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Public Policy and the Shaping of Disability: Incidence Growth in Educational Autism

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Abstract

Autism has gained the attention of policy makers and public administrators in recent years. The surge in prevalence, in tandem with a growing social preference for community inclusion of individuals with disabilities, strains a variety of policy infrastructures. Autism and related disorders, which were first described in 1943, were originally thought to be extremely low incidence and usually coincident with mental retardation. In accordance with the disability policy paradigm of the era, public services for autism were provided predominantly in institutional settings. Since then, however, autism and related disorders have come to be understood as more common than was originally thought and more rarely associated with mental retardation. In this article, shift-share analysis is used to gain insight into how the growth in autism incidence is being differentially experienced and recorded within a single arena of policy across the United States. The challenges associated with a sudden growth in supply (that is the number of children with autism), while unique to autism in some respects, include aspects that are similar for other disabilities and in policy challenges in other arenas. Especially since the implementation of the Government Performance Results Act of 1996, there is increased pressure to create public policy

> infrastructures that are anchored by clearly cut categorical service delivery. If the categories themselves leave significant room for interpretation and their use actually has a shaping effect on the target population, then it is important to administration and policy evaluation to understand how the effect is playing out.

The increased prevalence of autism spectrum disorders has come to the attention of a variety of public agencies over the past decade (Bertrand et al, 2001; Croen et al., 2000). A dramatic rise in incidence of a developmental disability over a short period of time is a pervasive administrative and policy challenge in and of itself. However, many circumstances surrounding the surge in autism make an effective public response elusive at best. These circumstances include: largely uncertain (and highly contested) causality; politicized and somewhat polarized treatments; an era of increasing reliance on community and civil rights based policy responses to disability; and, for the time being at least, oftentimes unknown prognosis (Feinberg and Vacca, 2000, p. 130).

Such circumstances beg not only for more attention toward autism on government policy agendas, but also beg the question of potential patterns in observable growth in autism in light of varying public infrastructures. In order to best address the recorded growth in autism, it is important to directly consider the hypothesis that the recorded growth is a matter of observation as much as it is a matter of proliferation. Furthermore, since autism and its related disorders are viewed by most as a continuum and, to some degree, a construction, the patterns of growth that cannot be immediately explained by obvious environmental or socio-economic factors are of particular interest to policymakers (Bargerhuff, 2003; Simpson, 2003; Tinge, 2002).

There have been efforts to reshape the public policy infrastructure directed at autism in recent years (Feinberg and Vacca, 2000). For example, states such as Maryland and Indiana have Medicaid waivers directed specifically at autism. Nevertheless, as the children that are part of the autism baby boom have yet to reach their teenage years, the work necessary for effectively adapting public infrastructures to respond to the autism challenge is far from complete. As terms such as educational autism—which sometimes serve to differentiate what a school considers to be autism from the opinions of the medical community--suggest, the definition and nature of autism itself has not even been solidified to the general satisfaction of stakeholders. Understanding how the incidence of autism is being differentially recorded across the states is helpful to the management of public policy challenges associated with autism. It is also among the first steps on a path toward understanding any potentially bi-causal relationships between developing public structures and the incidence of autism as recorded in the educational environments of individual states.

In this article, a shift-share analysis of the incidence of autism and related disorders (hereinafter referred to as autism) reported as part of the Individuals with Disabilities Education Act (IDEA) is used to gain insight into the nature of the growth patterns of autism as it is being experienced in the public education system. Since the public education system most comprehensively touches the lives of children in the United States and the observed incidence of autism is currently highest among young children, the public administration of autism happens most frequently within the public schools. A better understanding of the growth pattern of the recorded incidence of autism is likely to help in the development of public policy that more appropriately addresses society's challenges associated with the incidence of autism.

