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FRAMING AUTISM CAUSES AND PREVALENCE:

A CONTENT ANALYSIS OF TELEVISION EVENING NEWS COVERAGEð

1994 THROUGH APRIL 2010

by

ANGELA S. COLSON

Under the Direction of Dr. Holley Wilkin

ABSTRACT

Autism has been declared an urgent public health concern by the U.S. government and an epidemic by some advocacy groups. Determining autismôs diagnostic criteria, prevalence, and causes have been challenging. It is important to examine how the U.S. media have contributed to the publicôs understanding of autism. Previous research found that British media coverage of the theory that vaccines cause autism was shown to contribute to the decline of vaccination rates in Britain (Lewis & Speers, 2003). This study examined U.S. television news media coverage using an agenda-setting theory and media framing perspective. A content analysis was conducted of national television evening news broadcasts airing on ABC, CBS, and NBC from 1994, when autism was first recognized as a spectrum disorder through April 2010, the time of this study. Specifically, this study examined the saliency of autism stories and how autism was framed in terms of prevalence and causes.

INDEX WORDS: Autism, Vaccines, Television evening news, ABC, CBS, NBC, Agenda setting, Framing, Content analysis

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ANGELA S. COLSON

A Thesis Submitted in Partial Fulfillment of Requirements for the Degree of

Master of Arts

in the College of Arts and Sciences

Georgia State University

2010

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CHAPTER 1

INTRODUCTION AND BACKGROUND

Throughout the evolving understanding of autism, it seems the disorder has always held a fascination for the public and those who have researched it. Autism or autism spectrum disorders (ASDs), as many in the scientific community now describe it, are a ñgroup of developmental disabilities characterized by atypical development in socialization, communication, and behavior. ASDs typically are apparent before age 3 years, with associated impairments affecting multiple areas of a person's lifeò (Centers for Disease Control and Prevention, 2009a, np). It has been said that very little about autism is ever noncontroversial (Donnellan, 1985) and it is not surprising that many advocacy groups have adopted a puzzle as the symbol for autism given that determining the diagnosis criteria, the prevalence, as well as causes and risk factors have proven to be challenging. Determining the diagnostic criteria has especially been difficult. In fact, the recognition of autism as a spectrum disorder did not occur until 1994 when the American Psychiatric Association included Asperger syndrome and other developmental disorders in the fourth edition of its *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV),* the standard by which mental disorders are diagnosed in the United States.

The lack of established diagnostic criteria for autism or ASDs has meant inconsistent diagnoses and affected how and whether children received services. For many years, researchers believed the prevalence of autism was four to five per 10,000 children (Centers for Disease Control and Prevention, 2007a), but research published in 1999 suggested that it may be actually somewhere between 30 to 60 per 10,000 children or around 1 in 166 (Fombonne, 1999). Some researchers and parent groups in the U.S. believed this data was evidence that autism was an epidemic (Fombonne, 1999). In 2007, the Centers for Disease Control and Prevention (CDC)

published the first prevalence rates from multiple sites in the U.S. using the diagnostic criteria from the *Diagnostic and Statistical Manual of Mental Disorders-IV -Text Revision*. They reported that 1 in 150 children had an ASD diagnosis in 2002 (CDC, 2007b). In 2009, the CDC published prevalence rates reporting that 1 in 110 children were diagnosed with an ASD in 2006 (CDC, 2009a), up from their previous estimates. With the release of these prevalence rates, CDC has called ASDs ñan urgent public health concernò (CDC, 2009a, p.1), but has not been able to confirm whether prevalence rates are truly increasing or if the rates have increased due to the changes in diagnostic criteria over the years. Nevertheless, the largest autism advocacy groups began referring to autism as an epidemic and argued that it deserved to be recognized as a public health priority in terms of research and services (Autism Society of America, 2007; Autism Speaks, 2007).

