

# Research and Practice in the Schools

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The Official Journal of the Texas Association of School Psychologists

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**Texas Association of School Psychologists**

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**Research and Practice in the Schools:  
The Official Journal of the Texas Association of School Psychologists**

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# **Research and Practice in the Schools: The Official Journal of the Texas Association of School Psychologists**

*Research and Practice in the Schools* is a publication of the Texas Association of School Psychologists (TASP). It is an online, peer-reviewed journal that provides TASP members with access to current research that impacts the practice of school psychology. The primary purpose of *Research and Practice in the Schools* is to meet the needs of TASP members for information on research-based practices in the field of school psychology. To meet this need, the journal welcomes timely and original empirical research, theoretical or conceptual articles, test reviews, book reviews, and software reviews. Qualitative and case-study research designs will be considered as appropriate, in addition to more traditional quantitative designs. All submissions should clearly articulate implications for the practice of psychology in the schools.

## **Instructions for Authors**

### **General Submission Guidelines**

All manuscripts should be submitted in electronic form to either of the co-editors ([jeremy.sullivan@utsa.edu](mailto:jeremy.sullivan@utsa.edu) or [aeherna8@uiwtx.edu](mailto:aeherna8@uiwtx.edu)) as an email attachment. Manuscripts should be submitted in MS Word format and labeled with the manuscript's title.

It is assumed that any manuscript submitted for review is not being considered concurrently by another journal. Each submission must be accompanied by a statement that it has not been simultaneously submitted for publication elsewhere, and has not been previously published.

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Submissions should be typed, double-spaced with margins of one inch. All articles should meet the requirements of the *APA Publication Manual, 6<sup>th</sup> ed.*, in terms of style, references, and citations. Pages should be numbered consecutively throughout the document. Illustrations should be provided as clean digital files in .pdf format with a resolution of 300 dpi or higher. Tables and figures may be embedded in the text. A short descriptive title should appear above each table with a clear legend and any footnotes below.

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After receiving the original manuscript, it will be reviewed by the Editors and anonymously by two or more reviewers from the Editorial Board or individuals appointed on an *ad hoc* basis. Reviewers will judge manuscripts according to a specified set of criteria, based on the type of submission. Upon completion of the initial review process, feedback will be offered to the original (primary) author with either (a) a preliminary target date for publication; (b) a request for minor editing or changes and resubmission; (c) significant changes with an invitation for resubmission once these changes are made; or, (d) a decision that the submission does not meet the requirements of *Research and Practice in the Schools*.

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We invite proposals for special issues of the journal, with the goal of publishing one special issue each year in addition to the general issue. Special issues will include collections of papers related to some cohesive theme in the field of School Psychology, and will be edited by Guest Editors who will take the lead in soliciting contributions and coordinating the peer review process. In addition to special issues that focus on research and scholarship in School Psychology, we welcome special issues that cover important practical and applied issues in the field.

Special issue proposals should include a brief description of the theme to be covered by the issue, approximate number of articles to be included, qualifications and expertise of those who will serve as Guest Editors of the issue, and a plan for soliciting manuscripts and conducting the reviews. Proposals for special issues, and questions about the process, should be sent to [jeremy.sullivan@utsa.edu](mailto:jeremy.sullivan@utsa.edu).

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Please note: all manuscripts submitted to the Graduate Student Section must include either a faculty co-author or a faculty sponsor who provides the student with mentorship on the process of preparing and submitting their work for peer review. When submitting their manuscripts for review, student authors should include a cover letter verifying that their work has been vetted by a faculty co-author or sponsor.

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**Invited Article**

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# **A Report on the State of School Psychology in Texas Schools: 2017-2018 School Year**

Stephanie Barbre

## *HONDA Shared Service Arrangement*

At the present time, there is a shortage of school psychologists across the United States. Prior to this data collection, there has not been an initiative to examine the shortage of school psychologists, or licensed specialists in school psychology, in the state of Texas. The number of school psychologists employed by each public school district, shared service arrangement, charter school, region, and area was examined using data collected from the staff and full-time equivalent (FTE) reports obtained from the Texas Education Agency. In addition, the number of students enrolled at each entity was collected. Using this information, the respective ratios of school psychologists to student enrollment were calculated. The results indicated none of the twenty regions in Texas met the recommended ratio of one school psychologist per every 500-700 students, not to exceed 1,000 students. The shortage data collected are instrumental for training programs and for practicing school psychologists to advocate for the profession through recruitment, retention, and expanding professional capacity.

**Key words:** Shortage, LSSP, Texas

School psychologists have a wealth of knowledge related to education and mental health and are in an advantageous position in the school setting to address the academic, social, emotional, behavioral, and mental well-being of children. In 2010, the National Association of School Psychologists (NASP) published the Model of Comprehensive and Integrated School Psychological Services, otherwise known as the NASP Practice Model (NASP, 2010a). The practice model was designed to identify the skills, knowledge, and competencies school psychologists possess across ten practice domains.

School psychologists have foundational skills in diversity in development and learning, research and program evaluation, and legal, ethical, and professional practice. These foundational skills help support the school psychologist's ability to effectively provide direct and indirect services for students, families, and schools. Direct services for students may include interventions and instructional support related to academic skills as well as interventions and mental health services to develop social and life skills. School psychologists also have the unique training to assist with promoting school-wide practices to promote learning, establish preventative and responsive services, and facilitate collaboration services between families and schools. Across all services and aspects of practice, school psychologists utilize a problem-solving framework, value collaboration and consultation with parents, students, and other professionals, and commit to data-based decision making and accountability.

Within the NASP Practice Model, the association established a recommended ratio of one school psychologist for every 500-700 students, depending on the system's needs, but not to exceed

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*Note:* This invited article is based on information presented at the 2018 TASP Annual Convention in Dallas, TX. The editors of *Research and Practice in the Schools* solicited submission of this article given the importance of this information to TASP membership, and to all school psychologists in Texas. We hope this article will serve as a call to action to address the shortage of school psychologists in Texas schools.

1,000 students. This ratio is recommended in systems where the school psychologist is providing comprehensive and preventative services such as evaluations, consultation, counseling, and behavior interventions. In systems that require the school psychologist to work primarily with student populations requiring intensive special needs, the ratio should be lower than the 500-700 recommendation (NASP, 2010a).

The recommended ratio is a critical aspect of the quality of services delivered to students. NASP and supporting research indicate there has been a shortage of school psychologists nationwide for the past several years. During the 2014-2015 school year, the national ratio of school psychologists to enrolled students was estimated at 1 to 1,381 (Walcott, Hyson, & Loe, 2017). It is predicted the shortage of school psychologists will likely continue through 2025 (Castillo, Curtis, & Tan, 2014). By 2026, it is predicted the national student population will be close to 51,737,900 (National Center for Education Statistics, 2017), and it is likely that there will continue to be an insufficient number of school psychologists to keep up with the growing student population and increased needs in the United States.

### **Texas Ratio and Student Enrollment Data**

The Texas Association of School Psychologists (TASP) examined the state of school psychology in Texas at the end of the 2017-2018 school year. The purpose of the data collection was to identify how many LSSPs were employed in Texas public schools relative to the number of students enrolled. The data collected were largely obtained from the Public Education Information Management System (PEIMS) data reports obtained from the Texas Education Agency (TEA; 2017). The student enrollment totals are based on district profile data collected on Snapshot Date, which was October 27, 2017. The staff FTE and salary reports were used to determine how many LSSPs were employed in Texas public and charter schools.

The data did not include LSSPs that independently contracted or contracted through professional agencies with school districts, but only those that were actually employed by the school districts. Although this could be considered a

limitation, it may indicate relevant information in regards to why LSSPs are choosing not to work in the districts. It is noteworthy to mention Texas districts employed 42.35 “psychological associates”. By the Texas Education Data Standards PEIMS description of codes, a psychological associate “serves under the Licensed Specialist in School Psychology (LSSP) or psychologist to provide guidance and counseling services to students.” It is likely these personnel were school psychology interns or professionals that held the LPA (licensed psychological associate), but not the LSSP. Nonetheless, the 42.35 psychological associates are not included in the LSSP totals in this report.

At the present time, these data do not consider how LSSPs vary in their job descriptions or assigned job duties, which may affect the totals collected and reported. For example, some personnel may have a license to practice school psychology, but are coded by their district as something other than LSSP such as “other LEA exempt professional,” “research/evaluation professional,” or “district instructional program director/executive director”. Some personnel may be assigned as unit coordinators, supervisors, or administrators and have less psychological service delivery than other LSSPs in the district.

In addition to the staff FTE, the average annual LSSP salaries were collected for each district as well. Data were collected for each public school district, shared service arrangement, and charter school in Texas. At the time of data collection, the staff FTE and salary reports were last published on May 8, 2018.

The school districts were first divided among the 20 regions based on the location of their local educational service center (ESC). Next, the 20 regions and respective districts were divided into the six areas identified by TASP. For this report, the data for each of the 20 ESC regions and six TASP areas are reported. For questions regarding specific districts, readers are encouraged to contact the TASP Shortage Task Force Chair. The areas and regions are indicated in Table 1.

Exploring the LSSP FTE data and student enrollment across the 20 ESC regions suggests not one region in Texas met the NASP ratio recommendation during the 2017-2018 school year.

Area/Region	Student Enrollment	Employed LSSPs	Ratio	Average Salary
Area 1	1,684,268	528.78	1: 3,185	\$60,257.75
Region 7- Kilgore	169,729	58.58	1: 2,897	\$54,306.00
Region 8- Mt. Pleasant	56,159	5.50	1: 10,211	\$53,167.00
Region 10- Richardson	867,294	267.97	1: 3,237	\$64,937.00
Region 11- Fort Worth	591,086	196.73	1: 3,005	\$68,621.00
Area 2	269,242	35.60	1: 7,563	\$63,996.00
Region 18- Midland	91,057	10.60	1: 8,590	\$58,664.00
Region 19- El Paso	178,185	25.00	1: 7,127	\$69,328.00
Area 3	1,349,827	524.39	1: 2,574	\$67,625.00
Region 3- Victoria	53,676	24.56	1: 2,186	\$60,453.00
Region 4- Houston	1,212,397	494.83	1: 2,450	\$67,868.00
Region 5- Beaumont	83,754	5.00	1: 16,751	\$74,554.00
Area 4	766,664	387.20	1: 1,980	\$58,405.33
Region 6- Huntsville	198,781	71.88	1: 2,766	\$62,851.00
Region 12- Waco	174,566	52.52	1: 3,324	\$54,882.00
Region 13- Austin	393,317	262.80	1: 1,497	\$57,483.00
Area 5	1,061,957	403.54	1: 2,632	\$62,980.00
Region 1- Edinburg	433,171	70.31	1: 6,161	\$67,429.00
Region 2- Corpus Christi	103,940	24.73	1: 4,203	\$61,777.00
Region 15- San Angelo	50,109	9.00	1: 5,568	\$59,528.00
Region 20- San Antonio	474,737	299.50	1: 1,585	\$63,186.00
Area 6	266,534	54.33	1: 4,906	\$56,191.75
Region 9- Wichita Falls	36,878	7.50	1: 4,917	\$65,236.00
Region 14- Abilene	58,867	14.00	1: 4,205	\$49,199.00
Region 16- Amarillo	86,226	13.84	1: 6,230	\$57,335.00
Region 17- Lubbock	84,563	18.99	1: 4,453	\$52,997.00
Statewide Totals	5,399,682	1,933.84	1: 2,792	\$63,802.00

**Table 1.** Student Enrollment and Employed LSSPs by Area and Region

Even regions with more LSSPs employed did not meet the 1: 500-700 recommendation. In fact, the regional ratios varied greatly across the state ranging from 1: 1,497 to 1: 16,751.

Region 5 (Beaumont) had the highest ratio in Texas, followed by Region 8 (Mount Pleasant). Region 5 school districts only employed five LSSPs

and had 83,754 students enrolled, which indicated a ratio of one LSSP per every 16,751 students and nearly 24 times that of the NASP recommended ratio. However, four of the five LSSPs in Region 5 were employed by Liberty ISD, which participates in a special education cooperative consisting of five districts in Region 4 and two districts in Region 5. If



these four LSSPs are shared among the cooperative's seven school districts, it is likely some of them practice in Region 4 and not Region 5. The remaining LSSP in Region 5 practiced in a special education cooperative consisting of three school districts and 5,709 students. This means, unless the school districts contracted with LSSPs in close proximity areas, students in 31 school districts in Region 5 did not have access to an LSSP.

Region 8 (Mount Pleasant) had the second highest ratio in Texas. During the 2017-2018 school year, Region 8 districts employed 5.50 LSSPs and had 56,159 students enrolled making the ratio one LSSP per every 10,211 students. The Region 8 ratio was nearly 15 times that of the NASP recommended ratio.

The more rural areas of the state, such as West Texas, consistently yielded ratios ranging from 1: 4,205 to upwards of 1: 8,590. Area 2 includes school districts located around El Paso (ESC 19) and Midland (ESC 18). With sizable regional student enrollments, these two regions had the third and fourth largest ratios in Texas. Area 6 includes school districts located around Amarillo (ESC 16), Lubbock (ESC 17), Wichita Falls (ESC 9), and Abilene (ESC 14). These areas had smaller student populations than regions 18 and 19 and also somewhat smaller ratios, ranging from 1: 4,205 to 1: 6,230. These ratios were 6 to 9 times higher than the NASP recommendation.

The data clearly demonstrate more LSSPs are employed in more of the urbanized and populated areas including: Houston, Dallas/Fort Worth, Austin, and San Antonio. Region 4 (Houston) had the largest student enrollment as well as the most LSSPs employed, by far. During the 2017-2018 school year, Region 4 had 1,212,397 students enrolled and employed 494.83 LSSPs. Even with nearly 500 LSSPs, the region's ratio was 1: 2,450, which is 3.5 times higher than the NASP recommendation.

Region 10 (Richardson) and Region 11 (Fort Worth), accounting for the Dallas/Fort Worth area in Area 1, had the next highest student enrollment numbers. Region 10 enrolled 867,294 students and employed 267.97 LSSPs. Region 11 enrolled 591,086 students and employed 196.73 LSSPs. Although Region 10 employed almost 71 more LSSPs than Region 11, the Region 10 ratio of one LSSP per every 3,237 students is marginally less than

that of Region 11, which was one LSSP per every 3,005 students.

The San Antonio and Austin areas seemed to have the most balance between student enrollment and LSSPs employed. Region 13 (Austin) and Region 20 (San Antonio) were the only two regions with ratios lower than 2,000. Region 13 school districts employed 262.80 LSSPs and had 393,317 students enrolled, which yielded a ratio of one LSSP per every 1,497 students. Region 20 school districts employed 299.50 LSSPs and had 474,737 students enrolled, which yielded a ratio of one LSSP per every 1,585 students. Although these two areas had the lowest ratios in Texas, they were still over twice as high as the national recommendation.

The Region 1 (Edinburg) statistics pose an interesting dynamic. Region 1 enrolled 433,171 students, the fifth highest among the 20 regions, following Region 20 (San Antonio) and preceding Region 13 (Austin). Compared to the 262 and nearly 300 LSSPs practicing in Regions 13 and 20 school districts, respectively, only 70.31 LSSPs were employed by the school districts in Region 1. As a result, the LSSP to student ratio was 1: 6,161 and almost 9 times the NASP recommendation.

Based on the data collected, Texas is no exception to the national shortage and the state ratio was larger than the recommended ratio. During the 2017-18 school year, Texas schools educated 5,399,682 students and only employed 1,934 LSSPs. Therefore, the average Texas ratio for LSSPs to enrolled students was 1: 2,792, which is 3 to 4 times the recommended ratio suggested by the National Association of School Psychologists.

### **Longitudinal Ratio Data**

Comparing the data across the last four school years, the state average ratio is slowly decreasing; however, the change is minimal (see Table 2). Since the 2014-2015 school year, the Texas student enrollment has increased by 3.2%. During the 2017-2018 school year, there were 235 more LSSPs employed by Texas school districts than during the 2014-2015 school year. An increase in LSSPs is promising; however, the trend should be further examined over time.

	2014-15	2015-16	2016-17	2017-18
LSSPs Employed	1,699	1,733	1,849	1,934
Students Enrolled	5,232,065	5,299,728	5,359,127	5,399,682
Ratio	1: 3,079	1: 3,058	1: 2,898	1: 2,792

**Table 2.** *Longitudinal Ratio Data from 2014-2018*

During the 2015-2016 school year, there were 34 more LSSPs employed in the school districts than the previous year, which was a 2% increase. In 2016-2017, there was a 6.7% change and an increase of 116 more LSSPs taking the total from 1,733 to 1,849. Only 85 more LSSPs were employed during the 2017-2018 school year, which was a 4.6% increase from the prior year. The change in the number of LSSPs employed by the school districts should be considered with a number of factors. For instance, the numbers would likely include new licensees such as those that had applied for licensure after internship, but should also reflect licensees who had retired, transitioned to independent contract work, transitioned to academia, or left the profession.

### **State and Regional Average Salaries**

The average state LSSP salary, per the staff FTE data, is \$63,802; however, the average salaries by region vary greatly. It is important to note the average salary figures are based on the number of LSSPs practicing in their respective regions in addition to their FTE. Across the six areas identified by TASP, area 3 had the highest average salary of \$67,625 and area 6 had the lowest average salary of \$56,192. Across the 20 regions, Region 5 (Beaumont) had the highest average salary of \$74,554 and Region 14 (Abilene) had the lowest average salary \$49,199. There does not seem to be a clear relationship between the regional average salaries, student populations, and number of LSSPs employed in the data at the present time, although the average salaries should be explored further in future data reports.

### **Licenses Issued by the Texas State Board of Examiners of Psychologists**

During the 2017 fiscal year, the Texas State Board of Examiners of Psychologists (TSBEP)

issued 191 new licenses to practice school psychology and there were a total of 3,518 individuals that held the LSSP license (Sunset Advisory Commission, 2018; see Table 3). Based on the data presented in Table 1, this means that during the 2017-2018 school year, of the 3,518 LSSP licensees, only 55% ( $n = 1,933.84$ ) were employed by school districts, meaning 45% of LSSP licensees were not employed by a district.

In June 2018, TSBEP data indicated 3,488 individuals held an active LSSP license. During the 2018 fiscal year, TSBEP issued 186 new licenses to practice school psychology, down five licensees from the previous fiscal year. Of the 3,488 active LSSPs, 670 were also licensed psychologists (LP), 387 were licensed psychological associates (LPA), and 10 were provisionally licensed psychologists (PLP).

It is unclear how many dually licensed LSSPs were practicing in the school setting and employed by the school districts; however, dual licensure allows for the practice of psychology in the private and clinical sectors. It is possible dually licensed LSSPs left their employment in the school districts to pursue independent practice or practice in clinical settings (e.g., hospitals, community mental health agencies).

Longitudinal data, shown in Table 4, indicate the number of LSSPs has increased by 45%, adding 1,119 licensees in the past 11 years, and averaging around an additional 100 licensees per year. Among all licenses issued by TSBEP, the LSSP licensures show the highest percentage increase from 2007. By the end of the TSBEP 2018 fiscal year, 3,609 individuals held the license to practice school psychology, accounting for 37% of the 9,764 total licenses issued. The number of LSSPs is second to the number of licensed psychologists, which was 5,051 (52%).

Although there were 186 new licensees in 2018, the total number of LSSPs from 2017 to 2018 only increased by 91 licensees. The data at the

License Type	2016	2017	2018
Licensed Psychologists	244	245	277
Provisionally Licensed Psychologist	257	234	234
Licensed Psychological Associate	48	38	43
Licensed Specialist in School Psychology	221	191	186
Total	770	708	740

**Table 3.** *Number of New Licenses Issued by TSBEP Between 2016-2018*

Year	LP	PLP	LPA	LSSP	Total Licensees
2007	3,808	194	1,161	2,490	7,653
2008	3,907	186	1,137	2,600	7,830
2009	4,013	186	1,121	2,719	8,039
2010	4,089	191	1,117	2,840	8,237
2011	4,229	207	1,095	2,942	8,473
2012	4,531	219	1,154	3,099	9,003
2013	4,461	199	1,087	3,127	8,874
2014	4,582	225	1,053	3,212	9,072
2015	4,826	231	1,105	3,350	9,512
2016	4,808	228	981	3,418	9,435
2017	4,900	230	950	3,518	9,598
2018	5,051	181	923	3,609	9,764
% Change from 2007	32.6%	-6.7%	-20.5%	44.9%	27.58%

**Table 4.** *Longitudinal Trends in TSBEP Licensees from 2007-2018*

present time do not show how many LSSPs entered retired status; however, this data will likely be sought for the next annual shortage report. Based on the data provided in this report, initial speculations hypothesize the number of new licenses are not being issued at a substantial rate to adequately replace retired licensees.

Another concerning issue can be discerned from the data. The TSBEP data indicate 191 new LSSP licenses were issued at the end of the 2017 fiscal year, prior to or around the start of the 2017-2018 school year. However, the staff FTE data indicate only 85 more LSSPs were employed in the school districts compared to the previous year. It is

questionable where the remaining 106 LSSPs practiced, if at all.

### **Contributing Factors to the Texas Shortage**

There are several factors that contribute to the shortage across the nation. The number of training programs, recruiting new training candidates, retaining existing professionals, and visibility issues all play a role in the school psychology shortage. Unfortunately, these factors are also present in Texas.

### **Training Programs**

There are approximately 250 known school psychology graduate programs in the country and 20

of these programs are in Texas. The 20 training programs in Texas are not uniformly distributed across the state. Many training programs are located in close proximity to one another in the more urban areas and central Texas such as San Antonio, Austin, and Houston. Few training programs are in more rural and remote locations of the state such as West Texas and the Rio Grande Valley. Of the 20 training programs, 13 are NASP-approved programs, 6 have yet to be approved, and one has a candidacy status at the present time.

Not only is there a shortage of school psychologists, there is also a shortage of qualified faculty to train school psychology students. Similar to LSSP positions remaining unfilled at the school district level, numerous faculty positions remain unfilled at the training level. As a result, this hinders the number of prospective students, or candidates, the programs are able to admit into their training programs, while also abiding to the NASP ratio of 1 faculty FTE to 12 student/candidate FTE.

Aside from the personnel issue, some training programs in more urbanized areas have an abundance of qualified applicants, while other programs have trouble recruiting high quality applicants. The location of the training program and the program's accreditation, or lack thereof, and accessibility for working professionals may be contributing factors in both the quantity and quality of prospective training candidates. Once candidates complete their training, it appears they tend to practice in districts in close proximity to their training program, as suggested by the current FTE data.

### **Visibility**

School psychology as a profession, nationwide, seems to be in a visibility crisis. In Texas, it is also not uncommon for parents, administrators, teachers, and legislators to misidentify LSSPs with educational diagnosticians, counselors, and behavior specialists. During the 2017-2018 school year, Texas school districts employed 12,536 school counselors, 4,108 educational diagnosticians, 1,934 LSSPs, and only 750 social workers (TEA; 2018; see Table 5).

It is unclear how many behavior specialists were employed in the districts as there is not a distinct title listed in the staff FTE reports from TEA. It is

also unclear how many of the 12,536 school counselors are licensed professional counselors as opposed to certified school counselors. It is possible there are more LSSPs employed by the districts, but are coded as something other than "LSSP/psychologist".

While the professions are similar in some respects, school psychologists undergo rigorous training beyond the 48 credit hour training school counselors and educational diagnosticians pursue for certification by the Texas Education Agency. Similar to licensed professional counselors in Texas, school psychologists, or LSSPs, earn a specialist- or doctoral-level degree, which requires a minimum of 60 credit hours, and ultimately pursue licensure under a state psychology licensing board. In Texas, school psychologists are licensed under the TSBEP and must pass the jurisprudence examination set forth by the board. In addition, LSSPs must abide by the training standards outlined by the National Association of School Psychologists.

Per the *Standards for Graduate Preparation of School Psychologists* (NASP; 2010b), training candidates must complete a minimum of 60 graduate credit hours, 54 of which cover instruction relevant to ethics, cognitive assessment, biological bases of behavior, consultation and collaboration, academic and behavior interventions, human learning, human development, and psychoeducational assessment. In addition, school psychology training candidates also complete a supervised practicum and a minimum of 1,200 clock hours of supervised internship. Doctoral-level interns are required to complete 1,500 clock hours of supervised internship (NASP; 2010b). As a result of their holistic training and professional competencies, LSSPs are more qualified to address the academic, social, emotional, behavioral, and mental well-being of children than any other professional in the school setting.

### **Competitive Salaries**

Table 5 shows the state average salaries for educational diagnosticians, school counselors, LSSPs, and social workers during the 2017-2018 school year. The salary data show LSSPs earn somewhat less than their diagnostician and school counselor peers, despite their more extensive training and qualifications. In fact, LSSPs are qualified to

	Educational Diagnosticians	School Counselors	LSSPs	Social Workers
# Employed	4,108	12,536	1,934	750
Average Salary	\$64,683	\$63,973	\$63,802	\$58,449

**Table 5.** *Number of Professionals Employed in Texas Public Schools During the 2017-2018 School Year*

fulfill the job duties of both educational diagnosticians and counselors. The difference in salary and training requirements may be significant contributing factors to the school psychology shortage.

In many districts, LSSPs are on the same pay grade schedule as diagnosticians and counselors; although, some are on a teacher pay grade schedule and/or receive an additional stipend for having their LSSP, holding the NCSP (Nationally Certified School Psychologist) credential, or having a higher degree or license such as a Ph.D. or holding the LP. Unlike their school counselor and diagnostician counterparts, school psychologists are not required to have previous teaching experience; however, their extensive training could potentially result in more debt from student loans. Unless there is a financial incentive or assistantship available, the financial burden of pursuing a specialist-level degree in school psychology may deter students from the additional training and associated tuition expenses.

### **Title**

Licensed specialists in school psychology are commonly called “LSSPs” for simplicity; however, it is not uncommon for individuals to mistake the letters, omit letters, or replace letters of the shortened form, which further confuses parents, administrators, teachers, and legislators. In addition, explaining what “LSSP” means is a lengthy process and can be difficult for stakeholders, school district employees, and parents to understand, especially for parents with a first language other than English. In other words, there are both school counselors and LSSPs working in Texas schools. From a parent’s perspective, they may be more likely to turn to the school counselor, who may or may not be a licensed professional counselor, in the event their student needs academic, emotional, or behavioral support at school. The parent may not know there is a school psychologist

employed in their child’s district because one is not listed, and they may not know an LSSP is the same professional.

