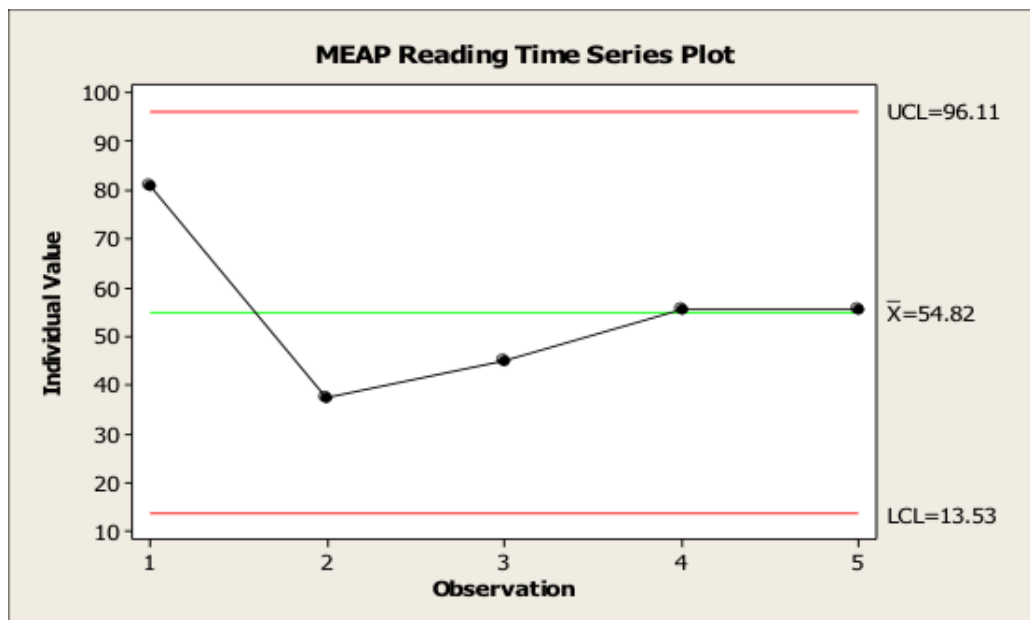


Figure 7. Annual MEAP Reading Time – Series Plot

MEAP Mathematics. To answer this question the MEAP Mathematics sixth, seventh, and eighth grades proficiency percentages were pooled and entered into the six parameter three-phase intervention model design matrix, found in Appendix O (MEAP Mathematics Data Six Parameter Three-Phase Intervention Model Design Matrix). This design matrix was analyzed using OLS regression (Huitema, 2011b, 2011c; Huitema & McKean, 2000a, 2000b; Huitema et al., 1999).

Using a standard OLS regression procedure the reduced model, excluding the annual time and slope change parameters, was fitted to the data by regressing the annual MEAP mathematics proficiency dependent variable scores on the level change predictor variables columns of the design matrix. Because of the small number of data points in each phase, a full model could not be fit to the data. The following is the reduced regression model equation, the regression analysis output shown in Table 28, the

ANOVA output shown in Table 29, and the time-series plot shown in Figure 8. The reduced regression model equation is MEAP Mathematics Proficiency Percentage = $37.4 - 22.4 \text{ LC}_1 + 2.8 \text{ LC}_2$.

Table 28

Annual MEAP Mathematics Reduced Model Regression Output

Predictor	Coef	SE Coef	<i>t</i>	<i>P</i>
Constant	37.43	19.51	1.92	0.195
LC ₁	22.39	27.59	-0.81	0.502
LC ₂	2.79	33.79	0.08	0.942

Table 29

Annual MEAP Mathematics Reduced Model ANOVA Output

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>P</i>
Regression	2	558.1	279.0	0.37	0.732
Residual Error	2	1522.5	761.3		
Total	4	2080.6			

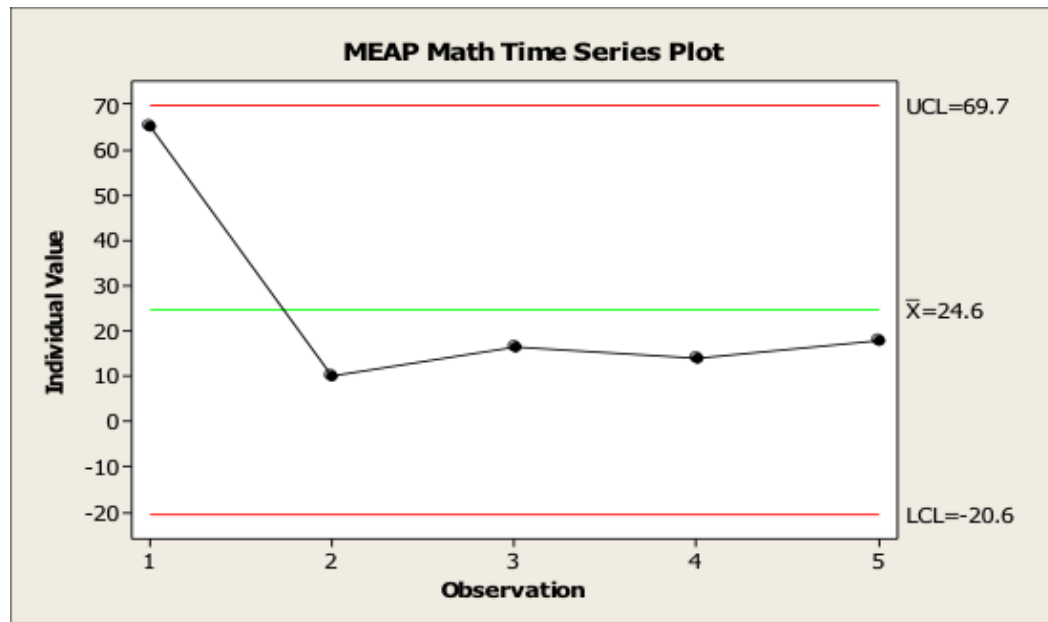


Figure 8. Annual MEAP Mathematics Time-Series Plot

From the regression output we know there was a non-significant mean phase level change decrease (LC_1 of -0.81) in MEAP mathematics proficiency percentage when the school counseling program was implemented. We also know there was a non-significant mean phase level change increase (LC_2 of 0.08) in MEAP mathematic proficiency percentage when the school counseling program was removed. Therefore, the null hypothesis was accepted for research question 3.

Research Question 4

Did the school counseling program have a positive impact on annual AYP attainment for the single school subject, as measured by School A's archived records?

Null Hypothesis 4: The school counseling program will have had no impact on the single school subject's AYP records, as measured by archived AYP records.

Table 30 shows the Adequate Yearly Progress (AYP) attainment status for the years of investigation. Because there was no variation in the AYP attainment status dependent variable, it was concluded that the school counseling program had no effect on the AYP data. Therefore, the null hypothesis for research question 4 was accepted.

Table 30

AYP Attainment Status

Year	Attainment Status
1	Met AYP
2	Met AYP
3	Met AYP
4	Met AYP
5	Met AYP

Summary

This chapter included the research questions, null hypotheses, research findings, and tables and figures summarizing and illustrating data. The next chapter presents a summary of this investigation and findings. A discussion is also included, as are recommendations for future research and practice implications.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

Introduction and Purpose of the Research

This research investigated the impact of one urban school counseling program on one school system using an ABA reversal single subject time-series analysis of archived school district records. The school counseling program's impact on the school system was investigated using attendance, suspension, and Michigan Educational Assessment Program (MEAP), and Adequate Yearly Progress (AYP) data as school level dependent variables. This study contributed to longitudinal outcome research in the school counseling field while using a novel methodology.

Review of the Literature

The literature review for this research addressed three major domains: (1) the development of comprehensive school counseling programs and a review of the current American School Counseling Association National Model (American School Counseling Association, 2003, 2005, 2012); (2) school counseling outcome research; and (3) attendance, suspension, MEAP, and Adequate Yearly Progress related literature. A justification for the value of, and need for, school counseling programs was presented (Amatea & West-Olatunji, 2007; Bemak & Chung, 2008; Carey & Dimmitt, 2008; Holcomb-McCoy & Lee, 2005; Murray, 2006; Romano & Kachgal, 2004a). The critical need for comprehensive school counseling programs in urban schools and for urban students, particularly African American students, was discussed (Awad, 2007; Davis, J.

E., 2003; Day-Vines & Day-Hairston, 2005; Fantuzzo et al., 2012; Kunjufu, 2005; Mandara, 2006; Whaley & Noel, 2012). A historical overview of comprehensive developmental program models including the work of Myrick (1987, 1997), Johnson and Johnson (1991, 2003), and Gysbers (Gysbers & Henderson, 2000, 2005; Gysbers & Moore, 1981) was reviewed. The development and framework of the American School Counseling Association National Model for comprehensive school counseling program best practice was put forth (ASCA, 2003, 2005, 2012).

Literature regarding school counseling accountability (Borders, 2002; Dimmitt et al., 2005; Hughes & James, 2001; Lapan, 2001; Lapan, Gysbers, & Petroski, 2001; Perry, 1993; Whiston & Sexton, 1998), program evaluation (Borders, 2002; Carey & Dimmitt, 2006; Gysbers & Moore, 1981; Lapan, 2001), and results-based comprehensive school counseling programs (Johnson & Johnson, 1982, 1991, 2003) was next presented.

Literature supporting the need for school counseling program outcome study research was then reviewed (Borders, 2002; Carey & Dimmitt, 2006; Carey, Dimmitt, Hatch, et al., 2008; Dimmitt et al., 2005; Green & Keys, 2001; Sabella, 2006; Whiston, 2002; Whiston & Sexton, 1998). A review of pertinent and related school counseling outcome research was presented including perception (Nelson & Gardner, 1998), perception and correlational (Lapan et al., 2001; Lapan et al., 1997), and empirical (Sink & Stroh, 2003a, 2003b) studies.

Method

This investigation utilized an ABA reversal single subject time-series analysis of archived data (Aeschleman, 1991; Barlow et al., 2009; Cook & Campbell, 1979; Crosbie,

1993; Huitema, 2011b, 2011c; Kazdin, 1980, 1994, 2003; Kivlighan, 1990; Morgan & Morgan, 2001; Slowiak et al., 2008). The single school subject, serving a majority African American student population qualifying for free/reduced lunch services, was recruited based on convenience (Murray et al., 1989; O'Brien, 2007; Patsy Tan, 2004; Smith & Palmieri, 2007) and purposeful (Creswell, 2007; Hoekstra et al., 2009; Marshall & Rossman, 2006; Sandelowski, 1995; Pissanos, 1995; Siegel, 2005) sampling procedures. The intervention for this research was an implemented school counseling program in School A of the City School District. The dependent measures for this research were daily attendance percentage (Tobias & Myrick, 1999), daily suspension percentage (Akos, 2000; Bridgman & Webb, 2007; Glosoff & Koprowicz, 1990; Muscott et al., 2008; Ross & Horner, 2009; Steen & Kaffenberger, 2007), annual Michigan Educational Assessment Program (MEAP) proficiency percentage (Michigan Department of Education, 2009; Michigan Government, 2011a; Lapan et al., 2001; Lapan et al., 1997; Nelson & Gardner, 1998; Sink & Stroh, 2003a, 2003b), and Adequate Yearly Progress (AYP) attainment status (Adequate Yearly Progress, 2011; Michigan Government 2011b; U.S. Department of Education, 2002; Wiley et al., 2005) archived data for School A of the City School District.

Data Analysis

This investigation visually analyzed data by graphing the attendance, suspension, and MEAP data time-series plots and the residuals of the regression analyses of these dependent variables. The statistical analysis of the attendance, suspension, and MEAP data utilized ordinary least squares (OLS) regression, which is an appropriate and

parsimonious analysis of interrupted time-series data (Huitema, 2011b, 2011c; Huitema & McKean, 2000a, 2000b; Huitema et al., 1999). Although each dependent variable data set required variations, the general statistical analysis process was as follows. First, an OLS regression full model was fitted to the data set including level and slope change parameters. To determine if the data set was autocorrelated, a Durbin–Watson test and the Huitema–McKean (Huitema & McKean, 2000b) analysis utilizing the conventional lag-1 autocorrelation coefficient (r_1) were conducted. The residuals of the initially fitted full model were then visually analyzed to determine if there were linearity, homoscedasticity, or normality assumption departures. Because autocorrelation or assumption departures were identified with all statistically analyzed data, correction procedures including weekly pooling of data sets (B. E. Huitema, personal communication, November 29, 2011; J. L. Urschel, personal communication, May 20, 2013) and conducting a double bootstrap Generalized Least Squares (GLS) analysis (J. W. McKean, personal communication, May, 23, 2013; McKnight et al., 2000) were utilized. The attendance and suspension data sets were pooled and reanalyzed as weekly data sets. The attendance data were reanalyzed using the double bootstrap GLS method. Third, a reduced model using only level change parameters was then fitted to the suspension data set. Fourth, to determine which model better fit the data, a model comparison test was conducted. Finally, descriptive and inferential measures of the suspension data set were calculated using the selected model.

Restatement of the Research Questions and Null Hypotheses

Research Question 1: Did the school counseling program positively impact the daily attendance percentage of the single school subject?

Null Hypothesis 1: The school counseling program will have had no impact on the single school subject's daily attendance records measured by archived attendance records.

Research Question 2: Did the school counseling program improve daily suspension percentage records for the single school subject?

Null Hypothesis 2: The school counseling program will have had no impact on the single school subject's daily suspension records, as measured by archived attendance records.

Research Question 3: Did the school counseling program have a positive impact on annual MEAP mathematics and English Language Arts proficiency scores for the sixth, seventh, and eighth grade students of the single school subject, as measured by the single school subject's archived MEAP records?

Null Hypothesis 3: The school counseling program will have had no impact on the single school subject's annual MEAP mathematics and English Language Arts proficiency scores, for the sixth, seventh, and eighth grade students, as measured by archived MEAP records.

Research Question 4: Did the school counseling program have a positive impact on annual AYP attainment for the single school subject, as measured by School A's archived records?

Null Hypothesis 4: The school counseling program will have had no impact on the single school subject's AYP records, as measured by archived AYP records.

Summary of Findings

Analysis of the school counseling program impact on attendance, suspension, MEAP, and AYP attainment status yielded pertinent results. Although significant weekly attendance changes were found as a function of the school counseling program intervention being implemented and then withdrawn, these changes were in the opposite hypothesized direction. Withdrawing the school counseling program intervention yielded a significant increase in daily attendance percentages during the post-intervention (A_2) implementation phase, $t(861) = 2.394$, $t_{critical\ value} = 1.963$, $df > 200$ and $t(861) = -2.253$, $t_{critical\ value} = 1.963$, $df > 200$. Statistical analysis of the weekly pooled suspension data yielded a significant decrease in administered suspensions during the school counseling program intervention phase due to the level change coefficient (LC_1) between the A and B phase of $t(5, 179) = -2.53$, $p = .012$, and because the Overall level change test statistic ($Z_{overall\ LC}$) (1.217) $> p = .0096$. Statistical analysis of the MEAP reading and mathematics data yielded no significant changes as a function of the school counseling program being implemented or withdrawn. Finally, because there was no variation in AYP attainment status, it was concluded that implementing and withdrawing the school counseling program had no effect on AYP attainment status.

Discussion of the Results

The school counseling program intervention implementation and subsequent withdrawal demonstrated hypothesized and non-hypothesized results. It is interesting

that a significant increase in daily attendance percentage was identified as a function of the school counseling program intervention being withdrawn. However, it should also be highlighted that there was a non-significant increase in daily attendance data as a function of the school counseling program being introduced. It may be that the influence of the implemented school counseling program intervention carried over to the A₂, post-intervention phase. Daily student attendance percentage may have also been influenced by other school level interventions during the A₂ post-intervention phase. It is also noteworthy that the pooled weekly attendance data analysis did not yield any significant changes. This finding may have been a function of weekly attendance trends, such as a possible higher absenteeism on Mondays or Friday, which were eliminated when the daily attendance data were pooled as weekly data.