Perhaps the most puzzling and controversial issue surrounding autism has been the suggested link between vaccines and autism. In 1998, a *Lancet* journal article presented findings that demonstrated a link between the measles virus and autism, suggesting that the vaccine for measles, mumps, and rubella (MMR) caused autism. At a press conference from the Royal Free Hospital in London, the studyôs main author, Andrew Wakefield, posited that giving children individual MMR vaccines in three separate doses at annual intervals would be a safe alternative to the current MMR vaccine. It should be noted that 10 of Wakefield's 13 co-authors disavowed the findings of the study in 2004, his claims in the article have been refuted by a substantial body of research, and *Lance*t retracted the article in 2010 (DeNoon, 2010). However, after Wakefieldôs study was published in 1998, MMR vaccination rates in Britain fell from a high of 92% to below 80% in 2003 (Lewis & Speers, 2003). Attempts to explain the fall of vaccination rates point to the mediaôs coverage of Wakefieldôs findings. One focus group study found that

ñthe media reports about MMR had affected most parentsô immunization decisions, except for those few who were already committed to their viewsò (Lewis & Speers, 2003, p. 914). Research on the subsequent MMR media coverage in Britain found a direct relationship between the level of media coverage and public concern (Lewis & Speers, 2003). Another study suggested that perceived safety of the MMR vaccine fell after periods of media coverage in October 2000 and March 2001, but rose again once media coverage declined (Lewis & Speers, 2003).

The MMR vaccine and autism media coverage in Britain and the subsequent decline in vaccination rates demonstrate the power of the mass media to contribute to potential public health crises. So, could that happen in the United States (U.S.)ð or has it already happened? The measles vaccine first became available in the mid-1960s and before that time, measles caused 450 reported deaths and 4,000 cases of encephalitis annually in the U.S. Endemic measles transmission was eliminated in the U.S. after the vaccine became available (CDC, 2008). However, between January and July 2008, 131 measles cases were reported to the CDC compared with an average of 63 cases *per year* between 2000 and 2007 (CDC, 2008). According to the CDC (2008), the number of measles cases reported between January and July 2008 was the highest year-to-date since 1996. Among those measles cases reported during the first 7 months of 2008, 76% occurred in people younger than 20 years of age and 91% were unvaccinated or of unknown vaccination status. So the idea of a return of measles due to vaccine refusal is of great concern to U.S. government agencies such as the CDC who are charged with protecting the publicôs health. In March 2010, a *Pediatrics* article reported that 1 in 4 surveyed parents in the U.S. in January 2009 believed that some vaccines cause autism (Freed, Clark, Butchart, Singer, & Davis, 2010) despite overwhelming consensus in the medical and scientific community that vaccines do not cause autism (Institute of Medicine, 2004). Parents were not

asked about their media viewing habits or if seeing or hearing specific media stories influenced their beliefs about autism. However, 81% of parents who believed that some vaccines cause autism reported that they had heard or read about problems with the MMR vaccine (Freed et al., 2010).

Current mass communication literature focuses on analyses of print media coverage of the debate over whether vaccines cause autism. However, only limited research is available about how other autism-related topics (e.g., prevalence rates and potential causes of autism other than vaccines) are covered by the news media. Furthermore, no research is available on broadcast media coverage of autism in the U.S. The influence of television has been studied since its invention and is an important medium to examine. A recent analysis of health information-seeking behaviors revealed that passive media outlets, such as television and radio, were more likely to be the primary sources of health information for the individual who was categorized as less health oriented (Dutta-Bergman, 2004). Furthermore, a recent survey conducted by Pew (2008) showed that 29% of respondents reported watching nightly network news. Respondents equally reported watching either NBC Nightly News or ABCôs World News Tonight (14% each) and 8% reported watching the CBS Evening News. Television remains a source of health information and television evening news continues to be watched among one-third of those surveyed in the U.S., thus, it deserves to be analyzed in terms of autism media coverage. Therefore, this study attempted to fill in some of the gaps in autism media coverage research by providing a content analysis of autism-related stories featured in national television evening news broadcasts airing on ABC, CBS, and NBC. The purpose of the analysis was to investigate how television news media framed autism causes and prevalence and contributed to the public discourse on these issues from 1994, when autism was first recognized as a spectrum

of disorders in the *DSM-IV,* through April 2010, the time of this study. This analysis will hopefully lay the foundation for additional research to understand what, if any, role U.S. mass media plays in influencing beliefs, attitudes, intentions, or behaviors of audiences in relation to autism.

