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Utilizing the Cognitive Orientation to Occupational Performance Approach

For Improved Performance and Executive Functioning

May 2018

This evidence project, submitted by

Casey Mendoza, Caitlin Mitchell, and Emily Reynolds

has been approved and accepted
in partial fulfillment of the requirements for the degree of
Master of Science in Occupational Therapy from the University of Puget Sound.

Project Chairperson: Jennifer Pitonyak, PhD, OTR/L, SCFES

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Key words: Cognitive Orientation to Occupational Performance, Intellectual Disability, Direct
Instruction, Executive Functioning

Abstract

The Outreach Program (TOP) in the Kent School District assists young adults in their transition from high school to adulthood. The research team and Dr. Abbott, an occupational therapist at TOP, sought to address whether better outcomes when teaching instrumental activities of daily living (IADLs) to adolescents with intellectual disabilities occur when addressing underlying performance skills and client factors through the Cognitive Orientation to Occupational Performance (CO-OP) approach or when addressing them through traditional occupational therapy practices. There is strong evidence to support CO-OP as an effective strategy to improve performance and moderate evidence indicating that it improves executive functioning and cognitive flexibility for a variety of diagnoses. We recommend CO-OP be integrated into traditional therapy practices and that additional research is conducted to explore group implementation and include more diagnoses.

Student researchers developed and presented an inservice presentation on the use and implementation of CO-OP in the school setting. An opportunity to receive Competency Assessment Units for NBCOT certification renewal through participation in a study group was provided during the inservice presentation to occupational therapists in Kent School District. Outcomes of this presentation were monitored through a survey to gain an understanding of whether the occupational therapists present would consider implementing CO-OP in their everyday practice. The findings suggest that the majority of people who attended the inservice presentation were interested in seeking more information regarding CO-OP without participating in the NBCOT study group. Additional research in the form of a scoping review is recommended in order to investigate what approaches best support developing autonomy and independent problem-solving in adolescents with intellectual disabilities.

Executive Summary

At the beginning of the year, the student researchers sought to investigate the following research question: When teaching adolescents with intellectual disabilities instrumental activities of daily living (IADLs), does the CO-OP model or direct instruction facilitate faster skill acquisition? Throughout the research process, the question developed to compare the CO-OP approach to traditional occupational therapy practice. While there is strong evidence to support CO-OP as an effective strategy to improve perceived performance in client-determined goals as reported on the Canadian Occupational Performance Measure (COPM), there is mixed evidence to support that the CO-OP approach also improves client satisfaction with their performance. There is moderate evidence indicating that this approach improves executive functioning and cognitive flexibility, which may explain the mixed evidence found regarding client satisfaction levels of performance. It has been hypothesized that as insight increases, satisfaction decreases. Limited evidence was found to support improvement of occupational performance through direct instruction in occupational therapy treatment.

The CO-OP approach provides consumers a unique opportunity to collaborate and receive semi-structured guidance from the occupational therapist while completing both familiar and unfamiliar tasks that are important to them. Due to this opportunity for collaboration, consumers can expect to take a more active role in their treatment by learning how to assess their own motor movement to improve performance; open collaboration between consumer and practitioner also prioritizes the client's culture, values, and goals for treatment, allowing for optimal client-centered care. However, a balance between consumer decision-making autonomy and practitioner support needs to be considered when implementing this approach in order to achieve the best outcomes for each individual consumer. Practitioners can also expect for this

approach to be effective in teaching IADL and activities of daily living (ADL) skills to individuals with cognitive dysfunction. Additional research is necessary to compare the CO-OP approach with other established teaching approaches beyond typical occupational therapy, and to determine ideal group-size, length of session, and amount of sessions needed for CO-OP to remain effective. Further research also needs to be implemented to determine the cause for decreased ratings of client satisfaction post CO-OP intervention.

Through our research, we conclude that CO-OP is an appropriate and effective approach for many diverse populations seen in occupational therapy, including those with stroke, developmental coordination disorder, and cerebral palsy. Implementation of the principles of the CO-OP approach into everyday practice can be done easily and can promote client-centered care. However, we recommend that practitioners consider the individual needs of their clients and the balance of decision making autonomy and client support during intervention.

To complete the knowledge translation of this research, the student researchers gave an inservice presentation to 19 practicing occupational therapists in the Kent School District regarding the implementation of the CO-OP approach into the school system. The student researchers also made the presentation available online to increase dissemination of the information. Student researchers conducted a survey to assess the occupational therapists' likelihood of implementation of CO-OP strategies in an effort to determine barriers to implementation. Ten occupational therapists said that they were very likely to implement CO-OP strategies and nine reported that they were somewhat likely to implement CO-OP strategies. Several attendees remarked upon how appropriate the CO-OP approach could be in addressing their student's goals.

CRITICALLY APPRAISED TOPIC (CAT) PAPER**Focused Question:**

When teaching IADLs to adolescents with intellectual disabilities, do better outcomes occur when addressing underlying performance skills and client factors through the CO-OP approach or when addressing them through traditional occupational therapy practices?

Collaborating Occupational Therapy Practitioner:

Barbara Abbott, DOT OTR/L

Prepared By:

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Chair:

Renee Watling, PhD, OTR/L, FAOTA

Course Mentor:

Jennifer Pitonyak, PhD, OTR/L, SCFES

Date Review Completed:

11/14/2017

Clinical Scenario:

The Outreach Program (TOP), in the Kent School District, serves young adults ages 18-21 in developing life and employment skills to assist them in their transition from high school to adulthood. Dr. Abbott serves as the only full-time occupational therapist in TOP where she addresses the individual needs of more than 30 adolescents transitioning out of highschool. Due to her desire to address broader intervention needs with her students in a limited amount of time, Dr. Abbott must implement the most effective method for improving IADL skills. Additionally, Dr. Abbott has observed challenges for some of her students in IADL skill acquisition with direct instruction alone, causing her to seek other strategies, such as visual schedules. Due to the need for multiple strategies, she has begun to implement the CO-OP approach to determine its efficacy in improving functional performance.

Review Process**Procedures for the selection and appraisal of articles**

Inclusion Criteria:

Articles published between 1997 and 2017; individuals with diagnoses in addition to intellectual disabilities such as traumatic brain injury, autism spectrum disorder, and Alzheimer's; articles that have adults, teenagers, adolescents, and children participants; articles that examine the instruction of ADLs and IADLs; those that examine the effectiveness of direct instruction or the CO-OP approach regardless of what outcomes are being studied; and articles that are intervention-based.

Exclusion Criteria:

Articles published before 1997; articles that were not peer reviewed; articles that are theory-based; posters and brief reports. When reference tracking articles, pilot studies were excluded due to their preliminary nature. Additionally, articles by the same authors that were initially pilot studies and then replicated into studies of higher rigor were excluded.

Search Strategy

Categories	Key Search Terms
Patient/Client Population	Adolescents
Intervention (Assessment)	Cognitive Orientation to Occupational Performance (CO-OP)
Comparison	Traditional Occupational Therapy Practice
Outcomes	Improved performance in Instrumental Activities of Daily Living (IADLs) and Activities of Daily Living (ADLs)

Databases and Sites Searched
PubMed
PsycINFO

CINAHL
ERIC
EBSCOHost

Quality Control/Review Process:

The student researchers met with Dr. Abbott to formulate a research question. After discussing the needs of her transition program, the students and collaborating practitioner agreed upon a research question that would explore the evidence in support of the CO-OP approach. Dr. Abbott stated in the initial meeting that she would like to compare this approach to that of “direct instruction”. The student clinicians requested more information regarding her interest in the CO-OP approach as compared to direct instruction and Dr. Abbott confirmed that her interest was specifically in evidence regarding use of the CO-OP approach as a teaching method and as direct evidence to justify advanced training and her professional development. The student researchers then collaborated to determine the 5 databases mentioned above within occupational therapy and tangentially question-specific fields, such as education and psychology, to narrow the initial search. The criteria excluded non peer-reviewed articles as well as posters and brief reports in order to promote well researched literature. Searching these databases allowed the student researchers to develop a broader search of relevant literature in various disciplines. In searching through these databases, literature addressing specific “direct instruction” was limited, however, studies did compare the CO-OP approach with traditional occupational therapy practice. The list of search terms was reviewed by two occupational therapy faculty members at the University of Puget Sound specialized in pediatrics and determined to be a thorough list of search terms.

Comprehensive searches of PsycINFO, PubMed, CINAHL, EBSCOhost and ERIC returned 430 results, with an additional 207 initial hits from citation tracking and 328 initial hits from reference tracking. Of those initial 430, 48 were selected for more thorough review, and of those, 24 were excluded; the remaining 24 were kept and included in this analysis. The 24 were excluded because they either did not measure the intended outcomes, were populations that did not meet our inclusion criteria, or were not published within the last 20 years. Of the 207 hits from citation tracking, 183 were excluded for not meeting the inclusion criteria. Of the remaining 24 articles, 21 were duplicates and 3 were included in the final analysis and added to the table to total 27 articles. Additionally, of the 328 hits from reference tracking, 300 were excluded for not meeting inclusion criteria; the remaining 28 articles found from reference tracking were duplicates of studies previously entered into the table.

Three student researchers conducted the searches, reviewed results, and collaborated to reach consensus if uncertain whether to include or how to classify an article. The student researchers also worked collaboratively with two occupational therapy faculty advisors in developing the language and concepts to complete this initial search. Finally, the collaborating practitioner, Dr. Abbott, helped to focus and narrow the strategy.

Results of Search

Table 1. Search Strategy of databases.

Search Terms	Date	Database	Initial Hits	Articles Excluded	Total Selected for Review
Cognitive orientation to daily occupation performance	9/8/17	PubMed	6	2	4**
Instrumental activities of daily living AND Skill acquisition	9/8/17	CINAHL	2	2	0
Direct instruction IADL	9/8/17	PubMed	0	0	0
Skill acquisition transition program	9/8/17	PubMed	0	0	0
Direct instruction skills adolescents	9/8/17	PubMed	0	0	0
skill acquisition developmental disability	9/8/17	PubMed	17	17	0
Transition AND Direct Instruction	9/26/17	CINAHL	3	2	1
cooking skill acquisition	9/26/17	PubMed	6	5	1**
direct instruction occupational therapy	9/26/17	PubMed	32	32	0
Cognitive orientation to daily occupational performance AND skills	9/26/17	PsycINFO	24	12	12**

direct instruction in special education AND skills training	9/26/17	PsycINFO	4	3	1
direct instruction cooking	9/26/17	PubMed	3	3	0
occupational therapy skill acquisition adolescents	9/26/17	PubMed	6	6	0
adolescent transition programs occupational therapy	9/26/17	PubMed	10	10	0
adolescent transition programs AND occupational therapy	9/26/17	PsycINFO	1	1	0
skill acquisition AND transition programs	9/26/17	PsycINFO	7	7	0
cooking skill acquisition	10/4/17	CINAHL	0	0	0
cooking skill acquisition	10/4/17	ERIC	1	0	1
Cognitive orientation to daily occupation performance	10/4/17	ERIC	0	0	0
Cognitive orientation to daily occupation performance	10/4/17	CINAHL	2	1	1**
direct instruction cooking	10/12/17	CINAHL	0	0	0
direct instruction cooking	10/12/17	ERIC	0	0	0
direct instruction occupational therapy	10/12/17	ERIC	0	0	0
direct instruction occupational therapy	10/12/17	CINAHL	0	0	0
direct instruction AND occupational therapy	10/12/17	CINAHL	1	1	0

direct instruction AND occupational therapy	10/12/17	ERIC	2	2	0
direct instruction in special education AND skills training	10/12/17	CINAHL	0	0	0
direct instruction in special education AND skills training	10/12/17	ERIC	3	3	0
"direct instruction" AND "CO-OP"	10/12/17	ERIC	1	1	0
"direct instruction" AND "CO-OP"	10/12/17	CINAHL	0	0	0
direct instruction effectiveness	10/12/17	CINAHL	3	2	1**
skill acquisition transition program	10/15/17	PsycINFO	1	1	0
occupational therapy skill acquisition adolescents	10/15/17	PsycINFO	0	0	0
cognitive orientation to daily occupation performance skill acquisition	10/15/17	PubMed	0	0	0
occupational therapy skill acquisition adolescents	10/15/17	PsycINFO	0	0	0
Cognitive orientation to daily occupational performance	10/15/17	PsycINFO	1	0	1**
skill acquisition AND developmental disability	10/15/17	PsycINFO	155	155	0
skill acquisition transition program	10/15/17	CINAHL	1	1	0
skill acquisition transition program	10/15/17	ERIC	2	2	0

skill acquisition transition program AND intellectual disability	10/15/17	ERIC	0	0	0
skill acquisition transition program AND intellectual disability	10/15/17	CINAHL	0	0	0
occupational therapy skill acquisition adolescents	10/15/17	CINAHL	0	0	0
occupational therapy skill acquisition adolescents	10/15/17	ERIC	0	0	0
CO-OP bibliography	10/15/17	http://co-opacademy.ca/	46	29	17
Direct Instruction AND Skill Acquisition	11/2	EBSCOhost	7	6	1
Money management AND CO-OP	11/2	EBSCOhost	1	1	0
Cooking AND CO-OP	11/2	EBSCOhost	3	3	0
IADL AND Cognitive Orientation	11/2	EBSCOhost	3	2	1
Skill acquisition AND CO-OP Approach	11/2	EBSCOhost	12	11	2 (1**)
Skill Acquisition AND Direct Instruction	11/2	EBSCOhost	64	63	1
Total number of articles found = 44 Total number of articles used in review from database searches = 24 **Duplicate articles = 20					

Table 2. Articles from citation tracking.

