Where Are the Data? Publication Profiles of Articles on Autism in JABA, JADD, and JPBI.

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Practitioners seeking a scientific basis for their interventions are often surprised by the paucity of empirical support. As part of a broader initiative to catalogue existing outcome research pertaining to the education of students with autism, we summarize the characteristics of more than 600 articles that reference autism, were published between 2000 and 2006, and appeared either in two of the established journals commonly referenced by practitioners - the Journal of Applied Behavior Analysis (JABA) and the Journal of Autism and Developmental Disorders (JADD) – or one of the newer journals – the Journal of Positive Behavior Interventions. We report on the article type (e.g., review, theoretical paper, basic research, outcome research, etc) and focus (behavior reduction and/or skill acquisition, each broken down by subtypes). For research articles, we further analyze articles based on other factors such as age of the student, type of design (single case, group design) and intervention methods examined. Our analyses reveal that these three journals have distinctive and complementary publication profiles with respect to these factors. Further, while the overall number of outcome studies remains relatively surprising small, it is nonetheless increasing.

INTRODUCTION

Practitioners seeking a scientific basis for their interventions are often surprised by the paucity of empirical support. As part of a broader initiative to catalogue existing outcome research pertaining to the education of students with autism, we summarize the characteristics of more than 600 articles that reference autism, were published between 2000 and 2006, and appeared either in two of the established journals commonly referenced by practitioners - the Journal of Applied Behavior Analysis (JABA) and the Journal of Autism and Developmental Disorders (JADD) – or one of the newer journals – the Journal of Positive Behavior Interventions (JPBI). We were interested in the following questions:

- How many articles reporting outcome research directly relevant to educational practice were published? Of these studies…
    - How many involved children versus adults?
    - How many involved single case designs versus group comparisons
    - Did they tend to focus on teaching new skills as opposed to reducing problem behaviors?

- We were also interested in whether these journals presented distinct profiles with respect to these factors
  We believe that these results will be important to helping educators in their search for outcome research to support the identification of scientifically-based practices.

METHOD

Literature search strategy

We used PsychInfo (through the University of Delaware), to conduct a literature search of all articles published in JADD, JABA, and JPBI from 2000 to 2006 that included the words "autism" or "autistic" or "ASD" in the title, abstract, or keywords. These were downloaded into a database (Reference Manager©). The second author (PD) did an additional search through the resulting abstracts to eliminate those articles that were ineligible for review (e.g., letters, commentaries, responses, corrections, articles that did not focus on autism, etc)

Coding

Since some of the variables assessed only pertained to outcome studies, we first sought to classify the articles by Type. We then focused specifically on the articles addressing outcomes, and categorized these according to the remaining variables (i.e., focus of research, age of student, and type of design). *(Note that a more detailed version of the coding manual is available from the 2nd author on request)*

Type of article

Each article was classified into one of the following types:

- A Review article summarizes theory and/or research for a particular topic, and did not describe the results of a specific study.
- A Theory-based paper proposes a specific explanation for some facet of autism or education.
- Basic research presents the findings for a study intended to: describe a fundamental genetic, neurological, and/or behavioral characteristic of autism; identify a possible cause or correlate of autism; describe a specific method or program (without providing specific outcome data); etc..
- Outcome research describes the impact of a specific intervention or a broad program on an educationally meaningful variable (i.e., one that one could imagine writing a specific education objective for or specifying in a lesson of behavior plan.).
- Assessment research is intended to describe the reliability, validity, and/or effectiveness of a specific assessment or diagnostic protocol intended to be directly applicable to clinical or educational practice.
- Other research is indirectly related to outcome – e.g., it may assess the effectiveness of different training strategies on educators, track changes in individuals over time without attributing specific changes to specific intervention, etc.
  Not reviewed: Letters, commentaries/responses to commentaries, book reviews, corrections, etc. These were excluded from all subsequent analyses
  To simplify the analysis, we collapsed Theory and Review Articles into an Other Article category, and collapsed Assessment Research and Other Research into a Related Research Category

Outcome Research: Focus of article

Skill acquisition included one or more than one of the following; Academic or pre-academic skills, Overall Adaptive functioning or Daily Living Skills, Attention, Communication (requesting,
language…), Community Skills, Domestic Skills, Coping/Self-management, Emotional skills/knowledge, Imitation, Overall Intellectual functioning, Motor Skills, Personal care skills, Play and leisure skills, Social-communication, Social skills, Vocational or job skills
Behavior reduction included one or more than one of the following; ; Aggression, Destruction, Disruptive/Tantrum behavior, Elopement, Hyperactivity, Non-compliance, Obsessions and rituals (including stereotyped and/or repetitive play and repetitive thoughts), Off-task behavior, Self-injury, Hypo/Hyper sensitivity or otherwise abnormal or inappropriate response to sensory stimuli, Stereotypic behavior (includes repetitive vocalizations and motor mannerisms), Sleep, Unspecified problem behavior, or Other problem behavior.
We also included an Other focus category for those outcomes which do not pertain to specific skills or behaviors directly relevant or amenable to educational intervention (e.g., medications).