Autism and the Public Context

The word "autism" was first coined in 1911 by Eugen Bleuler, a Swiss psychiatrist (Williams

2000) who described it as a temporary disorder related to schizophrenia. However, Leo Kanner, who studied a group of children with what came to be known as early onset autism, more (in)famously reinterpreted autism as non-temporary disorder and emphasized a connection to mental retardation and the need for institutionalization (Kanner, 1943). One of the causes often assigned to autism in the early years was the supposed “refrigerator mother” phenomena. Essentially, it was believed that children with autism chose to withdraw into an internal world because they were burdened with emotionally shutdown or cruel—and almost invariably WASP--mothers who did not show them enough or appropriate affection to allow the children to develop normally. As a result, a common early treatment for autism was therapy for the child’s mother.

This understanding of autism, combined with the prevailing tenor of disability policy in the middle part of the twentieth century that encouraged separation of individuals with disabilities from the general public (O’Briend, 2003; Jongbloed, 2003), meant that autism fell from most policy agendas. However, during the last part of the twentieth century, a dramatic change in the general perception of autism began to take place. Autism came to be understood as a complex disorder that was not caused solely by external factors, at least not external factors are simple as having a parent that did not provide enough love (Stokstad, 2001, Rutter, 2000). The causality of autism is now an open question toward which significant resources and research time are currently being directed.

A crucial component of the modern reformation of the understanding of autism was the reconsideration of the question “What exactly is autism?” During the 1990s, international efforts were made to specify the definition of autism. For example, the definition from the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV), published in 1994, includes criteria in three categories: qualitative impairment in social interaction; qualitative impairments in communication; and delays or abnormal functioning in either social interaction language as used in social communications or symbolic or imaginative play with onset prior to age three. In order to be diagnosed as having autism, a person must have a set number of characteristics in these categories from a defined list of possible symptoms.

According to Dr. Deborah Hirtz of the National Institute of Neurological Disorders and Stroke, autism is “a complex, life-long, developmental disability that results in difficulty with social interactions, problems in communication, and restrictive or repetitive interests and behavioral challenges. There is considerable variability in the severity of the symptoms, and intellectual function can range from profound mental retardation to above mean performance on IQ tests” (Hirtz 2000). However, the specifics of the definition of autism are hotly debated. For example, the Michigan Department of Education reported in 2002 that there was a lack of agreement on the proposed definition of autism and that despite the fact that the original criteria were retained, further development should be anticipated (Michigan Department of Education 2002).

Public policy that provides for services on the basis of diagnosis categories is, therefore, a difficult administrative match for autism because the service needs of children with autism spectrum disorder vary dramatically between children with autism spectrum disorders and during the life of a child with an autism spectrum disorder over time (Feinberg and Vacca, 2000). Neither the exact needs nor the expected prognosis can be easily estimated on a case-by-case basis given diagnosis. By the same token, since establishing accurate prognosis for individual children is nearly impossible and the most effective treatment highly debated (presumably because the treatments have not well understood differential effects on different individuals), public policy that provides services on the basis of individual demands or rights can be equally and uniquely difficult in managing the social challenges associated with autism.

This type of challenge, while unique to autism in some respects, includes aspects that are similar in other disabilities and in policy challenges in other arenas. Especially since the implementation of the Government Performance Results Act of 1996, there is pressure to create public policy infrastructures that are anchored by clearly cut categorical service delivery. If the categories themselves leave significant room for interpretation and their differential implementation has a shaping effect on the target population, then the distribution of incidence reflects variance in the (broadly cast) environment, including public infrastructures. Examining this potential is especially important in policy arenas that have complex fiscal federalism structures, such as is found in Medicaid and the provision of special education under the Individuals with Disabilities Education Act or Section 504 of the Rehabilitation Act.