Article	Date	Database	Initial Hits	Articles Excluded	Total Selected for Review
Cognitive orientation to daily occupational	10/19/17	EBSOhost	34	29	5 (3**)

performance (CO-OP): A new approach for children with cerebral palsy.					
Cognitive orientation to daily occupational performance (CO-OP) as group therapy for children living with motor coordination difficulties: An integrated literature review	11/8/17	Google Scholar	1	1	0
Cognitive strategy use in school-aged children with developmental coordination disorder	11/8/17	Google Scholar	42	35	6 (5**)
Cognitive orientation to daily occupational performance (CO-OP): A new approach for children with cerebral palsy	11/8/17	Google Scholar	4	1	3**
Exploring inter-task transfer following a CO-OP approach with four children with developmental coordination disorder: A single subject multiple baseline design.	11/8/17	Google Scholar	0	0	0
Occupation-based strategy training for adults with traumatic brain injury: A pilot study	11/8/17	Google Scholar	27	26	1**

Using the cognitive orientation to occupational performance (CO-OP) with adults with executive dysfunction following traumatic brain injury	11/8/17	Google Scholar	71	64	7**
Effectiveness of CO-OP on children with cerebral palsy: A mixed design	11/8/17	Google Scholar	0	0	0
Effects of computer-based video instruction on the acquisition and generalization of grocery purchasing skills for students with intellectual disability	11/8/17	Google Scholar	1	1	0
Cognitive approach to improving participation after stroke: Two case studies	11/8/17	Google Scholar	27	25	2**
<p>Total number of articles found from citation tracking = 24 Total number of articles used in review from citation tracking = 3 **Duplicate articles = 21</p>					

Table 3. Articles from reference tracking.

Article	Date	Articles Referenced	Articles Excluded	Total Selected for Review
Cognitive orientation to daily occupational performance (CO-	11/12/17	43	41	2**

OP) as group therapy for children living with motor coordination difficulties: An integrated literature review.				
Cognitive strategy use in school-aged children with developmental coordination disorder.	11/12/17	28	28	0
Cognitive orientation to daily occupational performance (CO-OP): A new approach for children with cerebral palsy.	11/12/17	39	35	4**
Using the cognitive orientation to occupational performance (CO-OP) with adults with executive dysfunction following traumatic brain injury	11/12/17	52	52	0
Effectiveness of CO-OP on children with cerebral palsy: A mixed design	11/12/17	44	38	6**
Cognitive approach to improving participation after stroke: Two case studies.	11/12/17	40	36	4**
'There's a real plan here, and I am responsible for that plan': Participant experiences with a novel cognitive-based treatment approach for adults living with chronic stroke.	11/12/17	41	36	5**
Inter-task transfer of meaningful, functional skills following a cognitive-based treatment: Results of three multiple baseline design experiments in adults with chronic stroke.	11/12/17	41	34	8**
Total number of articles found from reference tracking = 29 Total number of articles used in review from reference tracking = 0				

**Duplicate articles = 29

Total number of articles used in review from database searches = 24

Total number of articles used in review from citation tracking = 3

Total number of articles used in review from reference tracking = 0

Total number of articles used in review from UPS Master's Thesis = 0

Total number of articles used in CAT = 27

Summary of Study Designs of Articles Selected for the CAT Table

Pyramid Side	Study Design/Methodology of Selected Articles	Number of Articles Selected
Experimental	___ Meta-Analyses of Experimental Trials _4_ Individual Randomized Controlled Trials _1_ Controlled Clinical Trials _7_ Single Subject Studies	12
Outcome	___ Meta-Analyses of Related Outcome Studies ___ Individual Quasi-Experimental Studies _2_ Case-Control Studies _8_ One Group Pre-Post Studies	10
Qualitative	___ Meta-Syntheses of Related Qualitative Studies ___ Small Group Qualitative Studies ___ brief vs prolonged engagement with participants ___ triangulation of data (multiple sources) ___ interpretation (peer & member-checking) _X_ a posteriori (exploratory) vs a priori (confirmatory) interpretive scheme _1_ Qualitative Study on a Single Person	1

<p>Descriptive</p>	<p>_3_ Systematic Reviews of Related Descriptive Studies ___ Association, Correlational Studies ___ Multiple Case Studies (Series), Normative Studies _1_ Individual Case Studies</p>	<p>4</p>
<p>Comments: X - McEwen, Polatajko, et al. (2010) rigor methods</p> <p>AOTA Levels I- 6 II- 4 III- 6 IV- 9 V- 2</p>		<p><i>TOTAL = 27</i></p>

Tables Summarizing COPM Outcome Measure

Quantitative Articles

Author, Year, Journal Abbreviation, Country	Study Objectives	Study Design, Level of Evidence, PEDro score	Participants: Sample Size, Description, Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Cameron, Craig, et al. 2016 <i>Phys. & Occ. Therapy in Peds</i> Canada	Examine feasibility of CO-OP for children w/ CP and determine effects of CO-OP compared to CUPA.	Pilot RCT I E2 8/10	$N = 18$ In: 7-12 yo, dx of CP, rated level I, II, or III on GMFCS, typical intelligence, typical/corrected to typical hearing and vision, sufficient language skills to communicate. Ex: previously received or currently receiving cognitive tx, used AAC, regularly received BOTOX during intervention.	Tx: 10 1hr/wk sessions at home. CO-OP: $n = 9$, CUPA: $n = 9$. O: COPM and PQRS. KBIT-2, GMFCS used as screening tools; self-efficacy probe used to track freq of + and neg self-statements.	CO-OP participants met all set goals, demonstrating perf imp in tasks. CO-OP and CUPA promoted skill acquisition and maintenance at follow-up. CO-OP: small effect size ($d = 0.32$) at time 2 over CUPA perf on COPM. CUPA: med effect ($d = 0.4$) at time 3 over CO-OP for COPM sat.	Small sample size led to low statistical power. No statistical sig between group difference likely due to Type II error. Lack of other interventions and similarities in the underlying methods of each intervention may have caused contamination between 2 txs.
Polatajko, McEwen, et al. 2012 <i>AJOT</i> US	Compare effect of CO-OP vs standard OT in performance on goals for post-stroke patients.	Pilot RCT. I E2 7/10	$N = 20$ ($M = 60.4$ yo; 57.9% women). 12 participants w/d from study. In: ≥ 6 mo post CVA, living in community, no more than min aphasia, NIHSS score ≤ 13 ; IQ ≥ 80 .	Tx: 10 sessions CO-OP ($n = 4$) or standard OT ($n = 4$). Each group created own goals. O: goal performance measured by PQRS and COPM.	CO-OP: \uparrow in perf ($U = 0.0$, $p = 0.02$) on COPM compared w/ standard OT, but no sig difference in sat. CO-OP had + tx effect on PQRS and COPM perf.	Non-blinding of assessment administration, high w/d rates, and high recruitment - to - enrollment ratio.

Dawson, Binns, et al. 2013 <i>Archives of Phys Med and Rehab</i> US	Determine effectiveness of CO-OP for changing behavior and whether far transfers occurred, including participation in everyday life.	Partial RCT w/ pre and post Tx assessments masked to tx. II E3 8/10	$N = 13$ w/ TBI. In: ≤ 1 yr post-TBI, ≥ 18 yo, English speaker, no other sig neuro or psych hx, evidence of ED on testing, and able to identify specific day-to-day difficulties. Exclusion: not stated	Tx: CO-OP 1hr, 2x/wk for 10wks ($n = 7$), control ($n = 6$). O: COPM, Dysexecutive Questionnaire, M2PI, Participation Index, and AMPS.	CO-OP \uparrow far transfer on COPM perf ($p = .04$, $d = 1.33$) and sat ($p = .03$, $d = 1.53$) for untrained goals and \uparrow on participation (M2PI) ($p = .01$, $d = 1.82$).	Small sample size limits generalizability.
Poulin, Korner-Bitensky, et al. 2017 <i>Disability and Rehab</i> Canada	Examine feasibility and preliminary efficacy of occupation-based strategy training using adapted CO-OP compared to computer-based training.	Pilot single blind partial RCT. II E2 8/10	$N = 12$ (attrition = 2). In: dx of first or recurrent CVA w/in 12 mo, evidence of ED, living at home, proficient in English/French, able to identify day-to-day difficulties. Exclusion: hx of severe psych problems, severe uncorrected visual problems, post-stroke language problems, pre-existing disabling neuro functions.	Tx: CO-OP ($n = 6$) or computer training ($n = 5$) 2x/wk for 8 wks. Computer group had 4 computer tasks using NeuroActive software. O: COPM; mod LIFE-H.	Both CO-OP and computer Tx had sig sat in COPM. Both groups had clinically sig \uparrow in perf and sat. Both groups \uparrow self-efficacy and reduced impact of ED symptoms. No sig between group differences on outcomes.	Small sample size, absence of control group, inability to randomize 2 participants, and some + changes could be due to spontaneous recovery.
Rodger, & Brandenburg 2008 <i>AOTJ</i> Australia	Examine 2 case studies of children w/ AS to assess effectiveness of CO-OP.	Case study w/ pre-post-test. II O4 5/6	$N = 2$ (siblings). Alice: 11:5 yo girl; Bob: 9:6 yo boy. In: 5-12 yo, dx of AS, avg intelligence. Exclusion: Not stated	Tx: CO-OP approach for 10 sessions 1hr/wk. O: COPM, VABS Scales, PQRS, and M-ABC.	Alice: clinically sig \uparrow in perf, but not sat in using cutlery, tying shoes, and styling hair. Bob: clinically sig \uparrow in communication on VABS; \uparrow perf and sat in all 5 goals on COPM.	Small sample size and the participants were siblings. Same therapist provided Tx to both children, creating potential bias.

Ghorbani, N., Rassafiani, M. et al. 2017 <i>Research in Developmental Disabilities</i> Iran	Determine whether CO-OP improves motor skills and achievement in motor-based occupational perf goals in children w/ CP.	Mixed: Multiple baseline and 1 group pre/post-test. III E4 4/7	<i>N</i> = 5. In: 7-9 yo, CP, level I, II, III on GMFCS; Level I, II, III on MACS, motor perf problems in ADLs, IQ \geq 85, no visual/hearing problems. Attrition = 1 due to surgery. Exclusion: Not stated	Tx: Total of 12 CO-OP sessions, 45-60 min 2x/wk. Children divided into 3 groups on the basis of when they started tx according to baseline period. O: BOTMP, COPM and GAS to measure goals.	CO-OP improved motor perf for children w/ CP in level I of the GMFCS and levels I, II, III of the MACS. Perf and sat \uparrow for all participants on COPM \geq 2. All dimensions of BOTMP sig \uparrow in CO-OP.	Small sample size limits generalizability. 1st edition BOTMP used because of limited access to 2nd edition.
Henshaw, Polatajko, et al. 2011 <i>AJOT</i> US	Investigate use of CO-OP w/adults post stroke.	2 in-depth case studies III O3 3/6	<i>N</i> = 2 African- American females In: mild-mod CVA (\leq 13 on NIHSS), \geq 40 yo, 6-18 mo poststroke, English speaking, informed consent, 3 client-identified goals Ex: severe mental illness other than depression, global aphasia in acute setting, severe language impairment, dementia or tactile neglect, severe impairment in gen intellectual functioning, concurrent neuro dx, current drug/ alcohol abuse, receiving rehab or in other studies.	Descriptive and pre-post measures administered by an ind-tester. Response tracking and pre-post Tx measures administered throughout and before/ after Tx. Posttest measures re-administered by third-party rater. COPM, PQRS and post - Tx interview conducted by Henshaw.	Themes in using CO-OP: impact of motivating goal; customized guidance, structure, and support; resistance to new approach; impact of rapport; social support. Perf and sat on COPM \uparrow from pre- to posttest for each goal except for third goal. Clinically sig imp for all goals for one participant and for all but one goal for second participant. Statistical sig is debatable.	No participants w/ severe ID - limiting transfer of results to that pop. Participants were African-American females (65 and 70 yo); case study limits determination of causality or generalization of results to wider pop. PQRS was rated by treating therapist instead of an objective third-party. Lack of follow-up.

McEwen, Polatajko, et al. 2010b <i>Neuropsych Rehab</i> Canada	Investigate whether CO-OP improves perf in trained and untrained self-selected skills in adults w/ CVA.	Single case, multiple baseline, ABABABA B. III O4 4/7	$N = 3$. In: recruited upon discharge from outpt CVA program; motivated to participate in research; ≥ 1 yr post - CVA, living in the community, min score of 24/30 on MMS Exam. 5 recruited, 2 w/drew due to illness. Ex: Not stated	Tx: CO-OP for perf on 3 trained and 1 untrained skills. O: health status, self-efficacy, motor control, and UE activity; PQRS, COPM, SIS, RNLI, MAL, SSEMCD, ASBCS, and Chedoke-Mcmaster Stroke Assessment.	COPM perf sig \uparrow on 9/9 trained skills and 2/3 untrained skills at post- and 1 mo follow-up. COPM \uparrow in sat on all trained and untrained skills (12/12) at both post- and 1 mo follow-up.	Small sample size. During baseline phase there was a trend toward perf \uparrow which reduces the certainty that perf \uparrow was related to CO-OP Tx.
Missiuna, DeMatteo, et al. 2010 <i>Phys & Occ Therapy in Peds</i> Canada	Determine if CO-OP is associated w/ functional perf changes in children w/ ABI and whether changes are maintained after 4mo.	One-group pre-post study III O4 5/6	$N = 6$ In: 6-15 yo, initial GCS w/in mild-mod range (9-15), attending school full-time w/o full-time edu assistant, scores ≤ 5 on 2 or more sections of SFA. Ex: Not stated	Tx: 10 CO-OP sessions 1hr/wk. O: COPM or PEGSS, PQRS, and VABS.	All participants had sig \uparrow in perf & sat on COPM post-Tx and at 4mo follow-up ($p < .01$). \uparrow on VABS ($p < .01$), and PQRS ($p < .01$).	Small sample size and heterogeneity in sample.
Thornton et al. 2016 <i>Disability and Rehab</i> UK	Determine if 10 wk group-based CO-OP intervention improved outcome measures across impairment, activity, and participation levels of ICF framework.	Quasi - experimental , pre-post-test. III O4 7/7	$N = 20$ male children 8-10 yo w/ dx of DCD from DSM-IV. Ex: Not stated.	Tx: 10 wk CO-OP group Tx ($n = 10$) or regular activity ($n = 10$). O: MABC-2, COPM, and GAS.	Children in CO-OP group had \uparrow in impairment, activity, and participation outcomes. \uparrow parent and child perf and sat on COPM.	Results are limited to boys with DCD and focused on fine motor tasks. Lack of follow-up.