Outcome Research: Age of student

We coded participants as Preschoolers (less than 5 years of age), Children (6-11 years of age), Adolescents (12-17 years of age), Adults (18+ years of age), or age Not Specified.

Outcome Research: Research Design

We also categorized each study as one of the following:
- Group design: This includes any study in which a group of participants is assessed on a variable, and compared to the same group post-intervention, and/or another group receiving another condition (e.g., another intervention, a waiting list control, etc).
- SI: Single case design: A single child, or a small number of children are assessed individually, and interpretations are based on visual inspection of the changes subsequent to intervention
- OT: Another type of research design, or unspecified

Outcome Research: Intervention method

Initial examination of intervention methods revealed that these were not easy to categorize reliably. Raters therefore copied the text describing the intervention into a text field, but did not conduct additional analysis for the purposes of this presentation.

Coding procedures

A list of all articles subject to review was generated that included only a unique identifier and the abstract. These abstracts were divided among 5 of the authors (JA, LRL, KP, KM, and BW), while the other author (PD) conducted reliability checks on 20% of the abstracts. Coding for each abstract on the categories describing above were entered into a specially designed Excel Spreadsheet.

Inter-rater reliability

Although reliability for all 7 categories was marginal, at 74%. reliability for the 4 categories used in subsequent analyses (i.e., Other Articles, Basic Research, Related Research, and Outcome Research) was acceptable (80%). Note that the overall agreement regarding outcome research

Type	Other articles	Basic research	Related research	Outcome research
Other articles	14	4	3	1
Basic research		28	8	4
Related research			13	4
Outcome research				25

Type	Theory	Review	Basic research	Assessment research	Other research	Outcome research	Not reviewed
Theory	2	0	2	0	3	0	1
Review		12	2	0	0	1	0
Basic research			28	2	6	4	0
Assessment research				6	0	1	0
Other research					7	3	3
Outcome research						25	0
Not reviewed							3

versus all other articles was excellent (94%). Agreement on other ratings was at least acceptable (Skill =88%; Behavior=83%; Age = 90%; Design=85%).

RESULTS

Distribution of articles

- In total, there were 126 outcome studies published in the three journals over the 7 year period.
- Twelve to twenty-four outcome studies were published annually, with no increasing or decreasing trend over the period of time under consideration

    In general, there were clear differences in journal profiles with respect to type of articles;

- Of the three journals, JABA and JPBI focused most clearly on outcome research (59% and 53%), although JADD actually published the largest total number of outcome studies (49).
- JADD had the highest proportion (45%) and number (218) of studies reporting basic research.
- Both JADD and JPBI had a significant minority of articles reporting research indirectly related to outcome (20% & 23%).

    We also compared the distribution of articles in the 4 primary categories, over two different 3 year periods – 2000 to 2002, and 2004 to 2006. In general, the profiles with

	Review	Theory	Research Basic	Research Assess-ment	Research Other	Research Outcome	Total
JADD	52	24	218	41	52	49	480
JABA	1	0	23	5	3	47	80
JPBI	7	1	4	2	11	30	57
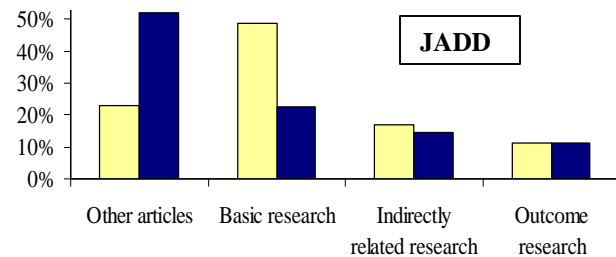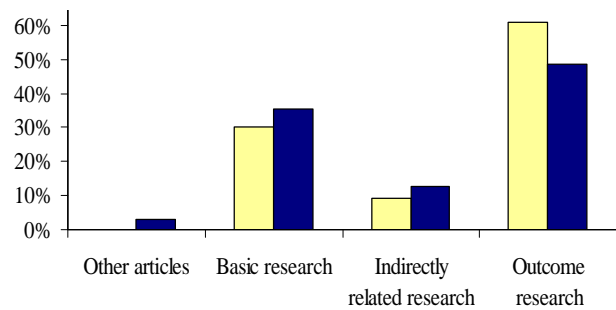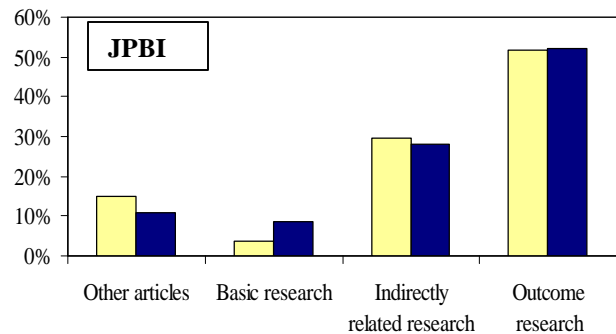
respect to Other Articles, Basic Research, Related Research, and Outcome Research remained relatively stable and distinct.