### **Limited Access to Students in General Education**

Given their background and training in system-wide intervention, preventative and responsive measures, consultation and collaboration, and data-based decision making, LSSPs are qualified to help administrators improve school climate, implement positive behavior interventions and supports, and design academic intervention processes, all of which would benefit most students. However, LSSP positions in Texas are often funded by federal monies through the Individuals with Disabilities Education Improvement Act (2004), which means they are largely tied to special education. Instead of being utilized on the forefront through multi-tiered systems of support as a proactive measure, LSSPs are often utilized as a last resort when the student is referred for special education and therefore, are limited in providing services to only a small percentage of the student population. Consequently, students are likely in crisis by the time they have contact with the LSSP. This issue can be exacerbated when the LSSP is spread across multiple campuses, as their very limited time on a particular campus may be spent on students in the most distress or with the most urgent needs.

### **Retention and Burnout**

The data show that not one region in Texas meets the NASP recommended ratio of 1 school psychologist for every 500-700 students. There were less than 2,000 LSSPs employed by Texas public school districts during the 2017-2018 school year. As mentioned above, the social, emotional, behavioral, and mental health needs of our students are increasing and there are not enough school-based mental health professionals to adequately meet the

need. School counselors are often tied to academic planning and guidance and assigned to duties irrelevant to counseling or mental health. LSSPs are often tied to special education and are underutilized in the general education setting.

Even in special education, LSSPs have large caseloads and not enough time during the workday to evaluate, write reports, counsel students, consult with parents, teachers, and administrators, and provide appropriate behavior intervention support. As a result, LSSPs often have no choice but to take a significant portion of their work home during the evenings, weekends, and over holidays to meet federally mandated timelines and service schedules.

Another commonly reported factor in school psychologists' burnout is the lack of administrative support (Castillo et al., 2017; NASP, 2017). Many LSSPs report they perceive little support from administrators and directors in making data-based decisions and abiding by the standards of professional practice. Their training in special education law, mental health, assessment, and best practice in behavior modification sometimes conflicts with administrator and teacher perspectives. As a result, the opinion of the LSSP can be unpopular and opposed in making educationally relevant decisions for the students with whom they work.

### **Conclusion and Future Considerations**

The data included in the report are significant to the state of school psychology in Texas. As the numbers suggest, there is not one region in the state that meets the NASP recommended ratio of one school psychologist for every 500-700 students and not to exceed 1,000 students. Longitudinal data from TEA and TSBEP show the number of LSSPs is increasing; however, there is a dire need for more school psychologists in Texas. The solution to remediate the shortage is not simple and there are several contributing factors. It is difficult to identify one specific factor that will evoke a momentous change, but it is clear school psychologists, as a professional body, need to advocate for the profession.

The Texas Association of School Psychologists is in the process of establishing a task force to focus on the LSSP shortage issues. The goal

is to continue to monitor the school psychology shortage annually. In the next shortage report, the association will aim to further explore the number of students identified as at-risk or in special education in each district, shared service arrangement, and charter school relative to the number of school psychologists and educational diagnosticians. In addition, future reports should examine the number of LSSPs retiring, employed by contracting agencies or independently contracting with school districts, and those leaving the profession entirely. Lastly, future reports should also survey Texas school districts and the number of vacant school psychology positions available, but that go unfilled due to the lack of applicants.

Monitoring and reporting on the state of school psychology is instrumental in tracking progress; however, action is imperative. The shortage task force will be charged with exploring options and initiating efforts in remediating the issues at all levels. The shortage is largely influenced by recruitment, retention, and visibility.

There is an obligation to identify the unique needs of school psychology training programs across the state. These needs range from a lack of faculty, quality student candidates, and making training programs more accessible and feasible for working professionals. Training programs may find it lucrative to create respecialization and retraining tracks for professionals with relevant training and experience. These professionals may be interested in exploring a career change and, if conducive to their working schedule, consider pursuing school psychology. Another possible recommendation for training programs would be to develop a system to track graduates' employment, which may help the shortage task force better understand what happens to newly licensed LSSPs who are not employed by a school district.

The association and task force will also work to establish partnerships with the regional educational service centers and school districts to identify potential funding sources and creating "train and place" pathways to increase the number of LSSPs in underserved areas. The school districts would identify existing and/or future employees to refer to school psychology programs in close proximity to receive training as they continue their employment.

Upon training completion, they would be utilized as interns and then school psychologists in their respective districts.

There are a number of opportunities and possible solutions to assist in remediating the shortage of school psychologists in Texas. The association will continue to advocate for social, emotional, behavioral, and mental well-being of Texas students and in the same respect, advocate for more school-based mental health professionals. In order to compound these efforts, practicing school psychologists must also be visible and vocal on the issues. The numbers presented in this report are meant to be shared with school board members, administrators, and parents. The report itself is intended to be used as an awareness and advocacy tool, and represents the starting point of an ongoing discussion and coordinated effort.

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Article

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# Increasing Post-Secondary Education (PSE) Readiness for At-Risk Students and Students with Disabilities

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*EnAble*d for College functions as a model postsecondary education (PSE) transition program to assist high school students who are at risk of not graduating from high school, are low-socioeconomic status (SES), and/or who have a disability. *EnAble*d for College pairs graduate student mentors with high school students, and mentors meet weekly with students at their high schools to cover a research-based curriculum designed to instill strategies for persisting until high school graduation and skills for preparing for PSE success. The preliminary results for the three-year study indicate high school participants' graduation and college acceptance rates exceeded national averages for students with disabilities and low-SES status. Participants reported statistically significant growth in college-going self-advocacy and college knowledge and participants' mean scores increased in determining ways to pay for PSE. Steps to implement a transition program are presented as well as practical implications and directions for future research.

**Key words:** transition program, students with a disability, mentor

President Barack Obama set a clear goal in 2010 when he wrote *A Blueprint for Reform, The Reauthorization of the Elementary and Secondary Education Act*. President Obama's goals stated that every student should graduate from high school ready for college and a career regardless of their income, race, ethnic or language background, or disability status (US Dept. of Education, 2015). Although President Obama set the goal, youth with disabilities continue to lag behind their peers in postsecondary education (PSE) enrollment (Newman et al., 2011; Sanford et al., 2011; Test et al., 2009). The *EnAble*d for College program has sought to reduce the barriers for students with disabilities to attain and sustain in PSE and to increase their ability to be post-secondary education ready.

What is meant by "post-secondary education ready"? Often college and career readiness is referred to as post-secondary education. Conley (2010) defines college and career readiness as the level of preparation that a student needs in order to enroll and

succeed in a post-secondary institution without remediation, or in a high-quality certificate program that allows a student to enter a career pathway with the potential for future advancement. Others have added the need for students to have the knowledge and skills to complete a college course successfully (Tierney & Duncheon, 2015). Conley (2012) also describes post-secondary as any formal setting in which an individual pursues additional instruction beyond high school; this might include two- or four-year degree programs, certificate or licensure programs, apprenticeships, or training programs in the military.

The Council for Exceptional Children (CEC), recognized as the leader for special education professional standards, also adopted a comprehensive and frequently cited definition of secondary transition (Halpern, 1994, p. 116), which defines transition as "a change in status from behaving primarily as a student to assuming emergent adult roles in the community. These roles include employment, participating in post-secondary education, maintaining a home, becoming appropriately involved in the community, and

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experiencing satisfactory personal and social relationships. The process of enhancing transition involves the participation and coordination of school programs, adult service agencies, and natural supports within the community.” Research has shown that effective transition services are directly linked to better post-secondary outcomes for students with disabilities (Council for Exceptional Children, 2015).

Attaining post-secondary readiness is a challenge for many students, but students with a disability encounter a variety of additional challenges in the transition to PSE. The National Longitudinal Transition Study-2 (NLTS2) reports key differences for students with disabilities from those of similar-age in the general population (Newman et al., 2011). For example, enrollment in PSE for students with disabilities continues to be lower when compared to students without disabilities. Completing PSE is also a concern for students with disabilities. Based on the six-year report from NLTS2, only 38% of students with disabilities completed any PSE compared with 51% for students in the general population (Sanford et al., 2011). The low attainment and completion rates for PSE for all students have led high schools and PSE institutions to reevaluate their transition services for high school students (Shaw & Dukes, 2013).

The purpose of the current pilot study is twofold. The first purpose of this article is to add support to the current research on the elements needed to ensure students with a disability are able to pursue and attain PSE. The second purpose of the pilot study is to provide support and validation for the implementation of the *EnAble for College* program. Several extensive literature reviews have determined the best evidence-based secondary transition interventions needed for PSE success for students with disabilities. For example, Test et al. (2009) completed a systematic review and determined the following factors correlated with improved post-school outcomes in the area of education and each had a moderate effect size: inclusion in general education classes, paid employment/work experience, transition programs, social skills, and vocational education. Career awareness and self-advocacy/self-determination showed small levels of effect size on improvement in post-school outcomes in the area of education. CEC has also addressed transition services for students with disabilities to

PSE by identifying the following areas of need: utilization of transition assessments, beginning transition strategies in elementary, becoming culturally aware of students from diverse backgrounds, providing secondary transition skills, adding technology, adding skills to increase students’ ownership of learning, and providing students with different work styles and experiences (Mazzotti & Rowe, 2015). Webb, Patterson, Syverud, and Seabrooks-Blackmore (2008) summarized needs and recommendations for college students with disabilities in five areas: self-determination, social skills, academic preparation, accommodations, and assistive technology.

Listed in several of the literature reviews, the importance of the transition skills of self-advocacy and self-determination are emphasized. Self-advocacy/self-determination refers to the “ability to make choices, solve problems, set goals, evaluate options, take initiative to reach one’s goals, and accept consequences of one’s actions” (Rowe et al., 2013, p. 8). In a more specific definition of self-determination, the Self-Determination Theory (SDT) identifies the needs of competence, relatedness, and autonomy as essential for personal growth and personal well-being for individuals. Individuals can foster self-determination by providing contexts that are supportive of autonomy, competence, and relatedness (Ryan & Deci, 2000). To increase self-advocacy and self-determination skills, students need the opportunity to practice within their classrooms as well as outside of school to develop expertise in these skills (Morningstar & Mazzotti, 2014; Rowe et al., 2013). Students who graduate from high school with a higher level of self-determination and self-advocacy are more likely to be more successful in employment after PSE (Test et al., 2009).

The *EnAble for College* program provides structure for implementation of the curriculum and program through an instrumental mentoring program. The mentors are involved in regular contact with the participants, provide positive interactions, build rapport, and implement lessons on college-readiness (McQuillin, Terry, Strait, & Smith, 2013). The primary goal of the sessions is to build college knowledge and college-going self-efficacy. Findings indicate that adolescents benefit significantly from having an adult to promote positive development

(Cates & Schaeffle, 2011; Rhodes, 2002) and from participating in programs that provide college information (Cates & Schaeffle, 2011). The *EnAble*d for College mentors follow the suggestions of Conley (2010) and Tierney and Duncheon (2015) to provide students with college information about PSE, how to access PSE, how to attain financial resources, and how the PSE system works. Providing participants access to college information is influential in increasing students' expectations of obtaining a college degree (Cates & Schaeffle, 2011). The literature of research-supported PSE strategies provides several recurring themes and an excellent framework for development of a PSE transition curriculum; strategies include instruction in the area of self-advocacy/self-determination, social skills, college and career knowledge, increasing students' ownership of learning, academic preparation, accommodation rights and responsibilities, and using technology. Literature also includes the importance of transition assessments and the benefits of having an adult mentor.

### *EnAble*d for College

The program was designed around two basic premises. First, a PSE transition curriculum based on evidence-supported practices would benefit high school students with disabilities who are at-risk of not graduating from high school. An at-risk student is a student who is at-risk of dropping out of high school before graduation or a student who fails to achieve basic skills. Second, adult mentors paired with these students to discuss PSE will magnify the program's impact on finishing high school and matriculating to PSE.

### **Mentors and the Curriculum**

The overarching goal of *EnAble*d for College is to prepare high school students with disabilities and/or students at-risk of not completing high school for access, transition, and completion of PSE. The vehicle for reaching this goal is through the pairing of trained mentors (graduate students studying school psychology and educational psychology from a four-year university). The mentors interact weekly with the students preparing them to be PSE-ready utilizing

the *EnAble*d for College curriculum. The curriculum includes the topics of self-efficacy, self-advocacy, college knowledge, social skills, and goal setting.

*Self-efficacy.* Bandura (1986) described self-efficacy as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (p. 361). Students' personal beliefs in their abilities to be able to take the correct course of action in attaining PSE affects students' personal beliefs in their ability to be college ready (Arnold, Lu, & Armstrong, 2012; Bandura, 1993). The college knowledge and cognitive strategies that students develop are essential and increase self-efficacy and their ability to engage in more rigorous instructional activities as well as advanced academic courses. The increase in self-efficacy is proven to create a positive chain reaction and promotes the students' participation in college fairs that are offered, co-curricular activities, as well as seek the steps to complete the college application process (Arnold et al., 2012). Providing students an opportunity to focus on developing study skills and organizational skills through their experiences in the mentoring program provides an opportunity to increase self-efficacy and their belief in being college ready (Bandura, 1993). Including this component in the curriculum is critical for attaining these skills and will likely reduce the anxiety associated with more rigorous courses in high school, and reduce the academic stress that students encounter when preparing for or attending PSE.

*Self-advocacy/self-determination.* The research-based curriculum has a strong focus on self-advocacy/self-determination. For example, mentors coach students on how to communicate with PSE faculty concerning their accommodations. Mentors and students engage in role-playing to prepare the student for this very important task. Research indicates that while 84% of high school students with disabilities receive accommodations, only 24% of them receive accommodations from their PSE institution (Newman, Wagner, Cameto, & Knokey, 2009). Therefore, it is important to create conditions and opportunities that support building students' knowledge and independence facilitates developing students' self-determination and highlights the importance of teaching self-advocacy skills to high

school students with disabilities (Ryan & Deci, 2000).

Mentors also focus on the rights of students with disabilities. Mentors assisted the students in locating resources such as tutoring and study labs available at the students' PSE destination. The mentor's ability to provide this additional adult support is vital due to the greater difficulties in negotiating the transition process to PSE experienced by a student with a disability (Leake, Burgstahler, & Izzo, 2011).

*College knowledge and social skills.* Additional non-cognitive factors included in the curriculum include materials aimed at increasing college knowledge. For example, students complete college applications, financial aid forms, the Free Application for Federal Student Aid (FAFSA) as well as college and community scholarship applications. Conley (2010) recommended including practices in interpersonal and social skills, collaboration and working as a team, communicating with professors, interacting with students from diverse cultural backgrounds, and demonstrating leadership skills in a variety of settings; the curriculum addressed these practices as well. Participants were provided opportunities to identify appropriate and inappropriate actions in scenarios along with discussions regarding suitable actions to address a variety of realistic PSE situations.

In addition to social skills, the curriculum also followed the suggestions of Conley (2010), Test et al. (2009), and Webb (2008) by providing opportunities for participants to rehearse and practice building interpersonal relationships with individuals in PSE. For example, participants evaluated unsuitable emails to professors and practiced writing emails concerning their need for accommodations to the local PSE campuses' office of learning access and accommodations (Additional curriculum topics are listed in Figure 2).

*Goal setting.* The curriculum also had a strong focus on goal setting and ownership of learning (Conley, 2012; Gothberg, Peterson, Peak, & Sedaghat, 2015; Webb et al., 2008). Opportunities were provided for students to evaluate their current learning preferences and determine areas of strengths and areas to improve as they prepare for PSE. Mentors shared study strategies and assisted students

in writing goals at the beginning of the semester and evaluated their progress throughout the school year.

*Curriculum.* During the first three years of implementation, each year the different mentors provided feedback to help sculpt the curriculum. During year one, the curriculum of the *EnAble*d for College program focused on self-advocacy, college applications, scholarship applications, financial aid, and independent living. The curriculum also included instruction in budgeting, goal setting, communication, testing readiness, and college visits. Year two included these same topics and added the additional topics of learning strategies and the realities of college. Also in year two, college essay writing activities were deleted and activities such as budgeting, financial aid, and the Free Application for Federal Student Aid (FAFSA) were increased. The mentors' feedback acknowledged most students were completing college essays in their senior English classes and allotted time was not needed for this activity. In year three of program implementation, lessons to discuss a new state-mandated assessment, a college syllabus, and how to locate academic resources on a college campus were added. Adding time in year three to discuss and prepare for a new state-mandated assessment was implemented to better prepare seniors for college enrollment and to provide awareness for the participants of the new assessment.

### **Purpose of the Pilot Study**

The purpose of this pilot study is to address the challenges and to reduce the obstacles of PSE attainment for students through the *EnAble*d for College curriculum. Our goal was to determine whether participation in *EnAble*d for College would impact our participants in the areas of college-going self-efficacy, college-knowledge and self-advocacy. The pilot study focuses on four research questions.

1. Do the *EnAble*d for College participants increase their college-going self-efficacy attendance and persistence?
2. Do the *EnAble*d for College participants increase their college-going knowledge?
3. Do the *EnAble*d for College participants with disabilities increase their self-advocacy for accommodations?

Descriptor	Campus A	Campus B	Campus C	Campus D	Campus E	Campus F
<i>EnAble</i> d for College Econ. Disadv.	100.00	90.00	31.80	92.30	26.70	90.00
LD	4	2	6	2	8	0
VI	0	0	0	0	0	2
504	0	4	0	4	0	0
ADHD	0	0	1	0	2	0
ED	0	0	3	0	1	0
AU	0	0	0	0	1	1

**Figure 1.** *Economically Disadvantaged and Disability Data for EnAble*d for College Participants by Participating Schools  
 Note. Econ. Disadv.=Percent of students economically disadvantaged in the *EnAble*d for College program for each high school; LD=Learning Disability; VI=Visual Impairment; 504=Accommodations and modifications for students that do not qualify for an IEP; ADHD=Attention Deficit Hyperactivity Disorder; ED=Emotionally Disturbed; AU=Autism.

- Do the *EnAble*d for College participants have a difference in high school graduation rate and enrollment in PSE than the other students at the participating high schools?

## Method

### Participants

The study includes students ( $n = 108$ ) from Central Texas suburban high schools ( $n = 6$ ) ranging in student body size from 400 to 1,800 students enrolled in grades 9-12. Each district's designee (principal or superintendent) and the researcher's University Institutional Review Board (IRB) granted permission to conduct the study. The participants for the *EnAble*d for College group are based on enrollment in the program during the school years of 2014-2015, 2015-2016, and 2016-2017. Seventy-three percent ( $n = 79$ ) were free or reduced lunch, 48% ( $n = 52$ ) were students with a disability or identified as a 504 student (Figure 1), 31% ( $n = 33$ ) were Hispanic, 20% ( $n = 22$ ) were African American, 57% ( $n = 61$ ) were female, and 14% ( $n = 15$ ) of the

students participated in the program during their junior and senior year.

### Procedures

A one-group pre-test post-test design was used for this pilot study to investigate whether participation in *EnAble*d for College (the independent variable) was related to participants' outcomes on PSE-related dependent variables. The program was implemented throughout the school year (27 weeks). Descriptive statistics and paired-samples *t*-tests were used to compare participants' college-going self-efficacy and college knowledge pre- and post-program implementation.

*Mentor recruitment and training.* Each January the university professors completed the recruitment of mentors from the master's program in the department of educational psychology affiliated with *EnAble*d for College. Selection of the mentors was based on an interview exploring interest and program-fit. Selected mentors began the program in August in one-hour weekly meetings for six weeks. Mentors were given weekly reading assignments along with the curriculum and a curriculum handbook. The mentor training also included a

Week	Description
1, 2	Introductions, Overview and data collection
3	Pre-Survey
4	Career Aptitude Tests
5	College Awareness
6	Study Tips and College Applications
7	Paying for College
8	Scholarship Applications
9	College Awareness Wrap Up
10	Goal Setting
11	How We Learn and Midyear Mentor Evaluation
12	FAFSA, review goals
13	College Expenses to Expect
14	Creating a Budget
15	Bank Accounts and Credit Cards
16, 17	Self-Advocacy
18	What is College Like?
19	Study Techniques
20	Finalize College Plans
21	College Housing
22	College Hopes and Fears
23	Resources at College
24	Post-Survey and Final Mentor Evaluation

**Figure 2.** EnAble for College Curriculum Topics

discussion of program goals and research on transition services for students with disabilities and/or at risk.

Upon completing the six-week training, mentors began meeting with their students at their

schools either one-on-one or in small groups. Mentor-participant meetings took place in the school libraries or in small offices in the school's front office. The goal of the initial meeting was to foster a supportive relationship and to provide an overview of the program. During the second week participants completed a pre-survey. Throughout the remaining 20-22 weeks, mentors and participants met weekly and covered topics in the curriculum. Weekly team meetings between the mentors, principal investigator, and university professors also continued throughout the school year during program implementation to discuss progress, concerns, data assessment, or important program matters.

*High school participant recruitment.* Selection of the high school participants began with an analysis of local high schools with a large enrollment of low socioeconomic students. The high schools were petitioned for participation and selected. In August, school counselors met with the principal investigators and the assigned mentor to select participants based on the following selection criteria: participants must have a disability, and/or be at risk, and/or a student in need of additional support to attain and persist in PSE. Once identified participants were contacted and provided with an overview of the program, assent forms, and parent consent forms. Students voluntarily chose to participate in the program. Upon obtaining the appropriate assent and consent forms, mentors began weekly meetings with their mentees the first week in October and continued through May. The meeting schedule followed the mentor's university calendar.

*Program implementation.* During the 27 weeks of program implementation, mentors met with their students at their schools either one-on-one or in pairs. Mentors and participants met weekly and covered topics in the curriculum designed to build college-going self-efficacy, college knowledge, and self-advocacy. Specific areas addressed included study tips, paying for college, goal setting, budgeting, and college expectations. During several meetings, participants role-played scenarios to provide an opportunity to experience these situations and to determine appropriate and inappropriate responses. Participants also completed college applications, explored financial aid resources and scholarship

options. A complete list of topics in the curriculum is provided in Figure 2. In May (week 26), at the conclusion of the program, all participants completed a post-survey.

*High school graduation and post-secondary enrollment.* Graduation from high school was verified for each participant with the principal. Verification for the graduation rates for the students from the high school were obtained from the Texas Education Agency Accountability website. The graduation rates were not available for 2017, therefore the rates for 2016 were used for each high school (Texas Education Agency, 2017).

The National Student Clearinghouse (NSC) StudentTracker was utilized to track the post-secondary enrollment of the participants after high school graduation. The NSC is a nonprofit organization organized in 1993. The StudentTracker is the only nationwide source of college enrollment and degree data. The NSC provides information on when and where students enroll in PSE, whether or not they earn a degree, and the major and type of degree earned (Dynarski, Hemelt, & Hyman, 2015). Over 3,600 national colleges and universities are included in the database, 178 of the 196 Texas colleges and universities are included, and all of the universities, colleges, and technical institutions within a 50-mile radius of the participant's high schools participate in the database (National Student Clearinghouse, 2017). The colleges and universities included in the StudentTracker data enroll 98% of all students in public and private U. S. Institutions (National Student Clearinghouse, 2016), but only 48% of for-profit schools (Dynarski et al.). Although the NSC includes less than 50% of for-profit schools, this institute type accounts for only 9% of U.S. undergraduate enrollment in PSE (Ackerman, Cronin, Turner, & Bershadker, 2011).

To verify PSE enrollment, the *EnAble*d for College participants for years 1, 2, and 3 were submitted to the NSC StudentTracker in November following high school graduation of year 3. Students' names, date-of-birth, and high school graduation date were submitted to verify PSE enrollment. Although the StudentTracker data includes 98% of students enrolled in public and private U.S. institutions, there is a possibility that some students' PSE enrollment is not correct.

## Instruments

The pre- and post-survey were identical and consisted of items from three different instruments. The *College-Going Self-Efficacy Scale* (Gibbons, 2005) consisted of 12 items that measured participants' beliefs about attending college and 14 items about persisting in college; a Likert scale (1=strongly disagree, 6=strongly agree) was used on all items. Gibbons (2005) reported Cronbach's alpha scores for the *College-Going Self-Efficacy Scale: Attendance* was .88 and persistence was .90. For the current study, the scale had a high level of internal consistency, as determined by a Cronbach's alpha of 0.78 for the 12-item pre-survey attendance scale and 0.87 for the post-survey. For the 14-item persistence scale, Cronbach's alpha was 0.93 for the pre-survey and 0.94 for the post-survey.

The second instrument used was the *College-Going Outcome Expectations Scale* (Gibbons, 2005) and consisted of 14 items that assessed positive outcome expectations as a result of attending PSE; a Likert scale (1=very unlikely, 6=very likely) was used on all items. Items included examples to measure physical domain, social approval, self-evaluation domain, and relational items. In a study with 255 middle school students, Gibbons (2005) reported Cronbach's alpha scores for the *College-Going Outcome Expectations Scale* was .84. For the current study, the scale had a high level of internal consistency, as determined by a Cronbach's alpha of 0.87 for the 14-item pre-survey outcome expectations scale and 0.87 for the post-survey.

The final instrument, the *Texas College Knowledge Inventory Part II* (Wisely, 2013) included 10 multiple-choice items that measured students' current level of knowledge of significant college terms, details of admission requirements, financial aid, and loan information. The *Texas College Knowledge Inventory* was based on the *North Carolina College Knowledge Inventory* (Gear Up, 2008) that had been administered to high school students. In a study with 52 middle school students, Wisely reported Cronbach's alpha scores for the *Texas College Knowledge Inventory* was .74 (Wisely, 2013). For the current study, the scale had internal consistency, as determined by a Cronbach's alpha of 0.46 for the 10-item college knowledge scale and 0.59 for the post-survey. By combining the pre- and

post-survey college knowledge questions, Cronbach's alpha is 0.63. In addition to items from these three scales, the pre survey contained several demographic items; the post-survey included two open ended questions that addressed participants' perceived benefits resulting from their relationship with their mentors and program participation.