The significant decrease in both daily and weekly administered suspensions during the school counseling intervention phase is especially noteworthy for multiple reasons. It is surprising that a significant reduction in administered suspensions occurred while there was an absence of a significant increase in daily or weekly attendance during the intervention phase. Additionally, the significant reduction in administered suspensions during the school counseling implementation years is particularly pertinent in light of the significant research regarding the disproportionate suspension rate of African American students (Mendez & Knoff, 2003; Skiba et al., 2000; Streitmatter, 1986; Townsend, 2000), and particularly African American male students (Bickel, 1980; Fenning & Rose, 2007; Mendez & Knoff, 2003), in kindergarten through 12th grade public schools.

Research has historically demonstrated correlations between school suspensions and a host of negative consequences including lower academic achievement (Arcia, 2006; Skiba & Rausch, 2006; Townsend, 2000), school dropout (Baker, Derrer, Davis, Dinklage-Travis, Linder, & Nicholson, 2001; Carpenter & Ramirez, 2007; Costenbader & Markson, 1998; Ekstrom, Goertz, Pollack, & Rock, 1986; Felice, 1981; Wheelock & Dorman, 1988), and involvement in the juvenile justice system (Advancement Project, 2005; Arcia, 2007; Civil Rights Project, 2000; Leone, Christle, Nelson, Skiba, Frey, & Jolivette, 2003; Wald & Losen, 2003) and adult prisons (Coalition for Juvenile Justice, 2001). The school to prison pipeline has been described as a civil rights crisis facing education (Christle, Jolivette, & Nelson, 2005; Fenning & Rose, 2007; Nicholson-Crotty, Birchmeier, & Valentine, 2009; Tuzzolo & Hewitt, 2006; Wald & Losen, 2003).

As the single school subject of this research served a 57% mean annual African American student population within a school district serving a 46% mean annual African American student population, a significant decrease in daily and weekly administered suspensions during the school counseling intervention phase seems critically pertinent as a prevention measure worthy of replication.

These results may have been a function of the school counseling program implementing preventative services or additional supports for students. The school counseling program may have also been instrumental in shifting the values and beliefs contributing to school level policies and procedures regarding educational practices (e.g., curriculum, academic engagement and enrichment, school-family-community

collaborations, etc.) historically advantaging White male students while disadvantaging underrepresented racial groups of students.

It should also be noted that the daily and weekly administered suspension numbers may not represent the total percentage of daily and weekly suspended students. Because an individual student may have received an “administered suspension” for multiple days or even weeks, the daily and weekly administered suspension percentages may not reflect the suspension percentage reality of the single school subject.

Although no significant results were found through the statistical analysis of the MEAP reading and mathematics data, salient results were identified warranting closer critique. For MEAP reading and writing, a non-significant decrease in proficiency percentage was found during the school counseling intervention implementation study phase. Independently these results may be alarming. However, upon critical examination a few observations should be highlighted. The year one MEAP scores for both reading and mathematics were recorded as having the same proficiency percentage for all individual grade levels, which is suspect. These MEAP scores were also based on substantially different cut scores than were the scores utilized during the subsequent years of analysis. Thus, a case could be made for throwing out this first year’s data. Also, because the MEAP assessment theoretically measures learning from the prior year, coupled with discarding the year one collected data, a visual analysis of the remaining MEAP reading data (see Figure 7) depicts vastly different results—an upward trend in proficiency attainment.

As previously noted, because there was no variation in AYP attainment status, these data were not statistically analyzed.

Conclusion

Using an ABA reversal single subject time-series analysis to answer the stated research questions was a novel methodology for investigating a school counseling program intervention's impact on student attendance percentage, student suspension percentage, MEAP proficiency percentage, and Adequate Yearly Progress attainment status as dependent variables. It can be concluded that during the school counseling intervention phase, there was a significant decrease in administered suspensions. It can further be concluded that when the school counseling program intervention was removed, although the administered suspensions continued to decrease, there was not a significant decrease during these years of analysis. The substantially different A₂ phase is suggestive of a post-intervention shift in administered suspensions. Likewise, based on a more critical review of the MEAP reading analysis, a positive increase in proficiency percentage is suggested.

Although significant changes were found in the hypothesized direction for the suspension data, it would be erroneous to conclude that the school counseling program intervention caused the change. Ideally, an ABA framework would have methodologically resulted in a significant increase in suspensions during the A₂ study phase. Additionally, using this analytic framework, significant results were not found during the school counseling intervention phase for multiple dependent variables and then again during the withdrawal (A₂) phase for multiple dependent variables. If the

latter two points were found, it could more confidently be concluded that the school counseling intervention was the cause for change.

Study Limitations

As with any research, this study contained a number of limitations. One limitation pertains to sampling bias associated with the single subject recruitment. However, due to the difficult nature of conducting school-based school counseling outcome research, some sampling bias seems inherent to such research. There are four primary limitations regarding the utilized ABA reversal single subject time-series analysis for this investigation.

First, a baseline was retrospectively established for the single subject prior to the school counseling program intervention being implemented. Attaining a consistent baseline prior to the intervention phase is ideal.

Second, when using an ABA reversal single subject time-series analysis, removing the intervention (the A_2 phase) theoretically results in the intervention no longer modifying the behavior of the single subject. This is not the case when the intervention produces ongoing effects for the single subject. When the school counseling program was withdrawn, it can reasonably be hypothesized that all services or programs facilitated by the school counseling program were also withdrawn (e.g., individual and group counseling, classroom-based psychoeducational and preventative programming, academic engagement initiatives or career exploration interventions, etc.). It would also be expected, or hoped, that some school counseling program effects on the single school subject would continually impact the school after the school counseling program

intervention was removed. Although, because of the high staff turnover typical of urban schools, it is uncertain whether such school-wide learning was sustained when the school counseling program intervention was removed. Obtaining annual teacher and staff turnover data for School A would have yielded more contextual understanding.

Third, the school counseling program intervention was not a fully implemented comprehensive school counseling program. The rationale for analyzing the sixth, seventh, and eighth grades was because the school counseling program was to focus interventions on these grades. Although the school counseling program interventions were targeted towards the sixth, seventh, and eighth grades, the program's advocacy based interventions were believed to impact the school system holistically—by impacting all students and school stakeholders. Even with this limitation, there is value and precedent for studying the impact of less than fully implemented school counseling programs (Lapan et al., 2001; Lapan et al., 1997; Sink & Stroh, 2003a, 2003b).

A fourth limitation pertains to possible confounding variables, additionally implemented school improvement programs, identified through review of school-level annual report documents for the academic years of analysis. School A was designated as a Reading First School during the 2006–2007, 2007–2008, and 2008–2009 academic years. Because of this designation, School A received additional staff professional development, a literacy coach, and new reading materials. During the 2008–2009 academic year the school also implemented additional mathematics support for identified students as another school improvement strategy. These supports included an extra math class, rather than an arts elective, and after-school tutoring. A health and wellness

program was also implemented during the 2008–2009 academic year. This program aimed to increase student consumption of fruits and vegetables and physical activity and decrease soda/sugary drink intake and unproductive screen time (e.g., watching television, playing video and computer games). Additionally, during the 2008–2009 academic year School A was involved with a City School District international exchange program that resulted in the School A principal and six selected students traveling aboard to Japan. As School A annual report documents were collected only for the 2006–2007, 2007–2008, and 2008–2009 academic years of analysis, additional possible confounding school improvement interventions may have been implemented during the five years of this investigation.

Implications for Future Research

Current Data Sets

There are a multitude of future research opportunities pertaining to the current data sets used in this study. Additional research questions could be investigated regarding the collected MEAP reading and mathematics data sets. For example, although the school counseling program was to target interventions for the sixth, seventh, and eighth grades, the MEAP reading and mathematics proficiency percentages for all assessed grades (third through eighth) could be pooled and then analyzed. The individual grade level proficiency percentages could also be reanalyzed using a multiple baseline single subject framework with the individual grades representing multiple single subjects. Additionally, a multiple baseline single subject framework could be used to investigate changes in MEAP proficiency regarding diverse racial subgroups of students. For

example, such research could investigate the MEAP proficiency changes specifically with the African American and White student subgroups. Using this paradigm would additionally yield higher power.

Additional post-intervention MEAP reading and mathematics proficiency percentage data could also be collected and analyzed. With this additional data, the 2005–2006 proficiency percentage data could be thrown out. The new data sets could then be reanalyzed using an ABA single subject time-series analysis. Although statistically analysis is possible with as few data points in a phase as was conducted in this study, having additional data points is preferred. A multiple baseline single subject analysis could also be investigated using these new data sets with the individual grades or student racial subgroups serving as multiple subjects.

Future Directions

Future research could use the findings from this investigation to serve as a pilot study to fully implement an ABA reversal single subject time-series analysis of a school counseling program's impact on the key school indicators of daily student attendance percentage, daily student suspension percentage, MEAP proficiency percentage, and Adequate Yearly Progress attainment status as dependent variable measures. Future research could also investigate the impact of multiple school counseling programs on multiple single school subjects using a multiple baseline single subject time-series analysis.

Based on an exhaustive literature review, this was the first study to investigate the impact of one school counseling program on the school indicators of academic

achievement as measured by MEAP proficiency percentages and AYP attainment status, daily attendance percentage, and daily suspension percentage data as dependent variables using an ABA reversal single subject time-series analysis. The results of this investigation will serve as a pilot study in application for an elementary school counseling grant up to \$400,000 through the U.S. Department of Education's Safe and Drug Free School Task Force to implement fully comprehensive school counseling programs in multiple schools over the three year grant cycle. The impact of the implemented multiple school counseling programs in multiple schools for three years will be investigated using a multiple baseline single subject time-series analysis framework.

This future research will facilitate multiple single school subjects having more homogeneous and fully implemented school counseling program interventions. This future grant-funded research will strategically introduce the more homogenous and fully implemented school counseling program interventions in multiple single school subjects purposefully selected as being more homogeneous regarding student and staff composition. Future research could also strategically introduce more homogenous fully implemented school counseling program interventions into randomly selected school systems. The future research opportunities to investigate the impact of more fully implemented school counseling program interventions on single school subjects using the analytic framework of this investigation, and deviations thereof, are limitless.

There is a need for counseling psychologists to partner with educators and others committed to prevention, consultation, and mental health services (Coleman, 2004; Forrest, 2004; Galassi & Akos, 2004; Gysbers, 2004; Pope, 2004; Romano & Kachgal,

2004a, 2004b; Whiston, 2004; Yeh, 2004). This research serves as an example of how counseling psychologists, or those training to become counseling psychologists, can partner with educators and school systems to conduct pertinent and needed longitudinal outcome research while working to dismantle historically and institutionally imbedded inequalities within educational systems.

Implications for Future Practice

Implications for practitioners and training future practitioners will next be reviewed. Despite the evidence of program importance and positive impact, some school counselors find it difficult to advocate for comprehensive school counseling program implementation. The current findings further inform the teaching of school counseling. School counseling faculty may utilize these findings to deliver strategies to help promote school counselor competence. To increase school counseling students' knowledge of successfully implemented school counseling programs with a documented history of positively impacting students' achievement, faculty should invite school counselors to classes to share their experiences. Faculty can also work to facilitate student visits to schools with a documented history of positive outcomes on key school indicators, such as academic achievement, attendance, and suspension. Additionally, as on campus in services are required by some accrediting organizations (e.g., CACREP), these findings can provide strategies other practicing school counselors are using to develop and maintain comprehensive school counseling programs.

As this investigation is an example of how one counseling psychology doctoral student partnered with a school system to answer pertinent school-based school

counseling outcome questions, this work can serve as a guide for how counseling psychologists, and those in training, can establish and maintain collaborative educational system-based partnerships. Additionally, this work can serve as a guide for how counseling psychologists, and those in training, can serve in a consultative role for educational systems wanting to evaluate mental health interventions.

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doi:10.1177/0011000003261358

Appendix A
Preliminarily Submitted Research Proposal

**Proposed Doctoral Dissertation Research:
The Impact of School Counseling Programs on Schools**

Submitted by:

Katherine L. N. Colles M.A., LPC, SCL,
Doctoral Student in Counseling Psychology
katherine.l.n.colles@wmich.edu

517.230.5950

Dr. Joseph R. Morris Ph.D, LP, LPC,
Doctoral Committee Chair
Western Michigan University
Department of Counselor Education and Counseling Psychology

WHO I AM

- I served as a School Counselor at [REDACTED] for five years. During this time, I served annually on the [REDACTED] and as the [REDACTED] for two years. Additionally, I served as the district [REDACTED] Co-Chair and subsequent Chair.
- I am appreciatively on a five year leave of absence from the [REDACTED] to pursue doctoral studies in Counseling Psychology at Western Michigan University.
- While [REDACTED]

PURPOSE OF PROPOSED RESEARCH

- The purpose of my proposed doctoral dissertation research is to study School Counseling programs in the context of the larger school system within a number of district schools. I'm proposing to research the impact of the School Counseling programs at (four specific district schools) over the past seven years.

METHOD and PROCEDURE

- I'm proposing to examine past building level student data using a time-series analysis (2, 5, 1, 3, 4). This time series analysis would investigate the impact of School Counseling programs on the individual schools as single subjects over multiple years. Specifically, the following building level data is requested:
 - daily student attendance data
 - daily student suspension data
 - yearly MEAP and AYP data
- Thus, daily student attendance and suspension data is requested for the noted schools. Additionally, yearly MEAP and AYP data is requested for the schools.

- Building demographic data is also requested. Such demographic information may include race, gender, percentage of students receiving free and reduced lunch and breakfast services, and percentage of students receiving Special Education services for the noted schools over the multiple years. Additionally, other possible relevant building wide descriptive information may be requested.
- In addition to the above noted retrospective building wide data, descriptive information pertinent to the building specific school counseling programs is requested. Such information would be gleaned through use of questionnaires and structured interviews with various school counselors.

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Appendix B

Human Subjects Institutional Review Board Letter of Approval

WESTERN MICHIGAN UNIVERSITY



Human Subjects Institutional Review Board

Date: February 28, 2012

To: Joseph R. Morris, Principal Investigator
Katherine Colles, Student Investigator for dissertation

From: Amy Naugle, Ph.D., Chair *Amy Naugle*

Re: HSIRB Project Number 12-02-63

This letter will serve as confirmation that your research project titled "School Counseling Program Impact: A Five Year ABA Reversal Single Subject Time-Series Analysis of Academic, Suspension, and Attendance Data" has been **approved** under the **exempt** category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may **only** conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: February 28, 2013

Walwood Hall, Kalamazoo, MI 49008-5456
PHONE: (269) 387-8293 FAX: (269) 387-8276

Appendix C

HSIRB Approved Application for Continuing Review

RECEIVED

WESTERN MICHIGAN UNIVERSITY
Human Subjects Institutional Review Board
 WMU Mail Stop: 5456 Phone: (269) 387-8293

DEC 31 2012

H.S.I.R.B.

APPLICATION FOR CONTINUING REVIEW or FINAL REPORT FORM

In compliance with Western Michigan University's policy that "the HSIRB's review of research will be conducted at appropriate intervals but not less than once per year," the HSIRB requests the following information:

I. PROJECT INFORMATION

PROJECT TITLE: School Counseling Impact: A Five Year ABA Reversal Single Subject Time-Series Analysis of Academic, Suspension, and Attendance Data in One School.

HSIRB Project Number: 12-02-63

Previous level of review: ☐ Full Board Review ☐ Expedited Review ☒ Administrative (Exempt) Review

Date of Review Request: November, 28, 2012

Date of Last Approval: February 28, 2012

II. INVESTIGATOR INFORMATION

Have all investigators completed human subjects protections training at www.citiprogram.org?