To better understand autismôs newsworthiness, it is important to first explore its history as a disorder. The body of work contributing to the medical and psychiatric understanding of autism is vast and fragmented. The events selected for this history were chosen based on a review of texts which identified sentinel milestones and trends in autism research that has helped establish diagnostic criteria, prevalence rates, and explore potential causes and risk factors.

Early Autism Accounts

Many scientists have argued that accounts of autistic-like behaviors can be found throughout history in literature and legends, long before psychiatrists and researchers such as Leo Kanner and Hans Asperger recorded their observations in the early twentieth century (Wing, 1997). Folktales of fairies replacing human babies with changeling children, who have voracious appetites or the inability to speak, could actually be diagnosed as autistic with the current criteria, some scientists insist. Legends about the followers of St. Francis of Assisi around the thirteenth century mention a story of Brother Juniper, who lacked social awareness and sense and would now likely be diagnosed with Aspergerôs syndrome (currently on the spectrum of autistic disorders). Prominent psychiatrist Sula Wolff (2004) wrote in her article on the history of autism about ñwolf children,ò or children discovered in the wild during the 1800s who were found to be mute, insensitive to cold, and walked on all fours. There is much speculation, she says, that these cases were perhaps some of the first records of children who had what would now be considered autism. One of the most celebrated ñwolf childrenò was Victor, described by young French

physician Jean Itard as the ñwild boy of Aveyron.ò Victor was discovered naked and covered with scars in the woods of Aveyron, France around the age of 11 or 12. He initially presented with an expressionless gaze, melancholy, sensitivity to loud noises, lack of imitation of others, gluttony, and made only guttural sounds. Itard attempted to educate and ñhumanizeò him over a period of several years and made some progress. Psychiatrists J.K. and Lorna Wing say that while Victor was deemed an ñidiotò who had been abandoned by his family for that reason, he showed most of the diagnostic features of autism (Wing & Wing, 1966).

These myths and early accounts are discussed in much of the literature about autism and are important to mention because they demonstrate that the autistic tendency existed throughout history. Todayôs scientists use these accounts to explain that autistic behaviors have always existed, but those who exhibited them were labeled as insane, ñidiotsò and/or as mythological creatures. These accounts, factual and fictitious, also demonstrate that individuals exhibiting what we would now describe as autism-like behaviors seem to have exerted a fascination worth noting for the public throughout history (Wing, 2005). Despite these early accounts, the connection between them, as well as other stories that attempted to explain weird or strange behaviors in children, were not made until the late nineteenth century when British psychiatrist Henry Maudsley posited that children who exhibited such behaviors could be afflicted with what he called childhood psychosis. In the first half of the twentieth century researchers in the field of abnormal child development began defining subgroups within childhood psychoses. It was through this work that one might say that autism was discovered. The following section discusses the work of those researchers who observed and described these behavior patterns and labeled them autism.

Labeling and Describing Autism

Prominent Swiss psychiatrist Eugen Bleuler, who studied schizophrenia, first introduced the term ñautismò in 1911. According to Bleuler, autism (from the Greek word *autos* or óselfô) describes how a person detaches from outer reality and immerses in an inner life. Influenced by Freudôs notion of autoeroticism, Bleuler believed that autism was used as a defense mechanism to avoid the conflicts between desires and reality that occur with schizophrenia. According to Bleuler, autism is a fundamental but secondary symptom of schizophrenia (Parnas & Bovet, 1991). His description of autism included a variety of clinical manifestations: social withdrawal, emotional indifference, inappropriate behaviors, and idiosyncratic beliefs and values (Stanghellini, 2001). Bleulerôs work led to years of research about autism and its relation to schizophrenia, but it is often ignored in the context of the current autism definition because of that focus.