### Data Reduction and Analyses

*Quantitative Data.* Average scores were created for each participant, descriptive statistics, pre and post program null hypothesis tests of significance, and Cohen's effect size were determined (Gay, Mills, & Airasian, 2011). The data were analyzed for all participants and then data for students with disabilities were separated and analyzed in order to study pre and post differences for this subgroup of interest. The mentors identified missing data upon completion of the surveys and the students were asked to provide responses for any missing responses. After revisions of any missing data by the participants, there was no missing data on any variable.

*Qualitative Data.* On the post-survey, participants responded to two open-ended questions regarding program strengths as well as suggestions for improvement. Responses were collected and analyzed using a constant comparative method (Creswell, 2013). Participants' qualitative responses provided insight into the perception of the participants upon completion of the program.

## Results

Since research questions focused on all at-risk participants as well as the subgroup of students with a disability, results are reported below, respectively.

### All Participants

*Attrition rate.* During the course of the 27-week program, 14% ( $n = 15$ ) of the original 122 students did not complete the program. In year 1, five students chose to no longer attend the weekly sessions and in year 2 three students chose to no longer participate. In year 3, three students chose to no longer participate in the program, two students withdrew from the current school to move to another

city/school, 1 withdrew from the program due to poor attendance at school, and 1 student withdrew due to the need to attend tutorials. The attrition rates within the group were examined to determine the possible effect attrition might have on the outcome. The means of the pre-intervention scores were compared between the participants who dropped out of the study against those who did not. Standardized mean differences less than 0.2 will be taken as evidence that attrition did not likely bias the outcome measures.

The standardized mean differences for the between group data are presented in Figure 3. The difference between the participants who completed the program and students not completing the program in self-efficacy attendance was small ( $d = 0.33$ ), and the difference between the two groups for self-efficacy persistence and college knowledge are negligible ( $d = 0.06$ ;  $d = 0.16$ , respectively) (Cohen, 1992).

Descriptive statistics for each dependent variable at pre- and post-survey are shown in Figure 4. A paired-samples  $t$ -test was used to compare each of the four dependent variables from pre- to post-survey at the conclusion of the program. Analyses indicated a significant difference from pre to post on college-going self-efficacy attendance,  $t(106) = 3.83$ ,  $p < 0.001$ ,  $d = 0.37$ ; college-going self-efficacy persistence,  $t(106) = 2.90$ ,  $p < 0.01$ ,  $d = 0.28$ ; and college knowledge,  $t(106) = 7.14$ ,  $p < 0.001$ ,  $d = 0.69$ . Further, Cohen's effect size ( $d = 0.69$ ) suggested a moderate to large effect size for college knowledge and a small to moderate effect size ( $d = 0.37$ ) for college-going self-efficacy attendance. There was not a statistically significant difference for college-going outcome expectations (Figure 4).

### Participants with a Disability

Descriptive statistics for participants with a disability on each dependent variable at pre- and post-surveys are shown in Figure 5. When analyzed as a subgroup, participants with a disability showed a significant difference on college-going self-efficacy attendance,  $t(51) = 1.99$ ,  $p < 0.05$ ,  $d = 0.28$  and college knowledge,  $t(51) = 4.27$ ,  $p < 0.001$ ,  $d = .60$ . As shown in Figure 5, while not statistically significant, changes on the other variables were in a positive direction.

Variable	<i>M1</i>	<i>M2</i>	<i>n1</i>	<i>n2</i>	<i>d</i>
Fall Self-efficacy attendance	4.87	4.67	120	15	0.33
Fall Self-efficacy persistence	5.07	4.98	122	15	0.16
Fall College knowledge	0.57	0.58	122	15	0.06

**Figure 3.** Mean Differences Between Group Score Differences for Completers and Non-Completers of the EnAble for College Program

Note. *M1* = Mean score for completers of the program; *M2* = Mean score for non-completers of the program; *n1* = completers of the program; *n2* = non-completers of the program *d* = Cohen’s *d*.

Variable	Pre-Survey		Post-Survey		<i>t</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
College-going self-efficacy attendance	4.87	0.56	5.09	0.66	3.8**	0.37
College-going self-efficacy persistence	5.07	0.68	5.23	0.65	2.9*	0.28
College-going outcome expectations	5.21	0.55	5.27	0.55	1.1	0.11
College knowledge	0.57	0.19	0.72	0.19	7.1**	0.69

**Figure 4.** Descriptive Statistics and *t*-tests for All Participants (*df* = 106)

Note. \**p*<.01; \*\**p*<.001; *d*=Cohen’s effect size.

**Graduation and College Applications: All Participants and Those with a Disability**

As shown in Figures 6 and 7, all participants, except for one (99%, *n* = 108), graduated on time. Participant graduation rate far exceeds the national average of 82% and the State of Texas rate of 94% (Texas Education Agency, 2017). The *EnAble for College* high school graduation rate also exceeded the graduation rates for all students for each of the high schools in the study except for two (see Figure 7). Ninety-eight percent (*n* = 52) of the *EnAble for College* participants with a disability graduated on time compared to the state average of 78%. Ninety-seven percent of the seniors completed an application for post-secondary education, and 89% of the

participants had been accepted to college at the end of the school year (Figure 6).

**PSE Enrollment: All Participants and Those with a Disability**

Participants’ PSE enrollment was verified in November following high school graduation in June utilizing the National Student Clearinghouse. The *EnAble for College* enrollment rate of 63% for all students exceeds the PSE enrollment rate for the county and the state. In four of the high schools *EnAble for College* participants exceeded the PSE enrollment for their high school campus (Figure 8). The students with a disability were enrolled in PSE at a rate of 54% (Figure 8). The *EnAble for College*



Variable	Pre-Survey		Post-Survey		<i>t</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Self-advocacy	3.16	0.54	3.26	0.93	0.9	0.13
College-going self-efficacy attendance	4.72	0.59	4.90	0.67	1.9*	0.28
College-going self-efficacy persistence	4.79	0.71	4.93	0.62	1.6	0.23
College-going outcome expectations	5.01	0.58	5.14	0.56	0.9	0.12
College knowledge	0.51	0.19	0.65	0.21	4.3**	0.60

**Figure 5.** Descriptive Statistics and *t*-tests for Participants with a Disability (*df* = 51)

Note. \* $p < .05$ ; \*\* $p < .001$ ; *d* = Cohen's effect size.

participant PSE enrollment rate for students without a disability, 71.4%, and students with a disability, 53.8%, exceeds the national average reported in the NLTS2 study of 62.1% for students without a disability and approaches the national average of 54.9% for students with a disability (Sanford et al., 2011).

### Mentoring

The participants' qualitative responses were analyzed using selective coding to determine eight themes that emerged: college knowledge, preparing for college, assistance with paperwork and finances, help with decision-making, affective/emotional growth, increased practical knowledge, quality of mentor relationships, and finally, appreciation for the program. A constant comparative method was used to review the transcripts, organize the data, and determine the main ideas (Creswell, 2013). Feedback from participants in the program concerning the

mentors was positive and supportive of the role of the mentor. The following are statements provided by the participants:

*"I have obtained the ability to fully write a resume and letter, how to properly write an email, and assistance with college choices."*

*"I have learned good studying techniques."*

*"I know what I need for my next step in life," and "I feel like I'm prepared for life. She [mentor] helped me figure out what I wanted."*

*"I learned how to fill out for scholarships applying for college classes and knowing what to expect."*

*"I am more confident about applying for colleges, taking tests, and presenting myself as a professional."*

*"Helped me with a lot of college things I didn't know how to do, because this is help I can't get at home."*

“I feel more confident about college thanks to my mentor.”

“I feel more prepared in what I have to do to apply and get into college. I am more confident about applying for colleges.”

“If I didn’t have this I wouldn’t have even thought about college.”

“I am more confident about going to college” and “I know how to succeed in college.”

“You’re helping so many people through a stressful time and we appreciate it a lot!”

Descriptors	All Students (n = 108)	Students with a Disability (n = 52)
Graduated on Time	99.1	98.1
Completed College Applications	97.2	98.1
Accepted to College	88.9	88.5

**Figure 6.** Participants’ Graduation, Complete Applications, and Acceptance to PSE

Descriptors	High School Graduation Rate by Campus 2016
State	89.1 <sup>1</sup>
Campus A-WHS	88.5 <sup>1</sup>
Campus B-McGregor	98.9 <sup>1</sup>
Campus C-Robinson	99.5 <sup>1</sup>
Campus D-Connally	91.5 <sup>1</sup>
Campus E-China Springs	99.4 <sup>1</sup>
Campus F – LaVega	93.1 <sup>1</sup>

**Figure 7.** Each Campus High School Graduation Rate  
Note. <sup>1</sup>Texas Education Agency, 2017.

## Discussion

A notable finding of the *EnAble*d for College program is that participants perceive themselves as better prepared to attain and complete PSE. Students who participated in the program showed an increase in college-going self-efficacy, attendance, and persistence. Additionally, participants exceeded the national average for enrollment in PSE as reported by the National Student Clearinghouse. An increase in self-efficacy provides students with additional elements needed to be better prepared for PSE (Arnold et al., 2012; Bandura, 1993). The increased college-going self-efficacy, attendance, and persistence gained by participating in the program may also lead to a participant’s increased self-confidence in organizing and executing plans for PSE (Savitz-Romer & Bouffard, 2012).

While the results of the current study do not emphasize academic skills, participants did increase their college knowledge in several areas. These areas include how to apply for PSE, how to secure financial resources, knowledge of college norms, and professors’ expectations. Also providing the *EnAble*d for College participants with a mentor, who possessed college knowledge, provided the participants an opportunity to communicate with an individual who has experienced PSE, which may assist them in attaining PSE (Tierney & Duncheon, 2015). Participants’ scores on college knowledge increased from 57% correct on the pre-survey to 72% correct on the post-survey. Providing participants with this key information could help to reduce the financial, social, and informational barriers that sometimes reduce the opportunities for students to attend PSE (Hooker & Brand, 2010).

The *EnAble*d for College program also provided participants with a disability additional support to negotiate the transition process to PSE. Newman et al. (2009) reported students with a disability and who are also from a low socioeconomic background enroll in a 2-year or community college at a rate of 24% or a vocational school 28% of the time. According to the National Student Clearinghouse data, 44% of the *EnAble*d for College (n = 34) students with a disability and from a low socioeconomic background were enrolled in PSE. Increasing participants’ college-going self-efficacy

Descriptors	PSE Enrollment 2015, 2016, 2017 <i>EnAble</i> d for College Participants	PSE Enrollment 2015, 2016, 2017 <i>EnAble</i> d for College Participants with a Disability	HS PSE Enrollment All Students 2016 Graduates <sup>1</sup>
State			51.9
County			61.5 <sup>2</sup>
Campus A	57.1 ( <i>n</i> = 7)	25.0 ( <i>n</i> = 4)	51.4
Campus B	72.5 ( <i>n</i> = 40)	44.4 ( <i>n</i> = 9)	70.0
Campus C	54.5 ( <i>n</i> = 22)	50.0 ( <i>n</i> = 20)	63.4
Campus D	53.8 ( <i>n</i> = 13)	83.3 ( <i>n</i> = 6)	52.2
Campus E	80.0 ( <i>n</i> = 15)	77.8 ( <i>n</i> = 9)	73.9
Campus F	36.4 ( <i>n</i> = 11)	25.0 ( <i>n</i> = 4)	62.0
Total	63.0 ( <i>n</i> = 108)	53.8 ( <i>n</i> = 52)	

**Figure 8.** Participants' PSE Enrollment by Campus Comparison with High School Campus PSE Enrollment

Note. <sup>1</sup>Texas Higher Education Coordinating Board: Home, 2017; <sup>2</sup>2014-2015 County Data, Texas Higher Education Coordinating Board: Home, 2017.

and college knowledge results in participants setting goals to attain PSE and believing they are capable of attaining these goals (Savitz-Romer & Bouffard, 2012). Although there was not a significant difference in self-advocacy, college-going self-efficacy, attendance, and college knowledge did show a significant statistical change for the students.

Participants with a disability not only need to believe they can attain PSE but need to be informed of options for accommodations in PSE to be effective self-advocates for educational needs (Joyce & Grapin, 2012). Mentors assist each participant with locating and contacting the Disability Specialists at their college of choice to assure the participant receives the accommodations in PSE that they received in secondary education. The students' response to the specific question, "I plan to ask for some accommodations in PSE that I receive in high school," supports a significant change for the *EnAble*d for College students ( $t(51) = 4.78$ ,

$p < 0.001$ ). Providing students with this important information and helping students to begin a relationship with the college advocate, could help to increase the number of students who ask for accommodations in PSE.

The *EnAble*d for College program provided students with higher odds of enrolling in PSE. Sixty-three percent of the *EnAble*d for College participants enrolled in PSE. The *EnAble*d for College program provided participants with access to information about the college process, which is vital to PSE readiness (Cates & Schaeffle, 2011; Conley, 2010; Tierney, Corwin, & Colyar, 2005; Tierney & Duncheon, 2015) and assisted in creating a college-going culture that provides students the know-how to attend PSE (Tierney & Duncheon). The *EnAble*d for College at-risk, low socioeconomic students needed support and additional resources to attain and persist in PSE (Reardon, 2011). Conley (2010) and Tierney and Duncheon (2015) provide the curriculum

framework needed for students to be effective in attaining and persisting in PSE.

### **Limitations and Future Directions**

Despite the relative success of the *EnAble*d for College program there is room for improvement. While this was a preliminary foray into the effects of the program, a number of design limitations prevent any strong conclusions. First, there is a need to increase the sample size. Logistics and resources prevented our recruitment of a larger sample; however, a larger sample of participants, especially those with a disability, would increase statistical power and generalizability.

A second major design limitation lies in the lack of a control group. There are two main design issues that a control group could offset. First, an equivalent control group of participants would address a variety of threats to internal validity inherent in a pre-experimental design such as ours. Secondly and more specifically, a control group could discern a possible “attention” effect brought about naturally by having a mentor paired with the participant for such a long period of time. The question raised is, what is the effect on the dependent variables attributable to an increased amount of attention (alone) paid to the participant (in the context of the mentor-mentee relationship)? This is an important internal and external validity threat that our design was unable to control or study. Nevertheless, as we have indicated above, the mentor-mentee relationship (as the curriculum is delivered) is considered part of the “treatment” in our view; however, the question does remain how much of an effect simply having an adult mentor has on the participant PSE variables of interest.

A third category of limitations comprises the fidelity of the program’s implementation by mentors and the commitment of the participants. While we believe the mentors were well-trained and implemented the program in a faithful manner, we did not directly monitor or control this element beyond weekly meetings and training. To do so, quality-control observations of the mentors on multiple occasions could be implemented as well as monitoring participant commitment to determine if variable rates of attendance, for example, play a role in program effects.

The current study is also limited by a number of other extraneous variables that could have contributed to whether or not participants actually enrolled in PSE after the program’s conclusion. Variables left uncontrolled and unanalyzed (due to small sample size) included parental income, high school quality, rising PSE tuition costs, ethnicity, and other important demographic factors. Each of these factors could be important contributors to whether a student actually enrolls in PSE or not (Bailey & Dynarski, 2011) despite the *EnAble*d for College program’s effectiveness. The most conventional way to control the spurious effects of these variables is to use randomization during participant selection and assignment to groups as well as the statistical study of these variables’ effects.

In addition to the suggestions listed above, future research should include beginning the program in earlier grades and continuing the program until PSE is completed. Beginning the program earlier (e.g., 8<sup>th</sup> or 9<sup>th</sup> grade), continuing dialogue with participants during PSE enrollment to determine which factors (e.g., self-advocacy, self-efficacy, and/or college knowledge) impede or advance PSE persistence, could possibly allow participants additional time to learn more and be better prepared for and persist in PSE (Knight, 2003). As data is collected each November from the National Student Clearinghouse on participants’ attainment, persistence, and graduation from PSE, it will provide the investigators the matriculation and persistence to determine if the program is a successful intervention for at-risk students and students with a disability.

### **Implications for Practice**

Mentors from educational and school psychology programs can play a significant role in PSE transition programs. The *EnAble*d for College program can be an integral part of school districts’ components that have been established to prepare students to attain and persist in PSE. The program requires collaboration within the immediate school, with the child’s parents, and between the student’s high school and post-secondary institution.

Given that collaboration is necessary to integrate existing pillars within the school, the *EnAble*d for College program communicates with each campus principal and lead counselor at the

beginning of each school year to determine how the program can best serve students in need. Based upon a recent recommendation from one of the participating high school principals, adding a review of each student's progress and curriculum details should be shared quarterly with the campus counselor. This practice will parallel the quarterly communication with the parents of the participants. This collaborative process between the *EnAble*d for College program and the school's team of professionals provides a framework to set goals, support students, and communicate with teachers and parents.

The success of any intervention, especially intervention programs within schools, depends upon collaborative efforts between consultants such as school psychologists acting as mentors, in-school staff, teachers, parents, and students. With a growing demand on teacher and counselor time, the role of mentors providing weekly, detailed transition services is evolving into an organizational consultant focusing on client-centered needs (Meyers, Meyers, Graybill, Proctor, & Huddleston, 2012). We propose that this integrated model of support best serves as the mode in which to provide services in the area of transition for students with disabilities and who are at risk.

## Conclusion

The goal of *EnAble*d for College was to increase the odds of success for at-risk students and students with a disability in *getting to* and *persisting in* PSE. The instrument for reaching this goal was through implementation of research-based curriculum by graduate student mentors. The program was designed to accomplish this goal by increasing college-going self-efficacy and college knowledge, by reducing the complexity of college, and by providing participants the skills to self-advocate. While preliminary, the data from the pre- and post-surveys and the National Clearinghouse data does suggest that research-based programs such as *EnAble*d for College assist in increasing at-risk students' self-efficacy and college knowledge.

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# Stop to Ask and Respond: Effects of a Small-Group Self-Questioning Intervention on Reading Comprehension Performance

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Self-questioning, a strategic approach for monitoring one's own comprehension, has shown promising outcomes for a diverse range of learners. The current study sought to replicate and extend this area of research by examining the effects of a small-group self-questioning intervention with systematic prompt fading on students' reading comprehension performance. Two small groups of fifth grade students performing among the lowest on reading comprehension in their general education classroom were selected to participate in this study. Three participants in each group were taught to stop to ask and respond to questions (STAR strategy) while chorally reading expository text passages. A multiple probe design across the small groups was used to examine the effects of this self-questioning strategy on the reading comprehension performance when prompts were systematically faded. Results indicated the groups, on average, demonstrated an increase in the number of comprehension questions answered correctly. Implications for practice are discussed.

**Key words:** self-questioning, reading comprehension, reading intervention, small-group intervention, Tier 2, elementary, expository text

Reading comprehension is defined as actively interacting, constructing, and extracting meaning from text (Woolley, 2001). Comprehending text involves the orchestration of several skills such as activating prior knowledge, understanding text structure, identifying key elements and themes, knowing the meaning of concepts, predicting events, making inferences, and recognizing connections between phrases, sentences, and paragraphs (Randi, Grigorenko, & Sternberg, 2005). Although many intermediate-grade students acquired decoding skills, they may struggle with gaining meaning from text. This is especially the case for students living in poverty (McCartney, Boyle, & Ellis, 2015). Moreover, across race and ethnicity groups in the United States, only 36% of fourth graders and 34% of eighth graders perform at or above the proficient level on a national reading comprehension assessment (National Center for Educational

Statistics, 2015). Compared to White students, Black and Hispanic fourth graders are significantly less likely to perform at or above the proficient level in reading (46% compared to 18% and 21%, respectively; National Center for Educational Statistics, 2015).

By the time students enter the intermediate grades, they are expected to have moved from learning to read to reading to learn (Jitendra, Burgess, & Gajria, 2011). This means that students progress from learning to decode words to gaining meaning from text. However, despite having acquired decoding skills, some students in the intermediate grades struggle with gaining meaning from text. There are effective strategies for helping students comprehend texts (Gajria, Jitendra, Sood, & Sacks, 2007). These strategies include identifying main ideas, paraphrasing, using graphic organizers,



comprehension monitoring, question generation, and making predictions (Mudzielwana, 2013).

A component strategy that is incorporated in many reading comprehension strategies is self-questioning (Joseph & Ross, 2018). Self-questioning involves asking oneself questions before, during, and after reading. It is a strategy used to monitor one's understanding of text (McCallum et al., 2011) while reading various text genres (Joseph, Alber-Morgan, Cullen, & Rouse, 2016). When students engage in self-questioning, they are actively interacting with the content of the text (Solis et al., 2012).

Positive effects of self-questioning on the reading comprehension performance of school-age students have been demonstrated in several studies (e.g., Berkeley, Marshak, Mastropieri, & Scruggs, 2011; Crabtree, Alber-Morgan, & Konrad, 2010; Fagella-Luby, Schumaker, & Deschler, 2007; Manset-Williams, Dunn, Hinshaw, & Nelson, 2008; McCallum et al., 2011; Rouse, Alber-Morgan, Cullen, & Sawyer, 2014; Wood, Browder, & Flynn, 2015). For instance, Fagella-Luby et al. (2007) required students to ask themselves questions before, during, and after they read a story. Before reading the story, students asked themselves "wh" questions (i.e., who, what, where, when, and why). They were asked to answer the questions when they read the story and write a summary of their responses to the questions. Findings revealed that students who used this approach performed better on reading comprehension measures than students who did not use this method. In this study, students were able to generate questions on their own. However, many students who struggle with comprehending text find it challenging to generate their own questions.

Students who have difficulty generating their own questions may need prompts to signal them to stop and ask themselves questions while they are reading. This can be done by inserting visual prompts such as stop signs and questions within the text to prompt students to pause, self-question, and record their responses. For example, in Crabtree et al.'s (2010) study, students improved their reading comprehension performance when three marked stopping points were inserted throughout a story to prompt students to pause, ask themselves questions, and record their answers.

Although prompts are helpful for signaling students to ask themselves questions when students initially learn to apply a self-questioning strategy, the goal is to have students eventually engage in the strategy without the support of the prompts. This is important as there will be many instances when students are required to read text independent of prompts. However, this may be challenging for many students who have depended on prompts to cue them to apply a self-questioning strategy. In these cases, it may be counterproductive to remove all prompts at once. Instead, prompts may need to be gradually faded as students demonstrate applying the strategy successfully on their own.

Researchers reported positive effects of systematically fading prompts while teaching a self-questioning strategy to students (Berkeley et al., 2011; Rouse et al., 2014; Wood et al., 2015). In Berkeley et al.'s (2011) study, researchers found that a self-questioning strategy using a worksheet with strategy steps and faded teacher prompts improved comprehension of seventh grade students with and without disabilities in inclusive middle school classrooms. It appeared that, initially, the students with and without disabilities were taught strategy use together in a large group context and then asked to practice using the strategy on their own. Students were asked to complete comprehension tests containing multiple choice and open-ended questions. Researchers reported that it was difficult to examine repeatable performance with strategy use over time given that only three instructional sessions using the strategy occurred in this study. Moreover, because the self-questioning was taught for only three days in a large group context, it was difficult to discern if specific individual learning needs of students with reading problems were addressed.

In Rouse et al.'s (2014) study, two fifth grade students with learning disabilities were asked to read expository passages with embedded questions that were systematically faded as students asked questions on their own. Self-questioning was taught to students in a one-to-one instructional context. Findings from this study revealed that students were able to answer (on average) more comprehension questions correctly both during the embedded self-questioning prompt condition and during systematic fading of prompts conditions compared to baseline

conditions. However, it should be noted that the overall mean performance on comprehension quizzes was slightly lower during systematic prompt fading conditions compared to the embedded prompts condition. Students were able to maintain asking themselves questions and answering the questions on quizzes correctly with at least 80 percent accuracy. Generalization was assessed in this study by having the students read new passages above their independent reading level, ask themselves questions, and respond to questions on quizzes. On this measure, one student made correct responses with just over 80 percent accuracy whereas the other student made correct responses with just over 50 percent accuracy.

In the Wood et al. (2015) study, three students with moderate intellectual disabilities in grades 4 and 5 were taught in a one-to-one instructional context to self-question using least prompts and a graphic organizer. The students were provided with a graphic organizer containing “wh” question words while reading a social studies text. Students received training on asking questions and using the graphic organizer. During the intervention sessions, students were asked to generate questions about the text and answer the questions. If the student did not generate a question within a 5 second time frame, the teacher verbally prompted the students to ask questions using the graphic organizer. If students continued to have difficulty generating a question, the teacher would remodel how to generate a question using the graphic organizer. Researchers reported that all students improved in generating and answering questions as a function of implementing the least prompts with a graphic organizer intervention.

Most of the studies that demonstrated positive effects of teaching self-questioning to students with learning problems were conducted either in general education whole classroom settings or in one-to-one instructional contexts. In some cases, general education whole classroom instruction may not be conducive to addressing the specific learning needs of students who struggle comprehending text. Likewise, one-to-one instruction may not be feasible given instructional time constraints and limited resources in school settings. It may be more efficient to teach students who have similar learning challenges in small-group contexts, as research has

shown small group instruction is just as effective as one-to-one instruction (Helf, Cooke, & Flowers, 2009; Klubnik & Ardoin, 2010). Moreover, small-group instruction provides students with increased opportunities for peer interaction and generalization of skills (Polloway, Cronin, & Patton, 1986).

With regards to reading comprehension outcome measures, researchers reported in a recent review of studies examining the effects of self-questioning that the multiple choice and short answer formats were mostly used (Joseph et al., 2016). The types of questions on most of these measures were factual in nature, with less being inferential. This may be in part due to the fact that the majority of studies used expository texts. It is also important to assess generalization of skills of students with learning problems as they often have difficulty applying skills taught in one context to another context (Troia, 2002). With regards to generalization measures, the majority of studies in the Joseph et al. (2016) review did not examine whether students with learning problems can generalize applying self-questioning strategy in one type of text genre to another type of text genre (e.g., narrative to expository text or vice versa). Examining generalization in this way is important given that students are expected to read various types of text genres in school.