Capistran, & Martini 2015 <i>Human Movement Science</i> Norway	Determine whether CO-OP leads to improved perf in untrained tasks.	Single subject, ABA, multiple baseline across skills, w/ 3 replications. IV E4 4/7	<i>N</i> = 4 children w/ DCD (7-12 yo). In: motor perf difficulties co-occurring w/ attention deficit and/or language difficulties. Ex: previously treated w/ CO-OP, presently receiving cognitive Tx, or not able to engage in therapy due to behavioral issues.	Tx: 10 CO-OP sessions on 3 tasks w/ a 4th identified but not worked on to verify transfer. Global strategies used w/ guided discovery to identify DSS. O: Perf rated over 4 phases using PQRS, DCDQ-FC, MABC-2, TONI-4, COPM. Caregiver logbook describe use of CO-OP at home.	Sig imp 11/12 trained tasks and 2/4 untrained tasks. Statistically sig change at post for 10 tasks. At follow-up 10 tasks maintain statistically sig change. When transfer not found, parents reported that global strategy use at home was limited.	Low number of repetitions of tasks for some phases made it difficult to verify auto-correlation. Level of parental involvement was impossible to control. First author did both tx and the analysis, increasing the possibility of bias.
Dawson, & Gaya 2009 <i>CJOT</i> Canada	Test applicability of CO-OP for adults with ED from TBI.	Pilot case series design IV O4 4/6	<i>N</i> = 3 w/ TBI and ED + SO familiar w/ their needs. In: complicated mild, mod, or severe TBI, > 1 yr prior, no concurrent depression, > 18yo, ED, ability to identify goals. SO must be close friend or family, at least 18 yo, willing to learn CO-OP. Ex: Not stated.	Tx: 20 CO-OP training sessions and 3 mo follow-up O: COPM.	Perf on 7/9 trained and 4/7 untrained goals ↑ post tx and 7/9 untrained and 3/7 untrained ↑ at 3-mo follow-up. 7/9 trained goals and 7/7 untrained goals ↑ sat post-tx; 7/9 trained and 3/7 untrained goals ↑ sat at 3-mo follow-up.	Participants had difficulty identifying goals and some untrained goals required add'l intervention not addressed w/ CO-OP alone. Discrepancy between self-report and SO report.
Ng, Polatajko, et al. 2013 <i>Brain Injury</i> Canada	Investigate feasibility of CO-OP in telerehab for adults w/ TBI in 3/5 client directed goals.	Pilot series 3 case studies w/ 3 mo follow-up IV O4 3/6	<i>N</i> = 3 w/ TBI and their SO (parent or spouse) In: > 18 yo, > 1 yr post-TBI, no concurrent depression, high speed internet access, ED, and self-identify goals. Ex: Not stated.	Tx: 1hr sessions: telerehab CO-OP instruction 2x/wk for 10wks. O: Adherence to 7 principles of CO-OP; COPM perf and sat: pre/post; 3 mo follow-up.	All adhered to most CO-OP strategies. COPM perf: 5/10 sig ↑ on trained goals at post-tx; 5/6 ↑ at follow-up. 2/8 sig ↑ on untrained goals at post-; 4/6 ↑ at follow-up.	Missing some follow-up data. High speed internet inclusion criteria limits reach of study. Limited observation of perf to assess and provide feedback.

Phelan et al. 2009 <i>CJOT</i> Canada	Investigate use of CO-OP w/ individuals w/ PDD.	Single case design, ABA IV E4 1/3	<i>N</i> = 2 males. Child A: 9 yo w/ AS Child B: 10 yo w/ ASD. In: dx of ASD or AS w/ good verbal communication skills; 7-14 yo; identified motor difficulties and perf problems; child and parental consent. Ex: limited verbal communication.	Tx: CO-OP 1hr 1x/wk 10 sessions teaching Goal-Plan- Do- Check strategy applied to client chosen tasks. O: PQRS, COPM.	General trend of improved perf w/ chosen goals on PQRS and single-case data graph. All goals in COPM reached clinically sig ↑ in perf and sat.	Small sample size. Limits generalizability across the population. Visual trend analysis of the data only.
Taylor, Fayed, et al. 2007 <i>OTJR: Occupation, Participation and Health</i> Canada	Determine effectiveness of CO-OP w/ young children (5-7 yo)	Experimental single case design, ABA IV E4 3/7	<i>N</i> = 4 boys (5-7 yo) In: DCD movement impairment profile consistent w/ DSM IV, typical intelligence, intact hearing and vision or correct to normal vision and hearing, both child and parent provide consent. Ex: not stated	Tx: CO-OP for 10 40-60 min sessions on 3 child-identified target goals. O: COPM and PQRS pre-/post-test. Videotaped observational data for 3 repetitions of target goals, scored using PQRS.	All showed imp in chosen tasks and reported ↑ in perceived perf on COPM. Parent, child and therapist ratings of ↑ performance indicates that CO-OP is suitable for 5-7 yo children.	Caution in generalizing single-case study results. Study did not have a comparison tx or control group. Slight modifications to the administration of CO-OP measures were necessary w/ younger children.
Skidmore, Holm, et al. 2011 <i>Neuropsychological Rehab</i> US	Examine feasibility of administering CO-OP during inpt rehab.	Case report V D4 2/3	<i>N</i> = 1 (31 yo) male w/ mild-mod severe embolic CVA. In: dx of acute CVA, impairment in EF (≥ 11 on EI), and written informed consent. Ex: Pre-existing disabling neuro condition, pre-existing cog impairment, current sig immediate memory impairment, severe aphasia, major depressive/bipolar/psychotic disorder, and alcohol/	Tx: CO-OP for 45 min/day 5 days/wk for 14 days. O: COPM and the Pittsburgh Rehab and Participation Scale. ADL perf measured using the FIM and PASS.	Participant met own target perf quality rating for 4/8 participant identified goals. Demonstrated clinically meaningful ↑ in rehab engagement and ADL perf while receiving training.	Case study, not generalizable.

			substance abuse w/in the past 6 mo.		
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Key to Abbreviations (Alphabetical)

↑ = Increase; + = Positive; ABI = Acquired Brain Injury; Add'l = Additional; ADL = Activities of Daily Life; AJOT = American Journal of Occupational therapy; AMPS = Assessment of Motor and Process Skills; ASPCS = Activity Specific Balance Confidence Scale; AS = Asperger's Syndrome; Avg = Average; B/c = Because; BOTMP = Bruininks-Oseretsky Test of Motor Proficiency Measure; CIHI = Canadian Institute for Health Information; COPM = Canadian Occupational Performance Measure; Cog = Cognitive; CO-OP = Cognitive Orientation to Occupational Performance; CUPA = Current Usual Practice Approach; CVA = Stroke; DKEFS = Delis-Kaplan Executive Function System; DCD = Developmental Coordination Disorder; DCDQ-FC = Developmental Coordination Disorder Questionnaire -French; DSS = Domain specific strategies; Dx = Diagnosis; Diff = Different; ED = Executive dysfunction; EF = Executive function; EI = Executive Interview; Ex = Exclusion; Freq = Frequency; FIM = Functional Independence Measure; GAS = Goal Attainment Scale; GCS = Glasgow Coma Scale; GMFCS = Gross Motor Function Classification Scale; Hr = Hour; hx = history; ICF = International Classification of Functioning, Disability and Health; Imp = Improvement; In = Inclusion; Ind = Independent; Inpt = Inpatient; KBIT-2 = Kaufman Brief Intelligence Test; LIFE-H = Assessment of life habits; M2PI = Mayo-Portland Adaptability Inventory-4; Min = Minimum; MMS = Mini Mental State; MACS = Manual Ability Classification System; Mod = Moderate; Mo = Month; MAL = Motor Activity Log; M-ABC = Movement Assessment and Battery for Children; M-ABC-2 = Movement Assessment Battery for Children 2; Neg = Negative; NIHSS = National Institutes of Health Stroke Scale; O = Outcome; Outpt = Outpatient; PACS = Pediatric Activity Card Sort; PASS = Performance Assessment of Self-Care Skills; PEGSS = Perceived Efficacy and Goal Setting System; Perf = Performance; Pop = Population; PQRS = Performance Quality Rating Scale; RCT = Randomized Control Trial; Rehab = Rehabilitation; RNLI = Reintegration into Normal Living Index; Sat = Satisfaction; SFA = School Function Assessment; Sig = Significant; SIS = Stroke Impact Scale; SSEMCS = Stanford Self-Efficacy for Managing Chronic Disease; SO = Significant other; TBI = Traumatic Brain Injury; Tele-rehab = Telerehabilitation; TONI-4 = Test of Nonverbal Intelligence-4; Tx = Treatment; VABS = Vineland Adaptive Behavior Scales; Wk = Week; W/ = week; W/d = withdrawal; W/in = Within; Yr = Year; Yo = Years old

Tables Summarizing COPM Outcome Measures*Meta-Analyses/Meta-Syntheses/Systematic Review Articles*

Author, Year, Journal Abbreviation, Country	Study Objectives	Study Design, Levels of Evidence of Studies	Number of Papers Included, Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Anderson, Wilson, et al. 2017 <i>AOTJ</i> Australia	Explore evidence for CO-OP in group tx for children w/ motor coordination difficulties.	Integrative literature review. I D1 1/3	6 articles (4 quantitative, 1 qualitative, and 1 mixed - method design). In: articles relating to children w/ motor coordination difficulties and CO-OP Tx in group format. Theoretical, quantitative, qualitative, or mixed methods. Published in a peer-reviewed English journal. Ex: not specified.	Critical analysis done by McMaster Guidelines for Critical Review and CASP checklist. COPM used in 4/5 studies, CSQ used in 1/5, MABC used in 3/5 of studies as outcome measures.	One study found that at 4-6wk follow-up skills did not transfer. All using COPM reported clinical sig. Lack of sig outcomes w/ MABC. + outcomes in self-rated perf and sat.	Limited number of studies included. Transferability of findings to other ped pop outside of those w/ movement coordination difficulties is limited.
Scammell, Bates, Houldin, & Polatajko 2016 <i>CJOT</i> Canada	Examine extent and nature of the literature on CO-OP.	Systematic Review I D1 1/3	26 articles examining the application of CO-OP w/ 8 populations including: DCD, ASD, PDD, AS, and ABI.	Tx: CO-OP. O: COPM, PQRS	All articles: effectiveness w/ CO-OP. + ↑ in perf on COPM and PQRS. Adaptations to format and session structure did not impede the effectiveness of the CO-OP approach and seemed to imp feasibility.	No critical appraisal done or any analysis of data from articles conducted.

<p>Weaver 2015 <i>AJOT</i> US</p>	<p>Examine interventions addressing work, ADLs, IADLs, education, and sleep for people w/ ASD.</p>	<p>Systematic review I D1 1/3</p>	<p>23 studies: 9 work, 11 ADL/IADL, and 3 edu-related tx. In: peer-reviewed scientific literature published in English, Tx approaches w/in scope of OT, published between 2006-2013 and participants w/ ASD; studies of Level I, II, and III evidence (Level IV and V when higher level evidence not found). Ex: data from presentations, conference proceedings, non-peer-reviewed research, dissertations and theses; Level IV and V evidence.</p>	<p>COPM, qualitative analysis to determine imp of goals.</p>	<p>Support for ADL/IADL Tx is variable w/ indications that CO-OP, SI, and contextual Tx may ↑ occupational perf. CO-OP is likely an effective Tx for ↑ ADL and IADL task perf among youth w/ ASD. Overall mod evidence to support CO-OP w/ ADL/IADL goals.</p>	<p>A small number of studies, several lacked methodological rigor, long-term outcomes, nonrandom assignment to groups, masked assignment and scoring, and comparison groups. Many studies used concurrent interventions and separating the effects of a single Tx may be difficult.</p>
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Key to Abbreviations (Alphabetical)

↑ = Increase; + = Positive; ABI = Acquired Brain Injury; Add'l = Additional; ADLs = Activities of Daily Living; AOTJ = Australian Occupational Therapy Journal; AS = Asperger's Syndrome; ASD = Autism Spectrum Disorder; CJOT = Canadian Journal of Occupational Therapy; COPM = Canadian Occupational Performance Measure; CO-OP = Cognitive Orientation to Occupational Performance; CSQ = Coordination Skills Questionnaire; DCD = Developmental Coordination Disorder; Edu = Education; Ex = Exclusion; Imp = Improvement; In = Inclusion; IADLs = Instrumental Activities of Daily Living; MABC = Movement Assessment Battery for Children; Ped = Pediatric; Perf = Performance; PDD = Pervasive developmental disorder; Pop = Population; PQRS = Performance Quality Rating Scale; Tx = Treatment; Sig = Significance

Tables Summarizing Executive Functioning Outcome Measure
Quantitative Articles

Author, Year, Journal Abbreviation, Country	Study Objectives	Study Design, Level of Evidence, PEDro score	Participants: Sample Size, Description, Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Wolf, Polatajko, et al. 2016 <i>AJOT</i> US	Estimate effect of CO-OP compared w/ usual OT for immediate and long-term outcomes on UE movement, cog flexibility, and stroke impact in people ≤ 3 mo post stroke.	Exploratory, single-blind RCT I E2 9/10	$N = 30$ (26 in primary analysis; 22 in secondary analysis) w/ ischemic CVA. In: met above criteria Ex: ≥ 3 mo post stroke, not referred to OT, prior neurological dx other than stroke, any major psychiatric illness, mod or greater aphasia, sig cog impairment.	Tx: CO-OP: 10 sessions max, 1x/wk for 60 min w/ post-intervention assessment followed by usual OT as needed ($n = 14$) or usual OT ($n = 16$). Participants randomized to either group. O: MoCA, and CIHI, COPM, PQRS: ARAT, D-KEFS Trail Making subtest, and SIS.	At post-tx CO-OP had a large effect over usual OT for SIS recovery ($d = 0.8$) and med effect over usual OT for changes in SIS physical summary score, SIS hand function, and D-KEFS Trail making subtest ($d = 0.5$). 3mo post-tx, there was a med effect for SIS hand function ($d = 0.6$) and D-KEFS trail making subtest ($d = 0.5$). + effect of CO-OP over usual OT on UE function, cog flexibility, and perceived body functions.	CO-OP group was eligible to receive add'l OT services after completing 10 CO-OP sessions (between post-intervention and follow-up assessment). Uneven number of sessions between sites. Content of add'l sessions is unknown and may have biased results. Effect sizes cannot be compared between the two groups b/c more people dropped out of the usual OT group than the CO-OP group. Need documentation and classification of what classifies usual care OT.