Autism Incidence

The incidence of autism was once believed to be 1 to 2 per 10,000 people. More recently, reported incidence has climbed drastically—to around 1 in 500 in most estimates (Mandell et al., 2002). However, specific estimates of the prevalence of autism as recorded in the research and reported to the public vary. For example, in 2001, Bertrand et al, who studied the prevalence of autism in Brick Township, New Jersey, reported, "the prevalence of all autism spectrum disorders was 6.7 cases per 1000 children. The prevalence for children whose condition met full diagnostic criteria for autistic disorder was 4.0 cases per 1000 children, and the prevalence for PDD-NOS and Asperger disorder was 2.7 cases per 1000 children" (Bertrand et al., 2001). However, in a study of the incidence of autism in children born in California between 1987 and 1994, it was found that "a total of 5038 children with full symptom autism were identified from 4,590,333 California births, a prevalence of 11.0 per 10,000. During the study period, the prevalence increased from 5.8 to 14.9 per 10,000, for an absolute change of 9.1 per 10,000" (Croen 2002). Outside of the academic literature, the range of reported and suspected incidence is even wider.

The causality of the rise of incidence in autism is highly debated and politicized. Class action suits, such as the one discussed on vaccineautism.com, are arising that seek to place blame on particular events or practices such as mercury poisoning in infants during childhood vaccination. The most widely accepted explanations are of complex causes: "recent research reports show that autism spectrum disorders may actually be more common than previously believed. General awareness and clinical knowledge of these disorders have increased, and the criteria in the ICD-10 and the DSM-IV are also now more detailed" (Kielinen 2000). As this quote suggests, there are two core cause groups—a better professional understanding of autism or changes in the (broadly defined) environment.

Shattock et al. describe four basic reasons that autism might have a perceived increase in recorded incidence independent of any actual increase in the raw rate of autism disorders in children. Their reasons include: "the increased awareness and skill in diagnosis which has developed, the changing diagnostic criteria, the lack of appropriate and available records and the increased number of associated disorders which may formerly have been included within the 'autism' diagnosis" (Shattock, 2001). Even though these authors are writing from the United Kingdom, these types of issues are expected to arise by those who are professionally or personally connected to autism related issues in the United States as well.

Suggestions abound for reasons related to autism's rise and—to the extent that it has been noted—variance within this recorded rise across space. Searching the web for "autism incidence" using a basic search engine brings up in excess of 21,000 hits. Autism tends to be popularly intriguing for reasons including the fact that autism is much more common in boys, with an incidence rate that is 3 to 4 times the rate found in girls (Hirtz 2000, Miles

2003), that it was once blamed on traumatic experience or perverse behavior on the part of parents, and the way in which autism is manifested, particularly in the case of the so-called savants.

These elements of fascination, in combination with the position stakeholders find themselves in trying to manage a specific case of autism in an era of rapidly shifting ground make the nature of the growth of autism a crucial concern for policy development and administration. Three major policy and administrative challenges are: identification, the distribution and selection of treatment options, and the creation of appropriate policy and administrative goals that will effectively address the autism baby boom in the long term. The effective management of these factors could be expected to be easier with information about how autism is being differentially recorded across the country.

Many observers have hypothesized that the reasons for this recorded rise might be expected to have as much to do with changing service systems and increased awareness as with an epidemiological growth in the general population (DeFrancesco, 2001; Barbaresi, W.J., 2002). To the extent that the rise in recorded incidence is the result of a change in broad based professional practice and in public awareness, if the rise in incidence is not occurring quite similarly across the country (if not world), then the structure of the public policy and socioeconomic conditions of states, as a defining region policy arenas such as health and education, could be having a shaping effect on the growth of autism. Especially because individuals with autism and their families are currently expected to require very different services from a variety of public agencies over the course of a lifetime than are individuals without autism, it is important to consider coincidences and correlations between observed patterns of growth in recorded incidence of autism and socioeconomic and political factors.