While work continued on autism and schizophrenia, it was Austrian Leo Kannerôs adoption and redefinition of the term ñautismò that led to its classification as a distinct disorder that most closely resembles todayôs definition of autism. Kannerôs 1943 article ñAutistic Disturbances of Affective Contactò first published in *Nervous Child* is described as one of the few scientific papers that has stood the test of time and has received an honored place in the history of psychiatry (Rutter, 1985). The article presented case studies of 11 children (eight boys and three girls) under the age of 11, most of whom he had carefully observed since 1938 while working at Johns Hopkins University. Setting the tone for the cases, he says ñthere have come to our attention a number of children whose condition differs so markedly and uniquely from anything reported so far, that each case meritsð and, I hope, will eventually receiveð a detailed consideration of its fascinating peculiaritiesò (Kanner, 1943/1985, p. 11). Following the riveting,

detailed accounts of each childôs case, he notes the emergence of essential common characteristics among all of the children that form a unique syndrome, and who previously would have been diagnosed as schizophrenic or been labeled feebleminded. He stressed that fundamental to this disorder is the childrenôs inability to relate to themselves from the beginning of life, distinguishing it from childhood schizophrenia, which he argued begins after a period of average development. Parental accounts of their children as having always been ñlike a shell,ò ñacting as if people werenôt there,ò and ñacting almost as if hypnotizedò gave rise to Kannerôs thoughts that this syndrome was unlike schizophrenia in children or adults. He stated that this syndrome is different because ñit is not a ówithdrawalô from formerly existing participation. There is from the start an extreme autistic aloneness that, whenever possible, disregards, ignores, shuts out anything that comes to the child from the outsideò (Kanner, 1943/1985, p. 41). In addition to the extreme autistic aloneness, Kanner listed as the universal characteristics the inability to use language for communication, excellent memory, literalness, delayed echolalia (described as parrot-like repetitions of heard word combinations that the child stores and utters at a later time), and monotonous, repetitive motions and behavior. He concluded that these 11 children ñhave come into the world with innate inability to form the usual, biologically provided affective contact with people, just as other children come into the world with innate physical or intellectual handicapsé .For here, we seem to have pure-culture examples of inborn autistic disturbances of affective contactò (p. 50).

In addition to supposing that autism has a biological origin, Kannerôs first publication about autism also introduced a controversial hypothesis for a social environmental cause of autism that supposes cold, emotionless parents are the cause of autism. He noted among the 11 children:

> é there are very few really warmhearted fathers and mothersé .Even some of the happiest marriages are rather cold and formal affairs. Three of the marriages were dismal failures. The question arises whether or to what extent this factor has contributed to the condition of the children. The childrenôs aloneness from the beginning of life makes it difficult to attribute the whole picture exclusively to the type of the early parent relations with our patients (Kanner, 1943/1985, p. 50).

This hypothesis was discussed further in a 1949 publication in which Kanner coined the term ñrefrigerator mother.ò In his memoir, Leon Eisenberg (2001), who trained with Kanner, stated that the concept of an inborn disturbance was not welcome within the field. ñThe rediscovery of the impact of severe maternal deprivation on child development brought psychogenesis to the fore. When Kanner coined the term órefrigerator mother,ô his view of autism became more fashionable; the presumption was that the refrigerator mother produced a frozen childò (p. 745). This hypothesis also received significant and lasting attention among the public thanks to the work of Bruno Bettelheim, a psychoanalyst who published multiple articles in popular magazines as well as his book *The Empty Fortress: Infantile Autism and the Birth of Self*. He suggested that autism develops as a response to extreme negative feelings shown by the parent and likened the response to that of inmates of concentration camps (Rutter, 1968/1985). The ñrefrigerator motherò hypothesis has since been discredited and it is now the belief that what was observed as unusual features in parents of children with autism were due to shared genes (Wolff, 2004).

After his initial publication in 1943, Kanner received much recognition and praise. His name has become synonymous with autism and in addition to his coining the term ñearly infantile autism,ò the disorder was also referred to as ñKannerôs autismò or ñKannerôs

syndrome.ò Researchers credit his superb skill at observing and recording behavior for the reason that his original description has withstood the test of time and scientific review (Donnellan, 1985). It should be noted that around the same time of Kannerôs article, Austrian pediatrician, Hans Asperger described four cases of what he called ñautistic psychopathy.ò He noted that some of these children had extraordinary gifts in math and science, but lacked the ability to form proper social and emotional relationships. Aspergerôs complementary work to Kannerôs did not get the same recognition until 1981, when Lorna Wing published her seminal paper about the pattern of behavior that had been described by Asperger. She called it Aspergerôs syndrome, which is often referred to as high functioning autism. Many believe that Asperger did not receive the same recognition because his work was published in German and not readily available to the English-speaking world (Wing, 2005).