The purpose of the current study was to systematically replicate and extend prior research examining the effects of self-questioning with systematic prompt fading for students who need supplemental instruction. The current study extends prior research in the following ways. First, a self-questioning reading comprehension strategy using faded prompts was implemented in small groups rather than in whole class or in one-to-one instructional contexts. Second, the administration of generalization measures that examined students' application of self-questioning from one text genre to another was included in the current study. Third, students as a group engaged in choral reading of the passages whereas past studies consisted of the students reading the passages silently. Finally, the current study required the students to recall content through fill in the blank items. Fill in the blank items are considered to be more cognitively demanding than multiple choice items. Moreover, administering

fill in the blank items minimizes students' guessing the correct response among response choices.

Specifically, this study was designed to answer the following research questions: (a) What are the effects of self-questioning with systematic prompt fading while reading expository text on the accuracy of answering reading comprehension questions? (b) Does the application of self-questioning generalize to chorally reading narrative text and silently reading expository text as measured by the number of comprehension questions answered correctly? (c) What are the students' and teachers' opinions of self-questioning with systematic prompt fading?

## Method

### Participants and Setting

Before participants were selected for inclusion in this study, approval and compliance were obtained from the researchers' university Institutional Review Board. Participants consisted of two small groups of three fifth grade students. The first group included Leah, Julia, and Hannah, and the second group included Brandon, Kelly, and Darien. Pseudonyms were used for each participant. These participants represented an ethnically diverse sample, similar to the school district in which they were enrolled (see Table 1 for participants' demographic information). The participants' primary language was English. All participants were not identified as having disabilities and received instruction in a general education classroom in an urban, Midwestern public elementary school. Darien was the only

Name	Gender	Race or Ethnicity	KTEA-3 Reading Comprehension Standard Score	Percentile Ranks	Score Descriptors
<b>Group 1</b>					
Leah	Female	Black	78	7	Below Average
Julia	Female	Hispanic	78	7	Below Average
Hannah	Female	White	89	23	Low Average
<b>Group 2</b>					
Brandon	Male	Black	86	18	Low Average
Kelly	Female	Black	86	18	Low Average
Darien	Male	Multiracial	81	10	Below Average

**Table 1.** *Demographic Information of Participants*

participant who received supplemental reading instruction in a Title I reading program.

The six participants were initially selected to participate in this study through referral from the school's principal and fifth grade teachers. According to their teachers, participants were able to read fifth grade texts; however, they had difficulty obtaining meaning from the texts. Participants who were referred scored in the bottom 20% of their general education class on the reading comprehension portion of the i-Ready reading assessment. Students were also administered the reading comprehension subtest of the Kaufman Test of Educational Achievement, Third Edition (KTEA-3; Kaufman & Kaufman, 2014). Three participants obtained a standard score classified in the below average range, and three participants obtained a standard score classified in the low average range (see Table 1).

**Selection to small instruction groups.** It is recommended that small groups of students receiving supplemental instruction comprise students who have similar skill needs and who perform skills at similar levels (Wilson, Nabors, Berg, Simpson, & Timme, 2012). Therefore, after the initial participant selection process, students were assigned to one of two small instructional groups based on their similar performance on reading comprehension probes that were administered during the first three baseline sessions.

## Materials

Materials for this study consisted of expository passages taken from readworks.org. Each passage used lexile levels equivalent to a fifth grade reading level. Each passage was a page to a page and a half long and written in Times New Roman 16-point font. The passages did not require visual graphic displays to understand the meaning of the text. All passages contained four paragraphs of connected text with an average of approximately 300 words per passage.

## Definition and Measurement of Dependent Variable

**Number of questions answered correctly.** Reading comprehension was measured by administering probes containing eight instructor-generated fill-in-the-blank comprehension questions

pertaining to expository passages that students were asked to read. The types of questions were based on the national English Language Arts common core standards. These included questions related to identifying main ideas and key details and understanding vocabulary in a passage. For each probe, two questions asked about main ideas, four questions asked about key details, and two questions asked about vocabulary. Each question was a 12- to 16-word sentence. All questions began with the phrase, "According to the text..." For example, a key detail question pertaining to a passage about pianos was, "According to the text, \_\_\_\_\_ are run through the harp and around the pins inside the piano."

To administer the probe, the instructor provided the students with written questions containing spaces for students to fill in the blanks with their answers. The instructor gave the following directions to the students, "Please answer these questions as best you can." Students silently read the questions on the probes and wrote their answers independently. The probes were administered immediately following each baseline, intervention, and generalization session. Items on probes were scored using answer keys.

## Experimental Design and Procedures

A multiple probe design across two small groups of students was used to examine the effects of the self-questioning intervention on reading comprehension probes. The experimental phases included baseline, three intervention phases, and generalization. Fifth grade level passages selected from readworks.com, as previously described, were randomly selected to be used in each experimental phase to minimize bias of passage selection in one phase over another. However, once the passage order was randomly determined for group one, this same order was used for group two so passage variety was not a confounding variable between the two groups. A trained instructor who was a graduate student implemented procedures in each phase in a quiet room that was different than the students' classroom at the school. At the end of each experimental phase (baseline, intervention, and generalization), the reading comprehension probes were administered. During each phase of the study, detailed scripts were

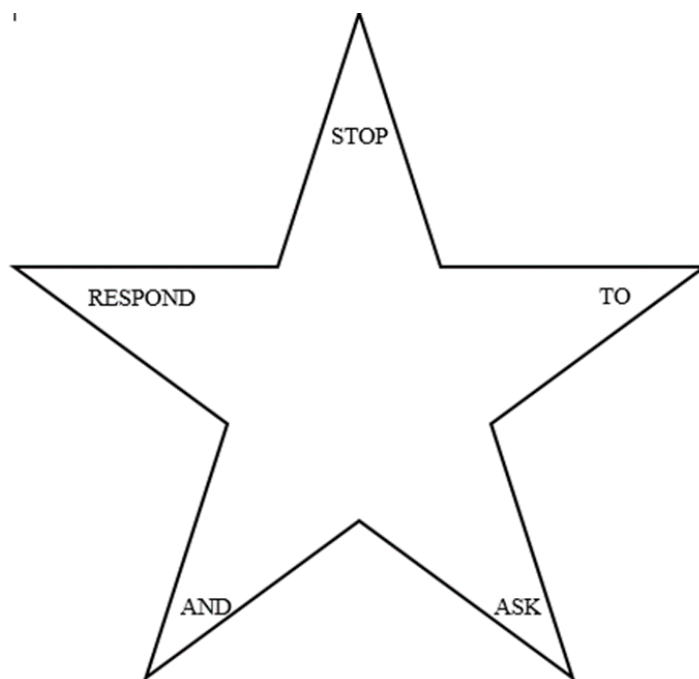
followed for each session to promote procedural integrity.

**Baseline.** Baseline sessions were administered individually with each student and lasted approximately 15 minutes. During baseline, the instructor provided an expository passage for the participant to read orally. The instructor provided the following directions, “Today you will read an expository passage. While you are reading, you can stop and ask yourself questions so you learn what the passage is about. When you are done reading, you will answer some questions about the story.” While the student read the passage orally, the instructor gave immediate corrective feedback on oral reading errors. After the participant read the passage orally during each baseline session, the instructor removed the passage and administered a reading comprehension probe that consisted of eight instructor generated fill-in-the-blank questions. The student read the probe questions silently and wrote the answers independently. Students were not permitted to engage in text look backs to locate answers to the comprehension questions. No feedback was provided to the student based on responses on the probe. The decision rule for moving from the baseline to first intervention phase was the following: all three students needed three to five stable data points with a non-ascending trend.

**Intervention.** Intervention consisted of the following three phases: Embedded Questioning-Training (EQ-TR), Embedded Questions (EQ), and Self-Questioning (SQ). These phases were created to gradually fade instructional prompts as students were able to apply self-questioning on their own. Each intervention session was implemented in a small-group format and lasted approximately 20 to 30 minutes.

*Embedded Questioning-Training (EQ-TR).* In this phase, the instructor first taught the students about self-questioning. For example, the instructor discussed the procedures for how to self-question using the mnemonic STAR, which stands for Stop to Ask and Respond (see Figure 1 for a visual depiction of the mnemonic provided to the students). The instructor checked students’ understanding of the strategy by asking them questions after describing the mnemonic. Students were given guidelines for working as a group such as remaining in their seats,

participating, and remaining silent during the administration of probes.



**Figure 1.** The mnemonic provided to students to teach self-questioning (i.e., STAR)

The instructor then provided students with passages containing one instructor-generated question pertaining to main ideas, key details, or vocabulary at the end of each paragraph. The students were instructed to engage in choral reading of the passage. After students read the first paragraph, the instructor modeled answering the first embedded question by verbally and physically demonstrating going back to the text to locate the answer and record it. For the second and third paragraphs and embedded questions, guided practice occurred as the instructor and students together read the question, looked back in the passage, and discussed the answer. The final question gave students the opportunity to look back in the text themselves for the answer while the instructor provided corrective feedback as needed. Students were asked to share their answers with the group and point to the section in the text where they found the answer.

At the end of each intervention session in this phase, the passage was removed and the student was instructed to complete an instructor-generated, fill-in-the-blank reading comprehension probe consisting

of eight questions pertaining to the passage. The student read the probe questions silently and wrote the answers independently. Students were not permitted to engage in text look backs to locate answers to the comprehension questions. No feedback was provided to the student based on responses on the probe.

Due to varying paces of choral reading across participants, the instructor modified the procedures for this phase in session seven for group one; the instructor engaged in choral reading with the students to establish a common reading pace. For group one, this instructor addition is called Embedded Questioning-Training-Lead (EQ-TR-Lead). This slight modification in procedures was not made until session seven for group one because students began to race each other to finish the passage first during sessions five and six. The instructor used the modified procedures for all EQ-TR sessions for group two.

At the end of each intervention session in this phase, the passage was removed and the students were instructed to complete a reading comprehension probe comprised of eight instructor generated fill-in-the-blank questions pertaining to the passage. The students read the probe questions silently and wrote the answers independently. Students were not permitted to engage in text look backs to locate answers to the comprehension questions. No feedback was provided to the student based on responses on the probe. The decision rule for moving from EQ-TR-Lead and EQ-TR to EQ was determined before the study began, and the rule was that all three students needed to correctly answer five out of eight comprehension questions.

*Embedded Questioning (EQ).* Procedures in this phase were mostly the same as in the prior phase; however, students were not given corrective feedback. Instead, they were required to look back in the text to locate the answers to the embedded questions on their own. If the students did not engage in text look backs, the instructor verbally prompted them to do so by saying, "Remember to go back to the paragraph to look for the answer before you write down your answer" at the end of each paragraph.

At the end of each intervention session in this phase, the passage was removed and the student was instructed to complete a reading comprehension

probe containing eight instructor generated fill-in-the-blank questions pertaining to the passage. The student read the probe questions silently and wrote the answers independently. Students were not permitted to engage in text look backs to locate answers to the comprehension questions. No feedback was provided to the student based on responses on the probe. The decision rule for moving from EQ to SQ was the following: all three students needed to correctly answer five out of eight comprehension questions.

*Self-Questioning (SQ).* The final phase consisted of similar procedures as in the EQ phase; however, instructor-generated questions were not provided. Instead, students were provided with blank lines at the end of each paragraph and were asked to generate their own questions and respond to them. The experimenter provided the following directions to the students during this phase:

"Today you will continue using self-questioning, but this time you will make your own questions instead of me creating them for you. You will see two lines after each paragraph. When you come to the two lines, stop to write a question on the top line, ask yourself that question, and respond to the question by writing on the bottom line."

The instructor checked all the students' self-generated questions to see if their questions pertained to the content in the respective paragraph.

At the end of each intervention session in this phase, the passage was removed and the student was instructed to complete a reading comprehension probe that consisted of eight instructor generated fill-in-the-blank questions pertaining to the passage. The student read the probe questions silently and wrote the answers independently. Students were not permitted to engage in text look backs to locate answers to the comprehension questions. No feedback was provided to the student based on responses on the probe. The decision rule for moving from SQ to the generalization phase was determined before the study began, and the rule was that all three students needed to have at least one data point at or above 75% accuracy (a score of six out of eight).

**Generalization.** Two ways of assessing generalization were conducted in this study. One way involved assessing how well students could generalize self-questioning from one text genre to another. Specifically, students were asked to answer eight instructor generated fill-in-the-blank comprehension questions after reading narrative passages chorally rather than reading expository passages chorally. The other way of assessing generalization involved using a different learning channel. Specifically, students read expository passages silently rather than chorally and answered eight instructor generated fill-in-the-blank questions. The generalization passages were within the same lexile range and of similar length as the passages used for the other phases.

All generalization probes were administered individually to participants across baseline and intervention phases using similar probe administration instructions as used in those phases. In every generalization session, students were asked to read a passage. No corrective feedback was provided for oral reading errors during oral reading of passages in the generalization phase. Each generalization session lasted 15 minutes.

## Results

Figure 2 presents a graph of reading comprehension performance during experimental phases of the study and across two small groups of students. For every session that probes were administered during experimental phases, mean reading comprehension scores were calculated for the groups and depicted on the graph. As can be seen in Figure 2, the first group's mean baseline performance on reading comprehension probes was relatively stable, ranging from a mean of 1 to 3 correct responses out of a total of 8 comprehension questions.

### Group 1

During the EQ-TR phase for group one, the range of mean comprehension performance was 2.7 to 6.0. All the data points in this phase were above baseline levels except for the last two data points. The last two data points in the EQ-TR phase overlapped with baseline performance due to the students'

variable pace in reading the passage, as described in the procedures for this phase. When the instructor chorally read with the students, setting a common oral reading pace (i.e., EQ-TR-Lead phase), the students' mean score on the probe was 5 out of 8. As such, the students' performance in the EQ-TR-Lead phase better aligned with their performance on the first four sessions in the EQ-TR phase.

During the EQ phase, the mean performance ranged from 4.0 to 6.5 with minimal variability, no overlap with baseline levels, and an upward trend in performance in the last three sessions of this phase. In the SQ phase, the mean score was consistently 6 correct out of 8 across the two sessions with no overlap with baseline levels of performance.

Table 2 presents mean performance on reading comprehension probes during each experimental phase for each student in the first group as well as for the whole group. There was relatively greater variability in performance on the probes in the EQ-TR phase than in the other phases. Overall, students performed similarly on reading comprehension probes during the EQ-TR-Lead, EQ, and SQ intervention phases of the study.

### Group 2

As can also be seen in Figure 2, the second group's mean baseline performance ranged from 1.3 to 5. During the EQ-TR phase, mean performance on probes ranged from 3.3 to 6.0 ending with an upward trend. In the EQ phase, the mean score ranged from 4.0 to 6.0 with a consistent upward trend in performance. During the SQ phase, mean scores on the probes ranged from 6.0 to 6.7 with no overlap with baseline performance levels.

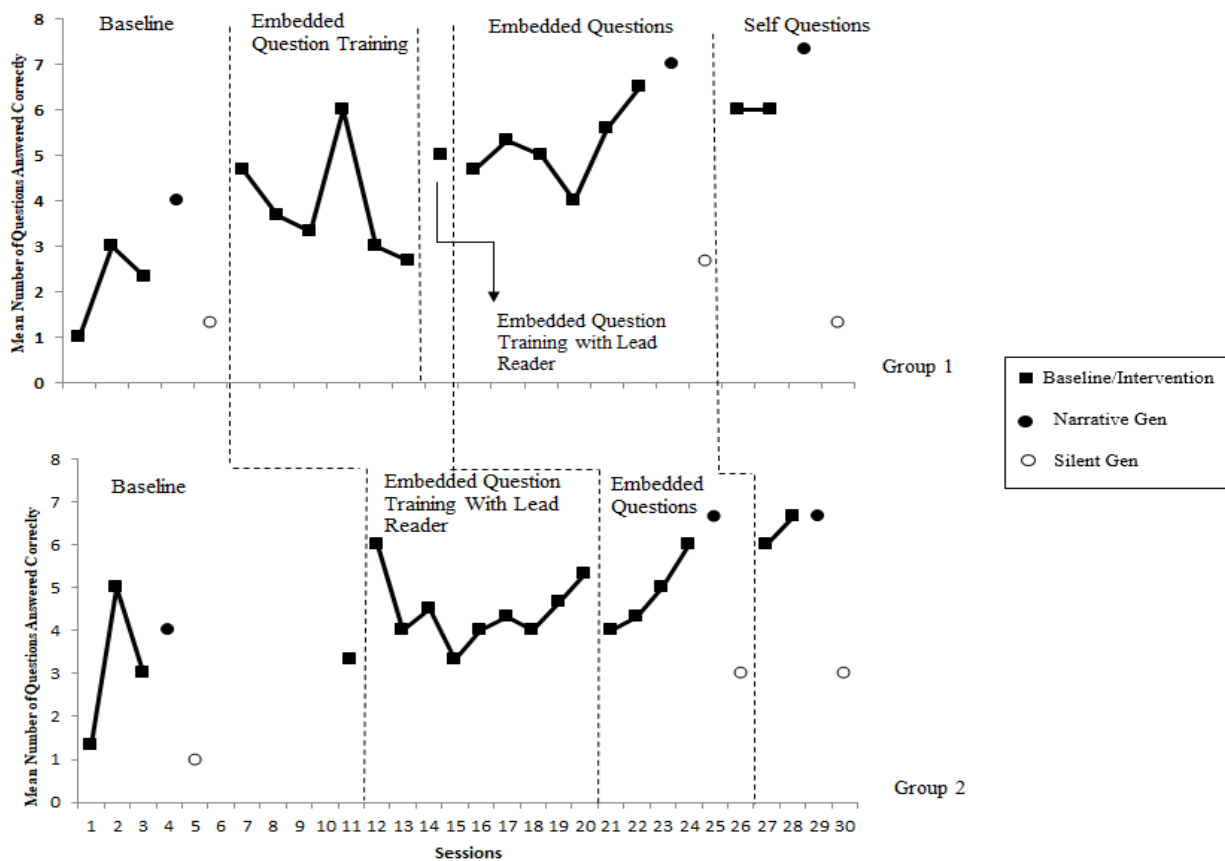
Table 3 presents mean performance on reading comprehension probes during each experimental phase for each student in the second group as well as for the whole group. Overall, students performed similarly on reading comprehension probes during the three self-questioning intervention phases of the study.

### Generalization

Both groups had similar patterns of responding for the generalization probes (see Figure 2). For narrative passages in baseline, participants' mean scores were 4 correct responses. During

	Baseline	Embedded Questioning Training	Embedded Questioning Training with a Lead	Embedded Questioning	Self-Questioning
Leah	2.0	2.6	5.0	5.0	6.0
Julia	1.7	3.5	5.0	4.2	5.0
Hannah	2.7	5.0	5.0	6.2	7.0
Group 1 Means	2.1	3.7	5.0	5.1	6.0
Group 1 Ranges	1.7–2.7	2.6–5.0	5.0–5.0	4.2–6.2	5.0–7.0

**Table 2.** Mean Number of Questions Answered Correctly for Students in Group One by Phase



**Figure 2.** Graph of the mean number of questions answered correctly for groups one and two by session and phase



	Baseline	Embedded Questioning Training with a Lead	Embedded Questioning	Self- Questioning
Brandon	4.0	4.1	3.8	5.5
Kelly	2.5	3.6	4.5	6.0
Darien	3.0	5.3	6.3	7.5
Group 2 Means	3.2	4.4	4.8	6.3
Group 2 Ranges	2.5–4.0	3.6–5.3	3.8–6.3	5.5–7.5

**Table 3.** Mean Number of Questions Answered Correctly for Students in Group Two by Phase

intervention phases, students achieved 7 to 8 mean correct responses. For silent expository generalization probes, participants' mean scores ranged from 1.0 to 1.3 correct answers in baseline. Mean scores across the remaining phases ranged from 2 to 3 correct responses.

### Social Validity

To assess the social validity of the intervention, the students completed a seven-item questionnaire using a five-point rating scale. Items on the questionnaire were read aloud to the students to ensure they did not have difficulty reading them. Student responses on the questionnaire suggested they all agreed that it is very important for them to understand what they read. In terms of how helpful the questions created for them were, responses were divided evenly between "slightly helpful" and "very helpful." The ratings were slightly more variable with regards to how helpful the questions they generated were. Five students indicated they thought this aspect of the intervention was "slightly helpful" or "very helpful," whereas one student found it to be "very unhelpful." Student responses ranged from neutral to strongly agree to the statement, "I am a better reader now that I have learned self-questioning." Students' responses ranged from disagree to strongly agree (with four students agreeing or strongly agreeing) for

very likely or likely to use self-questioning strategy on their own.

The fifth grade teacher completed a six-item questionnaire using a five-point rating scale. One open-ended question was also included. The teacher agreed that the intervention was effective in improving reading comprehension and agreed with the statement about being pleased with the progress his students were making comprehending text. He agreed this intervention would be feasible to implement in a small-group instructional context. However, he responded with "neutral" with regards to having the needed resources to implement the intervention in a small group. The teacher was asked an open-ended question (i.e., "Would you use this intervention to improve students' reading comprehension? Why or why not?"). He replied that he would use this intervention in the future because he felt that the intervention was not time consuming, and it helped his students improve their reading comprehension skills.

### Procedural Integrity

Procedural integrity was assessed during baseline and intervention phases to ensure that procedures were followed as intended. Detailed procedural checklists with up to 22 sequential steps were created for each phase and distributed to

independent observers. The independent observers consisted of graduate students in school psychology or special education doctoral programs with at least one year of training related to interventions. The independent observers observed 42% of baseline sessions and recorded that the instructor adhered to the procedures 100% of the time. The independent observers also observed 26% of the intervention sessions and recorded that the instructor adhered to the steps 99% of the time. Each time 100% adherence was not observed, the instructor was retrained on the procedures.

### **Interobserver Agreement (IOA)**

Interobserver agreement was obtained between the instructors' scores on probes and the independent observers' scores on probes. The independent observers were trained to independently score the reading comprehension probes, including generalization probes administered during baseline and intervention sessions. In each phase, 33% of probes were independently scored using an answer key. There was 98% IOA for baseline probes; 99% for intervention probes, 98% for expository generalization probes, and 96% for narrative generalization probes. IOA for this study was considered acceptable as IOA must reach at least 80% agreement to be considered acceptable (Kratowill et al., 2010).

### **Discussion**

The results of this study support the findings of previous research exploring the effects of self-questioning research. Similar to prior studies, findings of the current study reveal that students improved on answering comprehension questions when they applied self-questioning strategies (Crabtree et al., 2010; Rouse et al., 2014). The findings of the current study extend findings from prior studies in a number of ways. First, self-questioning was implemented effectively in a small-group instructional context for students who were in need of supplemental reading comprehension instruction. When self-questioning training and instructor generated embedded questions were faded, students engaged in generating their own questions while reading and were able to improve on answering

comprehension questions over and above baseline levels of performance. In addition, the findings of the current study extend findings from the Rouse et al. (2014) study as students in the current study were able to respond to questions that required them to recall from memory the content from the text rather than select an answer to a question from multiple response choices. However, it appears that they did not respond correctly to as many fill in the blank items as participants did in prior studies when multiple choice items were administered (e.g., Berkeley et al., 2011; Rouse et al., 2014).

Interestingly, in this study, two generalization conditions were implemented. One involved having the students generalize implementing self-questioning while chorally reading expository passages aloud to applying self-questioning while chorally reading narrative passages aloud. The other generalization condition involved having the students generalize applying self-questioning while reading expository passages aloud to applying self-questioning while reading expository passages silently. Students in this study performed over baseline levels of performance on both types of generalization measures when these measures were administered during the embedded questions condition. When students were asked to generate their own questions, students were able to generalize answering questions from narrative text over and above baseline performance levels. However, in the self-generated question condition, they were not able to perform over and above baseline levels on answering questions from reading expository text silently. Overall, students demonstrated higher levels of performance on answering questions from text when they engaged in self-questioning while reading narrative passages aloud than answering questions from text when they engaged in self-questioning of expository passages during silent reading. Perhaps students performed better on narrative passages because they chorally read the passages as they did in the experimental phases of the study. When students were asked to silently read an expository passage, it was challenging to observe whether or not they were actually reading the entire passage. Students may not have been able to respond to some of the questions if the entire passage was not read. Another possible reason is that the students may have found the

narrative passages to be interesting, enjoyable, and easier to read than reading the expository passages silently.

### **Limitations and Directions for Future Research**

Although every effort was made to group students according to similar performance levels, some variability in performance within groups existed in this study. These differences need to be taken into consideration when working effectively with small groups of students. For instance, during the choral reading portions of the intervention in this study, the researchers did not anticipate that students would compete with each other with regards to their pace at reading the passages. It may be advantageous for future researchers to account for this occurrence from the start of the study.

In this study, the expository passages were new to the students. However, students may have been exposed to the information described in the passages even though they did not have prior exposure to the actual passages. Variables such as this are difficult to control when assessing reading comprehension, although every effort is made to minimize extraneous variables influencing outcomes.

When students were asked to generate their own questions in the last phase of the study, there was no evaluation of the quality of their self-generated questions. Future research may explore how well students generated their own questions and the differential effects of high quality student generated questions versus low quality student generated questions on comprehending text.

There was no formal observation tool to assess if students self-questioned while reading generalization passages silently and chorally. Future studies should include a measure that detects whether students generate questions on their own during independent silent and oral reading activities.

Finally, experimental conditions were implemented across two tiers of small groups of students, which resulted in one replication effect. The school year ended which prevented researchers from adding another small group of students. Therefore, additional replications are needed to strengthen these preliminary effects of self-questioning as a small group (tier 2) intervention.

### **Implications for Practice**

Prior research examined the effects of self-questioning comprehension strategy in a one-to-one instructional context (tier 3). This current study demonstrated that self-questioning can be implemented in a small group (tier 2) instructional context. School psychologists can work with educators to identify students who may benefit from working in small groups and apply a self-questioning strategy such as the one used in this study to help students obtain meaning from text. However, there are some factors to consider when implementing this strategy in a small group. Although every effort was made to group students according to common skill level needs, a factor to consider is the variability in learning rate within the group of students. Another factor to consider is to arrange instructional conditions to maximize the number of opportunities for all students to make responses. For instance, in the current study, all students in the group were asked to chorally read the passages, ask themselves the questions that were embedded throughout the passages, and answer the questions.