☒ Yes ☐ No (Training must be completed before protocol can be renewed)

PRINCIPAL INVESTIGATOR OR ADVISOR

Name: Dr. Joseph R. Morris

Department: Counselor Education and Counseling Psychology Mail Stop: 5226

Electronic

Mail Address: joseph.morris@wmich.edu

(1) CO-PRINCIPAL OR STUDENT INVESTIGATOR

Name: Katherine L. N. Colles

Department: Counselor Education and Counseling Psychology Mail Stop: Off Campus: 19302 Evergreen Drive, Bonney Lake, WA 98391

Electronic Mail Address: katherine.l.n.colles@wmich.edu

(2) CO-PRINCIPAL OR STUDENT INVESTIGATOR

Name:

Department:

Mail Stop:

Electronic Mail Address:

III. CURRENT STATUS OF RESEARCH PROJECT

Please answer questions 1-4 to determine if this project requires continuing review by the HSIRB.

1. The project is closed to recruitment of new subjects.
☒ Yes (Date of last enrollment: 8.28.12) ☐ No (Project must be reviewed for renewal.)
2. All subjects have completed research related interventions.
☒ Yes ☐ Not Applicable ☐ No (Project must be reviewed for renewal.)
3. Long-term follow-up of subjects has been completed.
☐ Yes ☐ Not Applicable ☒ No (Project must be reviewed for renewal.)
4. Analysis of data is complete.
☐ Yes ☒ No (Project must be reviewed for renewal.)

☛ If you have answered "No" to ANY of the questions above, you must apply for **Continuing Review**. Please complete numbers 5-12 on page 2. If you need to make changes in your protocol, please submit a separate memo detailing the changes that you are requesting.

☛ If you have answered "Yes" or "Not Applicable" to ALL of the above questions, please check the **Final Report** box below and complete questions 5-10 on page 2.

☛ If your protocol has been open for three years and you still want to collect or analyze data, you must close this protocol by filing a final report using this form and apply for approval of a new protocol using an **Application for Initial Review**. Please make a **Final Report** on your project by completing numbers 5-10 on page 2.

Revised 7/03 WMU HSIRB
 All other copies obsolete.

IV. ☒ Application for Continuing Review

V. ☐ Final Report

HSIRB Project Number: 12-02-63

5. Have there been changes in Principal or Co-Principal Investigators? ☐ Yes ☒ No
(If **yes**, provide details on an "Additional Investigators" form (available at the HSIRB web site, http://www.wmich.edu/research/compliance/hsirb/hsirb_2.html)).
6. Has the approved protocol been modified or added to with respect to:
(If **yes** to any item below, provide the details on an attached sheet.)
- | | | |
|--------------------|------------------------------|--|
| a. Procedures | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| b. Subjects | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| c. Design | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| d. Data collection | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
7. Has any instrumentation been modified or added to the protocol? ☐ Yes ☒ No
(If **yes**, attach new instrumentation or indicate the modifications made.)
8. Have there been any adverse events that need to be reported to the HSIRB? ☐ Yes ☒ No
(If **yes**, provide details on an attached sheet.)
9. Total number of subjects approved in original protocol: **1**

10. Total number of subjects enrolled so far: **1**

If applicable: Number of subjects in experimental group: **1** Number in control group: **1**

Because of the ABA reversal methodology, the single subject serves as the experimental and the control group.

☛ If this is a **FINAL REPORT** you may stop here and return the form electronically.

☛ If this is an **APPLICATION FOR CONTINUING REVIEW** continue with numbers 11-13 below.

11. Estimated number of subjects yet to be enrolled: **0**

12. **Verification of Consent Procedure:** Provide copies of the consent documents signed by the last two subjects enrolled in the project. Cover the signature in such a way that the name is not clear but there is evidence of signature. If subjects are not required to sign the consent document, provide a copy of the most current consent document being used.

13. If you are continuing to recruit subjects for this project, please remember to include a clean original of the consent documents to receive a renewed approval stamp.

Joseph R. Harris
Principal Investigator/Faculty Advisor Signature

11/29/12
Date

Kirk Coed
Co-Principal or Student Investigator Signature

11.28.12
Date

Approved by the HSIRB:

Amy Naug
HSIRB Chair Signature

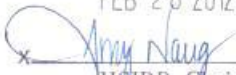
12/4/12
Date

Appendix D

HSIRB Approved Consent Form

WESTERN MICHIGAN UNIVERSITY
H. S. I. R. B.
Approved for use for one year from this date:

FEB 28 2012


HSIRB Chair

**Western Michigan University
Department of Counselor Education and Counseling Psychology**

Principal Investigator: Dr. Joseph R. Morris
Student Investigator: Katherine L. N. Colles
Title of Study: School Counseling Impact: A Five Year ABA Reversal Single Subject Time-Series Analysis of Academic, Suspension, and Attendance Data in One School.

You are invited to participate in a research project titled "*School Counseling Impact: A Five Year ABA Reversal Single Subject Time-Series Analysis of Academic, Suspension, and Attendance Data in One School*." This project will serve as Katherine L. N. Colles's dissertation research project for the requirements of the Doctor of Philosophy in Counseling Psychology. This consent document will explain the purpose of this research project and will go over all of the time commitments, the procedures used in the study, and the risks and benefits of participating in this research project. Please read this consent form carefully and completely and please ask any questions if you need more clarification.

What are we trying to find out in this study?

The purpose of this study is learn about the impact a school counseling program has on attendance, suspension, MEAP, and AYP data in a single school. This study is being conducted primarily to learn about school counseling program impact on the school's attendance, suspension, MEAP, and AYP data and to inform school counseling research and practice. This study will additionally serve to inform school counseling, school, and district decision making and improvement initiatives.

Who can participate in this study?

Inclusion Criteria: The challenges in conducting school counseling school based research are widely discussed (e.g. Perry, 1993). However, the value of using convenience sampling procedures when conducting school based research has been discussed (Murray Hannan, and Zucker, 1989) and routinely utilized (e.g. Smith & Palmieri, 2007; O'Brien, 2007; Patsy Tan, 2004). Your school district was identified for recruitment based on convenience sampling procedures and one school was purposefully selected for investigation (Creswell, 2007; Marshall & Rossman, 2006; Sandelowski, 1995). Purposeful sampling procedures are also routinely used in educational research (e.g. Hoekstra, Korthagen, Brekelmans, Beijaard, & Imants, 2009; Siegel, 2005; Pissanos, 1995).

Exclusion Criteria: All district high schools were purposefully omitted from study participation due to the developmental and chronological age differences of students in these buildings. All

WESTERN MICHIGAN UNIVERSITY
 H. S. I. R. B.
 Approved for use for one year from this date:
 FEB 28 2012

 HSIRB Chair

district elementary schools were also purposefully omitted from participation due to not having school counseling programs. All district high schools and middle schools were purposefully omitted because the counseling programs of these schools were implemented throughout all years of this proposed investigation. Thus, these schools do not fit the methodology of this investigation.

Where will this study take place?

Data collection for this investigation will take place at the administrative or measurement and evaluation offices of your school district.

What is the time commitment for participating in this study?

After obtaining approval to conduct the research, and after obtaining signed consent and a site letter of approval, a series of three meetings will be scheduled with the Federal Compliance Officer and/or this individual's staff to review the archival data to be collected. An initial two hour meeting will be scheduled to review the data to be collected. A second two hour meeting will then be scheduled to retrieve the necessary data. A third two hour meeting will then be scheduled to ensure all approved data to be collected is received.

The investigators will visit the school district a maximum of three times during the study. After obtaining consent to proceed with this investigation, the maximum amount of time participation in the study will require will be six hours, which will be three, two hour long meetings. Each of the three meetings may not require two hours and the third meeting may not be required.

What will you be asked to do if you choose to participate in this study?

If you choose to participate in this study, the district will assign someone to meet with the investigators for a series of three meetings. During the first meeting the district staff member and investigators will review the data to be collected and schedule a second meeting. The district staff member will then meet with the investigators for a second meeting to provide the reviewed archival data and documents. The district staff member will then meet with the investigators for a third and final two hour meeting, if need be, to confirm receipt of all data that the district consented to be collected.

What information is being measured during the study?

This section will describe the information that will be collected during your participation in the study. This section will specifically describe the archival data and documents that will be collected during the study.

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Archived daily attendance percentage, suspension percentage, MEAP English Language Arts and mathematics proficiency percentages for third, fourth, fifth, sixth, seventh, and eighth grades, and Adequately Yearly Progress attainment status for the purposefully selected school within your district for the 2006 to 2007, 2007 to 2008, 2008 to 2009, 2009 to 2010, and 2010 to 2011 academic years will be collected. District and school annual report and improvement plan documents will also be collected for the 2006 to 2007, 2007 to 2008, 2008 to 2009, 2009 to 2010, and 2010 to 2011 academic years.

What are the risks of participating in this study and how will these risks be minimized?

Because this investigation seeks to analyze archival data, the risks to the individual school and the district is minimal to no risk. Because this investigation seeks to collect data through the district, rather than collecting the data from the individual school, the risks to the individual school is even further reduced.

Upon consent from the district, these investigators will work with district personnel to collect the specified data. There is little to no inconvenience risks to the individuals involved in the data collection aspect of this study.

The investigation was designed so that minimal staff personnel and time, and no classroom teachers, will be utilized. Additionally, this investigation was designed so that data being requested is 1), publicly available regarding MEAP and AYP attainment status, 2), is data already collected by the district, and 3), is data that has already been analyzed by the district in different ways than is proposed by this investigation. Thus, the investigators are not requesting to collect original data further reducing risks to the district and the individual school.

What are the benefits of participating in this study?

The district and the individual school will benefit from the results of this investigation. The school will benefit from the knowledge regarding the impact of the school counseling program on MEAP, AYP, attendance, and suspension data. The school may use this information to make school improvement decisions and for decision making regarding the school counseling program. The district may use the results of this investigation for district improvement decisions and for decision making regarding individual school counseling programs. The more general and longer term benefits to both the district and the individual school from the results of this investigation pertain to the school and district school counseling programming, improvement, and decision making implications.

Are there any costs associated with participating in this study?

There are no costs associated with participating in this study. Participation will however, utilize

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HSIRB Chair

minimal amounts of district personnel time. This study will specifically utilize time of the district's Federal Compliance Officer and/or this individual's assigned staff.

Is there any compensation for participating in this study?

There is no compensation for participating in this study.

Who will have access to the information collected during this study?

The only individuals who will have direct access to the collected information will be the principal and student investigator of this research study. The results of this study will be disseminated through presentation and publication of this student investigator's doctoral dissertation. The study results will additionally be disseminated through conference presentations and journal manuscript submissions and publications. Additionally, the results of this investigation will serve as a pilot study for a subsequent grant application.

The privacy and confidentiality of subjects will be maintained and safe guarded throughout all steps of this investigation. The district will continually be referred to as the school district through the dissertation publication and defense presentation. The district will not be identified in any subsequent conference presentations and journal article submissions and publications.

The district and individual school will also be coded. As noted, the conveniently and purposefully selected school district will be coded and labeled as the, "school district." The purposefully selected single school subject will be coded as, "School A."

What if you want to stop participating in this study?

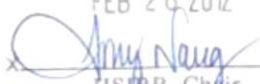
The district can choose to refuse to participate in the study and stop participating in the study at anytime for any reason. The district will not suffer any prejudice or penalty for the decision to stop participation. The district, and all district designated personnel, will experience no consequences either academically, publicly, or personally if the decision is made to withdraw from this study.

The investigator can also decide to stop the district's participation in the study without district consent.

Debriefing Process

The investigators will submit a report of the study findings to the district's Office of State and Federal Programs within 90 days of the close of the study.

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Should you have any questions prior to or during the study, you can contact the primary investigator, Dr. Joseph R. Morris at (269) 387-5112 or joseph.morris@wmich.edu or the doctoral student investigator, Katherine L. N. Colles at (517) 230 – 5950 or katherine.l.n.colles@wmich.edu. You may also contact the Chair, Human Subjects Institutional Review Board at 269-387-8293 or the Vice President for Research at 269-387-8298 if questions arise during the course of the study.

This consent document has been approved for use for one year by the Human Subjects Institutional Review Board (HSIRB) as indicated by the stamped date and signature of the board chair in the upper right corner. Do not participate in this study if the stamped date is older than one year.

I have read this informed consent document. The risks and benefits have been explained to me. I agree to take part in this study.

Printed Name

Date

Printed District Title

Date

Participant's Signature

Date

Appendix E

HSIRB Approved Site Approval Letter

Site Letter of Approval

With this letter, the School District approves Dr. Joseph R. Morris and Katherine L. N. Colles to conduct an investigation on the impact of one school counseling program on the school system level of one district school (School A) using an ABA Reversal single subject time series analysis of archived data.

The district specifically approves these researchers to collect and analyze attendance, suspension, and academic data of the Michigan Educational Assessment Program (MEAP) scores and Adequately Year Progress (AYP) attainment status for School A, as outlined in the signed consent form. The district additionally approves these researchers to collect and analyze school and district descriptive information and archived document records as outlined in the signed consent form.

The district further approves these investigators to communicate with and work with assigned district personnel to collect the all data and records.

Printed Name

Date

Printed District Title

Date

Participant's Signature

Date

Appendix F

City School District Research Application – Redacted

REQUEST TO CONDUCT RESEARCH IN THE [REDACTED] DISTRICT

• **Researcher Information:**

Name: Joseph R. Morris, Principal Investigator Application Date: 03/09/12
 Katherine L. N. Colles, Doctoral Student Investigator
 Work Phone: (517) 230 - 5950 Home Phone: (517) 230 -
 5950
 Email Address: katherine.l.n.colles@wmich.edu Fax #: (269) 387- 5090
 Mailing Address: 3612 S. Circle Drive Apt. 13
 City: Kalamazoo State: Michigan Zip Code: 49004
 Professional Title/Position: Doctoral Candidate
 Institution, organization or agency with whom you are associated, if any:

I, Katherine L. N. Colles, [REDACTED]
 [REDACTED]
 [REDACTED]

I am currently a Doctoral Candidate at Western Michigan University in the Counseling Psychology Program in the Department of Counselor Education and Counseling Psychology in the College of Education and Human Services. Dr. Joseph R. Morris serves as my dissertation chairperson, faculty advisor, and is a Professor in the Counselor Education and Counseling Psychology Department at Western Michigan University. Dr. Morris is named as the principal investigator following our university policy; however, please direct all communication to myself, Katherine L. N. Colles.

[REDACTED]

Reason for conducting the study:

☒ College or university course requirement
☐ On-going program with the [REDACTED] School District: Name of Program:

Although this research is not a direct on-going program with the district, this research stems from [REDACTED]
 [REDACTED]
 [REDACTED]

Location and contact person: [REDACTED]

☒ **Partial fulfillment for a Teaching Degree**

☐ Partial fulfillment for Masters Degree

☒ Partial fulfillment for Doctors Degree

☐ Other, please specify:

The partial fulfillment of a Teaching Degree is the partial fulfillment of a Doctors Degree so that I may be able to teach future Counselors.

If the study is being conducted as part of a course requirement or as partial fulfillment of graduate requirements, please provide the course title and instructor's name and/or the title/subject of your dissertation and your major advisor.

Instructor/Major Advisor: Dr. Joseph R. Morris Ph.D, LP, LPC

Full Title: Professor, Dissertation Chairperson

Address: 3108 Sangren Hall, Western Michigan University, Kalamazoo, MI 49008

Phone: (269) 387 - 5112

Course Title: _____

/or

Subject of Dissertation: school counseling program impact

• Study Information

Title of this study: School Counseling Impact: A Five Year ABA Reversal Single Subject Time Series Analysis of Academic, Suspension, and Attendance Data.

