The National Standards Report

Tiffany Jones
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Superheroes social skills training, Rethink Autism internet interventions, parent training, EBP classroom training, functional behavior assessment: An autism spectrum disorder, evidence based practice (EBP) training track for school psychologists

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Introduction: About the National Standards Project

- The overarching purpose of this project is to provide comprehensive information about the level of scientific knowledge that exists in support of the many educational and behavioral treatments that are currently available for individuals with Autism Spectrum Disorders (ASD).
- As the number of children diagnosed with ASD continues to increase, this standards report will be helpful in determining what intervention/s will be most helpful for these children.
- It is hoped that parents, caregivers, educators, and service providers will benefit from this resource.

(National Standards Report, 2009)

Primary Initiative of the National Autism Center and the Standards Project

- Provide the strength of evidence supporting educational and behavioral treatments that target the core characteristics of ASD.
- Describe the age, diagnosis, and skills/behaviors targeted for improvement associated with treatment options.
- Identify the limitations of the current body of research on autism treatment.
- Offer recommendations for engaging in evidence-based practice for ASD.

(National Standards Report, 2009)

History of Clinical Guidelines

- Evidence-based practice has become the standard in the fields of medicine, psychology, education, and allied health.
- Knowledge of EBP has become extremely important for families and professionals working with individuals with ASD.

(National Standards Report, 2009)

Limitations of Current Clinical Guidelines

- The current clinical guidelines have become outdated.
- The reviews for these guidelines didn't include all of the educational and behavioral treatment studies for a broad age range or a variety of ASD diagnoses.
- EBP guidelines have evolved. New guidelines tend to show each phase of decision making (transparency).

(National Standards Report, 2009)

How the National Standards Report Addresses Current Guideline Limitations

- A thorough review of educational and behavioral treatment literature that targets the core characteristics and associated symptoms of ASD was conducted and included material from 1957 up to 2007.
- Information has been provided about the effectiveness of treatment based on age, diagnosis, and treatment targets.
- The research panel presented the information in this report and sought feedback from professionals and parents, as well as a cross-disciplinary group of experts in order to maintain transparency.

(National Standards Report, 2009)

Overview of the National Standards Project

- The National Standards Project serves 3 primary purposes:
  - 1. Identify the level of research support currently available for educational and behavioral interventions used with individuals with ASD below the age of 22.
  - 2. Help parents, caregivers, educators, and service providers understand how to integrate critical information in making treatment decisions.
  - 3. Identify limitations of the existing treatment research involving individuals with ASD.