In the current study, instructors led all choral readings of passages to establish a reasonable pace of reading the passages. In practice, it may also be beneficial to have students in the small group take turns leading the choral reading of passages. In this way, peers can serve as models for each other.

As was the case in the current study, students with learning problems may initially find it very challenging to generate high quality comprehension questions on their own. Teachers may need to first provide pre-printed questions, model asking those questions, gradually fade the pre-printed questions, and guide the students to generate their own questions. Phasing out prompts may also occur by first inserting questions in the text after small amount of passages (e.g., one or two paragraphs) are read and then gradually inserting the questions after larger amounts of text (e.g., three paragraphs or more) are read. Providing instructional supports such as prompts should be differentiated according to the needs of students. School psychologists can assist educators in assessing the needs of the group as well as the individual students within the group and differentiate instruction accordingly. For instance,

self-questioning prompts may be faded as students are able to ask questions on their own and recall and understand information from the text.

In general, students in the current study did not exhibit challenging behaviors. However, students with reading difficulties can exhibit behavior problems, especially as they seek to avoid reading tasks. For these students, it may be helpful to incorporate group reinforcement contingencies while they work together in small groups to apply strategies and achieve academic goals.

School psychologists can assist educators with developing easy to administer progress-monitoring assessments on applying strategies during small group instruction and answering comprehension questions. For instance, a simple checklist printed on a worksheet or an electronic version may be used during reading to record each time students engage in self-questioning and respond to their questions. School psychologists can periodically meet with the instructor to review the recordings and evaluate student progress on applying the strategy and answering comprehension questions correctly. The progress monitoring data will assist in making decisions on whether to intensify the intervention (e.g., add visual prompts to help students stop to ask and respond to questions), de-intensify supports (e.g., fading the visual prompts) or add reinforcement contingencies.

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**Article**

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# The Effects of an Individual Matching Work System on Student On-Task Behavior

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Academic success often requires students to successfully complete work independently. Consequently, in order to be successful in general education settings, students must master a combination of skills supporting on-task behavior and independent task completion. For students with and at risk for disabilities failure to master these skills can lead to exclusion from general education classrooms and increased time receiving education in more restrictive educational placements. The purpose of this single-subject design study was to demonstrate a procedure for improving independent work completion of students with and at risk for disabilities receiving instruction in a general education classroom setting. The authors used an individual matching work system with visual prompts to encourage independent work completion. Results indicate that following implementation of the intervention, levels of student on-task behavior and task completion increased while student requests for teacher assistance and teacher prompts decreased. The implications of these findings for practice and future research are discussed.

**Key words:** Work Systems, On-Task Behavior, Task Completion, Students with Disabilities, Single Case, Math Instruction

Meaningful learning and successful outcomes in general education classroom settings frequently require that students are able to move between academic tasks and complete work without multiple teacher prompts or assistance (Rock & Thead, 2009). Assignments that students complete on their own allow teachers to assess student mastery of skills and concepts and provide students with opportunities to receive specific, individualized performance feedback (Chan, Konrad, Gonzalez, Peters, & Ressa,

2014). Therefore, an essential skill for students with learning differences who receive part or all of their academic instruction in an inclusive classroom setting is being able to remain on-task during independent work times with limited support from teaching staff. Unfortunately, for many students, including those with and at-risk for disabilities, these are not sufficiently-developed skills. In fact, characteristically struggling learners often face challenges attending to and completing tasks, understanding and following multi-step instructions, and moving between academic tasks independently (Vaughn, Bos, & Shumm, 2013). These challenges can, in turn, lead to the need for higher than usual levels of prompting from teaching staff, as well as increases in rates of student off-task behavior in the classroom.

High rates of student off-task behavior in the classroom can increase risk of academic failure and can result in exclusionary discipline practices (e.g.,

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office discipline referrals, in- and out-of-school suspension) and, ultimately, placement in more restrictive educational settings (Cortiella & Horowitz, 2014). For students with disabilities in inclusive settings, an inability to remain on-task without multiple prompts from teaching staff also often leads to a self-perpetuating cycle of prompt dependency (Gifford, Redpath, & Lionello-DeNolf, 2018). Furthermore, when one or a small number of students require an unusually high degree of attention and prompting from staff to remain on task, teachers can struggle to adequately use allotted instructional time to meet the needs of the remaining majority of students (Bettini, Kimerling, Park, & Murphy, 2015). This not only has the potential to negatively affect academic outcomes for peers, but can also lead to negative teacher perceptions related to the inclusion of students with disabilities in their classrooms (de Boer, Pijl, & Minnaert, 2011). To avoid the potential negative effects of off-task behavior for individual students as well as their teachers and peers, classroom staff and those supporting them (e.g., school psychologists, behavior specialists) need evidence-based strategies designed to increase student on-task behavior that are not only effective, but also efficient and feasible for use in general education settings.

There are numerous studies documenting effective behavior-change interventions for individuals with disabilities who exhibit challenging behavior. However, much of the research has been conducted in more restrictive environments (e.g., analogue, clinical, and special education settings), leaving school professionals to generalize the methods and procedures used in these studies to more typical educational contexts. One strategy that has been found to be effective for increasing student on-task behavior in special education settings is the use of visual supports. Visual aids such as symbols, photos, and static pictures modeling children engaging in on-task behavior have been shown to increase self-monitoring behavior and act as a substitute for teacher-delivered prompts (Milley & Machalicek, 2012). Researchers have also demonstrated the beneficial effects of using visual supports (e.g., visual activity schedules) to increase the on-task behavior and completion of academic tasks (e.g., Bryan & Gast, 2000; Pierce, Spriggs, Gast, & Luscre, 2013; Spriggs et al., 2007). For

example, Pierce et al. (2013) taught four students with autism spectrum disorder (ASD) to use a visual activity picture schedule to successfully transition between center-time activities in an elementary self-contained classroom. Following intervention, student task completion and autonomous transitioning between tasks increased and teacher prompting decreased.

Individual work systems are a specific type of visual support commonly used in special education settings to increase on-task behavior and facilitate independent task completion. These systems typically utilize a series of visual prompts (e.g., color-coded folders or tubs that hold activities to be completed) to provide students with information related to: (1) what activity to work on, (2) how much of the activity to complete, (3) how to know if sufficient progress on an activity is being made, (4) when the activity is finished, and (5) what activity to complete next (Mesibov, Shea, & Shopler, 2004). Two general types of individual work systems commonly used in special educational settings are the left-to-right work system and the matching work system. In a left-to-right work system, the student sits at a table in between a shelf on the left containing labeled folders (or tubs) with tasks to be completed and a container for finished tasks to the right. The student completes the tasks one-by-one, moving each completed task from the left and then placing it in the *Finished* container on the right before moving on to the next task.

The matching work system, similar to the left-to-right system, includes all assigned tasks in folders. However, teaching staff can place folders in a variety of locations in the classroom. Folders are organized by visual symbols (e.g., colored shapes) affixed to the outside of the folder. Students locate the assigned tasks through using a task schedule, which contains the same visual symbols found on the folders. Students match the visual symbol on the task schedule to the folder and complete tasks in the order they appear on the task schedule. This type of system may be more feasible for use in a variety of educational settings because it does not require an isolated center within the classroom as left-to-right work systems do (Hume & Reynolds, 2010). Moreover, matching work systems also allow teachers to more easily incorporate contingent breaks

and physical movement between assigned tasks, potentially further decreasing challenging behavior (Kreibich, Chen, & Reichle, 2015).

Studies have documented the positive effects of individual work systems on the on-task behavior and task completion of individuals with developmental disabilities. For example, Hume and Odom (2007) documented increases in on-task behavior and task completion, along with decreases in prompts from adults when researchers implemented an individual matching work system with contingent breaks for two elementary-aged boys with ASD in special education classrooms. Further, O'Hara and Hall (2014) utilized a matching work system to increase the appropriate play behavior of students with ASD during recess with typical peers. Using the work system participating students were able to independently move about the playground and engage with age-appropriate playground equipment without prompts from teaching staff. The results of this study extend previous research by illustrating the use of an individual matching work system outside of the special education setting.

### **Purpose**

To date, empirical studies examining the effects of individual matching work systems have focused primarily on students with ASD in special education settings. Furthermore, previous research has failed to show how these procedures can be effectively implemented by typical classroom staff. The current study attempted to extend previous research by assessing the effects of an individual matching work system intervention on the on-task behavior of students with and at risk for disability identification in a general education classroom setting. Specifically, the researchers sought to examine the extent to which an individual matching work system intervention implemented by the general education classroom teacher resulted in (a) an increase in student on-task behavior and task completion and (b) a decrease in student requests for teacher attention. Data were also collected on the number of teacher prompts provided during independent academic work times both before and after intervention.

### **Method**

#### **Participants**

After receiving approval to conduct this study from the University's Institutional Review Board (IRB), the researcher asked the general education classroom teacher and inclusion teacher to nominate students who (a) demonstrated low levels of on-task behavior and task completion during independent academic work times and (b) possessed the motor, visual, matching, and sequencing skills required to independently operate an individual matching work system. The researcher used pre-baseline observations to finalize participant selection. During pre-baseline assessment, all participants were observed engaging in on-task behavior for less than 50% of the observation session. Parental consent and student assent to participate in the study were obtained for all three participants.

Jacob, a Hispanic male, was 11-years old at the time of the study and spent 100% of his school day receiving instruction in a general education classroom. Jacob was not receiving any special education services, however at the time of the study he was being evaluated for Attention Deficit Hyperactive Disorder (ADHD) at the request of his teachers. In addition to low rates of on-task behavior, during pre-baseline classroom observations the student exhibited a number of off-task behaviors including talking to peers when the expectation was to work independently, out-of-seat behavior, and looking around the classroom rather than at academic materials.

Cody was an 11-year-old Caucasian male who was eligible for special education services due to his diagnoses of Other Health Impaired (OHI) and Emotional/Behavioral Disability (EBD). Cody also regularly took stimulant medication to enhance his concentration and follow-through with tasks. Cody spent 93% of his school day receiving instruction in a general education classroom with the support of the inclusion teacher for 30-minutes of math time. He also received reading pullout instruction for 40-minutes each day. Cody's Individual Education Program (IEP) stated he struggled with: 1) inattentiveness, 2) hyperactivity, and 3) impulsiveness. In addition to low rates of on-task behavior during pre-baseline classroom observations,



the researcher also observed high rates of out-of-seat behavior and talking- or calling-out behavior, including inappropriate verbal behavior (e.g., “This work is stupid!”) when asked to complete academic tasks.

Lucy, a Hispanic female, was 12-years old at the time of the study. Lucy was eligible for special education services due to her diagnosis of a specific learning disability in math and reading. She spent 90% of her school day receiving instruction in a general education classroom with 45 minutes of reading pullout instruction and 30 minutes of support in her math inclusion classroom. The teachers nominated Lucy for participation in this study due to concerns related to her low level of engagement in class, including low rates of on-task behavior and completion of independent academic tasks. During pre-baseline observations, Lucy failed to complete any academic tasks without receiving one-on-one instruction and prompting from teachers.

### Settings and Materials

All pre-baseline observations and experimental sessions took place in an inclusive math classroom of 26 students at a public elementary school in the Southwestern region of the United States. One general education fifth-grade teacher taught the class with the assistance of the school’s inclusion teacher. In addition to one kidney table with space to sit four to six students, the classroom had four tables to sit six to seven students each. During all phases of the study, the three participants sat in their assigned seats. Sessions took place two to five days per week during the students’ normally-schedule independent work time.

Each individual matching work system consisted of four black folders, a task schedule strip, and a small black wire basket. The researcher constructed the three individual matching work systems for each student. The researcher taped one visual symbol to each black folder. Each black folder had a different colored circle (i.e., orange, pink, green, and yellow) taped to the outside to serve as the visual symbols for the matching work systems. Underneath each colored circle on the folder, the researcher placed a 1-inch by 1-inch Velcro® square. Next, a moveable visual symbol was created by laminating the four different colored circles and

affixing them to an 8½-inch by 2-inch piece of laminated cardstock (henceforth referred to as task schedule) via another Velcro® square. The task schedule also contained a break symbol indicating a 5-minute computer break and a symbol indicating the activity (e.g., reading, lunch) that would occur after math.

### Measures

The dependent variables for this study were student on-task behavior, task completion, and requests for teacher attention. Although teachers’ use of prompts was not directly intervened on, the researchers also collected data on the number of teacher prompts delivered during baseline and intervention sessions. The researchers used a paper-and-pencil direct observation data collection sheet, and a timer for data collection.

**On-task behavior.** On-task behavior was operationalized as the participant being oriented toward and actively engaged in an assigned task (e.g., looking at the assigned task, writing/coloring, counting fingers, or moving symbols on task schedule). Additionally, to be coded as on-task, the participant needed to be seated in their seats (defined as the participant having his or her buttocks in an assigned seat with all four chair legs making contact with the floor; Hume & Odom, 2007). The researchers used a 1-minute momentary time sample (MTS) procedure to record the occurrence of on-task behavior. At the end of each 1-minute interval the researcher received a vibrating prompt from a MotivAider® timer. Upon receiving the prompt, the data collector scanned the participants in the same order (i.e., Jacob, Cody, and then Lucy) and scored either an occurrence or nonoccurrence of on-task behavior for each student.

**Task completion.** The researchers used a permanent product recording system to document the number of tasks completed at the end of each 20-minute data collection session. Task completion was operationalized as the number of math problems completed on each assignment found in the participants’ task folders or *Finished* basket. To get a percentage of task completion, the researchers divided the number of problems completed by the number of total assigned problems and then multiplied by one hundred.

**Requests for teacher attention.** Requests for teacher attention were defined as the participant raising his or her hand or calling out to or walking to the teacher and asking the teacher for assistance (e.g., “What do I do when I am finished with this?”). The researchers used an event recording system to tally the number of requests for teacher attention each participant made during each session.

**Teacher prompts.** Teacher prompts were operationalized as any direction or assistance the teacher provided to the participant. Directions or assistance included any gestural (e.g., pointing to the task schedule) or verbal prompts to the participant to remain on-task or to complete his or her assignments. Observers used an event recording system to tally the number of prompts teaching staff delivered to participants during each baseline and intervention session.

## Procedures

**Design.** This study employed a multiple-probe across participants design (Gast & Ledford, 2014) to examine the effects of an individual matching work system on participants’ on-task behavior, task completion, and requests for adult attention. Multiple-probe designs are a variation of the multiple baseline design in which continuous baseline assessment is replaced by intermittent probes to avoid exposing participants to prolonged baseline conditions. To establish experimental control, intervention was staggered across participants, beginning with one student at a time (i.e., stable responding was established during intervention for participant one, then intervention was implemented for participant two, and so forth) while baseline probes were conducted for participants still under baseline conditions.

**Baseline.** During baseline, data were collected during the students’ typical independent academic work time in Math which lasted for 20 minutes. Independent work time began with a verbal prompt from the teacher such as, “This is independent work time, please work quietly at your desk.” Work completed during this time consisted of math fact review worksheets, math fact workbook problems, and an end-of-unit assessment.

**Training.** Following baseline and before intervention, participants and the general education

classroom teacher received instruction from the first author regarding how to implement the individual matching work system intervention. Individual training sessions for all three participants took place in their typical general education setting during a time when all other students in the class were not present (e.g., recess). Training sessions lasted approximately 20 minutes. The researcher first asked the participants to practice taking one colored circle off the task schedule and placing it on the folder with the matching circle. Next, the researcher provided a description of each component of the individual matching work system, explaining how each task was to be completed in the order they appeared on the task schedule. Finally, the researcher demonstrated that a completed task is placed in the participant’s designated *Finished* basket before moving to the next item on the task schedule.

Next, participants were led through guided practice providing each participant the opportunity to use the work system with developmentally appropriate, non-academic tasks (i.e., an activity in which students selected their pseudonym to be used for the study, a drawing activity, a weekend activity, as well as a questionnaire). The researcher provided immediate feedback to each participant on his or her use of the work system.

**Intervention.** Once each student demonstrated mastery of the work system, the researcher asked the teacher to implement the intervention during his independent work time in math. During the intervention phase, the classroom teacher placed the work system on the students’ desks before independent work time in math began. To prepare the work system, the classroom teacher first selected math tasks at the appropriate academic level for each student. Next, the teacher placed any necessary materials needed to complete each assignment in the task folders. The teacher then placed visual symbols on the task schedules representing the assigned tasks and placed any break symbols at her discretion on the individualized task schedules. The last thing the teacher placed on each participant’s task schedule was a symbol representing the activity to begin after all assigned tasks were completed. Lastly, the teacher placed a basket labeled “finished” in a designated location that was easily accessible for each participant.

During the intervention phase, the classroom teacher verbally prompted participating students to use the individual matching work system by saying, "It's time to complete independent seatwork. Please follow your individual matching work system to complete your assigned tasks." The researcher provided support to the teacher during the intervention phase by allowing time at the end of each session for the teacher to ask questions.

**Interobserver Agreement (IOA).** A second observer independently coded on-task behavior, requests for teacher attention, and teacher prompts for a minimum 25% of baseline and intervention sessions. IOA was calculated in each category by dividing the number of agreements by the sum of agreements and disagreements and multiplying the quotient by one hundred. IOA for on-task behavior was 89%, and the IOA for teacher prompts, and request for teacher attention was 97%.

**Procedural Fidelity.** Procedural fidelity was assessed during 50% of intervention sessions and 100% of follow-up sessions using a researcher developed fidelity checklist. The checklist assessed the extent to which each component of the intervention was put into place and made available to participating students by the classroom teacher. Procedural fidelity remained at 100% throughout intervention and follow-up.

**Follow-Up.** The researcher conducted two additional follow-up data collection sessions two weeks after intervention data collection sessions ended for each participant to determine the extent to which (a) participants' on-task behavior, task completion, and independence maintained at intervention levels and (b) the classroom teacher continued to implement the individual matching work system intervention with fidelity, when support from the researcher was no longer present.

**Social Validity.** At the conclusion of the study, the researcher provided the classroom teacher and the inclusion teacher with a questionnaire to assess their view of the educational benefit and feasibility of implementing the individual matching work system intervention. The questionnaire consisted of four 5-point Likert-type scale items (i.e., 5 = Strongly Agree, 1 = Strongly Disagree) related to the extent to which teachers found the intervention acceptable, feasible, and effective, and whether or not

they would be likely to use a similar intervention for future students. The researcher also asked the three student participants questions related to acceptability and perceived effectiveness of the work system. The researcher recorded students' responses using a digital recorder.

### Data Analysis

The researchers graphed and visually analyzed all direct observation data to evaluate changes in level, trend, and variability within and across experimental phases, as well as immediacy of effect and overlapping data across adjacent phases following intervention (Kratochwill et al., 2013). The percentage of nonoverlapping data (PND; Ledford & Gast, 2018) was calculated for all dependent measures. Additionally, the researchers supplemented visual analysis and PND with a statistical analysis of effect size for each student outcome. Tau-U was selected for this analysis due to the control it provides for within phase trend and serial dependency in single-case data (Parker, Vannest, Davis, & Sauber, 2011).

## Results

### On-Task Behavior

The data for participant on-task behavior are shown in Figure 1 for the three participants. Upon implementation of the work system intervention, the data for each participant showed an immediate change in the level of on-task behavior. PND for on-task behavior was 100% for all three participants, suggesting the intervention was highly effective for increasing on-task behavior (Banda & Therrein, 2008). A summary of individual student response to intervention is provided in Figure 1.

During the baseline condition, Jacob exhibited on-task behavior for an average of 22% of intervals (range: 7-40%). Following intervention, Jacob's on-task behavior increased to an average of 81% of intervals on-task (range: 60-93%). Data from the two-week follow-up session indicate that increased rates of on-task behavior maintained with 93% of intervals on-task. Cody engaged in on-task behavior for an average of 24% of intervals (range: 13-33%) during the baseline condition. After the classroom teacher implemented the matching work

system intervention, Cody's data demonstrate an immediate level change of engagement in on-task behavior to an average of 91% of intervals (range: 80-100%). During follow-up, Cody was scored as being on-task for 87% of intervals in the first session and 93% of intervals in the second session. Baseline probes for Lucy document that she engaged in on-task behavior for an average of 20% of intervals (range: 7-33%). Following implementation of the work system intervention, Lucy's on-task behavior increased to an average 88% of intervals (range: 67-100%). During the two-week follow-up condition, Lucy's on-task behavior maintained at 93% of intervals during each of the two follow-up sessions.

### **Task Completion**

The data for task completion are illustrated in Figure 2 for each participant across all conditions. During the baseline condition, Jacob completed an average of 24% of tasks during independent work time (range: 0-30%). Following intervention, Jacob's task completion showed a stable increasing trend with an average of 92% of tasks completed per session (range: 80-100%). During the two-week follow-up session for Jacob, task completion dropped slightly below intervention levels with 80% of tasks completed. In the baseline condition, Cody completed on average 33% of tasks per session (range: 23-40%). After the teacher implemented the matching work system intervention, Cody's task completion increased to an average of 96% of tasks completed per session (range: 72-100%). Cody completed 100% of tasks assigned during both follow-up sessions. Lucy completed an average of 24% of tasks per session during the baseline condition (range: 0-32%). Upon implementation of the work system intervention, Lucy's task completion increased to an average of 92% (range: 82-100%). During two-week follow-up sessions, Lucy's task completion remained high at 100% of tasks completed in session one and 80% of tasks completed during the second follow-up session. As with on-task behavior, PND for task completion following intervention was 100% across all three participants, again suggesting that the matching work system intervention was highly effective for producing positive change in student behavior.

### **Student Requests for Attention and Teacher Prompts**

The results for student requests for teacher attention and teacher prompts are shown in Figure 3. During baseline, Jacob received an average of 8 teacher prompts per 20 minute session (range: 6-12) and requested teacher attention an average of 5 times per session (range: 3-6). Following intervention, teacher prompts decreased to an average of 1 per session (range: 0-2), and the average number of requests for attention made by Jacob decreased to 1 request per session (range: 0-1). During the follow-up session, Jacob received a total of 2 teacher prompts and made no requests for teacher attention during independent work time. Cody received an average of 5 teacher prompts per session during baseline (range: 4-7). Cody also had the highest average of requests for teacher attention prior to intervention with an average of 6 requests per session (range: 3-10). After the implementation of the work system intervention, the number of teacher prompts Cody received reduced to an average of 1 teacher prompt per session (range: 0-2), and his number of requests for teacher attention decreased to an average of 1 per session (range: 0-2). At the two-week follow-up, the number of teacher prompts Cody received increased slightly to 2 teacher prompts per session, while requests for attention remained at intervention rates. During baseline, Lucy received an average of 4 teacher prompts (range: 3-6) and made an average of 2 requests for teacher attention (range: 1-2) per session. Following intervention, the number of teacher prompts reduced to an average of 1 prompt per session. The number of requests Lucy made reduced to an average of 0.29 requests per session (range: 0-1). During the two-week follow-up condition, teacher prompts remained low, and Lucy made no requests for teacher attention during independent work time.

PND for student requests for teacher attention for Jacob and Cody was 100%, suggesting that the intervention was highly effective for reducing inappropriate levels of student requesting. By contrast, for Lucy's behavior PND was 78%, indicating that the intervention was moderately effective for reducing Lucy's requests for teacher attention (Banda & Therrein, 2008).

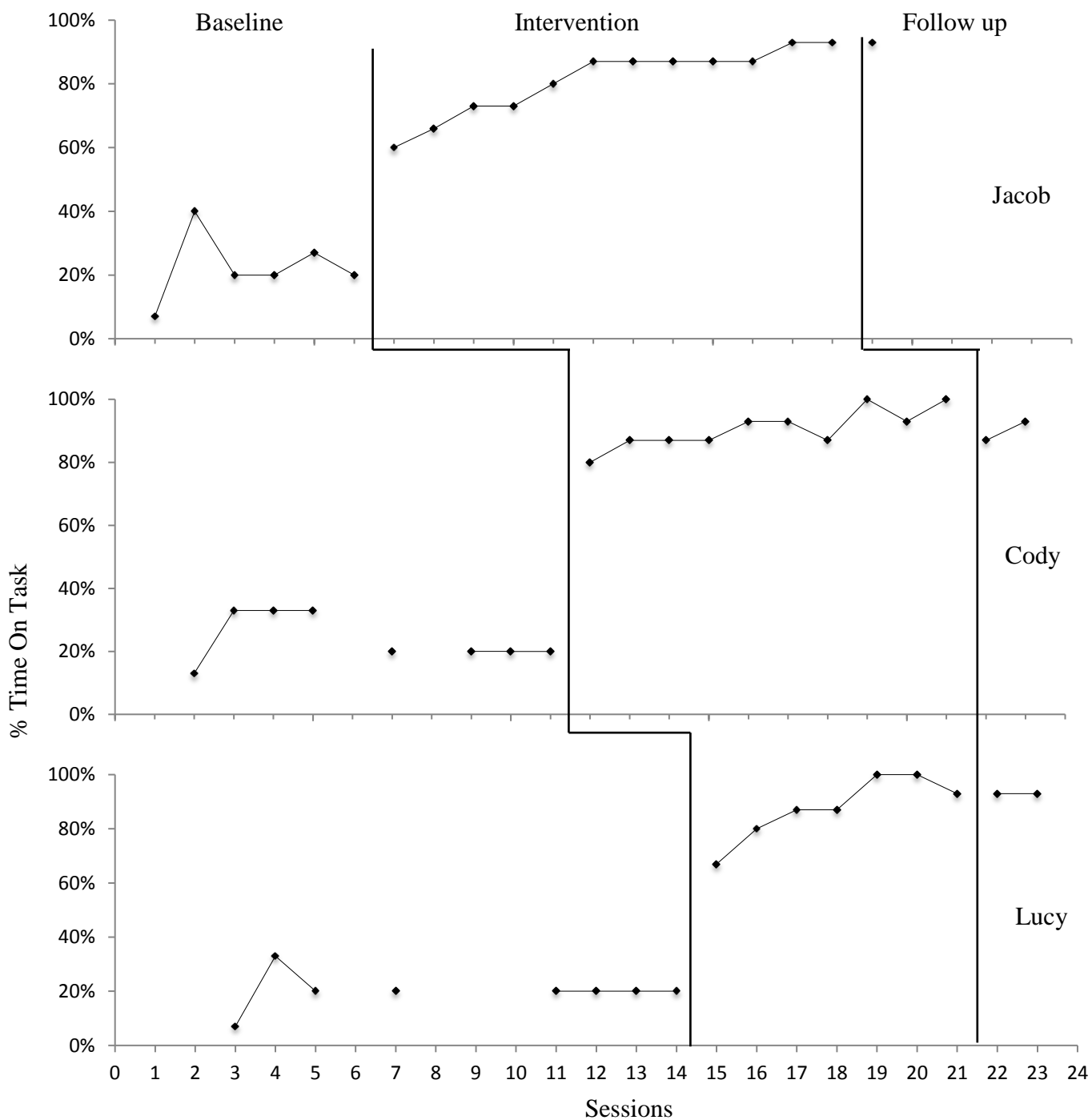


Figure 1. Percentage of 1-minute intervals with on-task behavior across conditions.