Duration of study:

Beginning Date: 3 / 9 / 12 Ending Date: 8 / 5 / 12

Name of desired School(s) or Building(s):

[REDACTED]

There is a need for school counseling outcome (e.g. Carey, Dimmitt, Hatch, Lapan, & Whiston, 2008; Sabella, 2006) research on the impact to school variables (e.g. Whiston, 2002; Gysbers, 2001; Borders, 2002; Dimmitt, Carey, McGannon, & Henningson, 2005; Lapan, 2001). The problem this research seeks to better understand is the impact one school counseling program may have on school variables measured by the school.

This research seeks to investigate the impact of the former school counseling program at [REDACTED] School using an ABA Reversal single subject time series analysis of archived data. This research specifically seeks to investigate the impact of the school counseling program on the variables of attendance, suspension, and academic data of the Michigan Educational Assessment Program (MEAP) scores and Adequately Year Progress (AYP) attainment status. These variables will be studied over a five year time period using archived data.

Name of person(s) entering the school or building: Katherine L. N. Colles

Abstract (150 words or less):

III. Protocol:

If students are the focus of your study,

Attach a copy of the letter you plan to use in seeking parent permission for a student's participation in your study.

How many students will you involve? No students will be involved in this study. At what grade level(s)? _____

How much student time will be required by your study? No student time will be involved in this study.

What, if any, are your requirements for particular student characteristics/demographics?

Because no students will be involved in this study, no student characteristics/demographics are required.

What, if any, are your requirements for a specific school, department, geographical area, etc.?

Because of the single subject nature of this study and the methodology used, [REDACTED] School was identified as the proposed single school subject due to a previously implemented and then terminated School Counselor position. Investigating the impact of the school counseling program at [REDACTED] School meets the requirements of this study: a School Counseling program was implemented and then terminated.

What, if any, are your requirements for review of, or access to, student records?

We will not need to review, or access, any individual student records. We are requesting access to daily attendance and suspension percentages; annual MEAP proficiency percentages for mathematics, English Language Arts-Reading, and English Language Arts-Writing; and annual AYP attainment status data for [REDACTED] School for the 2006 to 2007, 2007 to 2008, 2008 to 2009, 2009 to 2010, and 2010 to 2011 academic

years. We are also requesting access to the following descriptive information for [REDACTED] School for the 2006 to 2007, 2007 to 2008, 2008 to 2009, 2009 to 2010, and 2010 to 2011 academic years:

- mean student enrollment
- mean male student percentage
- mean female student percentage
- mean Caucasian/White student percentage
- mean African American/Black student percentage
- mean Hispanic student percentage
- mean Asian and Pacific Islander student percentage
- mean Native American student percentage
- mean free/reduced lunch student percentage

List any instruments that will be used with or administered to students. This should include interview protocols and schedules as well. ***Attach copies of all instruments you plan to use.***

No instruments will be used with or administered to students.

A Data To Be Collected Form is attached that can be found in Appendix C.

A District Descriptive Data Form is attached that can be found in Appendix D.

A School Descriptive Data Form is attached that can be found in Appendix D.

Will teachers be required to help or take part in your study? _____ Yes
 ___X___ No

If so, please describe the extent of involvement.

If teachers are the focus of your study,

Attach a copy of the letter you plan to use in securing teacher agreement to participate in this proposed study.

How many teachers will you involve? Zero teachers will be involved. At what grade level(s)? 6th, 7th, and 8th

Within what content area(s)?

How much teacher time will be required? No teacher time will be required.

Will teachers be recompensed for participating in your study? ___ Yes ___X___ No

If so, in what way?

What are your requirements, if any, for a particular school, department, or geographical location?

Because of the single subject nature of this study and the methodology used, [REDACTED] was identified as the proposed single subject due to a previously implemented and then terminated School Counselor position. Investigating the impact of the school counseling program at [REDACTED] School meets the requirements of this study: a School Counseling program was implemented and then terminated.

What are the requirements, if any, for review or access to staff records?

This study will not require review or access to any individual staff records. We are requesting access to the following building level descriptive staff records for [REDACTED] school for the 2006 to 2007, 2007 to 2008, 2008 to 2009, 2009 to 2010, and 2010 to 2011 academic years:

- mean number of teaching positions
- mean number of non-classroom teaching positions
- mean probationary teacher percentage
- mean teacher turn over percentage

This information will be collected using the District Descriptive Data Form and the School Descriptive Data Form that can be found in Appendix D.

Will any school personnel, other than the students and/or teachers already described, be involved in your study? ☒ Yes ☐ No

If so, who, in what way and for how much time?

Per a directive of [REDACTED], the doctoral student investigator previously communicated with [REDACTED] in the office of [REDACTED] about this research application. [REDACTED] communicated that we may work with [REDACTED] and [REDACTED] in the [REDACTED] office. If this research is approved, we will work with these individuals, and any other district staff we may be instructed to work with, to collect the archived data outlined in this research application.

A series of meetings will be scheduled with the [REDACTED] and designated staff to review and collect the archived data outlined in this research application. An initial two hour meeting will be scheduled to review the data to be collected as outlined in this research application. A second two hour meeting will be scheduled upon completion of the first meeting to retrieve the necessary data. Finally, a third two hour meeting will be scheduled with district designated staff to ensure all approved data to be collected is received.

The maximum amount of time needed to work with these individuals will be three meetings scheduled for two hours each. Each meeting may not require two hours and the third meeting may not be needed.

IV.Risks/Benefits:

Are there any possible risks to the subject (s) of your research: ____ Yes ☒ No

If so, please describe

Please describe the benefits to the staff and/or students of the [REDACTED].

Both students and staff of the [REDACTED] will benefit from the results of this research. The staff of [REDACTED] School will benefit from the knowledge regarding the impact of the school counseling program on MEAP, AYP, attendance, and suspension data. The staff of [REDACTED] School may use this information to make more informed school improvement decisions regarding students' English Language Arts and mathematics academic achievement as measured by the MEAP, student behavior, and student attendance. The staff of [REDACTED] School may also use this information for decision making pertaining to a school counseling program.

The district may use the results of this investigation to further inform district improvement decisions regarding students' English Language Arts and mathematics academic achievement as measured by the MEAP, student behavior, and student attendance. The district may also use the results of this investigation to further inform decision making regarding school counseling programs throughout the district.

All students of the [REDACTED] will benefit from knowledge gleaned from this study for four reasons: 1). The results of this study may serve to better inform the school improvement decision making process for [REDACTED] School, 2). The results of this study may serve to better inform the district improvement decision making process, 3). All district School Counseling Department staff may use the results of this study to inform program decision making, and 4). School Counseling programs impact all students in schools with implemented programs.

V. Confidentiality of Data:

Please describe, briefly, how you intend to protect the privacy of study participants.

The privacy and confidentiality of the [REDACTED], [REDACTED] school, and all district personnel will be maintained throughout all steps of this investigation. The [REDACTED] School District, [REDACTED] School, and any district personnel will not be identified in the research proposal, the dissertation

publication, the dissertation defense presentation, any subsequent conference presentations, and any peer reviewed journal submissions and publications.

Following professional standards, all collected data will be retained in the secure and confidential Western Michigan University Graduate College Archives for a duration of at least seven years.

As required by the [REDACTED] School District research application procedures, a report of investigation findings will be submitted to the district's [REDACTED] within 90 days of the close of this study.

VI. Consent:

Please describe, briefly, how you intend to obtain the consent of study participants and/or their parents or legal guardians.

The study participant of this proposed study is one school, [REDACTED] School of the [REDACTED] School District. Therefore, because study participants do not include students, consent does not need to be obtained from parents or legal guardians.

Because of the retrospective nature of this proposed research, we are seeking to analyze archived data already collected by the district. Therefore, we are seeking to obtain consent from a school district official. If this request to conduct research is granted, we will then seek the appropriate district official's signature on both the enclosed consent form and a site approval letter, found in Appendix A and B, following proper school district protocol.

This study was designed to minimize district personnel time by not requiring teacher or counselor time.

*It is **mandatory** that you attach a copy of the consent form you intend to use, please remember to do so.* The consent form to be used for this study can be found in Appendix A.

Please review and sign the following Statement of Agreement indicating your understanding of the expectation and your commitment to comply.

As a condition for permission to conduct this research, I agree to submit a written report of the findings of the study to the [REDACTED] within 90 days of the close of the study.

Signature: _____ Date: ____/____/____

Office of [REDACTED]
[REDACTED]

For Internal Use Only

[REDACTED] Project # _____

Approved: ____ Yes ____ No Date: ____/____/____

Appendix G

City School District Research Application Cover Letter – Redacted



Counselor Education and Counseling Psychology
College of Education

Katherine L. N. Colles
3612 S. Circle Drive, Apt. 13
Kalamazoo, MI 49004

March 9, 2012

Attention: [REDACTED]
[REDACTED]
[REDACTED]

Dear [REDACTED],

Contained in this mailing is a complete research application packet consisting of the following:

- A copy of our institution IRB approval letter
- The \$50.00 application processing fee for a course work related research request, which is located in the left binder folder.
- Ten copies of the [REDACTED] research application
- One copy of the research proposal
- A copy of the consent form, which is contained in the IRB approval letter and the ten copies of the research application.

Please email confirmation when this research application packet is received to katherine.l.n.colles@wmich.edu, the doctoral student investigator named on the research application. I can be contacted by phone at (517) 230 -5950 or by the noted email address.

Thank you for your time.

Sincerely and respectfully,

Katherine L. N. Colles M.A., LPC, SCL
Doctoral Candidate in Counseling Psychology
Department of Counselor Education and Counseling Psychology
Western Michigan University

Appendix H

City School District Research Application Non-Approval Letter – Redacted



March 21, 2012

Katherine L. N. Colles
3612 Circle Drive, Apt. 13
Kalamazoo, MI 49004

Re: Project # [REDACTED]

Dear Ms. Colles,

I regret to inform you that your Research Request Application entitled *School Counseling Impact: A Five Year ABA Reversal Single Subject Time Series Analysis of Academic, Suspension, and Attendance Data* **will not be approved** at this time.

The district is undergoing several restructuring initiatives and is unable to accommodate outside interference or place additional duties to our district-level staff at this time.

If you have any questions, need additional information, please do not hesitate to contact [REDACTED] either by telephone at [REDACTED] or via email at [REDACTED]. Thank you for your patience and for your interest in the [REDACTED].

Sincerely,

[REDACTED]

[REDACTED]

The [REDACTED] is committed to a policy of providing equal employment opportunities to all qualified people regardless of economic or social status and will not discriminate on the basis of race, color, ethnic origin, national origin, creed, religion, political belief, sex, sexual orientation, marital status, age, veteran status, or physical or mental disability.

Appendix I

City School District Research Application Approval Letter – Redacted

August 16, 2012

Katherine L. N. Colles
3612 S. Circle Drive, Apt. 13
Kalamazoo, MI 49004

Re: Project # [REDACTED]

Dear Ms. Colles:

Your Research Request Application entitled **School Counseling Impact: A Five Year ABA Reversal Single Subject Time Series Analysis of Academic, Suspension, and Attendance Data** is *Conditionally Approved pending consent of the [REDACTED] Superintendent of Schools.* This approval is granted based upon your agreement not to identify the [REDACTED] District within any publication without obtaining specific written permission from the district and all data will be reported anonymously or as a group data with no specific identifying information. It is also understood that as the researcher, you will submit to the district a report of the findings within 90 days of the conclusion of the project. **The following comments apply specifically to your request:**

1. The Western Michigan University Institutional Review Board on Human Subjects Committee has approved the intents and purposes of this study, and documentation of this approval will be forwarded to the Lansing School District's Office of State and Federal Programs to be kept on file before research activities are begun.
2. Written District consent and Site Letter of Approval forms will be obtained from the district prior to the commencement of this study.
3. A list of all persons participating in this study who are not employed by the [REDACTED] District and who will be entering the building or buildings where the study is to be conducted will be forwarded to the [REDACTED] District's Office of [REDACTED] to be kept on file before research activities are begun.
4. Your contact points for this project will be [REDACTED] and me.

If you have any questions, need additional information, or encounter other issues during the execution of your study, please do not hesitate to contact me either via telephone at [REDACTED] or via email at [REDACTED]. Thank you for your patience and for your interest in the [REDACTED].

Sincerely,

[REDACTED]

The [REDACTED] District is committed to a policy of providing equal employment opportunities to all qualified people. Regardless of economic or social status and will not discriminate on the basis of race, color, ethnic origin, national origin, Creed, religion, political belief, sex, sexual orientation, marital status, age, veteran status, or physical or mental disability.

Appendix J

Daily Attendance Data Six Parameter Three-Phase Intervention Model Design Matrix

Daily Attendance Data Six Parameter Three-Phase Intervention Model Design Matrix

1	0	0	0	0	98.78
2	0	0	0	0	98.58
3	0	0	0	0	98.68
4	0	0	0	0	98.02
5	0	0	0	0	95.08
6	0	0	0	0	96.5
7	0	0	0	0	97.72
8	0	0	0	0	96.77
9	0	0	0	0	97.52
10	0	0	0	0	92.1
11	0	0	0	0	92.57
12	0	0	0	0	95.33
13	0	0	0	0	96.65
14	0	0	0	0	95.79
15	0	0	0	0	95.89
16	0	0	0	0	96.36
17	0	0	0	0	97.99
18	0	0	0	0	95.88
19	0	0	0	0	94.06
20	0	0	0	0	94.43
21	0	0	0	0	97.31
22	0	0	0	0	97.12
23	0	0	0	0	97.7
24	0	0	0	0	96.74
25	0	0	0	0	95.11
26	0	0	0	0	96.93
27	0	0	0	0	96.16
28	0	0	0	0	98.08
29	0	0	0	0	96.64
30	0	0	0	0	94.24
31	0	0	0	0	96.55
32	0	0	0	0	96.55

33	0	0	0	0	96.74
34	0	0	0	0	95.87
35	0	0	0	0	93.19
36	0	0	0	0	94.82
37	0	0	0	0	94.63
38	0	0	0	0	95.59
39	0	0	0	0	96.07
40	0	0	0	0	96.26
41	0	0	0	0	96.07
42	0	0	0	0	95.96
43	0	0	0	0	95.18
44	0	0	0	0	95.38
45	0	0	0	0	93.74
46	0	0	0	0	96.44
47	0	0	0	0	96.15
48	0	0	0	0	96.24
49	0	0	0	0	95.86
50	0	0	0	0	95.95
51	0	0	0	0	95.66
52	0	0	0	0	94.22
53	0	0	0	0	94.89
54	0	0	0	0	93.74
55	0	0	0	0	93.83
56	0	0	0	0	96.44
57	0	0	0	0	95.76
58	0	0	0	0	95.47
59	0	0	0	0	97.21
60	0	0	0	0	100
61	0	0	0	0	94.12
62	0	0	0	0	96.82
63	0	0	0	0	91.33
64	0	0	0	0	92.49
65	0	0	0	0	93.74

66	0	0	0	0	93.75
67	0	0	0	0	93.27
68	0	0	0	0	93.65
69	0	0	0	0	94.04
70	0	0	0	0	93.08
71	0	0	0	0	92.69
72	0	0	0	0	95.1
73	0	0	0	0	93.46
74	0	0	0	0	94.04
75	0	0	0	0	91.14
76	0	0	0	0	96.71
77	0	0	0	0	94.87
78	0	0	0	0	96.81
79	0	0	0	0	94.87
80	0	0	0	0	93.13
81	0	0	0	0	89.07
82	0	0	0	0	92.55
83	0	0	0	0	93.91
84	0	0	0	0	92.94
85	0	0	0	0	86.94
86	0	0	0	0	94.39
87	0	0	0	0	92.46
88	0	0	0	0	93.42
89	0	0	0	0	90.02
90	0	0	0	0	91.76
91	0	0	0	0	93.22
92	0	0	0	0	93.7
93	0	0	0	0	90.23
94	0	0	0	0	100
95	0	0	0	0	86.78
96	0	0	0	0	94.31
97	0	0	0	0	96.24
98	0	0	0	0	94.69