There is no centralized place or database to which all cases of autism are reported. However, the incidence of autism in children is arguably recorded most comprehensively by the public education system under the provisions of the Individuals with Disability Education Act. Autism is one of thirteen categories in which children with disabilities are currently entitled to special education services under the Individuals with Disabilities Education Act. In accordance with this key structural policy of special education in the United States, states and regions are required to report the number of children with autism (and in twelve other disability categories) served to the Office of Special Education and Rehabilitation Services on a yearly basis. Whereas the categories are defined at the federal level, states, regions and, to a certain extent, individual districts, hold the responsibility to define exactly which children will be included in counts within individual school systems (Feinberg and Vacca, 2000).

The rise in autism incidence is catching the attention of public administrators—perhaps particularly those involved in special education service planning and delivery. In fact, in the data appendix of the 2001 Report to Congress on the implementation of IDEA, it is explained, “twelve states commented that the increases in counts of students with autism were a result of better diagnosis and identification of the disorder, continued reclassification of students, and improved training in methods and assessment of autism” (OSERS 2002). The twelve states are Alabama, California, Colorado, Connecticut, Georgia, Indiana, Kansas, Kentucky, Minnesota, Missouri, Washington and Wisconsin. In conducting the shift-share analysis a hypothesis was that these states would be those with both the highest rise in incidence and the highest relative growth as compared to the growth in incidence experienced by these states in the other disability categories.

Method

Shift-share analysis is most commonly used in regional economics. In that context,

“shift-share analysis produces results that can be valuable for diagnosing, describing and building understanding of major differences between the industry pattern of employment growth locally and nationwide trends” (Washington State University 2002). In the context of the incidence of autism as recorded in the public education system, this technique can be used to build understanding of the differences between the pattern of growth in autism as compared to the other diagnosis categories locally and in nationwide trends. In this article, a shift-share analysis of special education diagnosis categories are conducted using data reported by the Office of Special Education and Rehabilitative Services (OSERS) to Congress.

For the special education shift-share analysis, the local regions of interest are the states. The aggregate level is the national level. For this article, a shift-share analysis of the changes in diagnosis incidences in autism as recorded by public schools between the 1995-1996 and 2001-2002 school years was conducted. This period is of particular interest. The DSM-IV standards were developed and released during this era and the dawn of widespread public attention to the perceived rise in incidence in autism dates to at least the late 1990s (though perhaps up to ten years earlier in some locations).

Shift-share analysis is fundamentally a technique of arithmetic decomposition. In regional economics the purpose of shift-share analysis is to allow for comparison of differences in growth in selected industries in smaller regions (such as states or localities) with one another and with a larger, encompassing region (such as the nation). Through relatively simple calculations, shift-share analysis produces two measures of interest, which are typically called competitive and mix components in regional economics.

The arithmetic decomposition in shift share proceeds as follows. First, in traditional shift-share analysis, employment data is collected on a chosen number of industries for two time periods of interest for both the encompassing region (hereinafter referred to as national) and smaller regions of interest (hereinafter referred to as locality). The percent increase in total employment at the national level is first calculated. For each locality, the national growth share is then calculated. This is the increase that would have been expected in a given industry if that industry had grown at the regional level at exactly the same rate as the overall, national employment growth rate. That is, a number for each industry is calculated using the following formula:

National Growth Share = (Industry Employment, year 1) * (overall growth rate).

Not surprisingly, industries in given regions very rarely grow at exactly the growth rate observed on the national level. The national growth share is not generally observed in practice. In this article, the national growth share shows the increase that would have been seen in a given diagnosis category at the state level if that diagnosis category had grown in the state at the same rate as disability in general in the United States.

In traditional shift-share analysis, the expected growth in employment in a particular industry is calculated, using the national growth rate in that industry. This component, which is called the industrial mix component in traditional shift-share analysis, is calculated as follows:

Industrial Mix = (Local industry employment, year 1) * (National Industry Growth Rate).

In the context of disability as explored in this article, this is the number of additional individuals with a particular diagnosis one would expect to see at the state level if the category had grown at the same rate as the overall national rate.