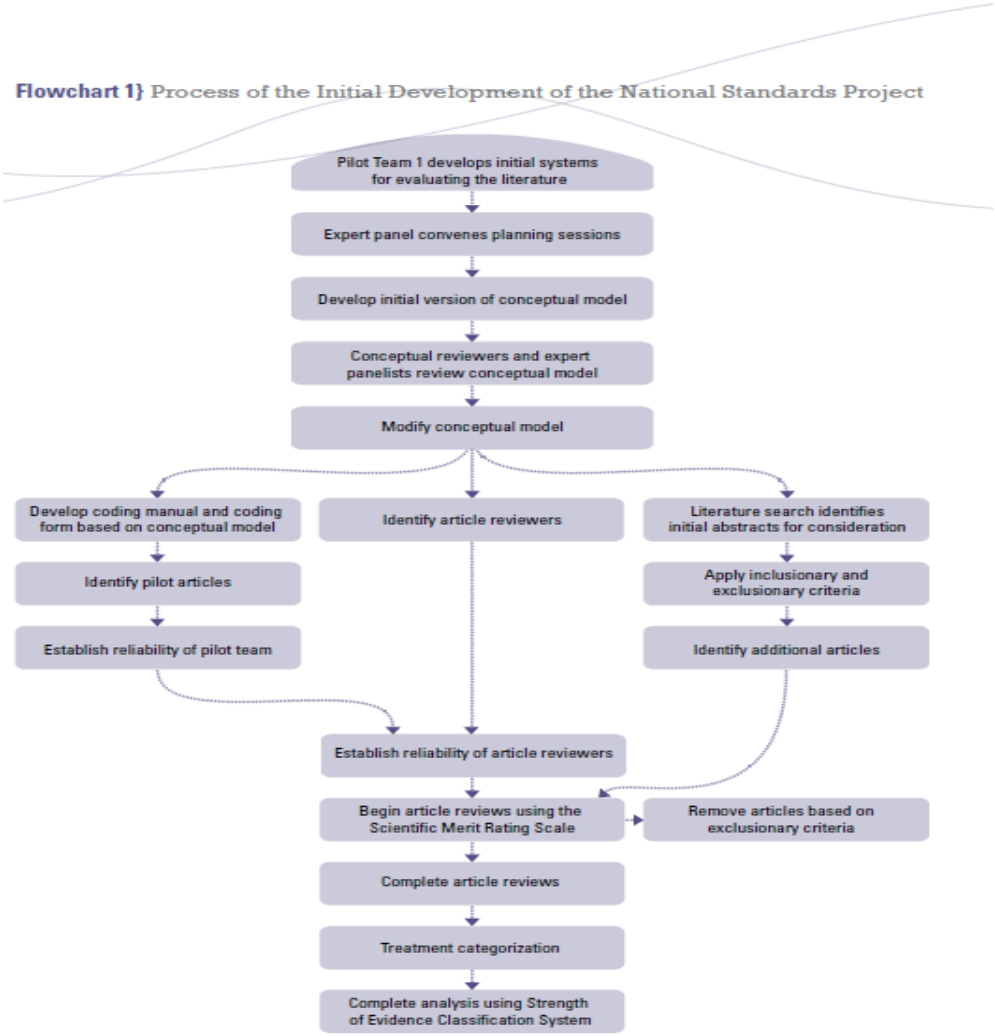
(National Standards Report, 2009)

Developing the Model

- The National Standards project began with a model for evaluating the literature involving the treatment of ASD.
- This model was developed by a working group that consisted of a pilot team and outside consultation from methodologists.
- The model was developed based on the examination of evidence-based practice guidelines from health and psychology fields as well as from 25 experts who took part in planning sessions for the National Standards Project.
- The model was modified based on the feedback received, and served as the foundation for data collection procedures.

(National Standards Report, 2009)

Flowchart of Model Development



Identifying the Research

- A total of 6,463 abstracts were identified through search engines.
- 575 additional abstracts were identified by expert panelists.
- Inclusion and exclusion criteria were applied to 7,038 abstracts.
- This resulted in the removal of 5,978 articles from consideration for this project, leaving 1,060 articles.
- Additional exclusions were made after additional review resulting in a total of 775 studies that were retained for further analyses.

(National Standards Report, 2009)

Inclusionary Criteria

- Studies were included for consideration if treatments could be implemented in school systems, early intervention, home, hospital and community-based programs.
- Individuals with ASD were the target of treatment studies.
- Articles were also included if they had been published in peer-reviewed journals.

(National Standards Report, 2009)

Exclusionary Criteria

- The studies examined were limited to educational and behavioral treatments. The only non-educational and behavioral treatments included in the review were curative diets.
- The second reason for exclusion was related to co-morbid conditions. Studies that included children with co-morbid conditions that are not commonly co-morbid with an ASD were excluded.
- The third reason involved the type of study or the data that were produced or presented. Non-empirical studies were not included.
- The 4th criterion for exclusion looked at the main purpose of each study. Studies were excluded if they mainly looked at mediating or moderating variables.
- The final reason for exclusion was age. This report only focuses on young individuals (i.e., under age 22).

(National Standards Report, 2009)

About the Scientific Merit Rating Scale

- The Scientific Merit Rating Scale (SMRS) was developed as a means to objectively evaluate the methods used in each study, and determine whether or not the methods were strong enough to determine treatment effectiveness for participants.
- A study is said to have scientific merit when the variables are so well-controlled that independent scholars can draw firm conclusions from the results.
- SMRS was applied exclusively to individuals diagnosed with Autistic Disorder, Asperger's Syndrome, or PDD-NOS who were under age 22.