99	0	0	0	0	94.1
100	0	0	0	0	93.91
101	0	0	0	0	95.94
102	0	0	0	0	95.36
103	0	0	0	0	92.65
104	0	0	0	0	93.04
105	0	0	0	0	93.52
106	0	0	0	0	92.94
107	0	0	0	0	93.23
108	0	0	0	0	94.58
109	0	0	0	0	96.81
110	0	0	0	0	95.16
111	0	0	0	0	91.1
112	0	0	0	0	90.14
113	0	0	0	0	91.88
114	0	0	0	0	90.33
115	0	0	0	0	90.14
116	0	0	0	0	93.04
117	0	0	0	0	92.75
118	0	0	0	0	94
119	0	0	0	0	91.88
120	0	0	0	0	93.33
121	0	0	0	0	93.44
122	0	0	0	0	95.85
123	0	0	0	0	94.98
124	0	0	0	0	94.59
125	0	0	0	0	95.16
126	0	0	0	0	93.31
127	0	0	0	0	95.14
128	0	0	0	0	95.86
129	0	0	0	0	95.94
130	0	0	0	0	94.65
131	0	0	0	0	93.43

132	0	0	0	0	96.8
133	0	0	0	0	95.5
134	0	0	0	0	96.45
135	0	0	0	0	96.8
136	0	0	0	0	94.38
137	0	0	0	0	96.45
138	0	0	0	0	96.54
139	0	0	0	0	95.67
140	0	0	0	0	94.72
141	0	0	0	0	94.46
142	0	0	0	0	96.63
143	0	0	0	0	94.98
144	0	0	0	0	94.29
145	0	0	0	0	96.54
146	0	0	0	0	93.94
147	0	0	0	0	95.33
148	0	0	0	0	96.54
149	0	0	0	0	96.89
150	0	0	0	0	95.16
151	0	0	0	0	96.8
152	0	0	0	0	92.56
153	0	0	0	0	95.76
154	0	0	0	0	94.81
155	0	0	0	0	94.56
156	0	0	0	0	95.85
157	0	0	0	0	97.06
158	0	0	0	0	96.8
159	0	0	0	0	96.29
160	0	0	0	0	96.29
161	0	0	0	0	95.34
162	0	0	0	0	95.68
163	0	0	0	0	95.25
164	0	0	0	0	92.31

165	0	0	0	0	94.04
166	0	0	0	0	96.8
167	0	0	0	0	93.61
168	0	0	0	0	94.39
169	0	0	0	0	96.03
170	0	0	0	0	94.21
171	0	0	0	0	94.47
172	0	0	0	0	95.69
173	0	0	0	0	96.43
174	0	0	0	0	99.55
175	0	0	0	0	99
176	0	0	0	0	98.55
177	0	0	0	0	97.55
178	0	0	0	0	97.94
179	0	0	0	0	97.85
180	0	0	0	0	98.29
181	0	0	0	0	97.67
182	0	0	0	0	97.04
183	0	0	0	0	97.31
184	0	0	0	0	97.4
185	0	0	0	0	97.41
186	0	0	0	0	96.87
187	0	0	0	0	97.23
188	0	0	0	0	95.8
189	0	0	0	0	97.14
190	0	0	0	0	98.13
191	0	0	0	0	96.52
192	0	0	0	0	95.89
193	0	0	0	0	94.55
194	0	0	0	0	96.61
195	0	0	0	0	98.13
196	0	0	0	0	97.23
197	0	0	0	0	96.43

198	0	0	0	0	96.96
199	0	0	0	0	98.75
200	0	0	0	0	98.3
201	0	0	0	0	97.05
202	0	0	0	0	96.16
203	0	0	0	0	96.43
204	0	0	0	0	95
205	0	0	0	0	94.11
206	0	0	0	0	95.98
207	0	0	0	0	96.43
208	0	0	0	0	93.39
209	0	0	0	0	95.27
210	0	0	0	0	94.29
211	0	0	0	0	95
212	0	0	0	0	94.64
213	0	0	0	0	94.11
214	0	0	0	0	94.73
215	0	0	0	0	95.98
216	0	0	0	0	91.79
217	0	0	0	0	93.2
218	0	0	0	0	96.42
219	0	0	0	0	93.84
220	0	0	0	0	92.95
221	0	0	0	0	95.53
222	0	0	0	0	92.22
223	0	0	0	0	95.89
224	0	0	0	0	96.49
225	0	0	0	0	95.95
226	0	0	0	0	95.05
227	0	0	0	0	94.06
228	0	0	0	0	93.44
229	0	0	0	0	93.77
230	0	0	0	0	95.32

231	0	0	0	0	95.58
232	0	0	0	0	95.67
233	0	0	0	0	95.13
234	0	0	0	0	93.59
235	0	0	0	0	96.93
236	0	0	0	0	96.12
237	0	0	0	0	95.31
238	0	0	0	0	93.95
239	0	0	0	0	95.76
240	0	0	0	0	98.01
241	0	0	0	0	97.02
242	0	0	0	0	93.41
243	0	0	0	0	94.95
244	0	0	0	0	89.26
245	0	0	0	0	93.41
246	0	0	0	0	95.49
247	0	0	0	0	97.47
248	0	0	0	0	94.86
249	0	0	0	0	98.47
250	0	0	0	0	96.21
251	0	0	0	0	96.93
252	0	0	0	0	96.39
253	0	0	0	0	97.74
254	0	0	0	0	93.4
255	0	0	0	0	94.67
256	0	0	0	0	93.58
257	0	0	0	0	94.21
258	0	0	0	0	94.3
259	0	0	0	0	92.41
260	0	0	0	0	94.48
261	0	0	0	0	94.57
262	0	0	0	0	92.48
263	0	0	0	0	95.03

264	0	0	0	0	99.82
265	0	0	0	0	93.4
266	0	0	0	0	99.82
267	0	0	0	0	92.39
268	0	0	0	0	94.47
269	0	0	0	0	94.83
270	0	0	0	0	100
271	0	0	0	0	94.74
272	0	0	0	0	100
273	0	0	0	0	94.74
274	0	0	0	0	94.83
275	0	0	0	0	97.1
276	0	0	0	0	91.92
277	0	0	0	0	93.65
278	0	0	0	0	93.56
279	0	0	0	0	93.19
280	0	0	0	0	93.19
281	0	0	0	0	93.38
282	0	0	0	0	92.65
283	0	0	0	0	93.1
284	0	0	0	0	94.37
285	0	0	0	0	89.47
286	0	0	0	0	91.92
287	0	0	0	0	90.83
288	0	0	0	0	91.29
289	0	0	0	0	93.47
290	0	0	0	0	94.46
291	0	0	0	0	94.46
292	0	0	0	0	95.46
293	0	0	0	0	94.65
294	0	0	0	0	93.56
295	0	0	0	0	93.17
296	0	0	0	0	94.54

297	0	0	0	0	95.17
298	0	0	0	0	95.26
299	0	0	0	0	91.53
300	0	0	0	0	95.26
301	0	0	0	0	93.35
302	0	0	0	0	95.36
303	0	0	0	0	95.99
304	0	0	0	0	95.26
305	0	0	0	0	95.63
306	0	0	0	0	95.08
307	0	0	0	0	95.63
308	0	0	0	0	91.17
309	0	0	0	0	93.9
310	0	0	0	0	96.36
311	0	0	0	0	95.9
312	0	0	0	0	96.54
313	0	0	0	0	95.25
314	0	0	0	0	95.14
315	0	0	0	0	97.61
316	0	0	0	0	93.85
317	0	0	0	0	92.57
318	0	0	0	0	95.14
319	0	0	0	0	94.57
320	0	0	0	0	95.3
321	0	0	0	0	95.58
322	0	0	0	0	94.48
323	0	0	0	0	92.56
324	0	0	0	0	94.3
325	0	0	0	0	96.14
326	0	0	0	0	95.22
327	0	0	0	0	94.12
328	0	0	0	0	91.73
329	0	0	0	0	92.1

330	0	0	0	0	95.4
331	0	0	0	0	95.22
332	0	0	0	0	94.03
333	0	0	0	0	93.57
334	0	0	0	0	94.94
335	0	0	0	0	92.74
336	0	0	0	0	94.94
337	0	0	0	0	94.03
338	0	0	0	0	93.75
339	0	0	0	0	94.39
340	0	0	0	0	94.85
341	0	0	0	0	95.22
342	0	0	0	0	95.13
343	0	0	0	0	96.51
344	0	0	0	0	96.41
345	0	0	0	0	95.95
346	0	0	0	0	97.42
347	0	0	0	0	97.17
348	1	0	0	0	99.1
349	1	1	0	0	98.1
350	1	2	0	0	98.74
351	1	3	0	0	98.56
352	1	4	0	0	97.31
353	1	5	0	0	97.94
354	1	6	0	0	97.94
355	1	7	0	0	98.49
356	1	8	0	0	97.33
357	1	9	0	0	95.37
358	1	10	0	0	97.68
359	1	11	0	0	97.86
360	1	12	0	0	98.13
361	1	13	0	0	97.5
362	1	14	0	0	97.14

363	1	15	0	0	95.27
364	1	16	0	0	98.75
365	1	17	0	0	96.7
366	1	18	0	0	96.7
367	1	19	0	0	95.18
368	1	20	0	0	95.54
369	1	21	0	0	94.91
370	1	22	0	0	96.52
371	1	23	0	0	94.38
372	1	24	0	0	96.16
373	1	25	0	0	96.88
374	1	26	0	0	97.95
375	1	27	0	0	96.16
376	1	28	0	0	93.65
377	1	29	0	0	96.42
378	1	30	0	0	98.21
379	1	31	0	0	96.33
380	1	32	0	0	98.03
381	1	33	0	0	96.6
382	1	34	0	0	95.17
383	1	35	0	0	96.87
384	1	36	0	0	97.32
385	1	37	0	0	96.78
386	1	38	0	0	96.6
387	1	39	0	0	95.71
388	1	40	0	0	96.7
389	1	41	0	0	97.5
390	1	42	0	0	98.48
391	1	43	0	0	95.09
392	1	44	0	0	95.87
393	1	45	0	0	95.87
394	1	46	0	0	96.59
395	1	47	0	0	97.04

396	1	48	0	0	95.06
397	1	49	0	0	94.88
398	1	50	0	0	95.51
399	1	51	0	0	96.32
400	1	52	0	0	94.97
401	1	53	0	0	93.42
402	1	54	0	0	93.78
403	1	55	0	0	95.59
404	1	56	0	0	97.12
405	1	57	0	0	92.97
406	1	58	0	0	92.34
407	1	59	0	0	89.82
408	1	60	0	0	89.37
409	1	61	0	0	95.05
410	1	62	0	0	94.86
411	1	63	0	0	96.31
412	1	64	0	0	95.86
413	1	65	0	0	97.75
414	1	66	0	0	94.14
415	1	67	0	0	96.49
416	1	68	0	0	97.3
417	1	69	0	0	93.24
418	1	70	0	0	89.73
419	1	71	0	0	93.6
420	1	72	0	0	93.6
421	1	73	0	0	96.31
422	1	74	0	0	99.64
423	1	75	0	0	96.22
424	1	76	0	0	95.59
425	1	77	0	0	93.51
426	1	78	0	0	97.21
427	1	79	0	0	96.22
428	1	80	0	0	95.83

429	1	81	0	0	94.75
430	1	82	0	0	93.3
431	1	83	0	0	89.13
432	1	84	0	0	99.46
433	1	85	0	0	91.67
434	1	86	0	0	93.66
435	1	87	0	0	96.1
436	1	88	0	0	94.74
437	1	89	0	0	97.28
438	1	90	0	0	95.37
439	1	91	0	0	96.37
440	1	92	0	0	93.01
441	1	93	0	0	94.27
442	1	94	0	0	95.45
443	1	95	0	0	94.36
444	1	96	0	0	95.91
445	1	97	0	0	94.27
446	1	98	0	0	95.09
447	1	99	0	0	95.45
448	1	100	0	0	95.45
449	1	101	0	0	95.63
450	1	102	0	0	96.08
451	1	103	0	0	92.87
452	1	104	0	0	95.98
453	1	105	0	0	95.06
454	1	106	0	0	93.33
455	1	107	0	0	92.86
456	1	108	0	0	92.31
457	1	109	0	0	94.59
458	1	110	0	0	95.4
459	1	111	0	0	95.02
460	1	112	0	0	93.45
461	1	113	0	0	93.36

462	1	114	0	0	94.83
463	1	115	0	0	94.37
464	1	116	0	0	91.79
465	1	117	0	0	89.09
466	1	118	0	0	92.05
467	1	119	0	0	92.59
468	1	120	0	0	90.93
469	1	121	0	0	94.17
470	1	122	0	0	96.2
471	1	123	0	0	95.83
472	1	124	0	0	95.19
473	1	125	0	0	95.28
474	1	126	0	0	86.76
475	1	127	0	0	85.83
476	1	128	0	0	88.98
477	1	129	0	0	91.11
478	1	130	0	0	89.44
479	1	131	0	0	93.24
480	1	132	0	0	95.09
481	1	133	0	0	96.02
482	1	134	0	0	95.74
483	1	135	0	0	92.69
484	1	136	0	0	94.17
485	1	137	0	0	96.2
486	1	138	0	0	98.15
487	1	139	0	0	97.13
488	1	140	0	0	95.19
489	1	141	0	0	94.91
490	1	142	0	0	96.85
491	1	143	0	0	97.69
492	1	144	0	0	94.26
493	1	145	0	0	93.15
494	1	146	0	0	95.46

495	1	147	0	0	97.13
496	1	148	0	0	97.69
497	1	149	0	0	96.39
498	1	150	0	0	95.83
499	1	151	0	0	93.06
500	1	152	0	0	96.2
501	1	153	0	0	95
502	1	154	0	0	95.56
503	1	155	0	0	93.8
504	1	156	0	0	92.78
505	1	157	0	0	94.44
506	1	158	0	0	97.87
507	1	159	0	0	96.32
508	1	160	0	0	94.87
509	1	161	0	0	92.95
510	1	162	0	0	94.93
511	1	163	0	0	95.47
512	1	164	0	0	95.65
513	1	165	0	0	94.96
514	1	166	0	0	93.44
515	1	167	0	0	96.22
516	1	168	0	0	96.13
517	1	169	0	0	95.03
518	1	170	0	0	94.13
519	1	171	0	0	97.55
520	1	172	0	0	96.59
521	1	173	0	0	96.17
522	1	174	0	0	98.71
523	1	175	0	0	97.38
524	1	176	0	0	98.11
525	1	177	0	0	97.22
526	1	178	0	0	97.23
527	1	179	0	0	97.49

528	1	180	0	0	98.03
529	1	181	0	0	96.95
530	1	182	0	0	96.41
531	1	183	0	0	93.1
532	1	184	0	0	95.97
533	1	185	0	0	95.79
534	1	186	0	0	96.95
535	1	187	0	0	95.07
536	1	188	0	0	94.6
537	1	189	0	0	97.13
538	1	190	0	0	98.11
539	1	191	0	0	97.21
540	1	192	0	0	95.59
541	1	193	0	0	91.94
542	1	194	0	0	94.87
543	1	195	0	0	95.86
544	1	196	0	0	96.85
545	1	197	0	0	93.71
546	1	198	0	0	93.08
547	1	199	0	0	92.46
548	1	200	0	0	93.91
549	1	201	0	0	93.53
550	1	202	0	0	90
551	1	203	0	0	89.32
552	1	204	0	0	89.05
553	1	205	0	0	87.92
554	1	206	0	0	85.16
555	1	207	0	0	74.6
556	1	208	0	0	82.62
557	1	209	0	0	86.69
558	1	210	0	0	91.71
559	1	211	0	0	94.68
560	1	212	0	0	96.15