While researchers have regarded Kannerôs original description and terminology over time as accurate and clear, the body of ñautismò research at the time of its publication lacked unifying principles. Edward Ornitz (1973), who reviewed childhood autism in clinical and experimental literature, points out that at least six major diagnostic rubrics were used to describe individuals (specifically young children) with the set of symptoms that we now call autism. Adding to the confusion was Kannerôs decision to use the term ñautismò because of its previous association with schizophrenia. Kanner admits that the decision to use the term ñautismò was done so reluctantly. The following is a lengthy citation, but one of great importance, because it explains why and how he chose to use the term autism:

> All this does not seem to fit in with Bleulerôs criteria for autism. There is not withdrawal in the accepted sense of this word and a specific kind of contact with the external world is a cardinal feature of the illness. Nevertheless, in full recognition of all this, I was unable

> to find a concise expression that would be equally or more suitably applicable. After all, these children do start out in a state that resembles the end result of later-life withdrawal and there is a remoteness at least from the human portion of the external world. An identifying designation appeared to me to be definitely desirable because, as later events proved, there was danger of having this distinct syndrome lumped together with a variety of general categories (Kannerôs unpublished autobiography, as cited by Donnellan, 1985, p. 2).

Kannerôs use of the term ñautismò was indeed confused with Bleulerôs concept of autism as well as others who associated autism with schizophrenia (Ornitz, 1973). In fact, much of the work that followed Kannerôs original publication focused on establishing criteria for separating the diagnosis of autism from a host of other labels for mental impairments (Donnellan, 1985). It was not until 1980 that autism was included as a separate diagnostic condition from childhood schizophrenia in the third version of the American Psychiatric Associationôs (APA) *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-III*), the standard by which mental disorders are diagnosed in the U.S.

Autism: A Distinct Disorder

The journey of the classification of autism as a distinct disorder in the *DSM* illustrates the widespread conflicts, not only in autism research, but in the field of psychiatry as well, which struggled to be recognized as a legitimate discipline within the greater medical discipline. The publication of *DSM-III* in 1980 has been called the most important psychiatric publication to appear between 1970 and 1980 and has been declared to be the most significant factor in promoting the ñremedicalizationò of American psychiatry (Wilson, 1993). The ñremedicalizationò of American psychiatry refers to the shift from a biopsychosocial model

informed by psychoanalysis, sociological thinking and biological knowledge to a research-based medical model, often called a biomedical model. Psychiatrist Arnold Ludwig summarized the general reputation of psychiatry in the 1970s in his essay for the *Journal of American Medical Association*: ñPsychiatry has become a hodgepodge of unscientific opinions, assorted philosophies, and óschools of thought,ô mixed metaphors, role diffusion, propaganda, and politicking for ómental healthô and other esoteric goalsò (p. 603). For autism and its progression in psychiatry, this was the case as well. Kanner reflected in his unpublished memoirs that autism had become quite ñfashionableò amidst the confusion in the field:

> [I]t became a habit to dilute the original concept of infantile autism by diagnosing it in many disparate conditions which show one or another isolated symptom found as a part feature of the overall syndrome. Almost overnight, the country seemed to be populated by a multitude of autistic children, and somehow this trend became noticeable overseas as well. Mentally defective children who displayed bizarre behavior were promptly labeled autisticé . (Donnellan, 1985, p. 3).

Kannerôs reflections illustrate the notion that in the 1950s and 1960s, schizophrenia diagnoses were quite common, and in children, that included autism (Wolff, 2004). These diagnoses continued throughout the 1960s and 1970s because psychiatrists, pediatricians, and general practitioners lacked a unifying language and set of criteria for diagnosis (Rutter, 2005). In 1980, with the help of many biomedical autism experts, the APA added autism to the *DSM-III* as a separate condition from childhood schizophrenia and included six mandatory criteria for diagnosis. The APA included infantile autism as a part of a class of disorders called Pervasive Development Disorders (PDD). The six mandatory criteria for diagnosing infantile autism were listed as follows:

1. Onset before 30 months of age;
2. Pervasive lack of responsiveness to other people;
3. Gross deficits in communication skill;
4. Peculiar speech patterns, if speech is present;
5. Bizarre responses to aspects of the environment; and,
6. Absence of delusions, hallucinations, loosening of associations, and incoherence. (APA, 1980, p. 89).