(National Standards Report, 2009)

Five Critical Dimensions of SMRS

- **Research Design**- reflects the degree to which experimental control was demonstrated.
- **Measurement of the dependent variable**- refers to the extent to which (a) accurate and reliable data were collected and (b) these data represent the most direct and comprehensive sample of the target skill or behavior that is possible.
- **Measurement of independent variable**- describes the extent to which treatment fidelity was adequately established.
- **Participant ascertainment**- refers to the degree to which well-established diagnostic tools and procedures were used to determine eligibility for participant inclusion in the study and the extent to which diagnosticians and evaluators were independent and/or blind to the treatment conditions.
- **Generalization**- defined as the extent to which researchers attempted to objectively demonstrate the spread of treatment effects across time, settings, stimuli, responses, or persons.

(National Standards Report, 2009)

Chart of SMRS Critical Dimensions- Rating of 5

Table 1} Scientific Merit Rating Scale

SMRS} Rating 5

Research Design		Measurement of Dependent Variable		Measurement of Independent Variable *(procedural integrity or treatment fidelity)*	Participant Ascertainment	Generalization of Tx Effect(s)
Group	**Single-subject[a]**	**Test, scale, checklist, etc.**	**Direct behavioral observation**			
Number of groups: two or more Design: Random assignment and/or no significant differences pre-Tx Participants: n > 10 per group or sufficient power for lower number of participants Data Loss: no data loss	A minimum of three comparisons of control and treatment conditions Number of data points per condition: > five Number of participants: > three Data loss: no data loss possible	Type of measurement: Observation-based Protocol: standardized Psychometric properties solid instrument Evaluators: blind and independent	Type of measurement: continuous or discontinuous with calibration data showing low levels of error Reliability: IOA ≥ 90% or kappa > .75 Percentage of sessions: Reliability collected in ≥ 25% Type of conditions in which data were collected: all sessions	Implementation accuracy measured at ≥ 80% Implementation accuracy measured in 25% of total sessions IOA for treatment fidelity ≥ 80%	Diagnosed by a qualified professional Diagnosis confirmed by independent and blind evaluators for research purposes using at least one psychometrically solid instrument DSM or ICD criteria or commonly accepted criteria during the identified time period reported to be met	Objective data Maintenance data collected AND Generalization data collected across at least two of the following: setting, stimuli, persons

Chart of SMRS Critical Dimensions- Rating of 2

SMRS} Rating 2

Research Design		Measurement of Dependent Variable		Measurement of Independent Variable *(procedural integrity or treatment fidelity)*	Participant Ascertainment	Generalization of Tx Effect(s)
Group	**Single-subject***	**Test, scale, checklist, etc.**	**Direct behavioral observation**			
Number of groups and Design: If two groups, pre-Tx difference not controlled or better research design OR A one group repeated measures pre-test/post-test design Data Loss: significant data loss possible	A minimum of two comparisons of control and treatment conditions Number of data points per Tx condition: > three Number of participants: > two Data loss: significant data loss possible	Type of measurement: Observation-based or subjective Protocol: non-standardized or standardized Psychometric properties modest Evaluators: neither blind nor independent required	Type of measurement: continuous or discontinuous with no calibration data Reliability: IOA ≥ 80% or kappa > .4 Percentage of sessions: Not reported Type of conditions in which data were collected: not necessarily reported Operational definitions are extensive or rudimentary	Control condition is operationally defined at an inadequate level or better Experimental (Tx) procedures are operationally defined at a rudimentary level or better Implementation accuracy measured at ≥ 80% Implementation accuracy regarding percentage of total or partial sessions: not reported IOA for treatment fidelity: not reported	Diagnosis with at least one psychometrically modest instrument OR Diagnosis provided by a qualified diagnostician or blind and/or independent evaluator with no reference to psychometric properties of instrument	Subjective data Maintenance data collected AND Generalization data collected across at least 1 of the following: setting, stimuli, persons

Ratings on SMRS

- Scores between zero and five were assigned to each of the five dimensions for each study, with zero representing a poor score and five representing a strong score.
- The dimension scores were then combined to produce a composite score.
- SMRS scores of 3, 4, or 5 indicated that sufficient scientific rigor had been applied.
- Scores of 2 provide initial evidence about treatment effects, but more research is needed.
- Scores of 0 or 1 indicated that insufficient scientific rigor had been applied.