Finally, the local share or competitive regional shift is calculated. This is the measure of particular interest in most shift-share analysis. In traditional shift-share analysis this

demonstrates the extent to which factors unique to the local area have caused growth or decline in regional employment of an industrial group. It is calculated as follows:

Regional Shift = (Local industry employment, year 1) * (Percent local growth in industry- percent national growth in industry)

In the context of disability as explored in this article, the result of this equation is the number of individuals (or lack of individuals if the number is negative) with a particular diagnosis attributable to a growth pattern unique to the state. Once these three calculations have been performed, the results are examined for growth patterns within and between states.

In the context of the administration of challenges and services associated with autism, the traditional shift-share language is somewhat awkward. Competition for children with specific disability types does not typically take place in state education systems in the same spirit as competition for businesses and industries takes place between regional economies. Nevertheless, the shift-share components are potentially very useful indicators in the diagnosis of growth patterns in educational autism because they provide a way to compare across states and between diagnosis categories. Therefore, in applying this technique to recorded incidence of disability it is helpful to employ language that better describes the measures of interest in the disability context. In this article “diagnosis mix” is hereinafter used instead of “industrial mix” to describe the expected growth in individual diagnostic categories and “state-specific label growth” is used in place of local share or competitive regional shift.

As is described above, in shift-share analysis national (or another larger, encompassing region) growth patterns are used as a reference point (Hoover and Giarantti 2002). At the national level, disability incidence on the whole is growing at any given time at a certain rate, but it is to be expected that the rate of incidence of individual diagnoses will be growing at different rates. That is, mental retardation incidence is not expected to be growing at exactly the same rate as deaf-blindness, for example. The diagnosis mix component shows how categories would have grown at the more local level if the growth pattern at the national level held uniformly in the localities. In the context of regional economics, a region is said to have a favorable growth mix if economic activity in a region is growing quickly (or more quickly) in a set of industries that are also growing quickly at the national level (Hoover and Giarantti 2002). Though the story and its implications are more complex when it comes to comparing the mix of slow and fast growing diagnosis in a state vis-à-vis a nation, the diagnostic mix component is, of course, of interest in public administration since a state that has a diagnostic mix pattern that is different from the national trend will face unique administration challenges (and, perhaps, opportunities), especially in an arena as flush with federalist tension as special education.

In regional economics, the competitive regional share or local share component is understood by “imagining a case of a region that has exactly the same mix of activities, as does the nation (and) its percentage share is the same for all activities” (Hoover and Giarantti 2002). A competitive advantage, in the context of regional economics, is found in regions that increase their share, or, as Hoover and Giarantti explained, “if most activities grow faster in the region than in the nation.” In the context of special education, and specifically autism, the state-specific label growth component examines how the growth in autism in individual states compare relative to each other and to the national growth rate.

Results

The increase in incidence of all disabilities as recorded through the system of special education was just over 15% between the 1995-1996 and 2001-2002 school years. During this period, autism grew faster than that in all fifty states, the District of Columbia and

Puerto Rico. In fact, of the twelve disability categories that were recorded in these years, autism was the fastest growing disability category in 32 states. The range of incidence growth rate during this period was between 53.7 percent (Puerto Rico) and 1,413.37 percent (Ohio) with a mean growth of 306.80 percent and a standard of deviation of 218.70 percent. The states' ranked growths are shown in Table 1 below.