<p>Sangster, Beninger, et al. 2005 <i>CJOT</i> Canada</p>	<p>Investigate impact of CO-OP on use of cog strategies in children w/ DCD.</p>	<p>Pilot study using data from an RCT II O3 6/6</p>	<p>$N = 18$ school-aged children from a previous study (Miller et al, 2001)</p>	<p>Tx: 10 sessions of CO-OP ($n = 9$) or CTA ($n = 9$). CO-OP group, video-recorded sessions from CO-OP RCT scored for freq and type of cog strategies used. Learned global cog strategy, DSS necessary for task perf. CTA group: NDT, multi-sensory, biomechanical, and functional approaches; sensory- integrative, fine and gross motor activities, and direct skill teaching by the therapist.</p>	<p>Differences w/in and between groups revealed changes in types and freq of cog strategies used. CO-OP generated sig more strategies following tx than CTA ($p < .05$). No sig dif in strategy generation between pre-/ posttest for CO-OP but showed sig diff between CO-OP and CTA at post-test.</p>	<p>Larger sample is needed to fully explore impact of CO-OP on strategy use of children w/ DCD. Due to small sample and low strategy freqs, there is an inability to investigate types of strategies used and the differential effects of tx on those strategies.</p>
<p>Bernie & Rodger 2004 <i>Physical & Occupational Therapy in Pediatrics</i> US</p>	<p>Examine type and freq of cog strategies used by children w/ DCD and investigate differences in cog strategy use in younger vs older children w/ DCD.</p>	<p>Exploratory; case-control, preexisting groups IV O3 4/6</p>	<p>$N = 4$ w/ DCD (2: 7 and 12 yo, 2: < 7) In: Meet criteria for DCD outlined by DSM IV.</p>	<p>Tx: Videotaped CO-OP sessions: 1h 2x/wk for 5 wks. O: Two 5 min sections randomly chosen from each session for analysis. Quantified descriptors of behavior, freq of event behavior, between group comparison of behavior freq.</p>	<p>Three types of DSS's were found as a result of the study to improve task perf. Task specification, body position, and verbal mnemonic. Task specification was most freq occurring DSS used by all.</p>	<p>Small N of male-only participants limits ability to generalize results. Randomization resulted in uneven representation of goals.</p>

<p>Rodger, Pham, et al. 2009 <i>AOTJ</i> Australia</p>	<p>Describe types of global strategies and DSSs used by children w/ AS in CO-OP and describe types of guidance utilized while child is practicing the task.</p>	<p>Exploratory: Two case studies IV E4 3/7 Secondary analysis of data collected by Rodger & Brandenburg (2008).</p>	<p><i>N</i> = 2 (11 yo female and 9 yo male) In: between 5-12 yo, have a dx of AS on the GADS and at least average intelligence using a standardized IQ measure.</p>	<p>Tx:10 1hr/wk CO- OP sessions. Global framework used to enhance skill acquisition. Systematic behavioral observation used to investigate types of cog strategies used. O: Video analysis of 2 5-min segments for duration and freq for global strategies, DSS, and type of guidance.</p>	<p>Both able to use CO-OP to enhance skill acquisition. More time spent in “Goal” phase in early sessions; time spent in plan, do, check consistent across sessions. 34 - 50% of total time spent in global strategy of ‘do’ for both children. Task specification/mod was most freq DSS used by both.</p>	<p>Despite verbal guidance occurring outside of “do”, it was only coded during “do”. Limited generalizability due to sample size. Unclear whether coded video segments were representative of I. Some goals may have been overrepresented w/ in segments.</p>
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Key Abbreviations (Alphabetical)

Add'l = Additional; AOTJ = Australian Occupational Therapy Journal; ARAT = Action Research Arm Test; AS = Asperger’s Syndrome; B/c = Because; CIHI = Canadian Institute for Health; Cog = Cognitive; CO-OP = Cognitive Orientation to Occupational Performance; CBVI = Computer-based video instruction; CTA = Current Occupational Therapy Treatment Approach; DCD = Developmental Coordination Disorder; D-KEFS = Delis–Kaplan Executive Function System Trail Making Subtest; DSM-IV *Diagnostic and Statistical Manual of Mental Disorders*; Dif = Difference; DSS = Domain specific strategies; Dx = Diagnosis; Ex = Exclusion; Freq = Frequency; GADS = Gilliam Asperger’s Syndrome Scale; Hr = Hour; In = Inclusion; I = Intervention; ID = Intellectual Disability; Med = Medium; Min = Minimum; Mo = Month; MoCA = Montreal Cognitive Assessment; Mod = Moderate; NDT = Neurodevelopmental treatment; ; OT = Occupational therapy; Perf = Performance PQRS = Performance Quality Rating Scale; Sat = Satisfaction; Sig = Significant; SIS =Stroke Impact Scale; Tx = Treatment; UE = Upper extremity; Wk = Week; W/ = With

Tables Summarizing Executive Functioning Outcome Measure
Qualitative Articles

Author, Year, Journal Abbreviation, Country	Study Objectives	Study Design, Level of Evidence	Participants: Number and selection, Description, Inclusion and Exclusion Criteria	Methods for Enhancing Rigor	Themes and Results	Study Limitations
McEwen, Polatajko, et al. 2010a <i>Disability and Rehab</i> Canada	Aimed at adapting the CO-OP tx approach for use w/ adults w/ CVA.	Semi-structured interview. V Q3	$N = 8$ community - dwelling people, at least 1yr post CVA first recruited for a single case experiment. Only 5 consented to semi-structured interview.	1-hour interviews conducted, and transcriptions were coded by 2 members of the research team. Interviewed 1mo after completion of post study testing.	Reported learning and transferring strategies and suggested increasing number of sessions. Themes: Balancing autonomy w/ support. CO-OP provides participants w/ imp decision -making autonomy but may require modifications to support higher levels of independence.	Sample size was small, which limits generalizability. Participants may not have wanted to reveal concerns about CO-OP to therapist.
Key Abbreviations: CO-OP = Cognitive Orientation to Occupational Performance; CVA = Cerebral vascular accident; Hr = Hour; Imp = Improvement; Mo = Month; Tx = Treatment; W/ = With; Yr = Year;						

Tables Summarizing Direct Instruction*Quantitative articles*

Author, Year, Journal Abbreviation, Country	Study Objectives	Study Design, Level of Evidence, PEDro score	Participants: Sample Size, Description, Inclusion and Exclusion Criteria	Interventions & Outcome Measures	Summary of Results	Study Limitations
Goo, Hua, et al. 2016 <i>Education and Training in Autism and Develop. Disabilities</i> South Korea	Evaluate the effects of CBVI on teaching grocery purchasing skills to students w/ mod intellectual disability.	Multi - probe design. III O4 4/10	$N = 4$ high school students w/mild- mod ID from a large urban district in South Korea. In: present perf level of grocery purchasing skills, read sight words related to grocery purchasing, match sight words to actual items/pictures, and use a computer mouse.	Baseline pretest and posttest Tx: CBVI program, 15 min, 1-2x/day in a special education classroom and 2 grocery stores. O: steps to perform grocery purchasing skills.	Each student improved in grocery purchasing skills. Generalization was between 55%-75% from pretest scores and between 0%-17.6% of correct steps.	Acquired skills limited to three grocery items that had been modeled through the CBVI. Real life distractions affected perf in grocery store. Limited measurements taken to examine generalization of acquired skills.
Botts, Losardo, et al. 2014 <i>Journal of Special Education</i> US	Examine the effectiveness of ABI and EDI.	Single Case Design, ABA IV E4 2/7	$N = 5$ males from 4:2 yo - 5:7 yo, In: dx w/ mild-mod language impairment - characterized by difficulties w/ comprehension and language production. Ex: Not specified.	Tx: 6 wk alternating ABI and EDI sessions 20-min 2x/wk, 8 generalization sessions 1x/wk. Maintenance sessions 5 mos after I. O: LLPC, KABC, BDI, LWID.	EDI more effective acquisition of target objectives and more rapid rate of acquisition of target skills. Neither tx produced spontaneous use of the targeted skills.	Generalization unlikely due to small N . Single case design does not produce as many objective measures by which to evaluate the effectiveness or efficiency of either approach.

<p>Park, Weber, et. al. 2007 Child and Family Behavior Therapy US</p>	<p>Determine effectiveness of model, lead, and test procedure, as well as fading procedure w/ prompts and DI</p>	<p>Multiple baseline single case design, ABCA IV E4 2/7</p>	<p><i>N</i> = 2 (1 male w/ CP, 1 female w/ dyslexia). In: cog and physical delays, have goals stating need for imp in academic areas as well as physical/developmental growth. Ex: Not stated.</p>	<p>Tx: A model and verbal prompts given to students to write their name. DI procedure of model, lead, and test used in the initial presentation of letter formation. O: Number of letters in child's name and letter legibility</p>	<p>Both students were able to write all the letters in their name legibly. Combination of modeling, fading, and prompting together w/ DI ↑ handwriting perf w/ preschool students w/ cog and physical delays</p>	<p>No comparison group. Small <i>N</i> with different diagnoses which could affect generalizability to others, and change outcomes. ↑ in handwriting could have been practice effect or spontaneous.</p>
<p>Key Abbreviations (Alphabetical) ↑ = Increase; ABI = Activity-based intervention; BDI = Battelle Developmental Inventory; CBVI = Computer-Based Video Instruction; Cog = Cognitive; DI = Direct Instruction; EDI = embedded direct instruction; Ex = Exclusion; In = Inclusion; Imp = Improvement; I = Intervention; KABC = Kaufman Assessment Battery for Children; LLPC = Ladders to Literacy Preschool Checklist; LWID = Letter-Word Identification and Dictation subtests of the Woodcock-Johnson Psychoeducational Battery - Revised; O = Outcome; Perf = Performance Tx = Treatment; W/ = With; Wk = Week; Yo = Year old</p>						

Summary of Key Findings:

Summary of CO-OP Articles using COPM as an Outcome Measure

There is strong evidence to support the Cognitive Orientation to Occupational Performance (CO-OP) Approach as an effective strategy to improve perceived performance in client-determined goals as reported on the COPM. All 20 articles* that utilized the COPM as an outcome measure found evidence that using a CO-OP approach to treatment leads to clinically significant improvement of client perception of performance. All but one of these studies (Poulin et al., 2017) found that the improvement in performance was significant compared to alternative cognitive training.

There is mixed evidence to support that a CO-OP approach also improves client satisfaction with their goal performance as reported on the COPM. One Level I study (Cameron et al., 2016) found that current occupational therapy practice generated more improvement in satisfaction than CO-OP. However, articles that compare standard occupational therapy to the CO-OP approach did not operationally define what encompasses standard occupational therapy treatment. One level I article (Polatajko et al., 2012) and two Level II articles (Poulin et al., 2017 and Rodger et al., 2008) found that there were no significant differences in satisfaction reported between interventions. However, one Level II article (Dawson et al., 2013), five level III articles (Ghorbani et al., 2017; Henshaw et al., 2011; McEwen et al., 2010b; Missiuna et al., 2010; and Thornton et al., 2016), and two level IV articles (Dawson et al., 2009 and Phelan et al., 2009) found evidence supporting a CO-OP approach in increasing satisfaction reported on the COPM. It is worth noting, that of the seven articles that found clinically significant improvement in satisfaction, six articles did not have a comparison measure.

* Cameron et al., 2016; Polatajko et al., 2012; Dawson et al., 2013; Poulin et al., 2017; Rodger et al., 2008; Ghorbani et al., 2017; Henshaw et al., 2011; McEwen et al., 2010b; Missiuna et al., 2010; Thornton et al., 2016; Capistran et al., 2015; Dawson et al., 2009; Ng et al., 2013; Phelan et al., 2009; Taylor et al., 2007; Skidmore et al., 2011; Anderson et al., 2017; Scammell et al., 2016; Weaver, 2015; and Henshaw et al., 2011.

Summary of Articles using Executive Functioning as Outcome Measure

There is moderate evidence indicating that the CO-OP approach improves executive functioning and cognitive flexibility in individuals with stroke. One Level I study (Wolf et al., 2016) found a medium effect on the Delis–Kaplan Executive Function System Trail Making Subtest (D-KEFS) for the CO-OP group over the usual occupational therapy group three months post-intervention. This study also found a positive effect for cognitive flexibility for the participants in the CO-OP group compared to the participants in the usual care group. Two Level IV studies (Rodger et al., 2009 and Bernie et al., 2004) found that the most frequently used Domain Specific Strategy (DSS) used by individuals instructed in CO-OP is task specification. Due to small sample sizes and limited generalizability, these two studies provide limited evidence that CO-OP strategies can be effective in enhancing skill acquisition through the use of DSS's and that the strategies used may be dependent on the goal being addressed. There is insufficient evidence indicating that individuals receiving CO-OP intervention will produce more cognitive strategies than individuals receiving their current occupation therapy treatment approach (CTA). One Level IV study (Sangster et al., 2005) found that the CO-OP treatment group generated significantly more strategies following treatment than the CTA group. One Level V qualitative study (McEwen et al., 2010b) found increased decision-making autonomy in

adults with stroke one month after CO-OP treatment, suggesting that the CO-OP approach is effective at improving decision-making in adults. It is important to note that articles stating that usual care and CTA were used as a control treatment did not operationally define those treatments.