(National Standards Report, 2009)

Treatment Effects Ratings

- Each study was also examined and rated on treatment effectiveness. The following four ratings were given:
  - **Beneficial**- this identification was made when it was determined that there was sufficient evidence supporting favorable outcomes resulting from treatment.
  - **Ineffective**- this identification was made when it was determined that there was sufficient evidence to support that favorable outcomes did not result from treatment.
  - **Unknown**- this determination was made when there was not enough information to confidently determine treatment effects.
  - **Adverse**- this identification was made when it was determined that there was sufficient evidence that showed that the treatment was associated with harmful effects.

(National Standards Report, 2009)

Identifying and Describing Treatments

- All results from the SMRS and the Treatment Effects Ratings were combined in order to identify the level of research support currently available for each educational and behavioral intervention examined.
- Whenever possible intervention strategies were combined into intervention classes in order to lend clarity regarding the effectiveness of the treatment.

(National Standards Report, 2009)

Treatment Classification

- Researchers on this project sought to combine intervention strategies into treatment categories that would be understandable to parents, educators, and service providers.
- Treatment approaches were combined when the treatments were substantially similar or held core characteristics.
- The final draft of the National Standards Project includes a total of 38 treatments.

(National Standards Report, 2009)

Strength of Evidence Classification System

- Once the treatments were identified, the Strength of Evidence Classification System criteria were applied.
- Ratings reflect the quality, quantity, and consistency of research findings for each type of intervention.
- There are four categories.
  - Established
  - Emerging
  - Unestablished
  - Ineffective/Harmful

(National Standards Report, 2009)

Treatment Subclassification

- There were many different skills or behaviors targeted for improvement when working with individuals with ASD.
- Some treatment targets seek to improve skills by increasing developmentally appropriate skills. 10 skills were identified in this category.
  - Academic, communication, higher cognitive functions, interpersonal, learning readiness, motor skills, personal responsibility, placement, play, self-regulation
- Other treatments are intended to improve life functioning by decreasing behaviors. 4 skills were identified in this category.
  - General symptoms, problem behaviors, restricted, repetitive, nonfunctional patterns of behavior, interests, or activity (RRN), sensory or emotion regulation (SER)

(National Standards Report, 2009)

Outcomes-Established

- The following 11 treatments were identified as established:
  - Antecedent package, behavioral package, comprehensive behavioral treatment for young children, joint attention intervention, modeling, naturalistic teaching strategies, peer training package, pivotal response treatment, schedules, self-management, story-based intervention package.
- The antecedent package, behavioral package, and comprehensive behavioral treatment for young children demonstrated favorable outcomes with more than half the skills that are often targeted to be increased.
- The behavioral package demonstrated favorable outcomes with 3/4 of the behaviors that are often targeted to decrease.
- The established treatments also demonstrated favorable outcomes with many different age groups and diagnostic groups.

(National Standards Report, 2009)

Chart for an Established Treatment- Behavioral Package

Behavioral Package {231 studies} — **Evidence Level} Established**

These interventions are designed to reduce problem behavior and teach functional alternative behaviors or skills through the application of basic principles of behavior change. Treatments falling into this category reflect research representing the fields of applied behavior analysis, behavioral psychology, and positive behavior supports.

Examples include but are not restricted to: behavioral sleep package; behavioral toilet training/dry bed training; chaining; contingency contracting; contingency mapping; delayed contingencies; differential reinforcement strategies; discrete trial teaching; functional communication training; generalization training; mand training; noncontingent escape with instructional fading; progressive relaxation; reinforcement; scheduled awakenings; shaping; stimulus-stimulus pairing with reinforcement; successive approximation; task analysis; and token economy.

Treatments involving a complex combination of behavioral procedures that may be listed elsewhere in this document are also included in the behavioral package category. Examples include but are not restricted to: choice + embedding + functional communication training + reinforcement; task interspersal with differential reinforcement; tokens + reinforcement + choice + contingent exercise + overcorrection; noncontingent reinforcement + differential reinforcement; modeling + contingency management; and schedules + reinforcement + redirection + response prevention. Studies targeting verbal operants also fall into this category.