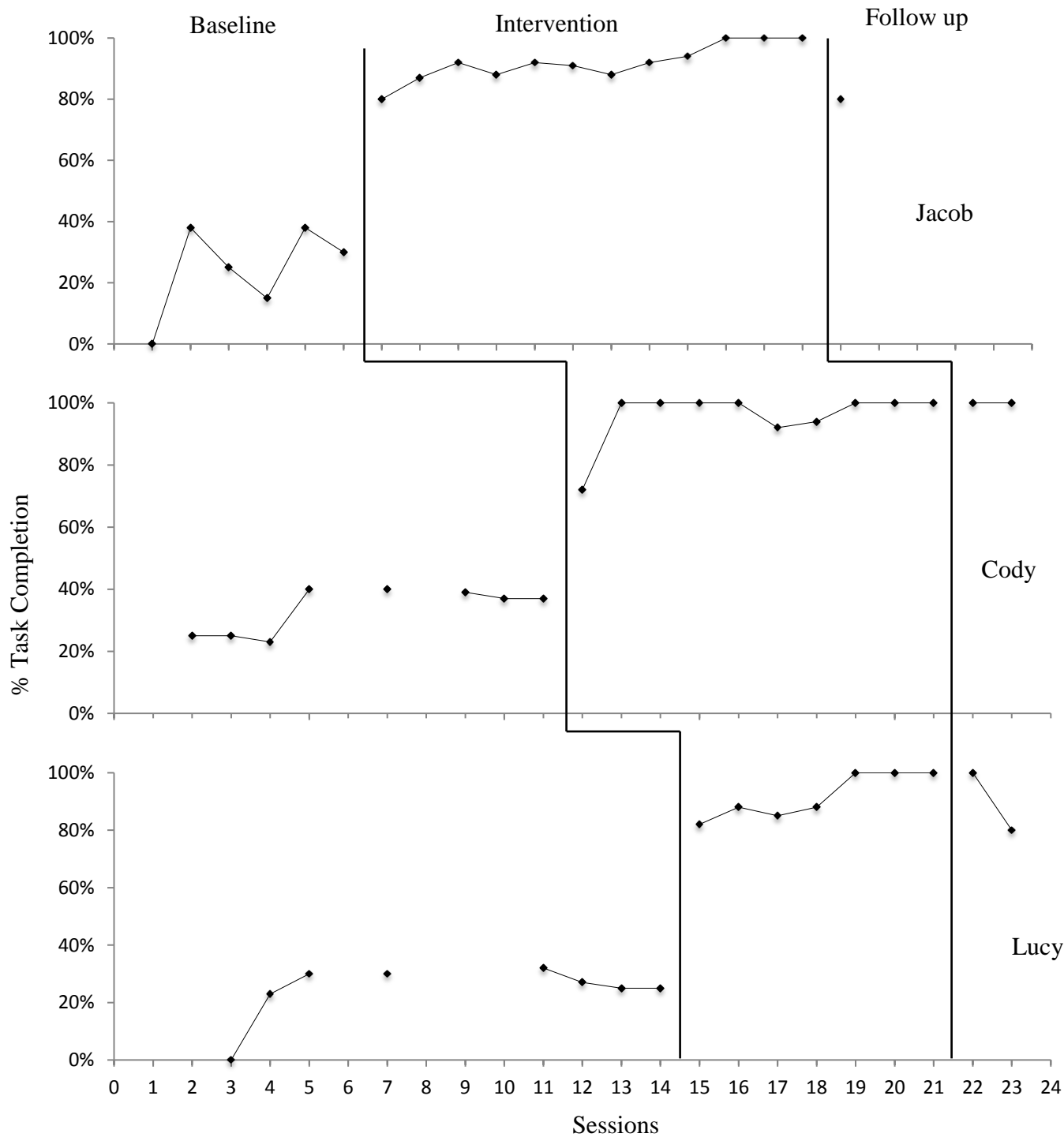


Figure 2. Percentage of task completed across conditions.

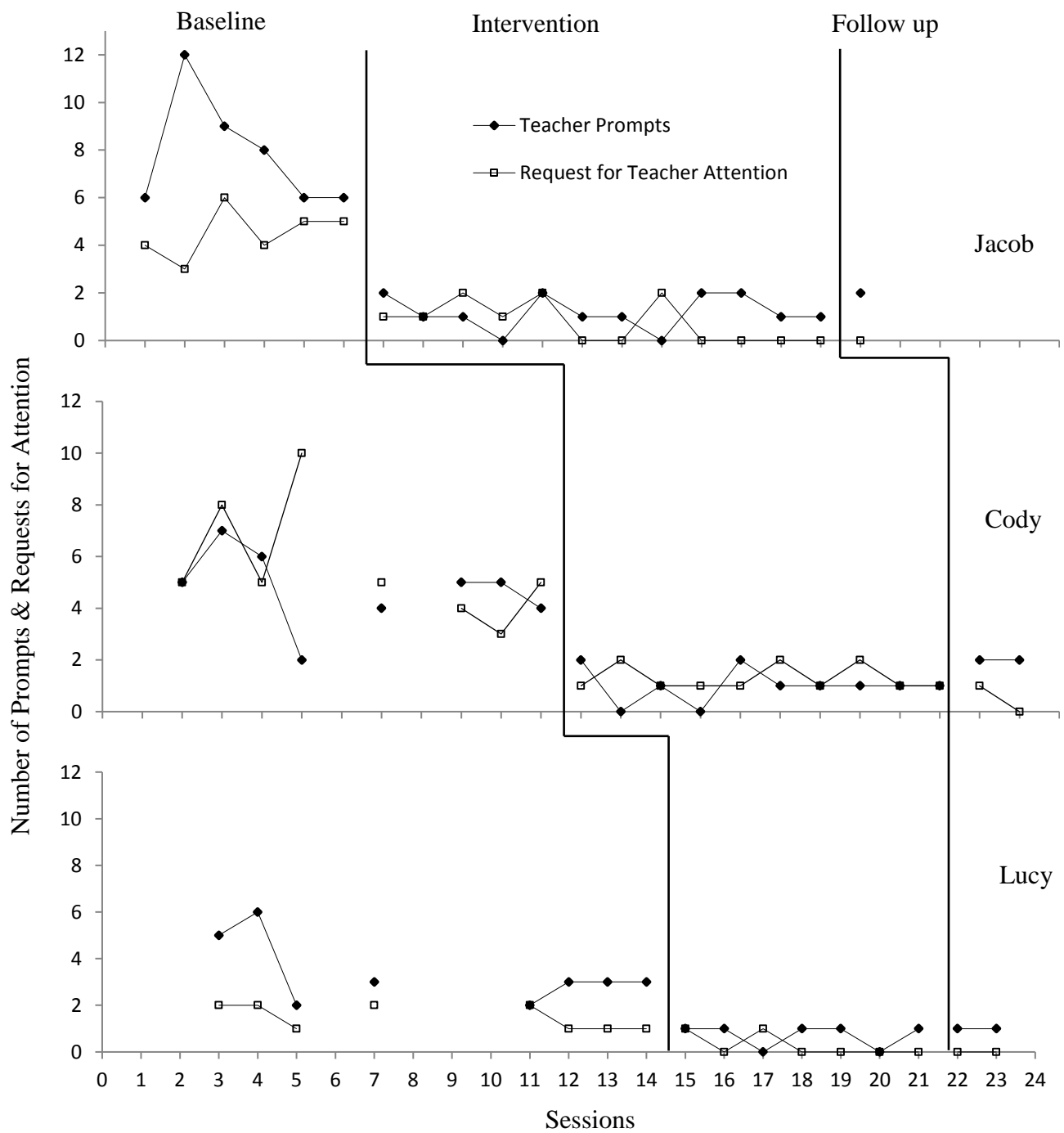


Figure 3. Total number of teacher prompts and student requests for teacher attention across conditions.

### Effect Size Analysis

The Tau-U Calculator (Vannest, Parker, Gonen, & Adiguzel, 2016) was used to statistically analyze the effects of the independent matching work system intervention on each of the dependent variables. A strength of the web application is its ability to analyze data from several phase contrasts from a single multiple-baseline design independently, while also providing an overall omnibus effect size (i.e., Tau). For the current study, Tau-U yielded significant effects for all dependent outcome measures. Possible Tau-U scores range from -1.0 - 1.0. For on-task behavior,  $\text{Tau} = 1.0, p < .001$ . For task completion,  $\text{Tau} = 1.0, p < .001$ . For student requests for teacher attention,  $\text{Tau} = -0.95, p < .001$ . For on-task behavior and task completion there are no overlapping data points, therefore Tau-U has a ceiling of 1.0. One benefit of the Tau-U statistic, however, is that it accounts for not only data overlap but also trend in data outside of the intervention phase (Parker et al., 2011). The resulting effect size values for the current study show that overall trends in data during intervention are statistically different from those in baseline and indicate a strong relationship between intervention implementation and changes in student behavior.

### Social Validity

**Teachers.** Both the lead classroom teacher and the inclusion teacher anonymously completed the teacher questionnaire. Both teachers either agreed (i.e., 4 out of 5) or strongly agreed (i.e., 5 out of 5) with statements indicating that student on-task behavior and task completion improved following implementation of the work system intervention. In response to the statement “I noticed an increase in students’ independence after implementing the matching work system” one teacher indicated agreement, while the other teacher selected “Neither Agree nor Disagree” and responded by saying, “Students still needed my assistance at times.” Both teachers indicated strong agreement with the statement, “I would recommend using an individual matching work system to other teachers.”

**Students.** The researcher interviewed each participant individually at the conclusion of the study. All three students agreed that they found the work system intervention to be easy to use and

helpful for staying on-task. For example, Cody explained, “The system helps me concentrate. When I use it, I can ignore my friends when they talk to me.” Lucy stated, “I always know what work I need to start working on and how much work I needed to complete without the teachers telling me to start working.” All three participants indicated they would like to continue using their matching work systems.

### Discussion

Inclusive practices have been shown to benefit not only students with and at risk for disabilities, but also their typically-developing peers (Kirby, 2017; Odom, Buysse, Soukakou, 2011). However, for students with and at risk for disabilities, an inability to consistently remain on-task and complete academic work with minimal support from adults can result in diminished access to least restrictive educational settings. The results of this study provide preliminary support for the use of an individual matching work system during academic seatwork time for students with and labeled as at-risk for disabilities in a general education classroom setting. Study findings document a functional relationship between the implementation of the matching work system intervention during and improvements in on-task behavior and task-completion, and decreases in student requests for attention. Moreover, the three participants continued to engage in high levels of on-task behavior two weeks after all formal researcher support ended, indicating that the teacher implementation and student use of the work system maintained without the continuous presence of the researcher. Finally, social validity data from students and teachers indicated that the intervention was perceived as acceptable and effective.

Previous studies have illustrated that individual work systems can be used to increase young children’s and students’ ability to remain on-task when implemented by researchers outside of special education settings (e.g., preschool classrooms, school playgrounds; Bennett, Reichow, & Wolery, 2011; Hume & Odom, 2007). The current study further extends these findings by employing typical classroom staff as implementers and by demonstrating the effects of implementing an



individual matching work system (which allows students to transition between both academic tasks and physical locations) in a general education classroom setting. Previous researchers have found that the use of individual work systems can effectively increase student independence and decrease students' reliance on teacher prompts (e.g., Cihak, Wright, & Ayres, 2010). The current study used two behaviors to gauge participants' level of independence: 1) request for teacher attention and 2) number of teacher prompts. Anecdotally, during baseline conditions all participants made multiple requests for information to teachers such as, "How many problems do I have to do," "Where is the warm-up sheet," and "What do I do when I finish this worksheet?" Following intervention, there was an immediate decrease in both students' requests for information from teachers and teacher-delivered prompts. Consistent with the findings from previous research, these data suggest that use of the matching work system intervention resulted in increased independence and less dependence on prompts from classroom staff for all three participants.

### **Limitations and Future Research**

It is important to note several limitations of the current study when interpreting the results. First, the study examined the behavior of only three student participants and no non-participating (i.e., comparison) peer data were collected. Due to the small sample size, caution needs to be used when generalizing the findings of this study to larger populations. Second, although a two-week follow-up condition showed promising results, this study took place over a relatively brief period of time in the late spring of the school year and long-term maintenance of intervention use and effectiveness is unknown. Additionally, data collection sessions were relatively brief (i.e., 20 minutes long) and observations were limited to independent work time in math. The researchers did not observe the generalization of the participants' use of the individual matching work system across academic subjects or to novel settings. Further research is needed to replicate and extend the findings of this study to examine the extent to which the system would continue to be used and positive changes in student behavior would maintain over time, and if use of the matching work system would

generalize to new untrained contexts with similar results. Additionally, to further increase student independence and decrease any risk of prompt-dependency, future studies might also investigate methods for systematically fading the use of the matching work system while maintaining student gains.

Another significant limitation of the current study relates to the lack of data collected on the accuracy of specific student responses. While researchers collected data on the number of assignment components completed, there was no measure of the extent to which students responded correctly to the problems or questions presented as part of the assignments. As stated previously, assignments were scored as complete if all questions were answered and they were placed in the *Finished* basket to allow the opportunity for teacher feedback. Further research is needed to determine the extent to which the implementation of individual matching work systems in general education settings results in not only increases in task completion, but also helps lead to improved accuracy and associated positive academic outcomes over time. Next, although the intervention was rated highly overall by teachers and students, one teacher did indicate that the work system procedures were, at times, not a good fit with all of the independent work activities included in the daily classroom schedule. Future research should focus on ways to modify procedures and provide coaching for implementers on how to implement the individual matching work system approach to best suit a variety of activities and contexts in general education settings.

Finally, during the two-week follow up session, Jacob and Lucy's task completion average dropped slightly below intervention levels during the second session of follow-up. It should be noted that the type of assigned task provided during this session was different from those assigned during previous intervention sessions. Specifically, rather than being asked to complete more basic computation problems as in previous sessions, the students were assigned five word problems to complete. Jacob and Lucy were able to complete four of the five problems, which resulted in a slightly lower percentage of task completion. Future investigations should seek to control for task content and task difficulty to better

assess the degree to which improvements in students' task completion rates are educationally significant (Faggella-Luby, Drew, & Schumaker, 2015).

## Conclusion

The purpose of this study was to investigate the effects of an individual matching work system on student on-task behavior, task completion, and requests for teacher attention. The empirical evidence from this study provides further support for the effectiveness of individual work systems for students with and at risk for disabilities, as well as contributes to current research on individual matching work systems by extending the use of this intervention to an independent academic work time in a general education setting. The limitations of the study should be noted when interpreting the results, and the data should be viewed as preliminary. However, the findings from this study do help to fill a gap in the current literature base related to efficient interventions for improving student behavior that can be implemented by typical general education teaching personnel. Thus, the results of this study have important implications for practice and highlight the need for further research in this area.

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**Article**

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# A Process Framework to Assist System Level Consultants with Program Evaluation in Schools

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Best practice processes provide systems level consultants in schools a method for planning, implementing, and evaluating large scale programming, such as multi-tiered systems of support. The purpose of this article is to review the *Getting to Outcomes™* (GTO) framework at the systems level to guide consultants in schools as they develop programs and evaluate current practices within districts. The GTO framework and current literature regarding its application in schools are reviewed. To contextualize the framework, an applied case illustration of its use for program evaluation at the systems level within a school district is described. This case follows two consultants as they assist a district administrator—the early childhood coordinator—in an evaluation of current parent engagement practices across three early childhood centers in a large suburban district. Case findings indicate the consultee may be empowered when provided a stepwise framework for systems change; however, clear measures of treatment implementation fidelity and process evaluation are lacking both in the case study and much of the current literature base.

**Key words:** Systems Level Consultation, Program Evaluation, Consultation in Schools

As districts increasingly implement systems level programming (e.g., multi-tiered systems of support, positive behavioral intervention supports) that requires the collection and analysis of data, there is a need for systematic methods to develop and

evaluate practices to achieve desired outcomes in school settings (Castillo & Batsche, 2012; Coleman & Hendricker, 2016). Consultants in schools are often involved in program development and evaluation of individual and group services, though there are not many examples of involvement in systems wide programming (Hylander, 2014; Ingraham, 2015). Despite the expectation for the involvement of consultants in systems-level teams, the current literature base is scant with examples of research-based frameworks to facilitate such a role (Ingraham, 2015).

As such, examining models and frameworks used to guide school-based consultants' efforts is critical (Maras, Wandersman, Splett, Flaspohler, & Weist, 2012). The Getting to Outcomes Framework (GTO©; Chinman, Imm, & Wandersman, 2004; Chinman et al., 2008) is one model that has shown promise when applied to systems change efforts across a number of practice domains. The purpose of this paper is to demonstrate the use of the GTO framework through an applied case illustration in a

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school district to facilitate systems change and evaluation.

### **Systems Level Consultation in Schools**

*Systems or organizational consultation theory* assumes that a system is the interaction between more than two individuals with a common goal (Curtis & Stollar, 2002). Within the context of a school system, operationalized definitions of “system” are malleable. For example, the entire district can be viewed as one organization and individual buildings can be viewed as their own system; grade level teams across the district or within a building could also be considered a system (Dougherty, 2013).

When considering systems level change to develop or evaluate large scale programs like MTSS, schools have to make important decisions around “which system” will be impacted and how that development or evaluation will be implemented across multiple systems. Consultants - whether external or school based - can assist school districts, buildings, and grade level teams with such decisions. However, consultation at the systems wide level often proves to be an overwhelming task since evaluating large-scale frameworks and programs across multiple buildings requires intensive planning, organization, and sustainability efforts (Meyers, Meyers, Graybill, Proctor, & Huddleston, 2012). Successful systems level processes typically require a multi-year commitment (Ingraham, 2015; Knoff, 2000), suggesting that thoughtful planning, specific goals, and clear delineation of responsibilities are paramount to sustainment of efforts.

### **Empowerment Evaluation**

Ingraham (2015) explains that considering contextual factors, prolonging engagement, involving stakeholders from different levels of the system, and empowering these stakeholders in shared decision making through multi-methodology are necessary for success in systems level school reform. *Empowerment Evaluation theory* (Wandersman et al., 2005) assumes that if individuals in the system are given the tools to plan efficiently, implement effectively, and evaluate continuously to improve then their goals are more likely to be attained and sustained over time (Fetterman & Wandersman,

2005). This type of approach addresses many of the postulates of Ingraham (2015) and proactively emphasizes building stakeholder capacity, achieving desired outcomes, and optimizing limited resources (Wandersman, Alia, Cook, Hsu, & Ramaswamy, 2016). The GTO Framework embodies these assumptions and was developed to assist in increasing the capacity of prevention programs in community-based settings (Wandersman et al., 2016; Chinman et al., 2008).

### **Getting to Outcomes Framework**

GTO is a stepwise, process-based approach focusing on collaborative program development and evaluation. Consultants use the GTO framework to guide the development and refinement of systems level processes with intentional sustainability planning within the beginning stages (Chinman et al., 2004). The GTO model has 10 steps that are often implemented in a continuous manner. Wandersman et al. (2016) outline the steps using guiding questions:

1. *What are the needs and conditions to address? (NEEDS/RESOURCES)*
2. *What are the goals, priority populations, and objectives (desired outcomes)? (GOALS)*
3. *Which science (evidence-based) models and best practices can be useful in reaching the goals? (BEST PRACTICES)*
4. *What actions need to be taken, so that the selected program fits with the community context? (FIT)*
5. *What organizational capacities are needed to implement the program? (CAPACITY)*
6. *What is the plan for the program? (PLAN)*
7. *How well is the program being implemented? (IMPLEMENTATION/PROCESS EVALUATION)*
8. *How well did the program work? (OUTCOME EVALUATION)*
9. *How will continuous quality improvement strategies be incorporated? (CONTINUOUS QUALITY IMPROVEMENT)*
10. *If the program is successful, how will it be sustained? (SUSTAIN; p. 5-6).*

In the first step of GTO, key stakeholders work together to identify (a) areas of *need*, (b) *resources* available, and (c) *goals* of the initiative, evaluation,

or program. The purpose of this step is to gather data regarding why a change is necessary and/or what is required to meet the needs of the organization. Once needs are established, stakeholders set *goals* in the second step. Goals are often better met when they are developed to be specific, measurable, attainable, reasonable, and timely (SMART; O'Neill, 2000). It is imperative that goals be revisited frequently throughout the process to ensure the objectives outlined by the team are in alignment with the intended outcomes of the initiative or program. Goals may have to be adjusted throughout the process, but core features of the goals should drive the change and be considered at all stages of the model. Overarching goals are often stated in multiple measurable, short-term objectives in order to be more attainable for the stakeholders involved in the process (Chinman et al., 2004).

In the third step, stakeholders identify *best practices* to support the needs and goals identified in the previous steps. GTO encourages evaluation teams to investigate intervention techniques or practices that are appropriate for the context in which they will be implemented, rather than considering specific programs and products (Coleman & Hendricker, 2016). GTO provides a systematic method to determine effectiveness of programs—stakeholders consider locally implemented programs and/or innovations in similar systems—and thus allows for the development of practice-based evidence (Kratowill et al., 2012).

In the fourth step, stakeholders consider if the chosen programs have good contextual *fit* with the organizational context. Once fit is established, stakeholders must consider *capacity* in the fifth step. Capacity often refers to examining existing programs or practices that staff are already familiar with and can easily integrate into day-to-day practice, which is one way to ease resistance to implementation (Chinman et al., 2004; Splett & Maras, 2012). These steps are critical in considering how the program chosen to be implemented will be viewed by those involved, fidelity of implementation, and feasibility of implementation (Flaspohler, Meehan, Maras, & Keller, 2012).

The sixth step requires stakeholders to develop a step by step *plan* to meet the goal and related objectives outlined in step two. The plan

outlines (a) program components, (b) objectives linked to each component, and (c) any adaptations to the program based on items reviewed in Steps 4 and 5. Key activities, persons responsible, dates, and anticipated outcomes are also addressed in the plan. Barriers are also considered in an effort to be more proactive about any challenges that may interfere with implementing the plan (Chinman et al., 2004).

During implementation, stakeholders conduct the seventh step—*process evaluation*—which includes formative assessment of the plan implementation. This is a way to monitor the progress of the plan and may include examining treatment integrity or fidelity of implementation of the program or plan outlined in step six. In the eighth step, stakeholders examine data to determine whether or not goals and objectives were met (Chinman et al., 2004). The ninth step focuses on continuous quality improvement. *Continuous quality improvement* uses data from the outcome evaluation findings to determine what could be improved. It requires the evaluator to consider if new programs are available, if the needs were met, if the plan was successful, and if outcomes were not met what could be done differently. This is a unique feature of GTO in that it encourages stakeholders to be accountable. It requires stakeholders to continuously consider what improvements could be made to the quality of the plan implementation (Wandersman et al., 2016). The tenth and final step of the GTO model considers if the program is worthwhile, then how will it be *sustained* (Chinman et al., 2004). Ultimately this model teaches individuals within an organization how to plan, implement, evaluate, and sustain organizational change.

### **Systems level School-Based Evaluation Project Illustrating GTO**

To date there has been a small foundation of work that discusses how consultants in schools could use GTO with specific examples of how it can be applied at the individual, group, and systems level (Flaspohler et al., 2012; Maras et al., 2012; Splett & Maras, 2011). Flaspohler et al. (2012) provides an overview of how schools can use best practice processes to plan, build capacity, implement, and evaluate multiple evidence-based programs. They

discussed how schools initially used the first five steps of GTO in the planning stages for implementing a preventative program. The case examples revealed that having a planning process such as GTO allowed an evaluation team, which included system level consultants, to assess the unique needs of the school, thereby making the school more likely to implement the program. Furthermore, the authors identified that the planning phase allowed the school to consider what the program will provide – or the goal (i.e. reduce behavior referrals) – and consider existing programs within the system that could meet the goal. Additionally, the feasibility of the implementation of programming and how the school's unique needs impact the types of programs chosen for implementation were also identified as key aspects to consider. Ultimately, Flaspohler et al. (2012) suggested schools have stronger outcomes when following a best practices process, such as GTO. For example, when applying this model along with consistent consultation and supports to increase capacity in implementation and fidelity, schools were able to more effectively implement evidence based universal prevention programs. Moreover, two additional articles have given an overview of the GTO framework and detailed conceptual examples of how school psychologists can apply this framework to implement evidence-based practices across academic, behavioral, and social emotional concerns (Maras et al., 2012; Splett & Maras, 2011).

Therefore, we seek to extend this work by providing a practical case illustration of how we have employed all the steps of the GTO framework as part of our work as system level consultants on a school-based program evaluation team. Our illustration of GTO with systems level data collection in schools is a case example of an actual school-based evaluation project that sought to assist an early childhood coordinator in developing a data management system across three early childhood centers to evaluate current family engagement practices.

### **Information about the Consultants**

The first and second authors served as external consultants on this project. The first author is a university professor in school psychology who was familiar with the GTO framework, process consultation, program evaluation, and data-based

decision making. The second author is a university professor in special education with experience working in early childhood settings as well as program evaluation. She also had experience with the district prior to this university partnership.