561	1	213	0	0	95.79
562	1	214	0	0	97.75
563	1	215	0	0	97.21
564	1	216	0	0	97.39
565	1	217	0	0	96.67
566	1	218	0	0	98.29
567	1	219	0	0	97.12
568	1	220	0	0	96.14
569	1	221	0	0	95.33
570	1	222	0	0	96.13
571	1	223	0	0	95.6
572	1	224	0	0	98.47
573	1	225	0	0	97.21
574	1	226	0	0	98.03
575	1	227	0	0	95.14
576	1	228	0	0	92.86
577	1	229	0	0	96.51
578	1	230	0	0	96.24
579	1	231	0	0	97.85
580	1	232	0	0	96.23
581	1	233	0	0	95.68
582	1	234	0	0	96.33
583	1	235	0	0	95.69
584	1	236	0	0	95.77
585	1	237	0	0	87.28
586	1	238	0	0	89.73
587	1	239	0	0	91.41
588	1	240	0	0	92.23
589	1	241	0	0	93.62
590	1	242	0	0	93.3
591	1	243	0	0	93.49
592	1	244	0	0	96.33
593	1	245	0	0	95.62

594	1	246	0	0	94.5
595	1	247	0	0	95.92
596	1	248	0	0	99.64
597	1	249	0	0	93.05
598	1	250	0	0	94.84
599	1	251	0	0	96.42
600	1	252	0	0	95.73
601	1	253	0	0	94.67
602	1	254	0	0	94.83
603	1	255	0	0	96.27
604	1	256	0	0	92.26
605	1	257	0	0	94.85
606	1	258	0	0	94.22
607	1	259	0	0	94.98
608	1	260	0	0	93.99
609	1	261	0	0	94.12
610	1	262	0	0	95.1
611	1	263	0	0	96.8
612	1	264	0	0	96.11
613	1	265	0	0	95.36
614	1	266	0	0	95.29
615	1	267	0	0	93.76
616	1	268	0	0	93.98
617	1	269	0	0	99.82
618	1	270	0	0	96.45
619	1	271	0	0	96.29
620	1	272	0	0	94.62
621	1	273	0	0	95.4
622	1	274	0	0	95.3
623	1	275	0	0	95.95
624	1	276	0	0	100
625	1	277	0	0	96.21
626	1	278	0	0	95.03

627	1	279	0	0	95.33
628	1	280	0	0	93.87
629	1	281	0	0	95.81
630	1	282	0	0	96.78
631	1	283	0	0	97.86
632	1	284	0	0	95.8
633	1	285	0	0	93.61
634	1	286	0	0	94.91
635	1	287	0	0	95.86
636	1	288	0	0	95.86
637	1	289	0	0	91.79
638	1	290	0	0	93.82
639	1	291	0	0	97.04
640	1	292	0	0	96.47
641	1	293	0	0	95.42
642	1	294	0	0	93.26
643	1	295	0	0	93.17
644	1	296	0	0	94.75
645	1	297	0	0	94.92
646	1	298	0	0	95.08
647	1	299	0	0	92.92
648	1	300	0	0	93.44
649	1	301	0	0	95.94
650	1	302	0	0	96.98
651	1	303	0	0	97.67
652	1	304	0	0	94.73
653	1	305	0	0	95.16
654	1	306	0	0	95.08
655	1	307	0	0	93.52
656	1	308	0	0	93.09
657	1	309	0	0	92.06
658	1	310	0	0	96.63
659	1	311	0	0	94.21

660	1	312	0	0	94.65
661	1	313	0	0	94.99
662	1	314	0	0	95.42
663	1	315	0	0	96.19
664	1	316	0	0	96.89
665	1	317	0	0	97.66
666	1	318	0	0	96.01
667	1	319	0	0	93.91
668	1	320	0	0	93.83
669	1	321	0	0	93.39
670	1	322	0	0	95.3
671	1	323	0	0	93.13
672	1	324	0	0	94.7
673	1	325	0	0	96.26
674	1	326	0	0	97.04
675	1	327	0	0	94.87
676	1	328	0	0	96.09
677	1	329	0	0	93.91
678	1	330	0	0	94.26
679	1	331	0	0	94.61
680	1	332	0	0	97.04
681	1	333	0	0	95.22
682	1	334	0	0	94.51
683	1	335	0	0	95.42
684	1	336	0	0	94.64
685	1	337	0	0	94.81
686	1	338	0	0	92.21
687	1	339	0	0	92.23
688	1	340	0	0	92.92
689	1	341	0	0	95.08
690	1	342	0	0	95.6
691	1	343	0	0	93.02
692	1	344	0	0	94.4

693	1	345	0	0	96.12
694	1	346	0	0	94.58
695	1	347	1	0	98.94
696	1	348	1	1	97.95
697	1	349	1	2	96.96
698	1	350	1	3	98.3
699	1	351	1	4	96.07
700	1	352	1	5	95.63
701	1	353	1	6	97.76
702	1	354	1	7	96.86
703	1	355	1	8	94.97
704	1	356	1	9	93.72
705	1	357	1	10	95.23
706	1	358	1	11	95.23
707	1	359	1	12	97.12
708	1	360	1	13	95.5
709	1	361	1	14	95.7
710	1	362	1	15	96.06
711	1	363	1	16	98.3
712	1	364	1	17	98.48
713	1	365	1	18	96.51
714	1	366	1	19	95.52
715	1	367	1	20	96.96
716	1	368	1	21	96.78
717	1	369	1	22	95.08
718	1	370	1	23	96.78
719	1	371	1	24	94.1
720	1	372	1	25	96.88
721	1	373	1	26	96.16
722	1	374	1	27	96.96
723	1	375	1	28	95.45
724	1	376	1	29	95.27
725	1	377	1	30	95.71

726	1	378	1	31	94.18
727	1	379	1	32	95.7
728	1	380	1	33	93.82
729	1	381	1	34	95.88
730	1	382	1	35	97.13
731	1	383	1	36	97.22
732	1	384	1	37	96.95
733	1	385	1	38	96.86
734	1	386	1	39	91.76
735	1	387	1	40	96.95
736	1	388	1	41	96.77
737	1	389	1	42	96.24
738	1	390	1	43	96.06
739	1	391	1	44	97.67
740	1	392	1	45	96.77
741	1	393	1	46	96.06
742	1	394	1	47	95.97
743	1	395	1	48	94.62
744	1	396	1	49	95.25
745	1	397	1	50	96.42
746	1	398	1	51	95.34
747	1	399	1	52	93.37
748	1	400	1	53	92.56
749	1	401	1	54	90.14
750	1	402	1	55	89.87
751	1	403	1	56	91.67
752	1	404	1	57	94.98
753	1	405	1	58	95.43
754	1	406	1	59	93.55
755	1	407	1	60	94.71
756	1	408	1	61	95.69
757	1	409	1	62	95.69
758	1	410	1	63	93.72

759	1	411	1	64	93.72
760	1	412	1	65	100
761	1	413	1	66	93.72
762	1	414	1	67	95.78
763	1	415	1	68	98.2
764	1	416	1	69	95.69
765	1	417	1	70	96.39
766	1	418	1	71	97.11
767	1	419	1	72	97.3
768	1	420	1	73	96.22
769	1	421	1	74	94.24
770	1	422	1	75	94.33
771	1	423	1	76	94.33
772	1	424	1	77	93.97
773	1	425	1	78	94.87
774	1	426	1	79	93.17
775	1	427	1	80	92.45
776	1	428	1	81	94.78
777	1	429	1	82	89.03
778	1	430	1	83	91.1
779	1	431	1	84	91.91
780	1	432	1	85	93.35
781	1	433	1	86	93.97
782	1	434	1	87	92.18
783	1	435	1	88	94.42
784	1	436	1	89	93.71
785	1	437	1	90	100
786	1	438	1	91	100
787	1	439	1	92	90.84
788	1	440	1	93	92.64
789	1	441	1	94	93.99
790	1	442	1	95	96.77
791	1	443	1	96	95.69

792	1	444	1	97	91.92
793	1	445	1	98	93.81
794	1	446	1	99	93.81
795	1	447	1	100	94.7
796	1	448	1	101	94.08
797	1	449	1	102	91.29
798	1	450	1	103	100
799	1	451	1	104	93.82
800	1	452	1	105	93.63
801	1	453	1	106	92.1
802	1	454	1	107	94.98
803	1	455	1	108	94.09
804	1	456	1	109	94.89
805	1	457	1	110	94.62
806	1	458	1	111	90.68
807	1	459	1	112	89.78
808	1	460	1	113	92.74
809	1	461	1	114	92.11
810	1	462	1	115	90.5
811	1	463	1	116	89.52
812	1	464	1	117	90.86
813	1	465	1	118	93.64
814	1	466	1	119	94.8
815	1	467	1	120	92.56
816	1	468	1	121	94.44
817	1	469	1	122	95.61
818	1	470	1	123	93.55
819	1	471	1	124	92.65
820	1	472	1	125	93.55
821	1	473	1	126	93.37
822	1	474	1	127	94.35
823	1	475	1	128	95.52
824	1	476	1	129	95.34

825	1	477	1	130	90.23
826	1	478	1	131	91.58
827	1	479	1	132	95.97
828	1	480	1	133	95.25
829	1	481	1	134	94.18
830	1	482	1	135	93.73
831	1	483	1	136	93.46
832	1	484	1	137	93.73
833	1	485	1	138	96.06
834	1	486	1	139	94.89
835	1	487	1	140	91.4
836	1	488	1	141	94.89
837	1	489	1	142	93.74
838	1	490	1	143	90.98
839	1	491	1	144	93.43
840	1	492	1	145	93.59
841	1	493	1	146	91.46
842	1	494	1	147	95.08
843	1	495	1	148	93.92
844	1	496	1	149	93.65
845	1	497	1	150	93.74
846	1	498	1	151	96.33
847	1	499	1	152	96.6
848	1	500	1	153	97.68
849	1	501	1	154	93.84
850	1	502	1	155	93.66
851	1	503	1	156	96.34
852	1	504	1	157	96.25
853	1	505	1	158	94.55
854	1	506	1	159	94.11
855	1	507	1	160	94.67
856	1	508	1	161	95.39
857	1	509	1	162	94.68

858	1	510	1	163	93.17
859	1	511	1	164	91.05
860	1	512	1	165	94.35
861	1	513	1	166	94.64
862	1	514	1	167	96.31
863	1	515	1	168	93.4
864	1	516	1	169	94.36
865	1	517	1	170	94.62
866	1	518	1	171	92.53
867	1	519	1	172	93.23
868	1	520	1	173	93.23

Appendix K

Weekly Attendance Data Six Parameter Three-Phase Intervention Model Design Matrix

Weekly Attendance Data Six Parameter Three-Phase Intervention Model Design Matrix

1	0	0	0	0	98.51
2	0	0	0	0	96.72
3	0	0	0	0	94.49
4	0	0	0	0	96.04
5	0	0	0	0	96.66
6	0	0	0	0	96.58
7	0	0	0	0	95.99
8	0	0	0	0	94.86
9	0	0	0	0	95.77
10	0	0	0	0	95.64
11	0	0	0	0	95.32
12	0	0	0	0	93.79
13	0	0	0	0	96.97
14	0	0	0	0	93.7
15	0	0	0	0	93.56
16	0	0	0	0	93.29
17	0	0	0	0	95.28
18	0	0	0	0	92.12
19	0	0	0	0	91.26
20	0	0	0	0	93.42
21	0	0	0	0	91.79
22	0	0	0	0	94.4
23	0	0	0	0	94.83
24	0	0	0	0	93.04
25	0	0	0	0	94.18
26	0	0	0	0	91.1
27	0	0	0	0	92.99
28	0	0	0	0	94.8
29	0	0	0	0	94.98
30	0	0	0	0	95.8
31	0	0	0	0	95.55
32	0	0	0	0	95.38

33	0	0	0	0	95.57
34	0	0	0	0	94.98
35	0	0	0	0	96.11
36	0	0	0	0	94.97
37	0	0	0	0	94.71
38	0	0	0	0	95.37
39	0	0	0	0	98.66
40	0	0	0	0	97.76
41	0	0	0	0	97.24
42	0	0	0	0	96.69
43	0	0	0	0	96.59
44	0	0	0	0	97.45
45	0	0	0	0	95.59
46	0	0	0	0	94.52
47	0	0	0	0	93.96
48	0	0	0	0	94.68
49	0	0	0	0	95.12
50	0	0	0	0	93.75
51	0	0	0	0	95.09
52	0	0	0	0	95.18
53	0	0	0	0	95.83
54	0	0	0	0	94.1
55	0	0	0	0	97.15
56	0	0	0	0	94.03
57	0	0	0	0	31.34
58	0	0	0	0	96.11
59	0	0	0	0	95.29
60	0	0	0	0	95.72
61	0	0	0	0	93.4
62	0	0	0	0	92.6
63	0	0	0	0	92.4
64	0	0	0	0	94.53
65	0	0	0	0	94.54
66	0	0	0	0	94.3
67	0	0	0	0	94.55

68	0	0	0	0	95.59
69	0	0	0	0	94.86
70	0	0	0	0	94.5
71	0	0	0	0	94.3
72	0	0	0	0	94.06
73	0	0	0	0	94.08
74	0	0	0	0	94.9
75	0	0	0	0	96.69
76	1	0	0	0	98.63
77	1	1	0	0	97.8
78	1	2	0	0	97.31
79	1	3	0	0	96.91
80	1	4	0	0	95.3
81	1	5	0	0	96.16
82	1	6	0	0	97.12
83	1	7	0	0	96.55
84	1	8	0	0	96.69
85	1	9	0	0	96.34
86	1	10	0	0	95.35
87	1	11	0	0	94.58
88	1	12	0	0	91.08
89	1	13	0	0	94.29
90	1	14	0	0	95.78
91	1	15	0	0	94.58
92	1	16	0	0	95.75
93	1	17	0	0	94.49
94	1	18	0	0	93.81
95	1	19	0	0	95.35
96	1	20	0	0	94.85
97	1	21	0	0	95.54
98	1	22	0	0	94.31
99	1	23	0	0	94.03
100	1	24	0	0	93.56
101	1	25	0	0	91.17
102	1	26	0	0	95.33
103	1	27	0	0	88.43

104	1	28	0	0	94.56
105	1	29	0	0	96.17
106	1	30	0	0	95.37
107	1	31	0	0	96.5
108	1	32	0	0	94.72
109	1	33	0	0	95.26
110	1	34	0	0	94.79
111	1	35	0	0	95.2
112	1	36	0	0	96.11
113	1	37	0	0	97.86
114	1	38	0	0	97.22
115	1	39	0	0	95.38
116	1	40	0	0	96.53
117	1	41	0	0	94.65
118	1	42	0	0	92.59
119	1	43	0	0	85.21
120	1	44	0	0	90.37
121	1	45	0	0	97.03
122	1	46	0	0	96.71
123	1	47	0	0	97.09
124	1	48	0	0	94
125	1	49	0	0	96.5
126	1	50	0	0	92.96
127	1	51	0	0	92.81
128	1	52	0	0	96.4
129	1	53	0	0	94.94
130	1	54	0	0	94.45
131	1	55	0	0	94.43
132	1	56	0	0	95.73
133	1	57	0	0	96.06
134	1	58	0	0	95.32
135	1	59	0	0	96.09
136	1	60	0	0	95.97
137	1	61	0	0	94.6
138	1	62	0	0	95.2
139	1	63	0	0	94.17