Table 1. Ranked Autism Percent Growth Rates

State	Rank	Rate	**State**	Rank	Rate	**State**	Rank	Rate
Alabama	36	201	Louisiana	48	104	Ohio	1	1413
Alaska	19	321	Maine	16	364	Oklahoma	24	283
Arizona	21	313	Maryland	15	365	Oregon	50	64
Arkansas	25	279	Massachusetts	12	377	Pennsylvania	32	227
California	18	333	Michigan	43	168	Puerto Rico	51	54
Colorado	4	573	Minnesota	10	392	Rhode Island	7	419
Connecticut	27	268	Mississippi	40	185	South Carolina	6	438
Delaware	47	118	Missouri	31	229	South Dakota	26	279
Florida	35	211	Montana	42	170	Tennessee	45	137
Georgia	9	394	Nebraska	23	288	Texas	38	193
Hawaii	17	352	Nevada	5	517	Utah	20	318
Idaho	30	233	N. Hampshire	2	936	Vermont	14	368
Illinois	11	379	New Jersey	28	268	Virginia	41	182
Indiana	29	250	New Mexico	37	194	Washington	3	650
Iowa	49	76	New York	46	126	West Virginia	39	188
Kansas	34	214	North Carolina	44	151	Wisconsin	8	397
Kentucky	13	373	North Dakota	33	220	Wyoming	22	303

As Table 1 demonstrates, the recorded growth of autism around the nation was far from uniform across the country. As is mentioned above, from a public administration and policy standpoint, in the context of marble cake federalist special education policy, to the extent the policies and administrative react to prevailing growth rates, states with outlying growth rates may have administrative and other policy related challenges. When a 95% confidence interval is drawn around the mean growth rate, the states that are found Ohio and New Hampshire are found to have statistically significantly higher growth rates. No states had statistically significantly lower growth rates (a state would have had to have a decrease in the reported incidence of autism for this to be the case).

The national growth rate for autism during this period was almost 240%. It is not surprising that this national growth rate is different from the mean growth rate since the populations of states vary dramatically and, therefore, the change in growth in a small state will have much less effect on the overall change in growth than will a similar (or even smaller) change in a

large state. It is interesting to note, however, that the national growth rate is less than one standard deviation away from the mean state growth rate.

States that self identified in their 2002 reports that increased incidence was due to better identification might be expected to have both a reported incidence rate that was relatively high when compared to other states and to have the highest growth of all disability categories have taken place in autism. However, neither of the outlying states—Ohio and New Hampshire—were in this group. When the percentage growth rates were examined, the ranks from highest growth to lowest of the twelve states that self-identified as improving their diagnoses mechanisms were: Alabama (36th); California (18th); Colorado (4th); Connecticut (27th); Georgia (9th); Indiana (29th); Kansas (34th); Kentucky (13th); Minnesota (10th); Missouri (31st); Washington (3rd); and Wisconsin (8th). As can be seen from these ranks, the states that self-identified as more aggressively diagnosing autism were almost as likely to be in the bottom half of the ranked growth rates and in the top half. Furthermore, autism was the highest growth category in only six (50%) of these self-identifying states (less than the 62% of all states or regions). This evidence does not support the hypothesis that exceeding rapid growth rate is caused by institutionalized overenthusiastic discovery of new cases of autism.

The diagnosis mix and state-specific label growth for each of the states and regions is shown in Table 2. As is described above, the numbers generated in the shift share analysis refer to the number of cases of autism. Diagnosis mix refers to the number of *additional* cases of autism one would expect in the school system's population if the state's growth in autism had exactly matched the national growth rate in autism. A larger number, therefore, means that the state had a larger population of children with autism in the mid-1990s. The state-specific label growth refers to the number of cases of autism above or below what would have been expected as an observed growth in autism once the overall growth in autism at the national level is controlled for. The state-specific label growth reports the absolute increase (or decrease) in the number of recorded cases of autism once the growth attributed to the national growth in autism has been controlled for. States that did not grow at at least the national rate would have a negative state-specific label growth. In other words, for example, a state with a very negative number has much less autism than would be expected given the number of cases they began with and the growth experienced in autism nation wide.