Summary of Direct Instruction Articles

There is limited evidence supporting direct instruction in improving occupational performance as indicated by one Level III (Goo et al., 2016), and two Level IV (Botts et al., 2014; Park et al., 2007) studies. Botts et al. (2014) found embedded direct instruction was more effective than activity-based intervention in acquisition of target objectives and produced a more rapid rate of acquisition of target skills. While direct instruction was shown to be effective in one Level III (Goo et al., 2016) and one Level II (Park et al., 2007) studies, the results were limited due to the small sample size and lack of control group.

Implications for Consumers:

The CO-OP approach to learning is effective in achieving performance improvement in client-directed goals for children with developmental coordination disorder or cerebral palsy, adolescents with autism or Asperger's syndrome, and adults with traumatic brain injury or stroke. Utilizing the CO-OP approach requires the client's active participation in therapy and may result in significant improvements in performance. Consumers should be prepared to collaborate more with their therapist and learn a new approach in assessing their own motor movement to improve their performance but can expect to make significant strides with this approach. While research has also shown direct instruction to be an effective method of teaching skill acquisition, the evidence is limited. Research indicates that consumers report significant improvement in performance, but not satisfaction on the COPM when using the CO-OP approach. This finding suggests that while consumers are likely to see an improvement in their performance capabilities they may not experience satisfaction with their results. However, this may be linked to improved insight regarding deficits due to improvements in executive functioning.

Implications for Practitioners:

A CO-OP approach is very effective in teaching IADL and ADL skills to individuals with cognitive dysfunction (Cameron et al., 2016; Polatajko et al., 2012; Dawson et al., 2013; Poulin et al., 2017; McEwen et al., 2010b; Missuna et al., 2010; Dawson et al., 2009; Ng et al., 2013; Skidmore et al., 2011; Henshaw et al., 2011; Wolf et al., 2016; and McEwen et al., 2010a). Collaboration through a CO-OP approach can improve participation in therapy and can lead to significant improvements in motor performance, therefore leading to improved outcomes for clients. It is easy to incorporate CO-OP principles into existing practice without certification, but there is an option of certification for therapists who want to implement CO-OP into their practice in its entirety. A CO-OP approach should be implemented with client-centered considerations regarding the balance between decision-making autonomy and support. Furthermore, Wolf et al. (2016) found that CO-OP may have broader positive effects on stroke recovery as well as UE function, cognitive flexibility, and perceived body functions than usual occupational therapy care.

Research suggests that the COPM is a reliable, valid, and clinically useful measurement of performance and performance satisfaction (Carswell et al., 2004), which indicates that it is a suitable measure to use with clients who are taught the CO-OP approach. Due to the client-centered nature of the COPM, it is an appropriate measure to administer as a practitioner to measure progress of clients who are instructed in the CO-OP approach. Neglecting to use the COPM, in either a CO-OP approach or direct instruction as a measure of effectiveness, prevents practitioners from fully understanding clients' perceptions of their performance and satisfaction.

Implications for Researchers:

Additional research needs to be done in comparing a CO-OP approach with other established teaching approaches beyond typical occupational therapy. There is some initial research regarding implementing a CO-OP approach in a group setting which needs to be further studied. Additional research also needs to be done to determine ideal group-size, length of session, and amount of sessions for a CO-OP approach. Current research indicates that ratings of performance on the COPM improve with a CO-OP approach, but ratings of satisfaction do not. Further research should be done to investigate the factors influencing consumer ratings of satisfaction. Further, additional research is needed to determine the importance of client established goals for therapy in contributing to the effectiveness of the approach. COPM is a valid, reliable, clinically useful measure that is acceptable for practitioners and researchers to utilize (Carswell, et al., 2004). Thus, the COPM should continue to be used in future research as it has shown to be an appropriate measure for this topic. In regard to usual care, therapists can incorporate aspects of the CO-OP approach into their treatment sessions by collaborating more with their clients.

Bottom Line for Occupational Therapy Practice/ Recommendations for Better Practice:

The CO-OP approach is an appropriate and effective approach for many of the diverse populations seen in occupational therapy such as those with stroke, developmental coordination disorder, and cerebral palsy (Bernie & Rodger, 2004; Cameron et al., 2016; Henshaw et al., 2011). It is easy to integrate into therapy and should be integrated into most teaching strategies. It is important to consider when implementing a CO-OP approach the individual needs of the client and consider balance in independent decision making on behalf of the client.

Involvement Plan

Introduction

After meeting with Dr. Abbott to discuss the implementation and translation of our research on CO-OP, we came to the conclusion of creating an inservice presentation that could also be accessed online by occupational therapists in the Kent School District. This presentation was used as a resource for Dr. Abbott to teach other occupational therapists about the CO-OP approach. Although Dr. Abbott has garnered support from staff at The Outreach Program (TOP), occupational therapists in her school district have been resistant to learning more about the CO-OP approach due to unfamiliarity, lack of time, and increased workloads as demonstrated in the Ottawa Model of Research Use (Graham & Logan, 2004).

Dr. Abbott also discussed wanting to create a CO-OP study group where members will analyze and summarize the textbook, *Cognitive Orientation to Daily Occupational Performance in Occupational Therapy : Using the CO-OP Approach™ to Enable Participation Across the Lifespan* (Dawson, McEwen & Polatajko, 2017). Dr. Abbott hoped that this study group would promote the use of CO-OP in her district. The presentation we created gave Dr. Abbott a platform to provide the occupational therapists in her district a resource to access information regarding CO-OP at their leisure. As a part of the presentation, participants were provided the opportunity to start the process of completing Competency Assessment Units (CAU) for NBCOT renewal through signing up to join a CO-OP study group led by Dr. Abbott.

Dr. Abbott believes the CO-OP approach can and should be implemented across all ages in the school district because of its effectiveness in therapy. Dr. Abbott and the student researchers felt that having an online presentation, in addition to the inservice presentation, was the most effective way to disseminate information. Dr. Abbott intends to use the online

presentation as a resource in the future for new occupational therapists in her district, who may lack experience with CO-OP.

Context

Dr. Abbot has educated the teachers in TOP about the CO-OP approach by having them present when she is teaching her students about the approach. The teachers have seen the benefits it can provide and therefore have implemented the approach with their students in the classroom as much as possible. The cooperation across professional disciplines at TOP serves as a facilitator for widespread implementation of the CO-OP approach. The willingness of teachers to implement CO-OP in their classrooms conveys the versatility of this approach across different disciplines and settings. Another facilitator to disseminating information about CO-OP is the support from the principal of TOP, who may serve as an advocate for its effectiveness. This also allows Dr. Abbott to pursue CO-OP certification in a supportive environment. Additionally, the book that Dr. Abbott is advocating to use for the online presentation and study group is \$40.00 and significantly more cost effective for continuing education credits compared to workshops that can cost hundreds of dollars.

Dr. Abbott's passion further supports implementing CO-OP in the Kent School District. She is determined to demonstrate the effectiveness of CO-OP and advocates for its use whenever possible. Additionally, she has taken it upon herself to increase her knowledge of the approach and single-handedly advocated for its use and implementation across the classrooms at TOP. Although there is research supporting the effectiveness of the CO-OP approach, there is limited evidence regarding its effectiveness with individuals with intellectual disability. However, Dr. Abbott has seen improvements in her students and is planning on implementing research at TOP regarding CO-OP to add to the growing body of CO-OP literature.

Dr. Abbott's passion and the support of her team and administration within TOP may support broader implementation of the CO-OP approach within the Kent School District. However, with any translation of knowledge to practice, there are barriers to consider. Within the Kent School District one of these barriers are the logistical time constraints to receive and process the information about CO-OP. The occupational therapists in the district only meet four times a year for an hour during each inservice. For efficiency, the agendas of each inservice are set months in advance and are not easily altered. While they allotted time for us to present our research findings, we needed to provide promotional materials and a web based presentation to access the information. Busy schedules and heavy caseloads are a deterrent to many occupational therapists who do not believe they have the time to learn about a new approach outside of work, and the likelihood of them independently accessing an online presentation is low.

Another barrier considered was the philosophical differences regarding what constitutes best practices. Dr. Abbott reported that she spends additional time educating some of the paraeducators within TOP to allow the students to independently problem-solve and resist the urge to help. Additionally, many therapists may have aligned their practice with more established models, and there may be resistance to change. Depending on the needs of the student, some occupational therapists may not find the CO-OP approach appropriate for students on their caseload and therefore will not implement it.

Tasks and Products Target Dates:

Task/Product	Deadline Date	Steps w/ Dates to achieve the final outcome
Make outline of what should go into presentation	2/19/18	<ol style="list-style-type: none"> 1. Meet as group to talk about what should go on outline by discerning which research from our CAT is most pertinent for the presentation by 2/15/18. 2. Email Dr. Abbott letting her know to expect outline by 2/15/18. 3. Create outline by 2/19/18. 4. Send to Dr. Abbott by 2/19/18 and ask to receive edits by 2/23/18.
Finalize outline with Dr. Abbott's edits	3/2/18	<ol style="list-style-type: none"> 1. Receive edits from Dr. Abbott via email by 2/23/18. 2. Email Dr. Abbott our edited presentation outline by 2/26/18. 3. Ask for final approval to be sent via email by 3/2/18.
Receive final approval from Dr. Abbott	3/2/18	<ol style="list-style-type: none"> 1. Wait for email of approval before proceeding with making presentation.
Make online presentation	3/9/18	<ol style="list-style-type: none"> 1. Write up slides by 3/7/18. 2. Record voice over the slides by 3/9/18.
Make marketing material to send out to OTs in the school district to promote online presentation	3/14/18	<ol style="list-style-type: none"> 1. Create quick fact sheets about CO-OP to send to OTs in the Kent School District by 3/14/18. 2. Create promotional flyer about online presentation with how to access it by 3/14/18.
Provide access and information for clinicians in the school district.	3/14/18	<ol style="list-style-type: none"> 1. Disseminate access to online presentation by 3/14/18.
Create an online survey for attendees to assess likelihood of implementing CO-OP.	3/14/18	<ol style="list-style-type: none"> 1. Determine what outcomes we want to have results of by 2/19/18 2. Create survey by 3/9/18. 3. Send it to Dr. Abbott for review and approval by 3/9/18 and ask for edits by 3/12/18. 4. Attach to powerpoint so that OTs can

		fill it out after watching the presentation by 3/14/18.
Request for results to be returned by 3/30/18 from online survey.	3/30/18	<ol style="list-style-type: none"> 1. Constantly monitor survey site we used and enter data into excel spreadsheet until 3/30/18. 2. Close survey on 3/30/18.
Provide Dr. Abbott with access to survey data on practitioner likelihood to implement CO-OP.	4/4/2018	<ol style="list-style-type: none"> 1. Email survey data to Dr. Abbott by 4/4/18.

Monitored Outcomes

We assessed how our inservice presentation was received through a 6 question paper survey that was distributed at the end of our inservice presentation. We collected 19 completed surveys and analyzed those for frequency distribution data regarding the therapists' likelihood of pursuing CO-OP further. We also sought to evaluate whether our presentation garnered interest in completing the NBCOT Certification Renewal Activity with Dr. Abbott.

Knowledge Translation

The knowledge translation activity took the form of an inservice presentation regarding implementation of the CO-OP approach into practice within schools (refer to Appendix A). The inservice presentation occurred for an hour on April 18th, 2018 at Kent Phoenix Academy, a non-traditional high school adjacent to TOP, in the Kent School District. To evaluate how attendees of the presentation intended to utilize the information, they were asked to complete an accompanying survey. A handout about CO-OP with a link to the inservice presentation (refer to Appendix B) was provided to the collaborating practitioner and attendees in order to further disseminate the information to paraeducators, teachers, and other occupational therapists who did not attend the inservice presentation. It is our intention that providing her with the link to the presentation will allow the opportunity for more therapists to learn about and implement this effective and evidence-based approach.

When developing the inservice presentation there were significant delays between drafts and communication with the collaborating practitioner, Dr. Abbott. Dr. Abbott has a full caseload and had conflicting break periods with the University of Puget Sound academic schedule which contributed to missed deadlines during our knowledge translation process. In conjunction with the need for additional communication time, student researchers were informed of an opportunity to present an inservice to occupational therapists in the Kent School District with minimal time to accommodate and prepare an inservice presentation. The presentation software utilized to develop the inservice presentation had several features that needed to be purchased in order to make the presentation available. This was an unforeseen expense that presented challenges in ensuring accessibility and in creating a pdf version of the inservice presentation.

A total of 21 occupational therapy practitioners attended the inservice presentation, 19 of whom were licensed occupational therapists. The student researchers presented the reviewed evidence regarding the CO-OP approach and how it may be implemented in the school setting, while Dr. Abbott provided a case study illustrating the benefits of CO-OP for individuals with a diagnosis of intellectual disability at TOP. Additionally, the student therapists presented an opportunity to gain Competency Assessment Units (CAU) needed for NBCOT certification renewal through a study group led by Dr. Abbott using a peer-reviewed text on the CO-OP approach. Nine of the 19 practicing occupational therapists who attended the inservice presentation demonstrated interest in participating in the study group and their contact information was provided to Dr. Abbott.

During the presentation, we encountered several unforeseen circumstances that affected the professionalism of the presentation. Initially the presenting room did not have a computer set-up for our use, though we had brought our own device in preparation for this situation. However, the port for the projector did not match the laptop and we needed to borrow one of the therapist's computer to connect to the overhead. During our presentation we encountered several distractors. Five of the occupational therapists arrived 10 minutes into the presentation and during Dr. Abbott's case study an announcement came on over the high school intercom, interrupting our presentation for approximately three minutes. Additionally, Dr. Abbott had to leave the room twice to receive urgent phone calls. One of these times was prior to her presentation, and the student researchers were uncertain if she would arrive back in time.