- One exception was that, over time, there was a shift in the articles published in JADD to include less basic research and more related research.

Outcome research

Age of participants

For all of the journals, children were the subject of the most outcome research, and preschoolers next. Little outcome research involved adolescents (18 studies total), and, even less, adults (10 studies total)

Type of design

Of the 126 outcome studies published, 33 involved between- or within group comparisons, 87 involved some type of single case design, and the remainder could not be clearly determined based on the abstract. There were clear differences across journals in the type of design used for outcome research:

- Outcome research published in JABA involved single subject research designs exclusively.
- Outcome research published in JPBI involved single subject research designs except in some isolated cases.
- Outcome research published in JADD involved a mix of single subject research designs and designs involving between- or within-group comparisons..

Skills and Behaviors

Overall, 60-70% of outcome research addressed the acquisition of new skills. While 40-70% of studies also considered how to reduce problem behaviors, 30-70% of considered skill acquisition in this context.

Skills: Communications was most commonly addressed (30 articles), followed by social/emotional skills (25), social communication skills (11), play skills (9), Academic and Personal Care Skills (5 each), and Self-Management (4). Many skills were difficult to classify (11 articles).
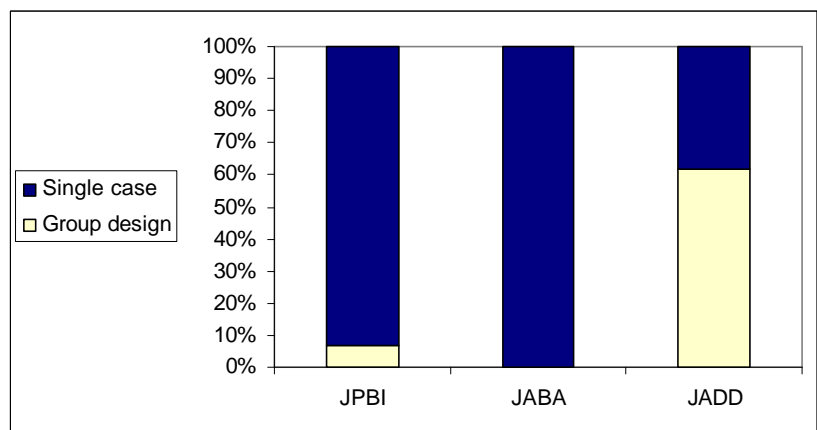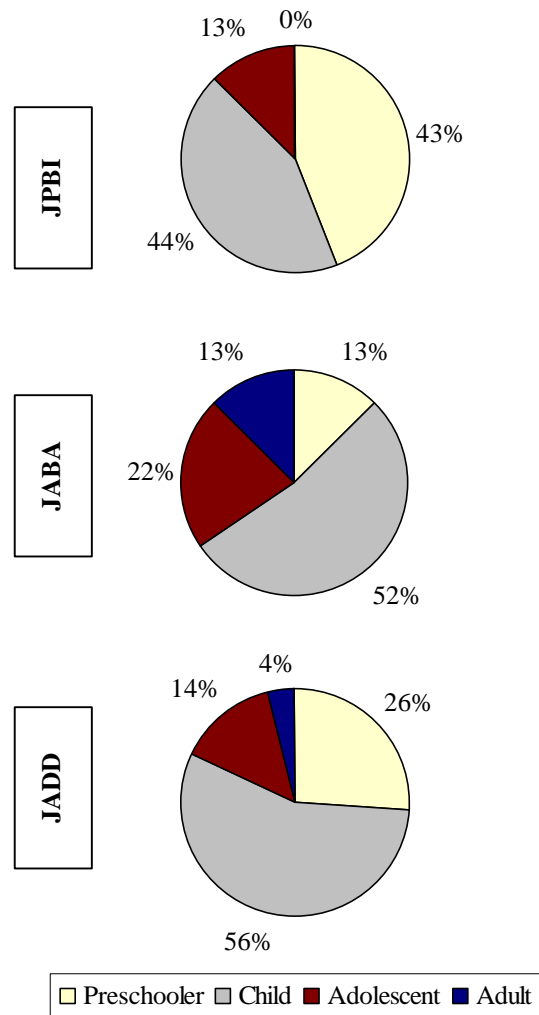
Behaviors: Stereotypic behaviors were most commonly addressed (9 articles), followed by: Aggression & Disruption (5 each), and; Non Compliance, Hyperactivity, Sleep, and Self-Injury (4 each). Many articles (13) simply referred to "problem behavior", while many others () were difficult to classify (10).
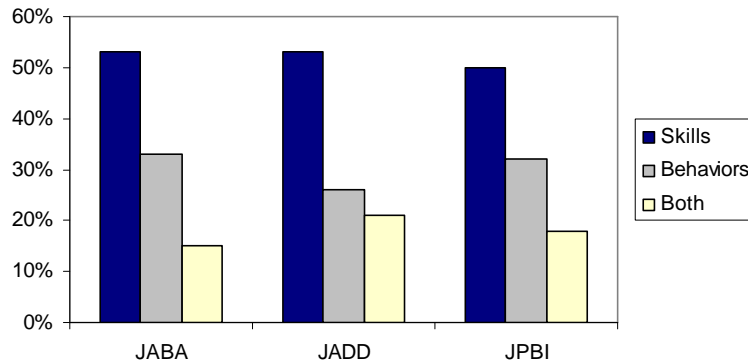
CONCLUSIONS