### **Description of the Client and Consultee**

A large suburban district in the southeast United States served as the client in this project. The school district educates over 50,000 students and is incredibly diverse in many ways. Reported student ethnicity is: 12% African American, 24% Asian, 24% Hispanic, 36% White, 4% Two or More Races, and less than 1% American Indian and Pacific Islander. Twenty-nine percent of the student population qualifies for free/reduced lunch or other public assistance. Fourteen percent of the student population demonstrates limited English proficiency. The early childhood program serves close to 1,000 preschool-aged children in the district with demographics reflecting that of the district. Almost all students in the early childhood program attend for free because they qualify for public preschool based on Title 1 funding criteria, although a small percentage of students are tuition paying students from the district who do not qualify for Title 1 funding.

The consultants worked with the coordinator of the district early childhood programs, who oversaw preschool programming of three early childhood centers and all of the kindergarten classrooms in the district (approximately 177 kindergarten classrooms in the district). The coordinator had over 15 years of experience in early childhood education and had served in many roles during her tenure in early childhood education: early childhood interventionist, early childhood curriculum specialist, assistant principal for an early childhood center, and district coordinator for early childhood programs, including kindergarten.

### **Request for Consultation & Contract**

The school district had recently received a state grant to develop a family engagement plan for the early childhood program. Expected outcomes delineated in the grant were documenting and developing a plan to engage parents within the existing preschool programming. *Family engagement* was defined by the district as the mutual

responsibility of families, schools, and communities to build relationships to support student learning and achievement; and to support family well-being and the continuous learning and development of children, families, and educators. Family engagement is fully integrated in the child's educational experience and supports the whole child in a culturally and linguistically responsive way. The grant required school districts to examine current practices in five different categories: (a) facilitate family-to-family support, (b) establish a network of community resources, (c) increase family participation in decision making, (d) equip families with tools to enhance and extend learning, and (e) develop staff skills in evidence-based practices to support families. To meet these objectives, a system wide intervention at the district level was needed in order to evaluate the family engagement programming across three separate early childhood centers. Initial contact was made by the consultee with the consultants through a previous connection with the second author. It was agreed that the consultants would assist the consultee with learning how to evaluate current practices through data collection and management. The consultee and consultants agreed that they would employ the GTO model to assist with teaching and empowering the consultee with learning about evaluation (Wandersman et al., 2016).

### **Assessment, Intervention, and Rationale**

Upon review of the current documentation of parent engagement activities, the consultee produced an outline of events throughout the year based on information gathered from each of the district early childhood centers. None of the documents provided enough information for the consultee to code events by the grant categories of family engagement. Furthermore, no logistics about the events, such as how many families were invited, how many were in attendance, and what could be improved for future programming were provided. The consultee determined that she needed to identify which programming was being offered according to the five grant categories and what programs may need to be developed. Overall, the goals of the consultee were to develop a way to collect data to answer the questions: (a) *What types of programs were being offered according to the grant categories?* and (b) *How many*

*events are being offered per month?* She also wanted to document more specific details around these events such as target audience, attendance, and evaluation data.

Through facilitation from the consultants using the GTO framework (see Table 1; Chinman et al., 2008), the consultee was empowered to examine current practices of other districts—specifically, data collection techniques—and consider the fit and capacity of those options within the context of the culture of the district and staff needs. She developed an intervention plan of developing data collection modalities using technology (i.e. Google Form) to collect evaluation data from the early childhood centers (see Table 2). Data collection forms required school personnel from each of the three centers to identify (a) their role (i.e. principal, parent liaison, counselor), (b) the type of event, (c) the topic, (d) the target audience, (e) the number in attendance at the event, and (f) what they may have changed if they were to schedule another event. Consultants met with the client monthly to conduct process evaluation. At the end of the school year, consultants met with the client to examine (a) outcome evaluation, (b) continuous quality improvement, and (c) sustainability to increase the client's capacities to conduct evaluation of programming (Wandersman et al., 2016).

The consultants used GTO as a framework to conduct process consultation. *Process consultation* has been defined as working closely with the client to establish a collaborative relationship and to facilitate the client's ability to explore potential issues and then solutions or interventions within the organization to address the issue. The ultimate goal of process consultation is to develop the consultee as a more effective problem solver (Rockwood, 1993; Schein, 1969). In process consultation theory, there are two approaches (i.e. catalyst and facilitator) that can be taken when working with the consultee to focus on the process instead of the content of the problem. When the consultee has content expertise then the consultant may take more of a catalyst approach to assist with applying the process of finding solutions without having a predetermined solution. Whereas when the consultant has equal or more content expertise compared to the consultee, in a facilitator approach the consultant takes a more passive role to



Step	Activities	Timeline
(1) Identify needs and resources	<ul style="list-style-type: none"> <li>• After five team meetings held prior to the start of the school year, it was determined that the client needed:               <ol style="list-style-type: none"> <li>1. A systematic way to review current programs in order to determine what data were already being collected to support the recently funded grant.</li> <li>2. A process for collecting information from all the EC centers about the type of programs available to parents, the attendance of such programs, and feedback around the programs offered.</li> </ol> </li> </ul>	June 2016
(2) Develop goals to meet needs	<ul style="list-style-type: none"> <li>• The client determined that the overall goal for the year was:               <ol style="list-style-type: none"> <li>1. To create and pilot a data management system for the EC coordinator to collect and manage information from multiple campuses for the upcoming school year.</li> <li>2. To answer the questions: how many events are being offered? What types of programs are being completed according to the categories outlined in the grant?</li> </ol> </li> </ul>	July 2016
(3) Determine evidenced-based practices (EBP)	<ul style="list-style-type: none"> <li>• Reviewed both appropriate measures of data collection (i.e. what was the district already doing) as well as how various programs within the district manage data (i.e. consulting with other administrators about how they collect this information).               <ol style="list-style-type: none"> <li>1. Through this review of various best practices in data collection, the team decided to collect electronic data via Google Forms.</li> </ol> </li> </ul>	July 2016
(4) Ensure EBP fits the organizational context	<ul style="list-style-type: none"> <li>• The client had knowledge of how to build and maintain a survey in Google Forms.</li> <li>• Related staff had previous experience using this software.</li> <li>• Already existed within the district.</li> </ul>	August 2016
(5) Assess the resources needed to ensure quality implementation	<ul style="list-style-type: none"> <li>• Did not require extensive training or extra time to learn.</li> <li>• Empowered client to build her <i>capacity</i> to use the technology in ways that she had not previously considered.</li> </ul>	August 2016
(6) Develop a plan to obtain all needed aspects of the program	<ul style="list-style-type: none"> <li>• The plan required client to convert the overall goal into realistic and timely objectives that were outlined in phases of Prior to the Beginning of the School Year, During the First Month of the School Year, During the School Year, and At the End of the Year (see Table 2).</li> <li>• The client developed a training date for her staff as well as follow up meetings regarding the implementation of schools reporting to her via the Google Forms.</li> </ul>	August 2016

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(7) Conducting process evaluations	<ul style="list-style-type: none"> <li>• Conducted once per month during the school year.</li> <li>• Evaluated how well the technology was working in collecting the necessary data and if the EC coordinator was on track to meet goal objectives.</li> <li>• Form was being used on average 20 times per month by the three early childhood centers.</li> <li>• Client provided support to individual buildings that may have had difficulty completing the form, reminded key personnel to complete the forms, and reviewed the fidelity as to how well the form was being completed.</li> </ul>	September – May 2017
(8) Conducting outcome evaluations	<ul style="list-style-type: none"> <li>• During the 2016 – 2017 school year the Google Form was completed a total of 201 times by the three early childhood centers.</li> <li>• Client feedback and the information gathered from process evaluation meetings informed the team that objectives in each phase of implementation had been met.</li> <li>• It was also determined via feedback sessions conducted by the client that key personnel commented that having a centralized location to share information with the client around parenting programs was beneficial as evidenced by the following information:             <ol style="list-style-type: none"> <li>1. Giving the staff a process for recording the data made them more aware of the information they were collecting.</li> <li>2. The client disclosed that she had a better sense of programs being offered at each campus but also district wide.</li> <li>3. This data helped to further shape EC programs and the district has now expanded their early childhood programs beyond just the early childhood centers and into elementary buildings. Thus, implying that the collection of the data via the Google Form was instrumental in demonstrating the need for a centralized location to gather and store information for the grant and the district.</li> </ol> </li> </ul>	June 2017
(9) Use data to improve current and future programs	<ul style="list-style-type: none"> <li>• Continuous quality improvement was conducted by gaining input from the building level key personnel. Improvements outlined by staff included:             <ol style="list-style-type: none"> <li>1. Having monthly deadlines to submit the form.</li> <li>2. Adding specific fields to the form that allowed for more text entry to explain programming logistics.</li> <li>3. Suggestions for future programming.</li> </ol> </li> </ul>	June 2017
(10) Ensure sustainability	<ul style="list-style-type: none"> <li>• The client planned to use the information gathered through the data management system to assist individual buildings with program planning for the next school year.</li> </ul>	June 2017

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- She also planned to create more consistent planning district wide and to plan based on parent needs, timing, attendance, and location that programming was offered.
  - An instructional assistant was also provided by the district to assist the client in her responsibilities and data collection through the Google Form. This demonstrates that the district had a hand in providing more resources to ensure that data collection and management could be sustainable in the future.
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**Table 1.** *Getting to Outcomes™ Activities within the School Based Evaluation Project*

allow the consultee to arrive at his or her own solutions. Process consultation is often employed with consultees that have more time and exhibit readiness to learn or change. When applying a systems approach to process consultation, it is important to consider not only the consultee's readiness but the system's readiness, openness, and capacity to participate in the consultative relationship (Dougherty, 2013; Hylander, 2014).

### **Consultation Dynamics and Processes**

With both systems theory and the process consultation model in mind, the consultants employed a catalyst approach using the GTO framework as a guide to engage the consultee in increasing her problem solving, implementation, and evaluation skills. For specific details on the employment of each GTO step please see Table 1. Consistent with the catalyst approach and in an effort to facilitate fidelity of this approach with the framework, at the beginning of each meeting, the first author would (a) review the GTO model steps, (b) discuss implementation of steps completed, and (c) delineate next steps within the framework to be employed. This approach allowed the evaluation team to reach a consensus about the status of the consultation relationship within the GTO framework, if the goals of the evaluation were being met, and reconcile or clarify any disagreements.

The GTO framework assisted in empowering the client an intervention that worked well within the culture of the organization and met her goals. The consultants facilitated this by (a) active listening, (b) introducing the GTO model to the client, (c) coaching

the client to consider practices already being implemented in the district, and (d) assisting her in organizing her ideas into action steps. GTO assisted in process consultation because it allowed the consultee and the consultant to distribute the work of a major evaluation into more feasible parts. It is well documented that system level change does not happen quickly; thus, the steps in this model can be planned and executed across weeks, months, and/or years (Knoff, 2000).

Process consultation considers all resources available to the organization that can be used for positive developments (Dougherty, 2014; Rockwood, 1993; Schein, 1969). GTO further facilitates this method by examining all resources, fit, and capacity before considering an intervention or plan. In this case, the consultants spent time examining needs and resources with the client before developing goals. In addition, fit and capacity considerations through GTO also align well with the idea of examining all resources which can include organization members, settings, and technology (Dougherty, 2014).

### **Results**

The GTO framework was implemented in its entirety across a one-year period (see Table 1). As a result, the client was able to develop a data management system that was implemented throughout the school year. The Google Form was completed a total of 201 times from September through June, with an average of 20 events being reported monthly. Of the three early childhood

Implementation Phase	Goal Objectives Tasks	Person(s) Responsible
Prior to the beginning of the school year	<ol style="list-style-type: none"> <li>1. Develop and pilot the Google Form</li> <li>2. Identify key personnel in each building to complete the form</li> <li>3. Develop a training for key personnel</li> <li>4. Develop data collection procedures</li> </ol>	Client & Consultants
During the first month of the school year	<ol style="list-style-type: none"> <li>1. Schedule and conduct a training for EC staff involved in completing the form</li> <li>2. Develop email reminders to be sent once a month through the school year</li> </ol>	Client
Monthly, during the school year	<ol style="list-style-type: none"> <li>1. Evaluate data gathering tool (i.e. are we meeting our goal overall?)</li> <li>2. Determine if any adjustments need to be made (i.e. is it working as planned?)</li> <li>3. Send reminders and obtain feedback from key personnel completing the form</li> </ol>	Client & Consultants
At the end of the school year	<ol style="list-style-type: none"> <li>1. Gather feedback from key personnel about feasibility</li> <li>2. Use data collected to develop programming</li> <li>3. Plan for the next school year (i.e. will we use this tool again?)</li> </ol>	Client

**Table 2.** *Intervention Plan for Meeting Goals for School Based Evaluation Project*

centers, one appeared to provide the most responses (i.e., 82%) and the other two contributed somewhat equally (i.e., 56% and 59%). The majority of individuals that contributed to the data collection included counselors (53%), followed by principals (22%) and the parent liaisons (13%). The majority of events were identified as *Category 4: Equip families with tools to enhance and extend learning* (72%), followed by *Category 1: Facilitate family to family support* (34%). The remaining categories collectively represented less than a quarter of the events with *Category 3: Increase family participation in decision making* as 12%, *Category 2: Establish a network of community resources* as 6%, and *Category 5: Develop staff skills in evidence-based practices to support families* as 4% of the events.

### **Key Learning & Implications from the Case Illustration**

Full implementation of the GTO model with the consultee may have occurred because she was ready and had the capacity for change. Flaspohler et al. (2012) discussed that completing readiness or capacity assessments in a district may assist consultants in identifying schools that would be more likely to be successful at implementing large scale changes. For this specific case, the consultee sought out supports from the university, thus communicating a willingness and readiness for change. She demonstrated buy in with the GTO model, sharing that “*having a step-by-step plan allowed [her] to know where we [the team] were in the process, especially during chaotic times in the middle of the school year.*”

Using GTO allowed flexibility in how the data management system was developed—it did not matter which data management system was used, but

rather how it was used (Splett & Maras, 2012). Using a familiar, easy, and accessible platform for data collection may have increased buy-in from district personnel. When asked to provide feedback on the process of the GTO model, the client shared that the most beneficial part was the actual implementation of the model and having steps to guide the process and keep the team “on track”. This corroborates conceptual examples from the literature that implementing best practice processes versus a specific program is beneficial in school settings (Coleman & Hendricker, 2016; Splett & Maras, 2012). The consultee shared that the most challenging part of the process was determining what data needed to be collected to give the district meaningful information that could also be used to report to the grant funding source (i.e., the state education agency).

While the information provided by the consultee is helpful, it is also a limitation in the implementation of this GTO example because of limited quantitative measurement of both the process and the outcomes. Noell and Gansle (2014) discuss that it is important to consider the integrity of the consultation process as well as the implementation of the plan developed through consultation. While the GTO framework was followed in its totality, the consultation procedures were not observed by an independent observer and, therefore, generalizability of this information beyond this case is limited. In the future, having a fidelity checklist or an adherence check would be beneficial, especially if the district continued using this model (Schulte, Murr, Tunstall, & Mudholkar, 2014).

**Need for treatment implementation fidelity and process evaluation.** Consistent with the suppositions delineated by Newman et al. (2017), examining treatment integrity of the GTO process was a challenge in the present study. Qualitative feedback from the consultee for plan implementation and discussion at evaluation meetings were the main source of fidelity information in the present study. Future research could solicit feedback from building level personnel regarding their perceptions of the technology and its effectiveness. Meyers, Tobin, Huber, Conway, and Shelvin (2015) described a delicate balance between empowering individuals with power and those that are actually carrying out

the task. This top-down approach used in the present case worked well but information was only gathered from the perspective “at the top”. In systems level consultation, it is important to consider multiple levels when evaluating the success of a program or process (Meyers et al., 2015).

Additionally, Meyers et al. (2015) commented that in systems consultation it is important that the consultant be familiar with the context of the school district in order to adequately obtain entry to assist with systems change. In this case, one of the consultants had previously worked in the district and thus had familiarity when discussing processes with the consultee. This was of great assistance when determining goals, as well as fit and capacity. This may suggest personnel such as school psychologists with training in consultation, program development, and evaluation may be more poised to provide systems level consultation because of their familiarity with the context of the district (Castillo & Curtis, 2014; Coleman & Hendricker, 2016). Providing a best practice process such as GTO may allow school-based consultants to be a more efficient and effective systems level consultant (Coleman & Hendricker, 2016; Splett & Maras, 2012).

Additionally, Knoff (2000) noted that in organizational development in schools, it often takes a year or more to develop a strategic plan. He stressed the importance of administrative and stakeholder commitment due to the many internal or external factors such as “politics, personalities, budget cycles, past district events, union pressure, apathy, cynicism, and an assortment of other potential barriers” (p. 19) that can derail a process like GTO. Fortunately, this case had administrative support and these barriers were not present. However, the amount of time needed as outlined by Knoff (2000) was accurate. Even a small change such as developing a Google Form and collecting data on pre-existing programs took an entire school year to implement and evaluate using the GTO model. Another key aspect that facilitated the GTO process was having a relatively specific and reasonable goal for the first year of implementation (O'Neill, 2000). This allowed the client to learn the GTO model while working on a small change that did not disrupt major systems within the district. This case may have had different

outcomes had the goal been to change programming instead of gathering data about programming.

### Conclusions & Future Directions

The present case provided an applied illustration of empowering a consultee through the application of GTO and its use beyond conceptual and theoretical discussion. Based on this implementation of the process within a school context, an initial practical foundation for future use as a research-based framework for consultants in schools is provided. Future research in systems level implementation of the GTO framework should focus on measuring (a) the fidelity of each step and (b) specific outcomes at each level within the school context (i.e., gaining feedback from all district, building, and individual personnel involved). Assuming each of the actions and steps within the process are clearly operationalized by the specific consultant and his/her team, GTO could offer a protocol to examine treatment integrity. Examination of the fidelity of implementation for process approaches such as GTO would greatly benefit the consultation literature base (Newman et al., 2017).

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**Graduate Student Section**

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# What School Psychologists Should Know About Rett Syndrome

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Rett Syndrome (RTT) is a genetic disorder resulting in profound communication impairments, characteristic hand stereotypies, and intellectual disabilities. This informational article addresses the background information that a school psychologist needs to be an effective member of a multi-disciplinary team that plans, implements, and assesses an appropriate educational program for an individual with RTT. The paper provides an overview of the history, medical features, including characterization of the classic and atypical manifestations of RTT, current medical research, and associated comorbidities for RTT. Based on the medical background, this article identifies key elements of an appropriate educational program, which include communication; educational goals with consideration for memory, executive functions, and slow processing speed; physical and/or occupational therapy; and medical management of comorbid disorders. Finally, the paper reviews recent research on newer assessment tools that refine the ability to differentiate preserved intellectual abilities and provide better information for monitoring progress and assessing efficacy of clinical trials.

**Key words:** Rett Syndrome, genetic disorders, intellectual disabilities

Rett Syndrome (RTT), a neurodevelopmental disorder of genetic origin, is the primary genetic source of profound intellectual disabilities in females (Knight, Horn, Gilbert, & Standridge, 2016; Tarquinio et al., 2017; Zoghbi, 2016). RTT occurs in about 1 in 10,000 female births (Brown & McMillan, 2011; Clarkson et al., 2017; Lane et al., 2017; Marschik et al., 2018; Rose, Wass, Jankowski, Feldman, & Djukic, 2017) and is characterized by typical early development followed by severe regression and developmental delays (Brown & McMillan, 2011; Clarkson et al., 2017; Lane et al., 2017; Leonard, Cobb, & Downs, 2017; Marschik et al., 2018; Neul et al., 2014). Girls diagnosed with RTT are profoundly affected in their communication and manual dexterity (Neul et al. 2010), which makes assessment of their abilities and academic progress difficult. This article provides the practicing school psychologist with a characterization of RTT as well as a review of the research of best practices in program planning and assessment for these young women.

## History

RTT was first identified in the literature by Andreas Rett (Lane et al., 2017; Leonard et al., 2017; Lotan & Ben-Zeev, 2006; Neul et al., 2010; Percy, 2016; Zoghbi, 2016), a young pediatrician specializing in children with intellectual disabilities and brain damage (Zoghbi, 2016). He was first alerted to the condition when he happened to observe two unrelated patients sitting together in a waiting area. Both girls were very thin and demonstrated similar stereotypic hand movements while rocking in a manner reminiscent of autism spectrum disorders (Brown & McMillan, 2011; Leonard et al., 2017; Neul & Zoghbi, 2004). Rett and others recognized additional patients with the same constellation of symptoms – normal early development followed by functional decline, expressionless, empty gazes, limited social interaction even with parents, severely limited verbal communication, gait apraxia or inability to control walking rhythm if ambulatory, and hand stereotypies (Hagberg, Aicardi, Dias, & Ramos, 1983; Zoghbi, 2016). Rett's findings were mainly overlooked (Brown & McMillan, 2011; Neul



& Zoghbi, 2004; Percy, 2016) until he met Bengt Hagberg, another doctor studying patients with similar symptomology, at a conference (Brown & McMillan, 2011; Percy, 2016; Zoghbi, 2016). Hagberg and colleagues (1983) christened the new disorder Rett Syndrome in deference to the initial publications produced by Rett (Brown & McMillan, 2011; Neul & Zoghbi, 2004; Zoghbi, 2016).

### **Diagnosis**

Since its initial identification, RTT has been diagnosed on the basis of clinical criteria (Brown & McMillan, 2011; Cianfaglione et al., 2015; Hagberg, 2005; Hagberg et al., 1983; Lane et al., 2017; Neul et al., 2010). Early clinical observations included normal development followed by regression, loss of purposeful hand usage, jerking and ataxia of the trunk, limbs, and gait, acquired microcephaly or decelerated head growth, and stabilization of mental status after the period of regression (Hagberg et al., 1983; Lane et al., 2017; Lotan & Ben-Zeev, 2006; Neul & Zoghbi, 2004). In order to better inform research, the classic presentation of RTT along with several atypical presentations have been categorized. Continued research and refinement has culminated in the most recent revision in clinical criteria for identifying the RTT phenotype (Leonard et al., 2017; Neul et al., 2010; Percy, 2016). The diagnostic criteria include regression followed by stabilization, loss of purposeful hand skills and spoken language, gait abnormalities, and stereotypic hand movements. Classic RTT is not caused by brain injury due to trauma, neurometabolic disease, severe infections, or significantly abnormal psychomotor development prior to age six months. All main diagnostic criteria must be present for the identification of classic RTT. For a diagnosis of atypical RTT, regression plus two additional main diagnostic criteria and at least five supportive criteria must be present. The supportive diagnostic criteria include breathing disturbances while awake, bruxism or teeth grinding while awake, impaired sleep, abnormal muscle tone, scoliosis, peripheral vasomotor issues, growth retardation, and small, cold feet and hands, inappropriate screaming/laughing, diminished pain response, or intense eye communication (Cianfaglione et al., 2015; Knight et al., 2016; Neul et al., 2010; Percy,

2016). With the publication of the latest update to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; American Psychiatric Association, 2013), RTT is no longer classified as a pervasive developmental disorder (Brown & McMillan, 2011; De Felice et al., 2016), but is considered a specifier to other disorders (i.e., Intellectual Disorder, Autism Spectrum Disorder, or Stereotypic Movement Disorder) when the full clinical diagnostic criteria for the other disorder are met.

### **Genetics of Classic RTT**

Although they did not have the means to fully test their theory at the time, Hagberg and colleagues (1983) suspected that RTT was associated with a mutation on the X chromosome. Researchers continued to narrow the possible mutation to chromosome Xq28. In 1999, at the Zoghbi laboratory, the connection between the methyl-CpG-binding protein 2 (MECP2) gene mutation and RTT was identified (Amir et al., 1999; Downs, Forbes, Johnson, & Leonard, 2016; Leonard et al., 2017; Percy, 2016; Pini, Bigoni et al., 2016). Researchers have identified the MECP2 gene mutation in over 90% of classic cases of RTT (Castro et al., 2014; Cianfaglione et al., 2015; Knight et al., 2016; Pini, Bigoni et al., 2016). The protein encoded by the MECP2 gene, MeCP2, binds in many locations in the genome and acts in inhibiting or activating gene transcription, regulating chromatin remodeling, repressing methylation, and altering non-coding RNA (Castro et al., 2014; Lyst & Bird, 2015; Qiu, 2018).

To date, over 200 identified mutations of the MECP2 gene have been identified (Bebbington et al., 2008; De Felice et al., 2016; Neul et al., 2008; Pidcock et al., 2016). Some authors (Kerr et al., 2001; Neul et al., 2010) note that mutations of the MECP2 gene do not always result in the clinical criteria required to diagnose RTT. Although X-chromosome inactivation can contribute to variance in the severity of RTT, it does not fully explain the significant heterogeneity in the phenotypes expressed in RTT (Bebbington et al., 2008; Kerr et al., 2001; Neul et al., 2008). Studies indicate that symptomology is associated with the specific type of

MECP2 mutation (Brown & McMillan, 2011; Cuddapah et al., 2014; Leonard et al., 2017; Neul et al., 2008; Pidcock et al., 2016). C-terminal truncations are associated with milder symptoms, while large deletions are associated with more severe symptoms (Bebbington et al., 2008; Cuddapah et al., 2014; Leonard et al., 2017; Neul et al., 2008). Girls with less severe mutations usually maintain more physical functions, have lower clinical severity scores, and are typically diagnosed at a later age than are girls with more severe mutations (Brown & McMillan, 2011; Cuddapah et al., 2014; Leonard et al., 2017; Neul et al., 2008). The studies also indicated that all levels of mutation became more severe as the girls aged (Cuddapah et al., 2014; Leonard et al., 2017). Information concerning the specific MECP2 type and associated prognosis is valuable in determining appropriate treatment for girls with RTT (Bebbington et al., 2008; Cuddapah et al., 2014; Leonard et al., 2017; Neul et al., 2008).