140	1	64	0	0	96.01
141	1	65	0	0	94.32
142	1	66	0	0	94.51
143	1	67	0	0	96.44
144	1	68	0	0	93.91
145	1	69	0	0	95.79
146	1	70	0	0	95.01
147	1	71	0	0	94.32
148	1	72	0	0	93.96
149	1	73	0	0	94.53
150	1	74	1	0	98.04
151	1	75	1	1	96.26
152	1	76	1	2	95.36
153	1	77	1	3	97.01
154	1	78	1	4	96.22
155	1	79	1	5	95.91
156	1	80	1	6	94.93
157	1	81	1	7	96.81
158	1	82	1	8	95.43
159	1	83	1	9	96.51
160	1	84	1	10	95
161	1	85	1	11	91.35
162	1	86	1	12	93.1
163	1	87	1	13	94.71
164	1	88	1	14	96.68
165	1	89	1	15	96.25
166	1	90	1	16	94.14
167	1	91	1	17	92.09
168	1	92	1	18	92.5
169	1	93	1	19	95.79
170	1	94	1	20	94.2
171	1	95	1	21	93.54
172	1	96	1	22	94.89
173	1	97	1	23	93.85
174	1	98	1	24	91.29
175	1	99	1	25	92.28

176	1	100	1	26	93.96
177	1	101	1	27	93.76
178	1	102	1	28	94.14
179	1	103	1	29	94.53
180	1	104	1	30	92.89
181	1	105	1	31	93.54
182	1	106	1	32	95.64
183	1	107	1	33	94.98
184	1	108	1	34	93.79
185	1	109	1	35	94.67
186	1	110	1	36	93.59

Appendix L

Daily Suspension Data Six Parameter Three-Phase Intervention Model Design Matrix

Daily Suspension Data Six Parameter Three-Phase Intervention Model
Design Matrix

1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0.19
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	0	0
16	0	0	0	0	0
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	0	0
20	0	0	0	0	0
21	0	0	0	0	0
22	0	0	0	0	0
23	0	0	0	0	0
24	0	0	0	0	0
25	0	0	0	0	0
26	0	0	0	0	0
27	0	0	0	0	0
28	0	0	0	0	0
29	0	0	0	0	0
30	0	0	0	0	0
31	0	0	0	0	0
32	0	0	0	0	0.19
33	0	0	0	0	0

34	0	0	0	0	0.19
35	0	0	0	0	0
36	0	0	0	0	0
37	0	0	0	0	0
38	0	0	0	0	0
39	0	0	0	0	0
40	0	0	0	0	0
41	0	0	0	0	0
42	0	0	0	0	0
43	0	0	0	0	0
44	0	0	0	0	0
45	0	0	0	0	0
46	0	0	0	0	0
47	0	0	0	0	0
48	0	0	0	0	0
49	0	0	0	0	0
50	0	0	0	0	0
51	0	0	0	0	0
52	0	0	0	0	0
53	0	0	0	0	0
54	0	0	0	0	0
55	0	0	0	0	0
56	0	0	0	0	0
57	0	0	0	0	0
58	0	0	0	0	0
59	0	0	0	0	0
60	0	0	0	0	0
61	0	0	0	0	0
62	0	0	0	0	0.39
63	0	0	0	0	0
64	0	0	0	0	0.19
65	0	0	0	0	0
66	0	0	0	0	0
67	0	0	0	0	0
68	0	0	0	0	0
69	0	0	0	0	0

70	0	0	0	0	0
71	0	0	0	0	0
72	0	0	0	0	0.58
73	0	0	0	0	0.19
74	0	0	0	0	0
75	0	0	0	0	0
76	0	0	0	0	0
77	0	0	0	0	0
78	0	0	0	0	0
79	0	0	0	0	0
80	0	0	0	0	0
81	0	0	0	0	0
82	0	0	0	0	0
83	0	0	0	0	0
84	0	0	0	0	0
85	0	0	0	0	0.19
86	0	0	0	0	0
87	0	0	0	0	0
88	0	0	0	0	0
89	0	0	0	0	0
90	0	0	0	0	0
91	0	0	0	0	0
92	0	0	0	0	0
93	0	0	0	0	0
94	0	0	0	0	0
95	0	0	0	0	0
96	0	0	0	0	0
97	0	0	0	0	0
98	0	0	0	0	0
99	0	0	0	0	0
100	0	0	0	0	0
101	0	0	0	0	0
102	0	0	0	0	0
103	0	0	0	0	0.19
104	0	0	0	0	0
105	0	0	0	0	0

106	0	0	0	0	0
107	0	0	0	0	0
108	0	0	0	0	0
109	0	0	0	0	0
110	0	0	0	0	0
111	0	0	0	0	0.19
112	0	0	0	0	0
113	0	0	0	0	0
114	0	0	0	0	0
115	0	0	0	0	0
116	0	0	0	0	0
117	0	0	0	0	0
118	0	0	0	0	0
119	0	0	0	0	0
120	0	0	0	0	0
121	0	0	0	0	0
122	0	0	0	0	0
123	0	0	0	0	0
124	0	0	0	0	0
125	0	0	0	0	0
126	0	0	0	0	0
127	0	0	0	0	0
128	0	0	0	0	0.36
129	0	0	0	0	0
130	0	0	0	0	0
131	0	0	0	0	0
132	0	0	0	0	0
133	0	0	0	0	0
134	0	0	0	0	0
135	0	0	0	0	0
136	0	0	0	0	0
137	0	0	0	0	0
138	0	0	0	0	0
139	0	0	0	0	0
140	0	0	0	0	0
141	0	0	0	0	0.17

142	0	0	0	0	0
143	0	0	0	0	0.17
144	0	0	0	0	0
145	0	0	0	0	0
146	0	0	0	0	0
147	0	0	0	0	0
148	0	0	0	0	0
149	0	0	0	0	0
150	0	0	0	0	0
151	0	0	0	0	0
152	0	0	0	0	0.17
153	0	0	0	0	0
154	0	0	0	0	0
155	0	0	0	0	0
156	0	0	0	0	0
157	0	0	0	0	0
158	0	0	0	0	0.17
159	0	0	0	0	0
160	0	0	0	0	0
161	0	0	0	0	0
162	0	0	0	0	0
163	0	0	0	0	0
164	0	0	0	0	0
165	0	0	0	0	0
166	0	0	0	0	0
167	0	0	0	0	0
168	0	0	0	0	0
169	0	0	0	0	0
170	0	0	0	0	0
171	0	0	0	0	0
172	0	0	0	0	0
173	0	0	0	0	0
174	0	0	0	0	0
175	0	0	0	0	0
176	0	0	0	0	0
177	0	0	0	0	0

178	0	0	0	0	0
179	0	0	0	0	0
180	0	0	0	0	0
181	0	0	0	0	0
182	0	0	0	0	0
183	0	0	0	0	0.36
184	0	0	0	0	0
185	0	0	0	0	0
186	0	0	0	0	0
187	0	0	0	0	0.18
188	0	0	0	0	0
189	0	0	0	0	0
190	0	0	0	0	0
191	0	0	0	0	0
192	0	0	0	0	0.54
193	0	0	0	0	0
194	0	0	0	0	0
195	0	0	0	0	0
196	0	0	0	0	0
197	0	0	0	0	0
198	0	0	0	0	0.18
199	0	0	0	0	0
200	0	0	0	0	0.18
201	0	0	0	0	0
202	0	0	0	0	0
203	0	0	0	0	0
204	0	0	0	0	0
205	0	0	0	0	0
206	0	0	0	0	0
207	0	0	0	0	0
208	0	0	0	0	0.36
209	0	0	0	0	0.18
210	0	0	0	0	0.18
211	0	0	0	0	0
212	0	0	0	0	0
213	0	0	0	0	0

214	0	0	0	0	0
215	0	0	0	0	0
216	0	0	0	0	0
217	0	0	0	0	0
218	0	0	0	0	0
219	0	0	0	0	0
220	0	0	0	0	0.18
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222	0	0	0	0	0
223	0	0	0	0	0
224	0	0	0	0	0
225	0	0	0	0	0
226	0	0	0	0	0.18
227	0	0	0	0	0
228	0	0	0	0	0
229	0	0	0	0	0
230	0	0	0	0	0
231	0	0	0	0	0.18
232	0	0	0	0	0
233	0	0	0	0	0
234	0	0	0	0	0
235	0	0	0	0	0.18
236	0	0	0	0	0
237	0	0	0	0	0
238	0	0	0	0	0
239	0	0	0	0	0
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244	0	0	0	0	0
245	0	0	0	0	0
246	0	0	0	0	0
247	0	0	0	0	0
248	0	0	0	0	0
249	0	0	0	0	0

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251	0	0	0	0	0
252	0	0	0	0	0
253	0	0	0	0	0
254	0	0	0	0	0
255	0	0	0	0	0
256	0	0	0	0	0
257	0	0	0	0	0
258	0	0	0	0	0
259	0	0	0	0	0
260	0	0	0	0	0.36
261	0	0	0	0	0
262	0	0	0	0	0
263	0	0	0	0	0
264	0	0	0	0	0
265	0	0	0	0	0
266	0	0	0	0	0
267	0	0	0	0	0.18
268	0	0	0	0	0
269	0	0	0	0	0
270	0	0	0	0	0
271	0	0	0	0	0
272	0	0	0	0	0
273	0	0	0	0	0.18
274	0	0	0	0	0
275	0	0	0	0	0
276	0	0	0	0	0
277	0	0	0	0	0
278	0	0	0	0	0
279	0	0	0	0	0.18
280	0	0	0	0	0
281	0	0	0	0	0.91
282	0	0	0	0	0
283	0	0	0	0	0
284	0	0	0	0	0.18
285	0	0	0	0	0

286	0	0	0	0	0
287	0	0	0	0	0
288	0	0	0	0	0
289	0	0	0	0	0
290	0	0	0	0	0
291	0	0	0	0	0
292	0	0	0	0	0
293	0	0	0	0	0.54
294	0	0	0	0	0
295	0	0	0	0	0
296	0	0	0	0	0
297	0	0	0	0	0
298	0	0	0	0	0
299	0	0	0	0	0
300	0	0	0	0	0.36
301	0	0	0	0	0.18
302	0	0	0	0	0
303	0	0	0	0	0
304	0	0	0	0	0
305	0	0	0	0	0
306	0	0	0	0	0
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310	0	0	0	0	0
311	0	0	0	0	0
312	0	0	0	0	0.18
313	0	0	0	0	0.18
314	0	0	0	0	0
315	0	0	0	0	0
316	0	0	0	0	0
317	0	0	0	0	0
318	0	0	0	0	0
319	0	0	0	0	0
320	0	0	0	0	0.74
321	0	0	0	0	0.37

322	0	0	0	0	0
323	0	0	0	0	0
324	0	0	0	0	0
325	0	0	0	0	0.18
326	0	0	0	0	0
327	0	0	0	0	0.37
328	0	0	0	0	0.18
329	0	0	0	0	0.18
330	0	0	0	0	0
331	0	0	0	0	0
332	0	0	0	0	0
333	0	0	0	0	0
334	0	0	0	0	0
335	0	0	0	0	0
336	0	0	0	0	0
337	0	0	0	0	0
338	0	0	0	0	0
339	0	0	0	0	0
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345	0	0	0	0	0
346	0	0	0	0	0
347	0	0	0	0	0
348	1	c	0	0	0
349	1	1	0	0	0
350	1	2	0	0	0
351	1	3	0	0	0
352	1	4	0	0	0
353	1	5	0	0	0
354	1	6	0	0	0
355	1	7	0	0	0
356	1	8	0	0	0
357	1	9	0	0	0

358	1	10	0	0	0
359	1	11	0	0	0
360	1	12	0	0	0
361	1	13	0	0	0
362	1	14	0	0	0
363	1	15	0	0	0
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365	1	17	0	0	0
366	1	18	0	0	0
367	1	19	0	0	0
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369	1	21	0	0	0
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373	1	25	0	0	0
374	1	26	0	0	0
375	1	27	0	0	0
376	1	28	0	0	0
377	1	29	0	0	0
378	1	30	0	0	0
379	1	31	0	0	0
380	1	32	0	0	0
381	1	33	0	0	0
382	1	34	0	0	0
383	1	35	0	0	0
384	1	36	0	0	0.18
385	1	37	0	0	0
386	1	38	0	0	0
387	1	39	0	0	0
388	1	40	0	0	0
389	1	41	0	0	0
390	1	42	0	0	0
391	1	43	0	0	0
392	1	44	0	0	0
393	1	45	0	0	0

394	1	46	0	0	0
395	1	47	0	0	0.36
396	1	48	0	0	0
397	1	49	0	0	0.36
398	1	50	0	0	0
399	1	51	0	0	0.18
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402	1	54	0	0	0
403	1	55	0	0	0
404	1	56	0	0	0.18
405	1	57	0	0	0.18
406	1	58	0	0	0
407	1	59	0	0	0
408	1	60	0	0	0
409	1	61	0	0	0
410	1	62	0	0	0
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421	1	73	0	0	0
422	1	74	0	0	0
423	1	75	0	0	0
424	1	76	0	0	0
425	1	77	0	0	0.18
426	1	78	0	0	0
427	1	79	0	0	0
428	1	80	0	0	0
429	1	81	0	0	0.18

430	1	82	0	0	0
431	1	83	0	0	0
432	1	84	0	0	0
433	1	85	0	0	0
434	1	86	0	0	0
435	1	87	0	0	0
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438	1	90	0	0	0
439	1	91	0	0	0
440	1	92	0	0	0.18
441	1	93	0	0	0
442	1	94	0	0	0
443	1	95	0	0	0
444	1	96	0	0	0
445	1	97	0	0	0
446	1	98	0	0	0
447	1	99	0	0	0
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449	1	101	0	0	0
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451	1	103	0	0	0
452	1	104	0	0	0
453	1	105	0	0	0.18
454	1	106	0	0	0
455	1	107	0	0	0
456	1	108	0	0	0
457	1	109	0	0	0
458	1	110	0	0	0
459	1	111	0	0	0
460	1	112	0	0	0
461	1	113	0	0	0
462	1	114	0	0	0
463	1	115	0	0	0.18
464	1	116	0	0	0
465	1	117	0	0	0

466	1	118	0	0	0
467	1	119	0	0	0
468	1	120	0	0	0
469	1	121	0	0	0
470	1	122	0	0	0.37
471	1	123	0	0	0
472	1	124	0	0	0
473	1	125	0	0	0
474	1	126	0	0	0.74
475	1	127	0	0	0
476	1	128	0	0	0
477	1	129	0	0	0
478	1	130	0	0	0
479	1	131	0	0	0
480	1	132	0	0	0
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484	1	136	0	0	0
485	1	137	0	0	0.19
486	1	138	0	0	0
487	1	139	0	0	0
488	1	140	0	0	0
489	1	141	0	0	0
490	1	142	0	0	0.19
491	1	143	0	0	0
492	1	144	0	0	0
493	1	145	0	0	0
494	1	146	0	0	0
495	1	147	0	0	0
496	1	148	0	0	0
497	1	149	0	0	0
498	1	150	0	0	0
499	1	151	0	0	0
500	1	152	0	0	0
501	1	153	0	0	0

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503	1	155	0	0	0
504	1	156	0	0	0
505	1	157	0	0	0.37
506	1	158	0	0	0
507	1	159	0	0	0
508	1	160	0	0	0
509	1	161	0	0	0
510	1	162	0	0	0.18
511	1	163	0	0	0
512	1	164	0	0	0
513	1	165	0	0	0
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525	1	177	0	0	0
526	1	178	0	0	0
527	1	179	0	0	0
528	1	180	0	0	0
529	1	181	0	0	0
530	1	182	0	0	0
531	1	183	0	0	0
532	1	184	0	0	0
533	1	185	0	0	0
534	1	186	0	0	0.18
535	1	187	0	0	0
536	1	188	0	0	0
537	1	189	0	0	0