Table 2. Diagnosis Mix (DM) and State-Specific Label Growth (SSLG)

State	DM	SSLG	**State**	DM	SSLG	**State**	DM	SSLG
Alabama	672	-115	Louisiana	1427	-866	Ohio	453	2371
Alaska	119	43	Maine	267	148	Oklahoma	459	89
Arizona	730	241	Maryland	1154	647	Oregon	3887	-3045
Arkansas	457	81	Massachusetts	1259	772	Pennsylvania	2722	-157
California	6865	2852	Michigan	3948	-1264	Puerto Rico	755	-626
Colorado	179	266	Minnesota	1488	1015	Rhode Island	166	133
Connecticut	894	115	Mississippi	363	-89	S. Carolina	421	374
Delaware	302	-164	Missouri	1331	-64	S. Dakota	148	26
Florida	3121	-403	Montana	164	-51	Tennessee	1042	-476

Georgia	1116	771	Nebraska	240	52	Texas	5424	-1123
Hawaii	188	95	Nevada	188	233	Utah	388	136
Idaho	240	-7	N. Hampshire	87	272	Vermont	119	68
Illinois	1777	1109	New Jersey	2149	269	Virginia	1878	-481
Indiana	2088	97	New Mexico	202	-41	Washington	587	1079
Iowa	706	-516	New York	6975	-3549	W. Virginia	291	-67
Kansas	531	-62	N. Carolina	2765	-1096	Wisconsin	1013	712
Kentucky	484	288	North Dakota	101	-9	Wyoming	65	19

The numbers presented in Table 2 are not controlled for the population size of the state or for the general population growth experienced by the state during the time frame. It is arguable, then, that except for very small deviations which may not be (statistically) significantly different from zero, that from a standpoint of public policy and public management, the most telling aspect of the state specific label growth is whether the number generated by the shift-share analysis is positive or negative.

The examination of state-specific label growth (SSLG) and of emergent patterns of growth demonstrated therein, also sheds light on the growth pattern of autism. The median SSLG was 52 recorded cases (with the mean, as would be expected, indistinguishable from zero). The largest SSLG was in California, which had 2852 cases. The four other states that had SSLGs in the top five were: Ohio (2371 cases); Illinois (1109 cases); Washington (1079 cases); and Minnesota (1015 cases). Autism grew the fastest of all the disability categories in each of these states except Washington.

The lowest SSLG was in New York, which had an SSLG of –3549 cases. The four other states that had local shares in the bottom five were: Oregon (-3045 cases); Michigan (-1265 cases); Texas (-1123 cases) and North Carolina (-1096 cases). As can be seen from Table 1, in some cases these absolute growths were also ranked in the same categories in terms of percentage growth. Of these states, autism grew the fastest of all the disability categories in Michigan, Texas and North Carolina. Other states, however, such as California, Texas and New York had changes that were large due to the size of the states population rather than the size of the percentage change.

In addition to states with outlying growth rates mentioned above, states or regions with growth rates closest to the mean, that is the most average states, are interesting from a standpoint of public policy and management. The states whose growth most closely matched the states' mean growth in autism included Idaho, Indiana, Missouri, North Dakota and Pennsylvania. The growth rate in each of these states was within 20 percentage points of the national mean. Autism was the fastest growing disability category in only two of these states—Idaho and North Dakota.

When the growths of other disability categories in these states are examined, we find that the state-specific label growth patterns on the whole is not overly similar across these states. We also find that the states were not average across all disability categories. For example, Pennsylvania had a very high state specific label growth in specific learning disabilities, whereas Missouri had a quite low (and negative) SSLG in the same category. This is interesting especially because learning disabilities are another type of disability sometimes regarded as potentially trendy. Also, North Dakota reported no children in the multiple disabilities category, whereas Pennsylvania had a large SSLG in that category as

well. Given autism's historical connection with mental retardation, it is worth noting that all but one of the average growth states (Indiana) had a negative state-specific label growth in autism. Finally, since autism and speech and language impairments are sometimes confounded or combined, one might expect that states that are average in autism would be similarly average in speech or language impairments. However, as Table 3 shows, only North Dakota was close to average in that category.