Status of outcome research

Number of outcome studies: While the overall number of outcome studies remains relatively surprising small (126 over a 7 year period), these are nonetheless continuing to accumulate. It is surprising that there was no general increase over time in the number of outcome studies published – perhaps the increased emphasis on evidence-based practice has not yet resulted in a shift in publication patterns.

Age of participants: Most outcome research continues to focus on preschoolers and children. The lack of outcome research on adolescents and adults remains of great concern.

Focus of research: Research continues to focus on the acquisition of new skills. It is interesting to note that a significant proportion of studies that sought to reduce behavior also addressed skill acquisition. We believe this reflects the growing recognition that teaching skills that are functionally equivalent to the problem behavior, and/or that prevent or otherwise replace such behavior, is an effective strategy.

- Communication and social skills were clearly a predominant focus
- A variety of behaviors were targeted for reduction.
- Many articles were difficult to classify, perhaps reflecting the limitations of relying on a review of abstracts

Research design: Single case designs comprised ¾'s of the published outcomes studies examined here. It will therefore continue to be important that researchers outside of the traditional field of behavior analysis continue to push for recognition of the importance of such single case designs in establishing standards of evidence-based practice (Reichow, Volkmar, & Cicchetti, in press), in contrast to models adapted from medicine that have emphasized double-blind clinical trials.

Journal Profiles

JABA, JADD, and JPBI have distinctive, complementary, and stable publication profiles.

- JABA and JPBI focused most clearly on outcome research that involves almost exclusively single case designs, with a secondary emphasis on research directly related to educational outcomes (e.g., assessment protocols, training, other methods, etc)
- While JADD maintains a strong emphasis on basic research, it nonetheless still publishes the largest number of outcome studies, about 1/3 of which entail the use of single case design.

Other findings

- Although overall reliability was at least adequate, we believe some of the disagreement arose because of difficulties establishing whether a given outcome is directly relevant to education.

Future directions

Setting standards: Before trying to conclude whether a given practice is evidence based, we must establish clear standards. These standards must specify the quality of single case and group designs, as well as the number and type of such studies needed to draw firm conclusions (Reichow, Volkmar, & Cicchetti, in press).

- We may be surprised by the relative lack of clear standards. For example, a recent review indicated that very few of the outcome studies published in JABA involving children with autism included reasonable controls to assure the validity of the autism diagnosis (Doehring et al., 2007a). Another survey of outcome research published in JPBI also suggests some areas of concern (Clarke & Dunlap, 2008)
- Important questions remain regarding the translation of research findings into specific recommendations regarding the applicability of a specific skill or method for a specific student. For example, an analysis of some of the research involving applications of verbal behavior suggest that there may be insufficient convergence to supporting conclusions that it is evidence-based, whereas research of PECS converges to support certain specific claims, at least for certain specific populations (Doehring et al., 2007b)

In the interests of full disclosure, note that the 2nd author joined the Editorial Board of the Journal of Autism and Developmental Disorders after submitting this presentation.

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