538	1	190	0	0	0.18
539	1	191	0	0	0
540	1	192	0	0	0
541	1	193	0	0	0
542	1	194	0	0	0
543	1	195	0	0	0
544	1	196	0	0	0
545	1	197	0	0	0
546	1	198	0	0	0
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548	1	200	0	0	0
549	1	201	0	0	0
550	1	202	0	0	0
551	1	203	0	0	0
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555	1	207	0	0	0
556	1	208	0	0	0
557	1	209	0	0	0
558	1	210	0	0	0.18
559	1	211	0	0	0
560	1	212	0	0	0
561	1	213	0	0	0
562	1	214	0	0	0
563	1	215	0	0	0.18
564	1	216	0	0	0
565	1	217	0	0	0
566	1	218	0	0	0.18
567	1	219	0	0	0
568	1	220	0	0	0
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570	1	222	0	0	0
571	1	223	0	0	0
572	1	224	0	0	0
573	1	225	0	0	0

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575	1	227	0	0	0
576	1	228	0	0	0
577	1	229	0	0	0
578	1	230	0	0	0
579	1	231	0	0	0
580	1	232	0	0	0
581	1	233	0	0	0
582	1	234	0	0	0
583	1	235	0	0	0
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585	1	237	0	0	0
586	1	238	0	0	0
587	1	239	0	0	0
588	1	240	0	0	0
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590	1	242	0	0	0
591	1	243	0	0	0
592	1	244	0	0	0.18
593	1	245	0	0	0
594	1	246	0	0	0
595	1	247	0	0	0
596	1	248	0	0	0
597	1	249	0	0	0
598	1	250	0	0	0
599	1	251	0	0	0
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602	1	254	0	0	0
603	1	255	0	0	0
604	1	256	0	0	0.17
605	1	257	0	0	0
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607	1	259	0	0	0
608	1	260	0	0	0
609	1	261	0	0	0

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612	1	264	0	0	0
613	1	265	0	0	0
614	1	266	0	0	0
615	1	267	0	0	0
616	1	268	0	0	0
617	1	269	0	0	0
618	1	270	0	0	0
619	1	271	0	0	0
620	1	272	0	0	0
621	1	273	0	0	0
622	1	274	0	0	0
623	1	275	0	0	0
624	1	276	0	0	0
625	1	277	0	0	0.18
626	1	278	0	0	0
627	1	279	0	0	0
628	1	280	0	0	0
629	1	281	0	0	0
630	1	282	0	0	0
631	1	283	0	0	0.18
632	1	284	0	0	0.18
633	1	285	0	0	0
634	1	286	0	0	0
635	1	287	0	0	0
636	1	288	0	0	0.54
637	1	289	0	0	0.18
638	1	290	0	0	0
639	1	291	0	0	0
640	1	292	0	0	0.18
641	1	293	0	0	0
642	1	294	0	0	0
643	1	295	0	0	0
644	1	296	0	0	0
645	1	297	0	0	0

646	1	298	0	0	0
647	1	299	0	0	0
648	1	300	0	0	0.35
649	1	301	0	0	0
650	1	302	0	0	0
651	1	303	0	0	0
652	1	304	0	0	0
653	1	305	0	0	0
654	1	306	0	0	0
655	1	307	0	0	0
656	1	308	0	0	0
657	1	309	0	0	0.17
658	1	310	0	0	0
659	1	311	0	0	0
660	1	312	0	0	0
661	1	313	0	0	0
662	1	314	0	0	0
663	1	315	0	0	0
664	1	316	0	0	0
665	1	317	0	0	0
666	1	318	0	0	0
667	1	319	0	0	0.17
668	1	320	0	0	0
669	1	321	0	0	0
670	1	322	0	0	0
671	1	323	0	0	0
672	1	324	0	0	0
673	1	325	0	0	0
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677	1	329	0	0	0
678	1	330	0	0	0.17
679	1	331	0	0	0
680	1	332	0	0	0
681	1	333	0	0	0

682	1	334	0	0	0
683	1	335	0	0	0.17
684	1	336	0	0	0
685	1	337	0	0	0
686	1	338	0	0	0
687	1	339	0	0	0.35
688	1	340	0	0	0
689	1	341	0	0	0
690	1	342	0	0	0
691	1	343	0	0	0
692	1	344	0	0	0
693	1	345	0	0	0.17
694	1	346	0	0	0
695	1	347	1	0	0
696	1	348	1	1	0
697	1	349	1	2	0
698	1	350	1	3	0
699	1	351	1	4	0
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701	1	353	1	6	0
702	1	354	1	7	0
703	1	355	1	8	0
704	1	356	1	9	0
705	1	357	1	10	0
706	1	358	1	11	0
707	1	359	1	12	0
708	1	360	1	13	0
709	1	361	1	14	0
710	1	362	1	15	0
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712	1	364	1	17	0
713	1	365	1	18	0
714	1	366	1	19	0
715	1	367	1	20	0
716	1	368	1	21	0
717	1	369	1	22	0.36

718	1	370	1	23	0
719	1	371	1	24	0
720	1	372	1	25	0
721	1	373	1	26	0
722	1	374	1	27	0
723	1	375	1	28	0.18
724	1	376	1	29	0
725	1	377	1	30	0
726	1	378	1	31	0
727	1	379	1	32	0
728	1	380	1	33	0
729	1	381	1	34	0
730	1	382	1	35	0
731	1	383	1	36	0
732	1	384	1	37	0
733	1	385	1	38	0
734	1	386	1	39	0
735	1	387	1	40	0
736	1	388	1	41	0
737	1	389	1	42	0
738	1	390	1	43	0
739	1	391	1	44	0
740	1	392	1	45	0
741	1	393	1	46	0.54
742	1	394	1	47	0
743	1	395	1	48	0
744	1	396	1	49	0
745	1	397	1	50	0
746	1	398	1	51	0.72
747	1	399	1	52	0
748	1	400	1	53	0
749	1	401	1	54	0
750	1	402	1	55	0
751	1	403	1	56	0
752	1	404	1	57	0
753	1	405	1	58	0

754	1	406	1	59	0
755	1	407	1	60	0
756	1	408	1	61	0
757	1	409	1	62	0.72
758	1	410	1	63	0
759	1	411	1	64	0
760	1	412	1	65	0
761	1	413	1	66	0
762	1	414	1	67	0
763	1	415	1	68	0
764	1	416	1	69	0
765	1	417	1	70	0
766	1	418	1	71	0
767	1	419	1	72	0
768	1	420	1	73	0
769	1	421	1	74	0
770	1	422	1	75	0
771	1	423	1	76	0
772	1	424	1	77	0
773	1	425	1	78	0
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776	1	428	1	81	0
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778	1	430	1	83	0
779	1	431	1	84	0
780	1	432	1	85	0
781	1	433	1	86	0.18
782	1	434	1	87	0.18
783	1	435	1	88	0
784	1	436	1	89	0
785	1	437	1	90	0
786	1	438	1	91	0
787	1	439	1	92	0
788	1	440	1	93	0
789	1	441	1	94	0

790	1	442	1	95	0
791	1	443	1	96	0
792	1	444	1	97	0
793	1	445	1	98	0
794	1	446	1	99	0.36
795	1	447	1	100	0
796	1	448	1	101	0
797	1	449	1	102	0
798	1	450	1	103	0
799	1	451	1	104	0.18
800	1	452	1	105	0
801	1	453	1	106	0
802	1	454	1	107	0
803	1	455	1	108	0
804	1	456	1	109	0
805	1	457	1	110	0.36
806	1	458	1	111	0.18
807	1	459	1	112	0
808	1	460	1	113	0.36
809	1	461	1	114	0
810	1	462	1	115	0
811	1	463	1	116	0.18
812	1	464	1	117	0
813	1	465	1	118	0
814	1	466	1	119	0.18
815	1	467	1	120	0
816	1	468	1	121	0.36
817	1	469	1	122	0
818	1	470	1	123	0
819	1	471	1	124	0
820	1	472	1	125	0
821	1	473	1	126	0
822	1	474	1	127	0
823	1	475	1	128	0
824	1	476	1	129	0
825	1	477	1	130	0

826	1	478	1	131	0
827	1	479	1	132	0
828	1	480	1	133	0
829	1	481	1	134	0
830	1	482	1	135	0.36
831	1	483	1	136	0
832	1	484	1	137	0
833	1	485	1	138	0
834	1	486	1	139	0
835	1	487	1	140	0
836	1	488	1	141	0
837	1	489	1	142	0.36
838	1	490	1	143	0
839	1	491	1	144	0
840	1	492	1	145	0
841	1	493	1	146	0
842	1	494	1	147	0
843	1	495	1	148	0
844	1	496	1	149	0.18
845	1	497	1	150	0
846	1	498	1	151	0
847	1	499	1	152	0
848	1	500	1	153	0.54
849	1	501	1	154	0
850	1	502	1	155	0
851	1	503	1	156	0
852	1	504	1	157	0
853	1	505	1	158	0
854	1	506	1	159	0
855	1	507	1	160	0
856	1	508	1	161	0
857	1	509	1	162	0
858	1	510	1	163	0
859	1	511	1	164	0
860	1	512	1	165	0.18
861	1	513	1	166	0.18

862	1	514	1	167	0.35
863	1	515	1	168	0
864	1	516	1	169	0.35
865	1	517	1	170	0
866	1	518	1	171	0
867	1	519	1	172	0
868	1	520	1	173	0

Appendix M

Weekly Suspension Data Six Parameter Three-Phase Intervention Model Design Matrix

Weekly Suspension Data Six Parameter Three-Phase Intervention Model Design Matrix

1	0	0	0	0	0
2	0	0	0	0	0.19
3	0	0	0	0	0
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0.38
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0.58
15	0	0	0	0	0
16	0	0	0	0	0.77
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	0	0.19
20	0	0	0	0	0
21	0	0	0	0	0
22	0	0	0	0	0
23	0	0	0	0	0.19
24	0	0	0	0	0.19
25	0	0	0	0	0
26	0	0	0	0	0
27	0	0	0	0	0
28	0	0	0	0	0.36
29	0	0	0	0	0
30	0	0	0	0	0
31	0	0	0	0	0.35
32	0	0	0	0	0
33	0	0	0	0	0.17
34	0	0	0	0	0.17

35	0	0	0	0	0
36	0	0	0	0	0
37	0	0	0	0	0
38	0	0	0	0	0
39	0	0	0	0	0
40	0	0	0	0	0.54
41	0	0	0	0	0.54
42	0	0	0	0	0
43	0	0	0	0	0.36
44	0	0	0	0	0
45	0	0	0	0	0.71
46	0	0	0	0	0
47	0	0	0	0	0.18
48	0	0	0	0	0.18
49	0	0	0	0	0
50	0	0	0	0	0.18
51	0	0	0	0	0.18
52	0	0	0	0	0
53	0	0	0	0	0
54	0	0	0	0	0
55	0	0	0	0	0
56	0	0	0	0	0.36
57	0	0	0	0	0
58	0	0	0	0	0.18
59	0	0	0	0	0.18
60	0	0	0	0	0.18
61	0	0	0	0	1.09
62	0	0	0	0	0
63	0	0	0	0	0.54
64	0	0	0	0	0
65	0	0	0	0	0.55
66	0	0	0	0	0
67	0	0	0	0	0.36
68	0	0	0	0	0
69	0	0	0	0	1.1
70	0	0	0	0	0.74

71	0	0	0	0	0.18
72	0	0	0	0	0
73	0	0	0	0	0
74	0	0	0	0	0
75	1	0	0	0	0
76	1	1	0	0	0
77	1	2	0	0	0
78	1	3	0	0	0
79	1	4	0	0	0
80	1	5	0	0	0
81	1	6	0	0	0
82	1	7	0	0	0.18
83	1	8	0	0	0
84	1	9	0	0	0.36
85	1	10	0	0	0.54
86	1	11	0	0	0.36
87	1	12	0	0	0
88	1	13	0	0	0
89	1	14	0	0	0
90	1	15	0	0	0
91	1	16	0	0	0.18
92	1	17	0	0	0.18
93	1	18	0	0	0
94	1	19	0	0	0.18
95	1	20	0	0	0.18
96	1	21	0	0	0.18
97	1	22	0	0	0.18
98	1	23	0	0	0
99	1	24	0	0	0.18
100	1	25	0	0	0
101	1	26	0	0	0.37
102	1	27	0	0	0.74
103	1	28	0	0	0
104	1	29	0	0	0.19
105	1	30	0	0	0.19
106	1	31	0	0	0

107	1	32	0	0	0
108	1	33	0	0	0.37
109	1	34	0	0	0.18
110	1	35	0	0	0
111	1	36	0	0	0
112	1	37	0	0	0
113	1	38	0	0	0
114	1	39	0	0	0.18
115	1	40	0	0	0.18
116	1	41	0	0	0
117	1	42	0	0	0
118	1	43	0	0	0
119	1	44	0	0	0.18
120	1	45	0	0	0.18
121	1	46	0	0	0.18
122	1	47	0	0	0
123	1	48	0	0	0
124	1	49	0	0	0
125	1	50	0	0	0
126	1	51	0	0	0
127	1	52	0	0	0.18
128	1	53	0	0	0.18
129	1	54	0	0	0.18
130	1	55	0	0	0
131	1	56	0	0	0
132	1	57	0	0	0
133	1	58	0	0	0
134	1	59	0	0	0.18
135	1	60	0	0	0.35
136	1	61	0	0	0.71
137	1	62	0	0	0.18
138	1	63	0	0	0
139	1	64	0	0	0.35
140	1	65	0	0	0
141	1	66	0	0	0.17
142	1	67	0	0	0

143	1	68	0	0	0.17
144	1	69	0	0	0.17
145	1	70	0	0	0.17
146	1	71	0	0	0.17
147	1	72	0	0	0.35
148	1	73	0	0	0.17
149	1	74	1	0	0
150	1	75	1	1	0
151	1	76	1	2	0
152	1	77	1	3	0
153	1	78	1	4	0.36
154	1	79	1	5	0.18
155	1	80	1	6	0
156	1	81	1	7	0
157	1	82	1	8	0
158	1	83	1	9	0.54
159	1	84	1	10	0.72
160	1	85	1	11	0
161	1	86	1	12	0
162	1	87	1	13	0.72
163	1	88	1	14	0
164	1	89	1	15	0
165	1	90	1	16	0
166	1	91	1	17	0
167	1	92	1	18	0.36
168	1	93	1	19	0
169	1	94	1	20	0
170	1	95	1	21	0.36
171	1	96	1	22	0.18
172	1	97	1	23	0.54
173	1	98	1	24	0.36
174	1	99	1	25	0.36
175	1	100	1	26	0.36
176	1	101	1	27	0
177	1	102	1	28	0.36
178	1	103	1	29	0

179	1	104	1	30	0.36
180	1	105	1	31	0.18
181	1	106	1	32	0.54
182	1	107	1	33	0
183	1	108	1	34	0
184	1	109	1	35	0.7
185	1	110	1	36	0.35

Appendix N

MEAP Reading Data Six Parameter Three-Phase Intervention Model Design Matrix

MEAP Reading Data Six Parameter Three-Phase Intervention Model Design Matrix

0	0	0	0	81
0	0	0	0	37.2
1	0	0	0	45
1	1	0	0	55.4
1	2	1	0	55.5

Appendix O

MEAP Mathematics Data Six Parameter Three-Phase Intervention Model Design Matrix

MEAP Mathematics Data Six Parameter Three-Phase Intervention Model Design Matrix

1	0	0	0	0	65
2	0	0	0	0	9.87
3	1	0	0	0	16.24
4	1	1	0	0	13.84
5	1	2	1	0	17.83