Through our knowledge translation, we hoped to evaluate whether the evidence-based practice intervention approach that we outlined would be implemented as a result of our inservice presentation. In order to evaluate the practitioner's interest in pursuing additional information regarding the CO-OP approach, attendees were asked to complete a short, six

question survey (refer to Appendix C) at the conclusion of the inservice presentation. We concluded our presentation with 20-minutes remaining to address questions from the attendees and collect surveys. In a follow up email after the inservice presentation, we provided Dr. Abbott with the data from our survey (refer to Appendix D). Dr. Abbott reported that she had heard positive feedback regarding our presentation and is hopeful about the possibility of implementing CO-OP earlier in the education system in the Kent School District.

Deadline Completion Table:

Task/Product	Deadline Date	Steps w/ Dates to achieve the final outcome	Explanation of activity completion
Make outline of what should go into presentation	2/19/18	<ol style="list-style-type: none"> 1. Meet as group to talk about what should go on outline by discerning which research from our CAT is most pertinent for the presentation by 2/15/18. 2. Email Dr. Abbott letting her know to expect outline by 2/15/18. 3. Create outline by 2/19/18. 4. Send to Dr. Abbott by 2/19/18 and ask to receive edits by 2/23/18. 	All deadlines were met on time. We created a thorough outline of what we planned to have in our presentation and emailed the outline to Dr. Abbott.
Finalize outline with Dr. Abbott's edits	3/2/18	<ol style="list-style-type: none"> 1. Receive edits from Dr. Abbott via email by 2/23/18. 2. Email Dr. Abbott our edited presentation outline by 2/26/18. 3. Ask for final approval to be sent via email by 3/2/18. 	<ol style="list-style-type: none"> 1. Followed up with Dr. Abbott when we did not receive confirmation/edits of our outline. We received email on 3/6 stating that our outline looked good and that Dr. Abbott was able to secure us time to give an inservice presentation on 4/18 instead of a web-based presentation. We responded to some questions that Dr. Abbott had for us at that time. An email was sent to our chair, Jenny, with our presentation for her to review prior to us sending it to Dr. Abbott. 2. Received email on 3/26 from Dr. Jennifer Pitonyak stating that she would get back to us that week regarding the presentation. 3. Dr. Abbott emailed on 3/28 asking for an update. We

			responded on 3/28 stating that we were waiting for approval from our chair prior to sending the presentation to her for review and asked follow up questions.
Receive final approval from Dr. Abbott	3/2/18	1. Wait for email of approval before proceeding with making presentation.	1. We received approval from Dr. Abbott on 3/6 and proceeded with continuing to make our prezi. A case study was requested to put into our presentation.
Make online presentation	3/9/18	1. Write up slides by 3/7/18. 2. Record voice over the the slides by 3/9/18.	1. Slides were completed on 3/18/18. 2. Prezi was sent to chair on 3/19/18. We waited for a response before proceeding with making a voice over for our slides. 3. It was determined that a voice over was no longer appropriate and we provided Dr. Abbott and the present occupational therapists with a link to our presentation.
Make marketing material to send out to OTs in the school district to promote online presentation	3/14/18	1. Create quick fact sheets about CO-OP to send to OTs in the Kent School District by 3/14/18. 2. Create promotional flyer about online presentation with how to access it by 3/14/18.	1. Completed on 3/18/18 and was used to supplement the inservice presentation. 2. A promotional flyer was not needed due to the change in the dissemination of our information.
Provide access and information for clinicians in the school district.	3/14/18	1. Disseminate access to online presentation by 3/14/18.	1. Due to new information, this is no longer an aspect of our knowledge translation. Presentation on 4/18/18 is when our presentation was disseminated.
Create an online survey	3/14/18	1. Determine what outcomes we want to	1. Completed on 2/19/18. 2. Completed on 2/20/18.

for attendees to assess likelihood of implementing CO-OP.		<p>have results of by 2/19/18.</p> <ol style="list-style-type: none"> 2. Create survey by 3/9/18. 3. Send it to Dr. Abbott for review and approval by 3/9/18 and ask for edits by 3/12/18. 4. Attach to powerpoint so that OTs can fill it out after watching the presentation by 3/14/18. 	<ol style="list-style-type: none"> 3. After deliberation, it was determined that sending the survey to Dr. Abbott was no necessary as the outcomes were for the reporting of our knowledge translation piece. 4. Completed on 2/20/18.
Request for results to be returned by 3/30/18 from online survey.	3/30/18	<ol style="list-style-type: none"> 1. Constantly monitor survey site we used and enter data into excel spreadsheet until 3/30/18. 2. Close survey on 3/30/18. 	<ol style="list-style-type: none"> 1. This activity was adjusted to reflect our new knowledge translation piece of an inservice presentation. Physical surveys were handed out after our presentation and reviewed on 4/18/18.
Provide Dr. Abbott with access to survey data on practitioner likelihood to implement CO-OP.	4/4/2018	<ol style="list-style-type: none"> 1. Email survey data to Dr. Abbott by 4/4/18. 	<ol style="list-style-type: none"> 1. This date was not met due to the change in our knowledge translation activity. The contact information of the practitioners interested in being involved in the study group was emailed to Dr. Abbott on 4/19/18 and the survey data was emailed on 4/22/18.

Outcomes and Effectiveness

A survey was provided at the end of the presentation in order to gain a greater understanding of the audience's prior knowledge of and current interest in utilizing the CO-OP approach in practice (see Appendix B). Physical copies of the survey were provided and collected at the end of the inservice presentation to ensure that we were able to get feedback immediately. The survey took approximately five minutes to complete and was completed by every practicing occupational therapist present. A certified occupational therapy assistant student and an occupational therapy student were present, but did not fill out the survey and were not included in our data. We did not include survey results for the students as they are not currently practicing occupational therapy and could not speak to the likelihood of implementing the approach at this time.

Outcomes of the presentation were measured by analyzing frequency data regarding the likelihood that attendees would utilize the CO-OP approach in their practice after our presentation. The knowledge of the CO-OP approach prior to our presentation inservice was surveyed in order to determine the awareness of this approach in the educational system. Interest in the CO-OP approach was measured by how many therapists wanted to further their knowledge about the approach after hearing the evidence supporting the strategy and information regarding how it could be implemented into their everyday practice. In order to demonstrate that we illustrated the vast amount of diagnoses that can benefit from this approach, we had the therapists report on if they felt the approach was appropriate for the population that they serve. Lastly, we measured how many people demonstrated interest in obtaining Competency Assessment Units for NBCOT certification renewal by signing up for Dr. Abbott's study group.

Evaluation of Outcomes

We have found through our analyses of the survey data that our inservice presentation and handout were effective in communicating the principles of CO-OP and in conveying that the CO-OP approach may be an effective treatment approach with their students. Our survey inquired whether the CO-OP approach was something that attendees were currently utilizing. We found that prior to the inservice presentation the majority of the attending licensed occupational therapists had only “heard of [CO-OP] once or twice” with six out of 19 having never heard of the approach (please refer to Appendix D for a report of frequency data for each survey question). We did not objectively measure the attendees’ knowledge of the approach at the end of our inservice presentation but have heard anecdotally that the presentation was informative.

Our primary objective for our presentation was to demonstrate the effectiveness of the CO-OP approach and propose its utilization in school-based occupational therapy. For this objective, we were pleased to discover that all 19 licensed occupational therapists were at least “somewhat likely” to both seek more information regarding CO-OP and to implement strategies of CO-OP into their practice. No therapists reported that they had no interest in seeking additional information or in implementing CO-OP strategies in their practice. Fewer practicing therapists were willing to commit to the NBCOT Certification Renewal Activity study group that Dr. Abbott was facilitating. For this question on the survey, a majority of respondents ($n = 9$) reported that they were “not likely” to participate. However, five respondents reported that they were “somewhat likely” and another five indicated that they were “very likely” to participate in the study group.

In our review of the literature we noted a gap in the research regarding the effectiveness of the CO-OP approach in individuals with intellectual disabilities. This was a particular concern for our knowledge translation because Dr. Abbott had reported that the majority of her students

have a diagnosis of intellectual disability. Dr. Abbott has anecdotally remarked upon her success in implementing CO-OP strategies with her students and intends to conduct research to more formally evaluate the validity of the CO-OP approach with this population, but it was currently a limitation in the evidence. Therefore, we included in our survey a question prompting the therapists to list the three most common diagnoses which they work with. The four most common listed diagnoses were Autism Spectrum Disorder, developmental delay, intellectual disabilities, and Down Syndrome. The evidence in the literature does indeed support the CO-OP approach for adolescents with Autism Spectrum Disorder, though evidence is limited for the other listed diagnoses. While the evidence does not explicitly support the CO-OP approach with some of the therapist's populations served, a majority of respondents ($n = 11$) believed that the CO-OP approach would "absolutely" be appropriate with their population.

The results of the surveys seem to indicate that a majority of the practicing occupational therapists intend to further explore the CO-OP approach with their students. This indicates that the inservice presentation inspired interest and that more practitioners in the school setting may be interested in this approach but are currently unaware of it. While we are encouraged by our outcome data from our survey, we recognize that the therapists may have provided inflated responses to the questions in order to support the student-therapists' experience with the inservice. We remain hopeful that this evidence-based approach will be implemented and disseminated among school-based occupational therapists.

Analysis of Overall Process

This project was a valuable learning experience that provided an opportunity to collaborate with a practicing clinician to formulate and investigate a research question pertinent to occupational therapy. We found this to be a unique topic, as it sought to explore whether the treatment approach our collaborating practitioner was beginning to implement and advocate for had evidentiary support. We had no prior knowledge of our research topic and therefore it was a great experience to thoroughly investigate an unfamiliar treatment approach. Initially, we had difficulties finding research regarding direct instruction, but after communicating with our collaborating practitioner, we were able to refine the research question to compare with traditional occupational therapy. We were able to find strong evidence that the utilization of the CO-OP approach improves occupational performance as measured on the COPM. We also found moderate evidence that the CO-OP approach improves executive functioning. Finally, we were able to identify gaps in the literature regarding implementation of the approach with groups and with individuals with intellectual disabilities.

The knowledge translation component of this project has exceeded our expectations in introducing and fostering interest in the implementation of the CO-OP approach with school-based occupational therapists. We found that the opportunity to present to occupational therapists in person further facilitated our professional development and we are both grateful for the opportunity and proud of our professionalism. We also learned ways in which to continue conducting research to ensure that we are providing evidence based interventions in our practice. We especially valued the opportunity to see the research process from start to finish: from formulating a question to implementing the evidence into practice. Finally, we developed an appreciation for diligent organization in long-term projects. We are proud to present our final research paper and grateful to the opportunity to translate this knowledge into practice.

Recommendations for Future Research

Early in our literature review we began to note a trend that the CO-OP approach seemed to be improving performance on the COPM in many of the articles. In discussions with our project chair, we began to explore the mechanisms behind the CO-OP approach that may foster such dramatic improvement in performance. We began to theorize that the CO-OP approach may improve the client's self-awareness and consequently that the approach may develop the client's self-efficacy and self-determination. When we presented this as a potential avenue for our project to our collaboration practitioner, she requested that we first determine the effectiveness of the CO-OP approach as compared to other traditional models. We believe that conducting research to explore whether cognitive strategy approaches, including the CO-OP approach can serve to develop the client's self-efficacy. We believe that Dr. Abbott and transition programs would have a vested interest in identifying a cognitive strategy that would serve to develop esteem as the adolescent students are learning life skills.

Future cohorts may also consider examining longitudinal effects of cognitive strategies regarding improvements in executive functioning. We found moderate evidence to support that the CO-OP approach improved executive functioning skills which may indicate improved mastery of the life skills taught in transition programs and in learning new skills after exiting the school program. We recommend that future student researchers continue to collaborate with Dr. Abbott to further explore the benefits of the CO-OP approach or other cognitive strategies in developing self-efficacy and autonomy in young adults with intellectual disabilities. Further research could explore the life-skills benefits of developing more independent problem-solving to establish whether the CO-OP approach is the most appropriate intervention approach for adolescents in transition with intellectual disabilities.

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“*” before a reference indicates one that appears in the CAT table itself.

“**” before a reference indicates one that did not have a doi available

Appendix A

CO-OP
Cognitive Orientation to Occupational Performance
Casey Mendoza OTS, Caitlin Mitchell OTS, Emily Reynolds OTS & Dr. Barbara Abbott, OTR/L

Theoretical Foundation, Effectiveness, Comparing to OT as usual, Case Study, Why use CO-Op?, Questions, About, Outcomes, Manualization of CO-OP, Implications, NBCOT Renewal, Survey

1.

Based on the premise that cognition plays a vital role in acquiring occupational skills (Polatajko et al. 2001)

3 main objectives:
1. Skill Acquisition
2. Cognitive Strategy Development
3. Generalization and Transfer

2.

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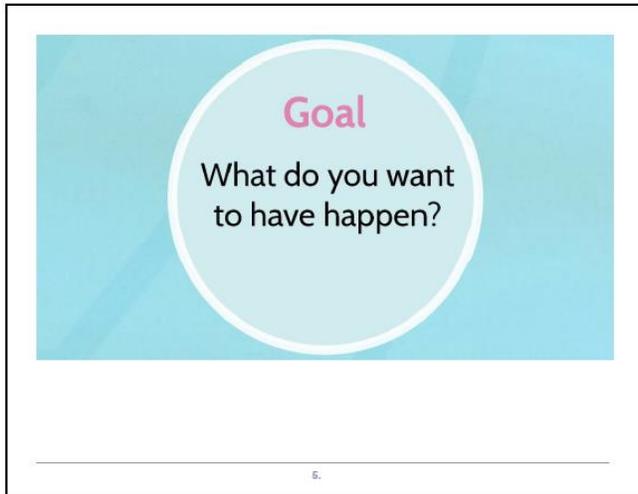
3.