Skills Increased

Academic	Communication	Higher Cognitive Functions	Interpersonal	Learning Readiness	Motor	Personal Responsibility	Placement	Play	Self-Regulation
X	X		X	X		X		X	X

Behaviors Decreased

Problem Behaviors	RRN	SER	General Symptoms
X	X	X	

Ages

0-2	3-5	6-9	10-14	15-18	19-21
X	X	X	X	X	X

Diagnostic Classification

Autistic Disorder	Asperger's Syndrome	PDD-NOS
X		X

Outcomes-Emerging

- Emerging treatments were those treatments for which one or more studies suggest the intervention may produce favorable outcomes.

- A large number of studies fell in the "Emerging" level of evidence and are as follows:
  - Augmentative and alternative communication device, cognitive behavioral intervention, exercise, exposure package, imitation-based interaction, initiation training, language training (production), language training (production & understanding), massage/touch therapy, multi-component package, music therapy, peer-mediated instructional arrangement, picture exchange communication system, reductive package, scripting, sign instruction, social communication intervention, social skills package, structured teaching, technology-based treatment, and theory of mind training

(National Standards Report, 2009)

Outcomes-Unestablished and Ineffective/Harmful

- The following treatments were those for which little or no evidence could be drawn from the literature that allowed the researchers to draw firm conclusions about the effectiveness of these interventions for individuals with ASD:
  - Academic interventions, auditory integration training, facilitated communication, gluten and casein-free diet, and sensory integrative package
- There were no treatments that had sufficient evidence to be rated as ineffective or to produce harmful outcomes.

(National Standards Report, 2009)

Recommendations for Treatment Selection

- It is recommended that treatment selection should be made by a team of individuals who can consider the unique needs and history of the individual with ASD.
- The results from the National Standards Report may used to help in treatment selection.
- No matter what resources service providers choose to use, it is best to select an evidence-based practice approach.

(National Standards Report, 2009)

Recommendations based on research findings

- Established treatments in the National Standards Report have sufficient evidence of treatment effectiveness. It is recommended that decision-making teams give serious consideration to these treatments.
- It is also recommended that decision-making teams do not begin with emerging treatments, as there is limited research support for these treatments.
- Given how little is known about unestablished treatments, these treatments should only be considered after additional research has been conducted.

(National Standards Report, 2009)

Evidence-based Practice

- Evidence-based practice is more complicated than simply knowing which treatments are effective.
- The National Standards Report identified the following four factors of evidence-based practice:
  - Research Findings- the strength of evidence ratings for all treatments being considered must be known.
  - Professional Judgment- the judgment of professionals who have expertise in ASD must be taken into consideration.
  - Values and Preferences- the values and preferences of parents, care providers, and the individual with ASD should be considered.
  - Capacity- treatment providers should be well positioned to correctly implement the intervention.

(National Standards Report, 2009)

Limitations

- The following limitations with the National Standards Report have been identified.
  - This document only focused on research with individuals with ASD under the age of 22.
  - Determining the categories for treatments presented a challenge.
  - The research review included an examination of most group and single-subject research design studies, but did not include every type of study.
  - There was not a training session held prior to field reviewers examining the pilot article in order to establish inter-observer agreement.
  - Articles written in a language other than English were not included.

(National Standards Report, 2009)

Limitations continued

- The National Standards Project did not evaluate the extent to which treatment approaches were studied in "real world" versus laboratory settings.
- Intensity level required for delivery of the interventions included in this report was not determined.
- This report only includes research that was published prior to September 2007 when the literature review phase of this project ended.
- This report also does not include other areas that may be important when selecting treatments (i.e., cost-effectiveness, social validity, studies that examined mediating and moderating variables).

(National Standards Report, 2009)

Future Directions

- Review literature that covers the lifespan.
- Potentially include qualitative studies or other types of peer-reviewed studies that were excluded.
- Modify treatment classification based on feedback from experts in the autism community.
- Examine the extent to which treatments have been studied in "real world" settings.
- Add reviewers who can accurately interpret peer-reviewed articles that are published in non-English journals.

(National Standards Report, 2009)

Questions