Table 3. State-Specific Label Growths in States with Average Autism Growth

	Idaho	Indiana	Missouri	North Dakota	Pennsylvania
Specific Learning Disabilities	413	3562	-1441	-793	15899
Speech or Language Impairment	749	-993	2027	71	-5795
Mental Retardation	-1078	883	-620	-122	-564
Emotional Disturbance	323	3464	-1364	345	1978
Multiple Disabilities	-41	190	43	N/A	588
Hearing Impairments	-34	238	22	20	-346
Orthopedic Impairments	-46	258	-225	-10	-298
Other Health Impairments	-195	1611	2493	114	2084
Visual Impairments	23	60	85	6	-207
Autism	-7	97	-64	-9	-158
Deaf-Blindness	2	-47	-51	-50	21
Traumatic Brain Injury	-88	-147	-172	-17	-1612

Conclusion

State environment—including perhaps public infrastructure--seems clearly to have had a role in the shaping of the autism baby boom in the United States. Presumably in the recording of any phenomena by agencies in the public infrastructure (such as the system of formal education) there will be always be some variation in growth rates. The range of growth rates recorded by the public education systems as measured by shift-share analysis is too large to be explained away through pure chance or variation in a phenomenon of the physical environment that remains unnoticed. Differences in the implementation patterns of special education policy between states are a far more likely causal element. As can be seen by the range of growth rates, to the extent that identification by the school district can be connected with appropriate educational (and, to some degree other) services, the willingness on the part of states to provide services for children with autism is perhaps remarkably different in different states.

Furthermore, as can be seen from the shift-share results, autism's growth pattern as measured by the system of formal education does not appear to be spatially correlated. Whereas the states that are growing at close to the national rate are basically midwestern, the states that grew most quickly or most slowly have no such proximity. Neither can

population or state wealth explain the distribution of growth as measured in the shift share analysis. After all whereas California experienced the largest share of growth in educational autism during this era, New York's share indicated that educational autism grew much less than was expected.

This lack of a preeminent environmental or regional causality suggests that there is a relationship between the recorded growth of autism and the public infrastructure. In his description of shift-share analysis, Martin Sheilds states that among the many questions to consider in the interpretation of results from shift-share analysis, two of the most important are:

1. Compared to other regions, does the community seem highly competitive in any particular industry? What is the source of this competitiveness?
2. Does this information support popular perceptions? Or, does the analysis uncover "surprising" areas of economic growth? (Located online at: http://radburn.rutgers .edu/lahr/509/)

This study has thus far focused on the first of these questions, looking at a single diagnosis (the "industry" for our purposes). As is mentioned above there are several states that appear to be highly competitive when it comes to the recording of autism in their educational system and part of the source of this competitiveness is most likely connected to the public infrastructure (but not to a reported enthusiasm for diagnosing autism cases). As far as the second question is concerned, the information leads several surprises, both from the standpoint of growth in autism specifically and in the way in which the development and administration of policy is more generally understood. First of all, the popular perception is that autism is growing very rapidly, but presumably relatively evenly nationwide. Furthermore, the most oft discussed clustering of autism is in Brick Township, New Jersey. New Jersey did not rank among the top growths of states. A nationwide surge in incidence is a much less complex (and arguably less troublesome) occurrence than a surge with a magnitude that varies dramatically from state to state.

From the standpoint of public policy and administration, these findings call for a sustained look at the relationship between the unfolding of social policy problems and the public infrastructure. Shift-share analysis, after all, provides only a two-period snapshot of growth that is continuous in nature. To the extent that this variance in growth is due to street and state level bureaucracy, public policy has a level of responsibility for the shaping of the public challenge. Especially when this challenge is so intimately connected to the development of children and to the unfolding of the new conception of civil rights being forged through modern disability policy, there should be more direct examination of behavior within public infrastructures that accounts for wide differences in observation and in understandings of a federally defined public mission.

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