Goal-Plan-Do-Check

- 4-step self-instructional problem-solving strategy that targets self-regulatory skills in setting, planning, monitoring, and evaluating a goal (Jasko, Polatajko & Whitehead, 2015)
- Collaborative approach
- Participant's autonomy in decision-making
- Frames how the therapist and client can talk through problem-solving
- Promotes metacognitive thinking (Polatajko et al. 2001)

Goal, Plan, Do, Check, Cognitive Strategies

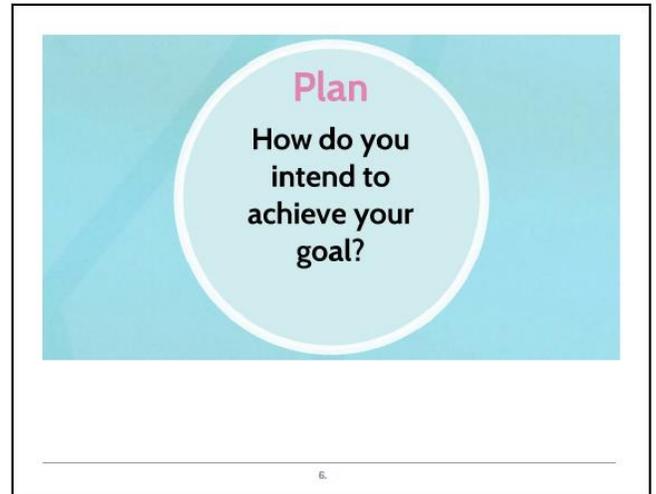
4.



Goal
What do you want to have happen?

5.

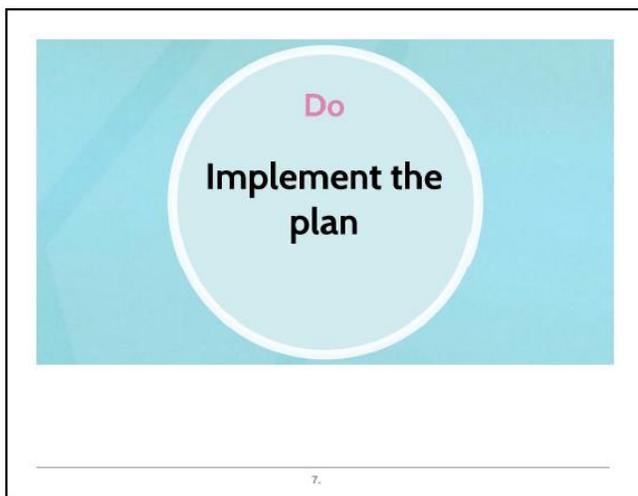
This slide features a light blue background with a white circle in the center. The word "Goal" is written in pink at the top of the circle, and the question "What do you want to have happen?" is written in black below it. A horizontal line is positioned below the circle, and the number "5." is centered at the bottom of the slide.



Plan
How do you intend to achieve your goal?

6.

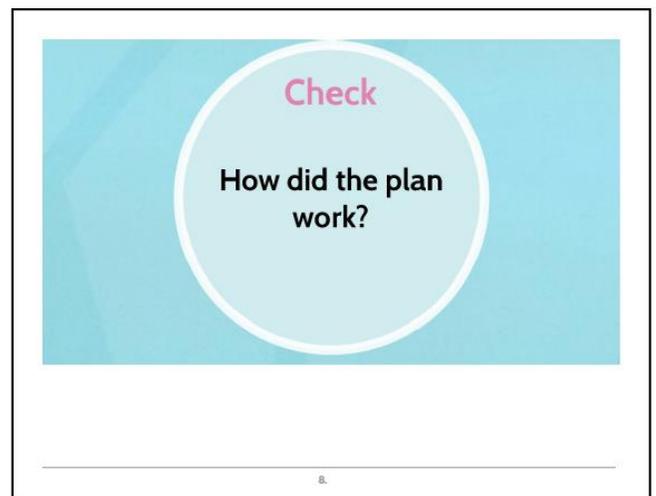
This slide features a light blue background with a white circle in the center. The word "Plan" is written in pink at the top of the circle, and the question "How do you intend to achieve your goal?" is written in black below it. A horizontal line is positioned below the circle, and the number "6." is centered at the bottom of the slide.



Do
Implement the plan

7.

This slide features a light blue background with a white circle in the center. The word "Do" is written in pink at the top of the circle, and the text "Implement the plan" is written in black below it. A horizontal line is positioned below the circle, and the number "7." is centered at the bottom of the slide.



Check
How did the plan work?

8.

This slide features a light blue background with a white circle in the center. The word "Check" is written in pink at the top of the circle, and the question "How did the plan work?" is written in black below it. A horizontal line is positioned below the circle, and the number "8." is centered at the bottom of the slide.

Domain Specific Strategies (DSS)

- Specific cognitive strategies that focus on improving performance that are specific to the task, child, or situation
- 8 DSS used in CO-OP
 - Body position
 - Task specification / Modification
 - Feeling the movement
 - Verbal motor mnemonic
 - Verbal rote script
 - Verbal instruction
 - Verbal self-instruction
 - Attention to doing
(Hendrich et al., 2001)

Definitions

9.

Task Specification/ Modification:

- Any discussions regarding the specifics or parts of the task, that facilitate motor performance. Modification of all or parts of the task that facilitate motor performance.

Motor Mnemonic:

- Attachment of a label to the task or component of the task which evokes a mental image to guide motor performance.

Body Position:

- Verbalization of attention to, or shifting, of the body, whole or in part, relative to the task.

Feeling the Movement:

- Verbalization of attention to the feeling of the movement.

Attention to Doing:

- Verbalization to cue attending to the doing of the task.

Verbal Guidance:

- The therapist talks the child through the motor sequence.

Verbal Self-Guidance:

- The child talks him/her self through the motor sequence.

Verbal Rote Script:

- A rote pattern of words used to guide the motor sequence.

10.

CO-OP

Cognitive Orientation to Occupational Performance

Casey Mendoza OTS, Caitlin Mitchell OTS, Emily Reynolds OTS & Dr. Barbara Abbott, OTR/L

About

Outcomes

Manualization of CO-OP

Implications

NBCOT Renewal

Survey

Theoretical Foundation

Effectiveness

Comparing to OT as usual

Case Study

Why use CO-OP?

Questions

11.

Populations

A CO-OP approach is effective in teaching IADL, ADL, and leisure skills to individuals with a variety of diagnoses

Specific Diagnoses

Gaps in Literature

(Cameron et al., 2016; Palumbo et al., 2013; Dawson et al., 2013; Poulton et al., 2017; McEwen et al., 2010b; Masuro et al., 2010; Gasser et al., 2009; Ng et al., 2011; Siddons et al., 2011; Hennehan et al., 2011; Wolf et al., 2016; and McEwen et al., 2010)

12.

Diagnoses

- Children with Cerebral Palsy (Cameron et al., 2016; Horton et al., 2017; Park, 2007)
- Cerebral Vascular Accident (Palatijo et al., 2012; Pouli et al., 2017; Hershaw et al., 2011; McEwen et al., 2010b; Skidmore et al., 2011; Wolf et al., 2016)
- Children and adults with Asperger's Syndrome and Autism Spectrum Disorder (Rodge & Brandenburg, 2008; Phalen et al., 2009; Weaver et al., 2015)
- Developmental Coordination Disorder (Horton et al., 2016; Casson et al., 2015; Tyler et al., 2007)
- Traumatic Brain Injury (Dawson & Gaya, 2009; Ng et al., 2013)

13.

Gaps in Research

Research suggests that CO-OP is effective with a wide range of ages and populations, but more research needs to be done in order to investigate its effectiveness with people who have intellectual disabilities. Additionally, further research needs to be done to determine effective group size to implement CO-OP in group interventions.

14.

CO-OP

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15.

Demonstration of Effectiveness of CO-OP

- Improved performance as measured by the Canadian Occupational Performance Measure (COPM)
- Improved executive functioning as measured by the Delis-Kaplan Executive Function System Trail-Making Subtest, Stroke Impact Scale.

COPM

Executive Functioning Improvements

16.

COPM

In a systematic review of 88 papers researchers determined that the COPM is a "valid, reliable, clinically useful, and responsive measure."
(Carswell, McColl, Baptiste, Law, Polatajko, & Pollock, 2004)

CO-OP & COPM

17.

COPM Outcomes with the CO-OP Approach

Of 27 articles found, 20 utilized the COPM as an outcome measure for the CO-OP approach. All 20 articles found significant improvement in client's performance when the CO-OP approach was implemented

18.

Improvement in Executive Functioning

- The CO-OP approach generalizes problem-solving skills, improving executive functioning (DKFES-Trial Making Subtest)
- The Stroke Impact Scale (SIS) Recovery Subset found significant improvement over treatment as usual when the CO-OP approach was used ($d = 0.8$)

19.

CO-OP

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Why use CO-OP?

Questions

20.

Comparing to OT as usual

- What makes it different?
- COPM
- Executive Functioning

21.

OT Best Practices

- Client-centered care
- Increased collaboration
- Increased autonomy

22.

COPM

- 19 of 20 articles found significant improvement in performance over traditional OT
- One article found that satisfaction was better improved by CO-OP over traditional OT

23.

Executive Functioning

The CO-OP approach was found to improve executive functioning (DKEFS), strategy development, and decision-making

24.

CO-OP
Cognitive Orientation to Occupational Performance
Casey Mendoza OTS, Caitlin Mitchell OTS, Emily Reynolds OTS & Dr. Barbara Abbott, OTR/L

Menu items: About, Outcomes, Manualization of CO-OP, Implications, NICOOT Renewal, Survey, Theoretical Foundation, Effectiveness, Comparing to OT as usual, Case Study, Why use CO-OP?, Questions

26.

Manualization of CO-OP
What makes CO-OP unique, distinguishing it from other intervention approaches?

Global Strategies
Domain Specific Strategies

26.

Global Strategies

- Goal - What do you want to have happen?
- Plan- How do you intend to achieve your goal?
- Do- Implement the plan
- Check- How did your plan work?

Return to plan if goal not achieved

27.

Domain Specific Strategies (DSS)

- Close transfer of successful implementation of a plan to similar goals
- Utilizing specific cognitive strategies that are unique to an individual problem
- Less generalizable, but can teach the principles of the approach to the client in more concrete environments
- 8 DSS used during CO-OP

8 DSS

28.



DSS

- Body position
- Task specification / Modification
- Feeling the movement
- Verbal motor mnemonic
- Verbal rote script
- Verbal instruction
- Verbal self-instruction
- Attention to doing

(Mandich et al., 2001)

29.

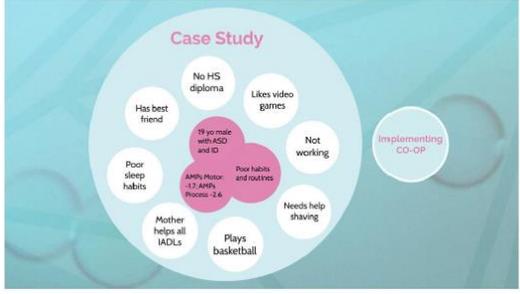


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Theoretical Foundation, Effectiveness, Comparing to OT as usual, Case Study, Why use CO-OP?, Questions, About, Outcomes, Manipulation of CO-OP, Implications, NICOI Removal, Survey

30.



Case Study

Implementing CO-OP

19 yo male with ASD and ID

AMPY Motor -1.7, AMPY Process -2.6

Poor habits and routines

Needs help shaving

Plays basketball

Mother helps all IADLs

Poor sleep habits

Has best friend

No HS diploma

Likes video games

Not working

31.



Overall Goal: Fry an egg

Overall Plan:

1. Wash hands
2. Put pan on stove
3. Melt butter
4. Crack 2 eggs into pan
5. Cook until whites hard
6. Stove off
7. Flip eggs
8. Slide onto plate

Crack egg

Flip egg

32.

Goal #1: Crack egg

Do

Check

33.

Do

Step 1: Cracked egg on side of pan
Step 2: Pushed both thumbs into egg
Step 3: Dropped shell into pan when trying to get egg into pan

Step 1 & 2:

Step 3:

34.

Check

Step 1: Crack egg on flat surface
Step 2: Hold egg with left hand while right thumb pushes in and slowly moves egg shell out

Step 1:

Step 2:

35.

Goal #2: Flip egg

Do

Check

36.

Do

- Flip
- Used both hands to hold spatula
- Spatula angled straight down into pan, breaking yolk



37.

Check

- Hold pan left hand.
- Slide spatula under egg, right hand rolling over.



38.

CO-OP

Cognitive Orientation to Occupational Performance

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39.

The Bottom Line

- CO-OP is an appropriate and effective approach for many of the diverse populations seen in occupational therapy
- It is easy to integrate into therapy and should be integrated into most teaching strategies
- It is important to consider the individual needs of the client when implementing a CO-OP approach



40.

Practitioners

- CO-OP is effective in teaching IADL, ADL and leisure skills to individuals with cognitive dysfunction (Cameron et al., 2016; Polzella et al., 2012; Dawson et al., 2013; Poulin et al., 2017; McEwen et al., 2010a; Hosana et al., 2010; Dawson et al., 2009; Ng et al., 2013; Skilmore et al., 2011; Hershaw et al., 2011; Wolf et al., 2016; and McEwen et al., 2010a)
- CO-OP should be implemented with client-centered considerations regarding the balance between decision-making autonomy and support

41.

Researchers

Additional research needed to:

- Determine effectiveness with individuals with intellectual disabilities
- Compare CO-OP with other established teaching approaches beyond typical occupational therapy
- Determine ideal group-size, length of session, and amount of sessions for a CO-OP approach
- Investigate the factors influencing consumer ratings of satisfaction

42.

Consumers

- The CO-OP approach to learning is effective in achieving performance improvement in client-directed goals
- This approach requires the client's active participation in therapy
- Increased collaboration between client and therapist
- Satisfaction may not improve as much as performance on COPM

43.

CO-OP

Cognitive Orientation to Occupational Performance

Cassie Mendoza OTS, Caitlin Mitchell OTS, Emily Reynolds OTS & Dr. Barbara Abbott, OTR/L

44.

Why Use CO-OP?