### **Genetics of Atypical RTT**

In addition to the MECP2 mutations identified with classic RTT, additional mutations have been associated with atypical RTT (Leonard et al., 2017; Neul et al., 2010). Three distinct forms of atypical RTT have been identified. They include the early seizure variant, which is associated with a cyclin dependent kinase-like 5 (CDKL5) mutation, the congenital variant, which is associated with a forkhead box G1 (FOXP1) mutation, and a preserved speech or Zappella variant, which is associated with an MECP2 mutation. The early onset variant is a more severe form which is not characterized by a period of apparently normal development, but early onset of seizures is the primary symptom (Artuso et al., 2010; Lotan & Ben-Zeev, 2006). The congenital atypical form of RTT is evident soon after birth and characterized by acquired microcephaly, jerky movements of upper limbs, and repetitive thrusting of the tongue (Ariani et al., 2008; Harada et al., 2018; Mencarelli et al., 2010). The preserved speech or Zappella variant is a milder form of RTT that is characterized by delayed regression, less intense hand stereotypies, some preserved speech, and less severe dyspraxia (Grillo et al., 2013; Renieri et al., 2009). A few males have also been identified with

RTT. For males, the symptoms are generally more severe, and the lifespan is typically very short (Brown & McMillan, 2011; Neul & Zoghbi, 2004).

### **Current Genetic Research**

Although no effective treatment regimen has been identified for RTT, current research is focused on medical interventions that will correct gene mutation results and improve neurological functioning in individuals with RTT. Various lines of gene therapy are currently under study. Scientists have been able to engineer an MECP2 gene mutation in mice resulting in RTT-like symptoms (Castro et al., 2014; Derecki, Cronk, & Kipnis, 2013; Sinnamon et al., 2017). From these engineered mice, Sinnamon and colleagues (2017) have used a naturally occurring enzyme, a binding peptide, and a guide to improve the MECP2 protein levels and increased heterochromatin binding at the cellular level, but off-target editing sites also occurred. Tang and colleagues (2016) have studied the membrane K<sup>+</sup>Cl<sup>-</sup> cotransporter (KCC2). MECP2 mutations seen in individuals with RTT reduce the production of KCC2 that helps to regulate GABA functions during neuronal development. Derecki and colleagues (2013) have used bone marrow transplants in mice to increase production of microglia-like cells. Castro and colleagues (2014) have worked with MECP2 targeting brain-derived neurotrophic factor (BDNF), which is depressed in RTT. While BDNF does not easily cross the blood-brain barrier, insulin-like growth factor 1 (IGF1) has been shown to correct synaptic errors in mice. Clinical trials IGF-1 Trofinetide (Glaze et al., 2017) and Recombinant Human IGF-1 Measermin (Pini, Congiu et al., 2016) show promise in improving core disabilities associated with RTT. Continued research holds the promise of a treatment that may reverse the damage caused by MECP2 gene mutations.

### **Comorbid Conditions**

In addition to the main characteristics that typify RTT, many girls experience comorbid clinical manifestations including epilepsy, growth deceleration, swallowing and feeding difficulties, abnormal breathing, scoliosis, sleep disturbances,

agitation/screaming, and bone fractures (Boban et al., 2016; Brown & McMillan, 2011; Jefferson et al., 2016; Knight et al., 2016; Lane et al., 2017; Leonard et al., 2017; Lotan & Ben-Zeev, 2006). As these girls have limited communication skills and low cognitive abilities, care must be taken when determining the best course of treatment for associated disorders, especially when there is little evidence to determine best practices. Clear communication with families and a strong ethics framework can ensure the principals of autonomy and beneficence in the pursuit of treatments that will be in the best interest of the individual with RTT and the family (Downs, Forbes et al., 2016).

Epilepsy is difficult to diagnose in girls with RTT due to abnormalities in electroencephalogram (EEG) patterns that are associated with RTT (Brown & McMillan, 2011; Leonard et al., 2017; Percy, 2016; Tarquinio et al., 2017). The incidence of seizures varies, but some reports place the comorbidity as high as 90% (Knight et al., 2016; Leonard et al., 2017; Lotan & Ben-Zeev, 2006; Percy, 2016; Tarquinio et al., 2017). Seizure rates were generally higher in girls with more severe clinical manifestations (Leonard et al., 2017; Tarquinio et al., 2017) and tended to peak in adolescence (Tarquinio et al., 2017). Seizure activity can usually be controlled with medication (Brown & McMillan, 2011; Lotan & Ben-Zeev, 2006; Tarquinio et al., 2017), but the incidence of prolonged remission is less in girls with RTT than in individuals with other childhood-onset epilepsy (Tarquinio et al., 2017).

Growth deceleration is common in RTT. A declining growth rate in head circumference is typically the first evidence of slowing growth rates (Brown & McMillan, 2011; Jefferson et al., 2016; Leonard et al., 2017; Lotan & Ben-Zeev, 2006; Percy, 2016). By twelve years of age, median height reaches the second percentile (Percy, 2016). Feet and hands are also small (Leonard et al., 2017; Leonard et al., 2013; Percy, 2016). Growth failure is more pronounced in girls with severe genetic mutations (Leonard et al., 2017) and may lead to lethal malnutrition if not appropriately monitored (Lotan & Ben-Zeev, 2006).

Poor growth and weight loss may also be associated with swallowing and feeding difficulties,

which are common in RTT (Brown & McMillan, 2011; Leonard et al., 2013; Lotan & Ben-Zeev, 2006; Percy, 2016). Poor chewing patterns lead to prolonged meal times (Lotan & Ben-Zeev, 2006; Percy, 2016). Although girls with RTT typically have good appetites, they have reduced caloric intake and are at risk for malnutrition (Leonard et al., 2013; Lotan & Ben-Zeev, 2006). Up to 30% of girls with RTT may require gastrostomy to overcome severe difficulties with swallowing (Brown & McMillan, 2011; Leonard et al., 2013; Lotan & Ben-Zeev, 2006; Percy, 2016). Use of a feeding tube has been shown to result in weight gain for girls with RTT (Downs, Forbes et al., 2016; Leonard et al., 2017), and dietary interventions may improve gastrointestinal symptoms in individuals with RTT (Borghini et al., 2017).

Breathing abnormalities most commonly present as breath-holding or hyperventilation and may result in abdominal bloating. The abnormalities occur during waking hours and are believed to be a result of autonomic dysregulation. The majority of individuals with RTT experience some type of breathing abnormality (Leonard et al., 2017; Lotan & Ben-Zeev, 2006).

Altered motor skills and neurological impairments may lead to scoliosis, which occurs by the age of 13 years in up to 75% of individuals with RTT (Downs, Torode et al., 2016; Leonard et al., 2017). Scoliosis occurs earlier in individuals with severe mutations (Leonard et al., 2017) and can affect spinal mobility, ambulation, and respiratory health (Lotan & Ben-Zeev, 2006; Percy, 2016). Intense physical therapy may regress the spinal deformity and possibly prevent the need for surgery (Lotan & Ben-Zeev, 2006). Spinal fusion surgery is indicated when the Cobb angle exceeds 40 to 50° (Downs, Torode et al., 2016; Lotan & Ben-Zeev, 2006; Percy, 2016) and typically results in improved survival and reduced incidence of severe respiratory tract infections (Downs, Forbes et al., 2016; Downs, Torode et al., 2016; Percy, 2016).

Sleep disturbances are often seen in RTT (Brown & McMillan, 2011) with some estimates approaching 80% (Boban et al., 2016). Night time disturbances include laughing or screaming on waking, seizures, and teeth grinding. When individuals with RTT have poor night time sleep, the

burden on the family can be considerable (Boban et al., 2016; Percy, 2016). Lack of sleep also has implications in the educational environment. Sleep disturbances are more common in younger individuals, those with epilepsy, and those with more severe mutations (Boban et al., 2016). Day time naps were also common among individuals with RTT regardless of age (Percy, 2016). Efforts to increase night time sleep include behavioral interventions (Brown & McMillan, 2011) and medications such as melatonin (Boban et al., 2016; Brown & McMillan, 2011; Lotan & Ben-Zeev, 2006; Percy, 2016).

Individuals with RTT have frequent incidence of agitation, screaming, and tantrums (Brown & McMillan, 2011). Physical and neurological changes related to the onset of symptomology may provoke emotional volatility. Emotions tend to calm and regulate once physical deterioration reaches a plateau, but communication challenges make it difficult to express personal needs for girls with RTT. Caretakers must know the child and be able to decipher her moods to meet her physical and emotional needs (Brown & McMillan, 2011; Lotan & Ben-Zeev, 2006). In situations of increased lethargy and social withdrawal, depression must also be considered (Hryniewiecka-Jaworska, Foden, Kerr, Felce, & Clarke, 2016).

Reduced pain perception is frequently reported in individuals with RTT (Brown & McMillan, 2011; Hunter, 2007; Lotan & Ben-Zeev, 2006). Some attribute this in part to low amounts of P-substance, a neuromodulator, in the neural system of girls with RTT (Brown & McMillan, 2011; Lotan & Ben-Zeev, 2006). Caregivers must use caution in treating individuals with RTT and should carefully check for tissue damage when they see changes in behaviors (Lotan & Ben-Zeev, 2006).

Osteoporosis and bone fractures are more common in girls with RTT (Jefferson et al., 2016; Lotan & Ben-Zeev, 2006) with reduced bone density beginning at a young age. Factors that contribute to osteoporosis include poor ambulation and antiepileptic drugs that diminish Vitamin D absorption (Lotan & Ben-Zeev, 2006). Bone fractures in girls with RTT occur at about four times that of the general population (Jefferson et al., 2016; Percy, 2016). Medical and non-medical management to increase bone density in girls with RTT include

taking calcium and vitamin D supplement, using bisphosphonates, increasing exposure to sunlight, and increasing mobility (Jefferson et al., 2016).

### **Educational Intervention**

A multi-disciplinary team is needed to address the core deficits that are recognized with RTT along with the comorbid disorders that arise (Hunter, 2007; Lotan, 2006; Lotan & Ben-Zeev, 2006). This team needs to intervene early and have high expectations for the academic and social progress of the individual with RTT (Hunter, 2007). The most significant need that must be addressed in educational planning is communication (Hunter, 2007; Sigafos et al., 2011). The most common mode of communication for individuals with RTT is eye gaze or eye pointing (Didden et al., 2010; Djukic, McDermott, Mavrommatis, & Martins, 2012; Urbanowicz, Downs, Girdler, Ciccone, & Leonard, 2016; Urbanowicz, Leonard, Girdler, Ciccone, & Downs, 2016). Urbanowicz, Leonard, and colleagues (2016) found that parents believe that their daughters with RTT are able to participate in meaningful communication with their communication partners, while Julien, Parker-McGowan, Byiers, and Reichle (2015) found that although adults perceived communicative intent in individuals with RTT there was variability in interpretation of these potential communications. Sigafos and colleagues (2011) found that some individuals with RTT appear to have a limited range of communicative behaviors, which should be assessed and developed. Byiers, Dimian, and Symons (2014) designed a preliminary study to assess the feasibility of functional communication training in individuals with RTT. Their results suggested that girls with RTT can learn to communicate with caregivers. Although studies are available for the use of oral language, gestures, graphics/symbols, or electronic systems, Sigafos and colleagues (2009) reviewed the literature on communication interventions in RTT, but found inconclusive data to support evidence-based practices in communication interventions for RTT. Many of the studies they found were poorly designed and led to inconclusive outcomes. The literature indicates that communication training is important

for individuals with RTT, but attention to current capabilities and understanding of communication limitations is important in planning therapy. Instruments such as the Inventory of Potential Communication Acts (Sigafoos et al., 2000) can be helpful in communication assessments.

Special education services that provide educational and social benefit should be proportioned in the least restrictive environment to individuals with RTT. Depending on the severity of the phenotype, these services may be delivered in a variety of locations ranging from a general education setting to a hospital setting depending on the needs of the individual (Hunter, 2007; Lotan, 2006). Skills to be addressed through special education include attention, memory, and communication. Although their memory skills are not as mature as typically developing individuals, girls with RTT show preference for faces and eyes (Rose et al., 2013), but have difficulty attending to salient features that express emotion (Djukic, Rose, Jankowski, & Feldman, 2014). Studies of shifting and sustaining attention (Rose et al., 2016) found impaired executive attention, but relatively intact orienting attention. Rose and colleagues (2017) used gaze-based tasks to assess distractibility and attention and found that sustained attention in individuals with RTT was diminished.

Motor skills generally require interventions by physical and/or occupational therapists (Hunter, 2007; Lotan, 2006). The goals of physical therapy should be to maintain or increase motor skills, maintain or develop transitional skills, prevent or reduce deformities, alleviate discomfort, and improve independence (Lotan & Hanks, 2006). Programs designed to increase motor skills and endurance through environmental enrichment have been shown to improve gross motor skills in individuals with RTT (Downs et al., 2018). Stahlhut, Downs, Leonard, Bisgaard, and Nordmark (2017) adapted several measures of gross motor skills and walking to meet the needs of the population with RTT. Use of an activPAL accelerometer can also help measure sedentary time as a part of measuring the physical activity continuum for individuals with RTT (Stahlhut, Hill et al., 2017).

## Assessment Tools

Several instruments have been developed to gain more insight into the cognitive abilities, behavior, and development of girls with RTT. These instruments have application in educational planning and efficacy measurements for clinical trials (Clarkson et al., 2017; Glaze et al., 2017; Lane et al., 2017; Neul et al., 2015).

As most commonly used cognitive assessment tools rely on intact expressive language and/or fine motor abilities, it is difficult to gain an accurate measure of the true intellectual ability of girls with RTT (Clarkson et al., 2017; Hunter, 2007; Lane et al., 2017). Clarkson and colleagues (2017) have developed an adaptation of the Mullen Scales of Early Learning (MSEL). The authors capitalized on preserved skills like eye gaze, allowed additional presses, gave partial credit for equivocal responses (Clarkson et al., 2017), and allowed extended response time to compensate for delayed processing speed (Clarkson et al., 2017; Hunter, 2007; Lotan & Ben-Zeev, 2006). Psychometric properties of reliability, validity, and sensitivity in the adapted measure were promising. As expected, Fine Motor (FM) and Expressive Language (EL) domains were consistently low for all participants, while Visual Reception (VR) and Expressive Language (EL) domains were variable. The adapted versions of the MSEL are promising in helping to determine developmental abilities as a baseline for developing targeted interventions and therapies for girls with RTT (Clarkson et al., 2017). With a more accurate understanding of individual abilities, more appropriate expectations of academic progress can be made.

The Rett Severity Score (RSS; Neul et al., 2008; Pini, Congiu et al., 2016) is another measure developed to assess social and cognitive ability in girls with RTT. It is based on rating video footage based on ten positive features and ten negative features. The main application for this measure is to assess efficacy of interventions in clinical trials, but it could also have relevance for measuring efficacy of therapeutic interventions. Measures of adaptive behavior such as the Vineland Adaptive Behavior Scale (Clarkson et al., 2017; Glaze et al., 2017) are

also useful in assessing social and cognitive abilities in RTT.

Multiple rating scales have been developed by leading researchers in the field of RTT to use as measures of clinical severity in determining efficacy for clinical trials (Bebbington et al., 2008; Neul et al., 2008). Kerr and colleagues (2001) developed a 20-item checklist to assess current clinical features of RTT (Bebbington et al., 2008). Pineda and colleagues (Monros et al., 2001) created a global severity measure with scores based on developmental characteristics (Bebbington et al., 2008). The scale created by Percy and colleagues (Schanen et al., 2004) combines both developmental and functional information (Bebbington et al., 2008). Neul and colleagues (2008) developed a RTT-specific clinical severity rating scale, the Clinical Severity Score (CSS), based on 13 categories of common clinical features in RTT (Neul et al., 2014). Other measures that have proven useful in measuring treatment outcomes for individuals with RTT include the Rett Syndrome Motor Behavior Assessment Scale (Glaze et al., 2017), which measures motor skills, the Rett Syndrome Gross Motor Scale (Downs, Stahlhut et al., 2016), which measures gross motor skills, the Rett Syndrome Behaviour Questionnaire (Mount, Charman, Hastings, Reilly, & Cass, 2002), which differentiates behavior characteristic of RTT from behavior of individuals with severe intellectual impairments, the Clinical Global Impression Scale with RTT-specific anchors (Glaze et al., 2017; Neul et al., 2015), which measures clinical change, and the RTT Caregiver Inventory Assessment (Lane et al., 2017), which measures a caregiver's perceived level of burden or the impact of caring for an individual with a disability on daily tasks.

### Conclusions

While researchers have progressed in identifying the underlying cause of RTT and recognizing the clinical manifestations of the syndrome, less progress has been made in identifying treatments to ameliorate the severity of RTT. The prospect of a definitive treatment to address the genetic issues in RTT exists, but most current interventions are palliative. School psychologists working with girls with RTT in the schools should be

knowledgeable in the current standards of treatment for RTT to be an informed member of the multi-disciplinary team developing an appropriate educational program. This program should include consideration for developing communication, adopting educationally relevant goals, providing physical and/or occupational therapy, and managing associated medical conditions in an environment that supports the educational, social, and emotional growth of the individual. The school psychologist should be cognizant of newer tools that are available to help monitor progress for girls with RTT and refine the measures of efficacy for clinical trials. With additional research the hope is that better treatments will be found that can continue to improve the outlook for girls with RTT.

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**Graduate Student Section**

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# **Test Review: The Global Appraisal of Individual Needs**

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The Global Appraisal of Individual Needs Q3 (GAIN-Q3; Titus et al., 2013) is a semi-structured clinical screener used to assess estimates of the severity of problems across various domains for adolescents and adults. Clinical reports from this screener allow for (a) the identification of individuals experiencing severe problems, (b) the identification of an individual's need for a more detailed assessment or specialized treatment, and (c) developing interventions catered to the needs of the individuals including student assistance, juvenile and child welfare programs.

Three versions of the GAIN-Q3 assessment are available. The first is the Q3-Lite which measures levels of severity of problems on nine screeners including: school, work, physical health, sources of stress, risk behaviors for infectious diseases, internalizing mental health, externalizing mental health, substance abuse, and crime and violence. This form requires approximately 20 minutes to complete and measures problem recency calibrated from the most recent experienced problem within the past 90 days, 12 months, or lifetime of behaviors. Successive items can be added to the Q3-Lite including information on the frequency of participant utilization of services and current state of life satisfaction within the past 90 days to comprise the Q3-Standard form. Completion time, on average,

increases by 15 minutes. The Motivational Interview (Q3-MI) can be administered to individuals who score in the problematic range of a domain, gauging a person's level of readiness for change with a yes or no response to statements pertaining to reasons for behavioral change. This interview can be successively administered after the screeners as a 45-minute session, or as a separate session. The authors advise against the latter, as the delay in administration may lead to participant dropout, and subsequently, reduced reliability for the Q3-MI items. For participants who demonstrate some degree of cognitive impairment (e.g. intoxication or temporary or permanent mental problems), a 7-item Cognitive Impairment Screener is suggested.

For all three forms, total summative scores are calculated and used to assign individuals into one of three groups: individuals with no area of concern or need for attention (low recency of reported behaviors, no diagnosis), individuals with mild problems and in need of a brief intervention (moderate recency of reported behaviors, possible diagnosis), and individuals with need for referral, more detailed assessment, and/or specialized treatment (severe recency of reported behaviors, probable diagnosis). All GAIN-Q3 assessments can be administered by pencil-and-paper form or with the Assessment Building System (ABS) - a Health Insurance Portability and Accountability (HIPAA) compliant, cloud-based system allowing for interactive administration and reporting. Over-the-telephone, remote assessment through Skype, or help of an interpreter are additional accommodations available for deaf and hard-of-hearing clients. Data collected from the different forms of the assessments comprise four indices called the Life Impact Measures including the Quality of Life Index, the

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Problem Prevalence Index, the Quarterly Cost to Society Index, and the Life Satisfaction Index. The administrator decides which is most appropriate given the purpose of the evaluation.

Information entered into the GAIN ABS system generates three possible reports. The Recommendation and Referral Summary is a clinical descriptive planning report which includes demographic and background information, the reason for referral or treatment, and evaluation process. This report also lists the participant's problems and service utilization, followed by placement and planning recommendations. Additional information and notes can be added to the final narrative report, which can require up to 35 minutes to complete. The Individual Clinical Profile provides case administrators a visual representation of cut-off points for low, moderate, and high problem severity or service utilization. This report is only advised to be used by trained persons. It is not to be edited once produced. The Personalized Feedback Report describes the person's reasons for changing and creates an outline for a motivational interviewing session. The GAIN-Q3 also provides a validity report that can identify inconsistencies in the participant's self-report.

### **Content and Structure**

The GAIN-Q3 was developed using Miller and Rollnick's (2002) framework of motivational interviewing (MI). The test authors state that this clinical client-centered approach allows for more directive counseling to resolve ambivalence about behavior change which they adopted from the Compassionate Helpers Openly Inviting Client Empowerment (CHOICE) protocol. The intent of using MI is to encourage participants to learn and engage in complex reflections, a technique found successful in drug cessation programs (McCambridge, Thomas, & Strang, 2011). Through this approach, interviewers play an active role in directing the conversations to focus on the target behavior. Details about the development of the items used in the assessment were not specified in the technical manual.

### **Standardization**

Scores (i.e., means, standard deviations) based on raw score data for the GAIN-Q3 were calculated from a normative sample of 32,452 individuals of which 9,016 were adults (i.e., 18+ years of age), and 23,436 were adolescents, ranging in age from 12-17 years. Standardized scores (e.g., T-scores, percentiles) are not provided in the manual or on the website referenced in the manual. Additional details about specific subgroups are categorized by age, gender, and race and ethnicity on the GAIN Coordinating Center's website. The website includes demographic (e.g., age, race, environment, health status), scoring, and psychometric information for the normative sample. Data from a client population were used for scoring and psychometric analyses. The sampling plan and procedure were under-specified on the website and the manual.

### **Reliability**

Internal consistency reliability was estimated via Cronbach's alpha coefficient with a criterion of .70 or greater. The test manual provides a coefficient for both adolescents and adults ( $\alpha = .90$ ) on the 53-item total score. Four of the nine domain scores (i.e., School Problems, Internalizing- and Externalizing disorders, and Substance Use) demonstrated lower values among adolescents and adults ( $\alpha = .70-.76$ ) than the total score. The remaining domains of Work Problems, Physical Health, Crime and Violence, Sources of Stress, and Risk Behaviors had even lower values between adults and adolescents ( $\alpha = .56-.67$ ). The test manual states that (a) the reduced number of items, (b) the presence of more heterogeneous presentations than referred to in the screener items, and (c) specific nature of the experiences captured among particular populations are possible explanations for the lower reliability estimates. No other forms of reliability evidence were presented.

### **Validity**

The test manual identifies two sources of validity. Concurrent validity was examined by the association between the shortened and full-length GAIN scales with moderate to strong relationships ( $r = .82-.90$ ). Discriminant validity examined Q3 screeners with measures on the unrelated full-length GAIN-I scales ( $r = .14-.40$ ). Given the GAIN-I is

designed to be a comprehensive bio-psychological assessment for clinical diagnosis, placement, and treatment planning, there is striking overlap between the domains on this assessment with the GAIN-Q3 (e.g. substance abuse, mental health, physical health, crime and risk behaviors, and desire for services). No other forms of validity evidence were provided (e.g. internal structure, fairness). Cut-off points for adolescents and adults were validated using sensitivity (percentage of people with disorders = 90%) and specificity (percentage of people without disorders = 90%) of the GAIN-I total and individual screeners, and percentage of area under the curve (AUC) in a receiver operating characteristics (ROC) analysis. Although 92% of adolescents and adults were under the AUC for all of the screeners, no optimal cut-point with at least 90% sensitivity and specificity was found across the screeners. The author states that because of this limitation, there is a risk for over-identification of “possible diagnosis” among some screeners for certain groups. Careful examination of populations and subdomains assessed is advised. ROC comparisons by age suggest that the assessment was more accurate for adults compared to adolescents on the following subdomains: School Problems, Health Problems, Sources of Stress, Risk Behaviors, Internalizing Disorders, and Substance Disorders Screeners. However, the scores were more accurate for adolescents on the domains of Work Problems, Externalizing Disorders, and Crime and Violence Screeners.

### **Critique**

The GAIN-Q3 is a cross between a clinical interview and a standardized assessment used to examine a wide range of life problems among adolescents and adults, both in clinical and general populations. Instructions for test administration including the interview training and certification are detailed in the manual and on the GAIN Coordinating website. Self-administration is not recommended. As a clinical tool, the instrument provides detailed instructions on how to elicit, record, and interpret responses. Despite support for the GAIN-Q3, there are scant details on item development, internal structure, relations with other variables, issues with low reliability coefficients, and the obtainment of the

normative sample, as outlined in the Standards for Educational and Psychological Testing (AERA, APA, & NCME, 2014). The limited and mixed reliability and validity evidence provided in the manual is a major weakness of the assessment. In the absence of documented evidence, it is difficult to support score use for individual decisions based upon these scores. Additionally, there is no evidence to suggest the assessment is comparable to other risk and needs assessments, as the predictive validity was only conducted with the corresponding full-length GAIN-I. The usefulness of psychometric properties of the test may be increased if details of the development of the test items are provided in the manual.

### **Summary**

The GAIN-Q3 is designed to gather information about adolescent and adult behaviors on a number of life domains. Given its widespread use among health clinics, criminal justice settings, and student assistance programs, the GAIN-Q3 serves to identify the severity of problems on a variety of domains including school, work, health, substance abuse, and crime and violence. Specifically, a school psychologist may find the information for the areas assessed a viable and valuable place to begin a conversation with a student about concerns in their life. The instrument offers a blend of both qualitative interviewing and standardized procedures. Information regarding the reliability of both interviewer and interviewee is not reported. It is unclear if this assessment may be used in combination with other risk-indicator assessments. A stronger argument can be made for the GAIN-Q3 by detailing the theory and development of the test items (e.g. content and construct validity), and evidence that the test converges with similar risk-assessments. Finally, limited reliability and validity evidence presented in the manual is a concern for the inferences derived from individual screeners and composite score. Future interpretation and use of scores from the GAIN-Q3 assessments, especially for individual decisions impacting student well-being, must be carried out with caution until further information is documented.

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