- Easy implementation into classroom activities
- Long-term goal of increased independence in ADL, IADL skills
- Provide student with cognitive strategies that can be used throughout their lives

45.

CO-OP
Cognitive Orientation to Occupational Performance

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46.

NBCOT Certification Renewal Opportunity

- Opportunity to receive Competency Assessment Units (CAU)
 - CAU value = two articles or two chapters = 1 unit
- Read peer-reviewed textbook
- Annotated bibliography AND a report with analysis of how the article/textbook has assisted with improving skills in one's role.

Study Group

47.

Study Group

- Led by Dr. Abbott, OTR/L
- Book: Cognitive Orientation to Daily Occupational Performance in Occupational Therapy - Using the CO-OP ApproachTM to Enable Participation Across the Lifespan (Dawson, McEwen & Polatajko, 2017)
- Meet at least 1x/month to discuss 2-3 chapters
- All chapters of book will be covered except chapters 8 and 9
- Look for sign up sheet after our talk if you are interested

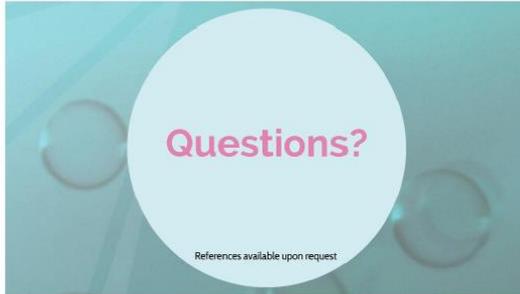
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Theoretical Foundation, Effectiveness, Comparing to OT as usual, Case Study, Why use CO-OP?, Questions, About, Outcomes, Manualization of CO-OP, Implications, NBCOT Renewal, Survey

40.



Questions?

References available upon request

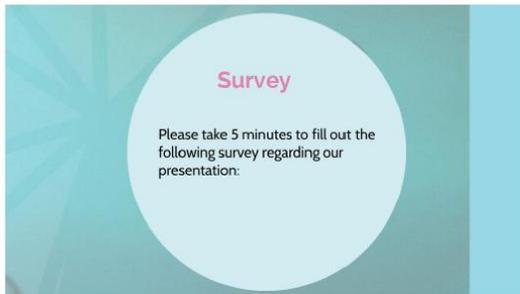
50.



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51.



Survey

Please take 5 minutes to fill out the following survey regarding our presentation:

52.

Appendix B

Handout



**Cognitive
Orientation to
Occupational
Performance**

CO-OP: How to Implement this approach
into your everyday practice

**GOAL
PLAN
DO
CHECK**

CO-OP is based on the premise that cognition plays a vital role in acquiring occupational skills (Polatajko et al., 2001). It follows a four-step instructional problem-solving strategy that targets self-regulatory skills in setting, planning, monitoring, and evaluating a goal (Jokic, Polatajko & Whitebread, 2013). The three main objectives are skill acquisition, cognitive strategy development, and generalization and transfer. There is a focus on collaboration between the participant and therapist as well as the participant's autonomy in decision-making. Overall, this approach promotes meta-cognitive thinking (Polatajko et al., 2001).

Domain Specific Strategies (DSS)

1. **Body position** is the verbalization of attention to, or shifting, of the body, whole or in part, relative to the task.
2. **Task specification / Modification** is any discussion regarding the specifics or parts of the task, that facilitate motor performance. **Modification** of all or parts of the task that facilitate motor performance.
3. **Feeling the movement** is verbalization of attention to the feeling of the movement.
4. **Verbal motor mnemonic** is attaching a label to the task of component of the task which evokes a mental image to guide motor performance.
5. **Verbal rote script** is a rote pattern of words used to guide the motor sequence.
6. **Verbal instruction** is when the therapist talks the client through the motor sequence.
7. **Verbal self-instruction** is when the client talks him/her self through the motor sequence.
8. **Attention to doing** is verbalization to cue attending to the doing of the task.

IMPORTANT POINT!

The CO-OP approach was found to increase executive functioning, strategy development, and decision-making.



Find our presentation at:
<https://prezi.com/vie-w/1VxvASHw8UutOIS8AEay/>

NBCOT Certification Renewal

Study group led by Dr. Abbott once a month to cover 2-3 chapters (excluding chapters 8 & 9) of textbook: Cognitive Orientation to Daily Occupational Performance in Occupational Therapy : Using the CO-OP Approach (TM) to Enable Participation Across the Lifespan (Dawson, McEwen & Polatajko, 2017)

Appendix C

Cognitive Orientation to Occupational Performance (CO-OP) Approach Survey**1. How much did you know about the CO-OP approach prior to this presentation?**

- a. I didn't know it existed
- b. I had heard of it once or twice
- c. I have read at least one article about it
- d. I use some of the principles of the approach in my practice

2. How likely are you to seek more information regarding CO-OP after this presentation?

- a. Not likely
- b. Somewhat likely
- c. Very likely

3. How likely are you to implement CO-OP strategies into your practice?

- a. Not likely
- b. Somewhat likely
- c. Very likely

4. How likely are you to participate in the NBCOT Certification Renewal Activity with Dr. Abbott using *Cognitive Orientation to Daily Occupational Performance in Occupational Therapy: Using the CO-OP Approach (™) to Enable Participation Across the Lifespan* (Dawson, McEwen, & Polatajko, 2017)?

- a. Not likely
- b. Somewhat likely
- c. Very likely

5. So you think CO-OP is a good fit for the population you serve?

- a. I do not know
- b. Maybe, but I need more information
- c. Absolutely!

If not, please expand on why you would not use this approach in your practice:

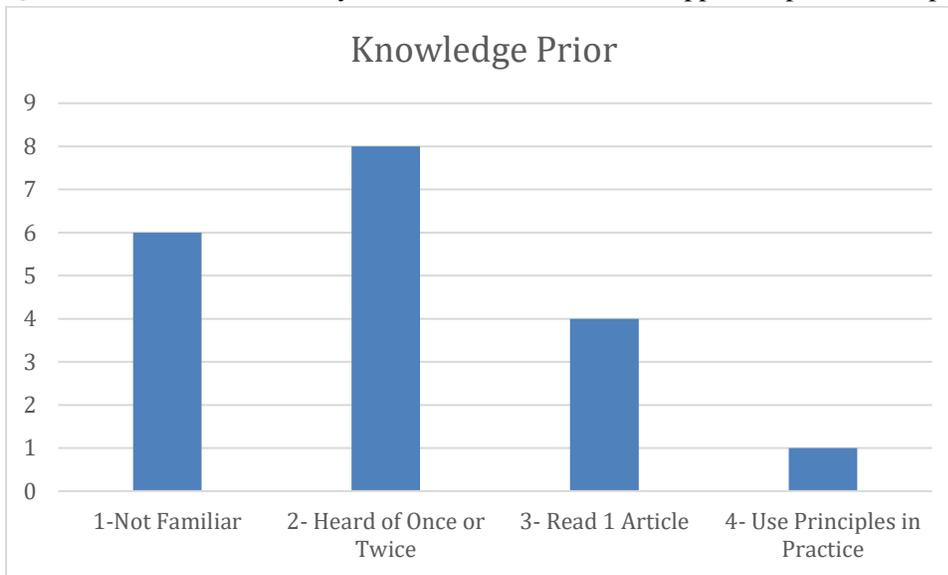
6. What populations do you serve? Please list the three

Thank you for your time!

Appendix D

Frequency Data for CO-OP Survey

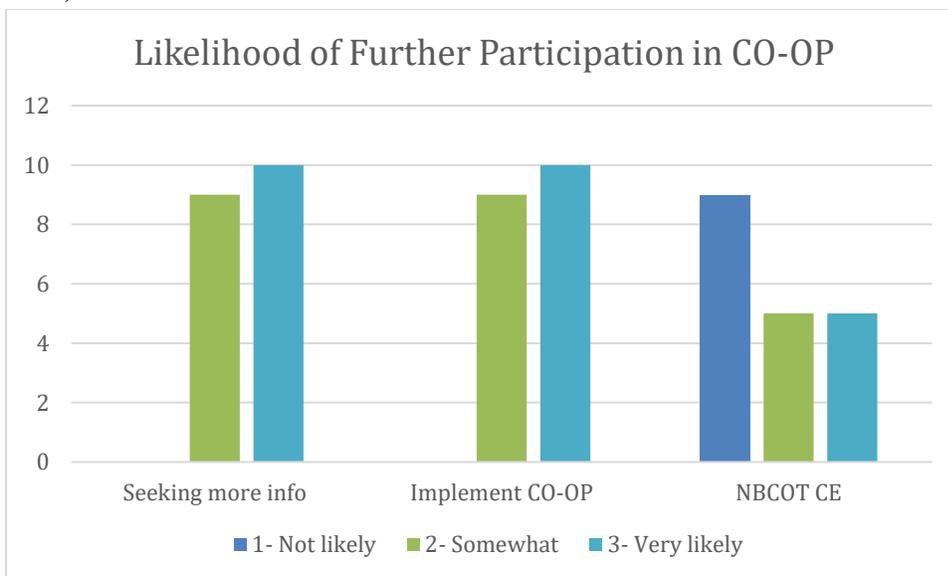
Question 1: How much did you know about the CO-OP approach prior to this presentation?



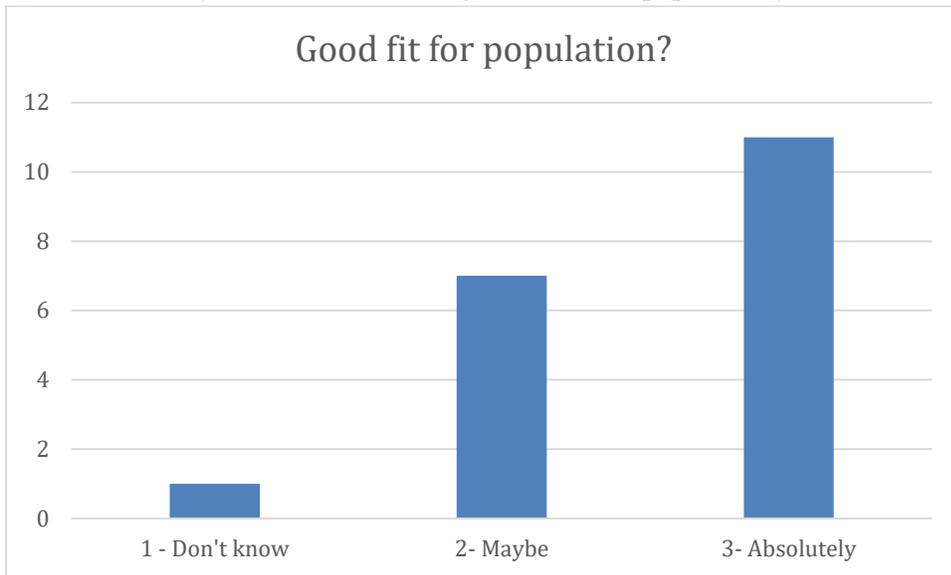
Question 2: How likely are you to seek more information regarding CO-OP after this presentation?

Question 3: How likely are you to implement CO-OP strategies into your practice?

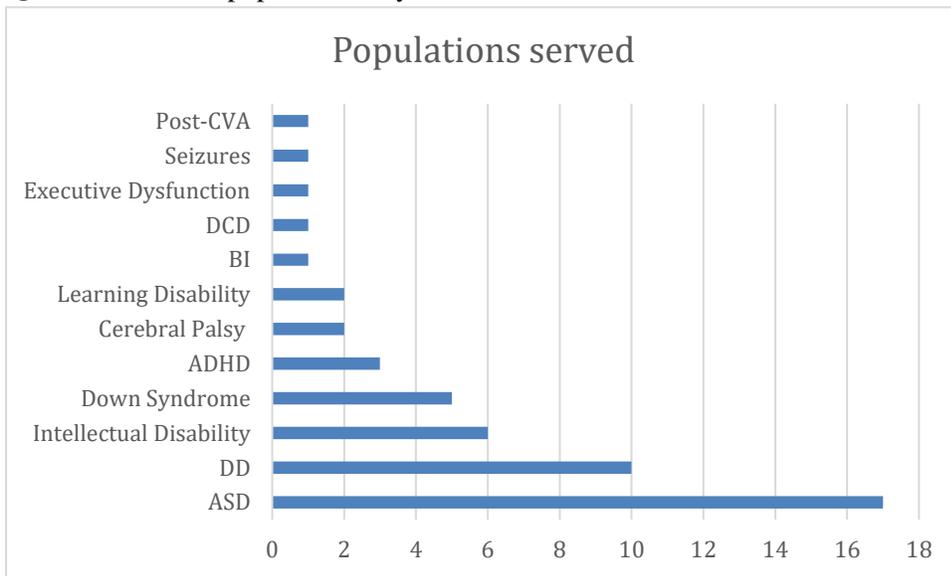
Question 4: How likely are you to participate in the NBCOT Certification Renewal Activity with Dr. Abbott using Cognitive Orientation to Daily Occupational Performance in Occupational Therapy: Using the CO-OP Approach™ to Enable Participation Across the Lifespan (Dawson, McEwen, & Polatajko, 2017)?



Question 5: Do you think CO-OP is a good fit for the population you serve?



Question 6: What population do you serve?



Acknowledgements

We want to acknowledge and thank our collaborating practitioner, Barbara Abbott, DOT, OTR/L for her insight, support, and direction into researching the effectiveness of the CO-OP approach. We are very grateful to our Project Chair, Jennifer Pitonyak, PhD, OTR/L, SCFES for her mentorship and guidance, especially with the direction of our research and knowledge translation. We also express our gratitude to Renee Watling, PhD, OTR/L, FAOTA for her mentorship in developing our research. Lastly, we would like to thank George Tomlin, PhD, OTR/L, FAOTA for his wisdom and passion for evidence-based research, furthering our appreciation and desire to implement evidence-based research into our future careers.

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Name: _____ Date: _____

Signature of MSOT Student

Name: _____ Date: _____

Signature of MSOT Student

Name: _____ Date: _____

Signature of MSOT Student