Despite the monumental accomplishment of establishing these criteria for autism, many felt that the descriptor *infantile* and emphasis on the condition in very young children was problematic because it is a lifelong condition.

Major revisions were undertaken in the *DSM-IIIR*, published in 1987, to address these issues. The APA changed ñinfantile autismò to ñautistic disorderò to reflect that it is a lifelong condition. In the *DSM-IIIR*, the criteria also were expanded to a very detailed list of sixteen (eight of which were required for a diagnosis) to encompass developmental changes that can occur across the lifespan. Age at onset was also dropped as a diagnostic feature. Another category within PDD, called Pervasive Development Disorder-Not Otherwise Specified (PDD-NOS), was added. According to the criteria, PDD-NOS was a diagnosis used when some impairments were observed in social interaction and of verbal and nonverbal communication skills, but the criteria were not met for Autistic Disorder, Schizophrenia, or Schizotypal or Schizoid Personality Disorder (APA, 1987). Child psychiatrist and primary investigator for APA autism research projects Fred Volkmar argued that while the *DSM-IIIR* was an improvement, various studies showed a high rate of false positive cases (Volkmar et al., 1994). He also pointed out that the World Health Organizationôs *International Statistical Classification of Diseases and*

Related Health Problems-10 (*ICD-10*) published in 1992 differed from the *DSM-IIIR* in what was included in the pervasive developmental disorders class. The *ICD-10* included Rett syndrome, Childhood Disintegrative Disorder, and Asperger syndrome within PDD. Volkmar ultimately spearheaded the efforts to conduct a large field trial to better understand the reliability and validity of the criteria in the *ICD-10*, *DSM-III* and *DSM-IIIR* that would address these issues for the next version of the *DSM*.

Volkmar et al. (1994) concluded that the *DSM-IIIR* criteria were associated with more false positive diagnoses and that the *ICD-10* criteria proved the best overall for autism. They recommended that the *DSM-IV* use the *ICD-10* entry for PDD. Published in 1994, the *DSM-IV* expanded its definition and conditions within PDD to reflect that of the *ICD-10*:

> Pervasive Developmental Disorders are characterized by severe and pervasive impairment in several areas of development: reciprocal social interaction skills, communication skills, or the presence of stereotyped behavior, interests, and activities. The qualitative impairments that define these conditions are distinctly deviant relative to the individual's developmental level or mental age. This section contains Autistic Disorder, Rett's Disorder, Childhood Disintegrative Disorder, Asperger's Disorder, and Pervasive Developmental Disorder Not Otherwise Specified. These disorders are usually evident in the first years of life and are often associated with some degree of Mental Retardationé . (APA, 1994, pp. 70-71).

The *DSM-IV* also reflected Lorna Wingôs (1981) idea that autism is actually a spectrum of disorders (Autistic Disorder, Rettôs Disorder, PDD-NOS, Asperger syndrome, etc.) that are related, but vary in severity. Diagnosis depends on which and how many sub-criteria within each of the three major impairments the person has. A person will be diagnosed with autism if he/she

meets at least eight of the *DSM-IV*ôs sub-criteria. A person will be diagnosed with Asperger syndrome if he/she only meets five or six different sub-criteria (APA. 1994). The next revision of the manual, the *DSM-V,* is scheduled for publication in 2012.

The implications of the classification of autism as a distinct disorder are still being debated. From Kannerôs strict criteria for infantile autism, reflected in autismôs first appearance in the *DSM* in 1980, to the current *DSM-IV* definitions, which present autism as a spectrum of disorders that include Asperger syndrome and other developmental disorders, the way autism is diagnosed has certainly changed. Having consistent criteria for diagnosis has enabled scientists to gather better samples of people with autism to conduct surveillance in terms of prevalence as well as research in terms of causes and risk factors. The next two sections will explore how changes in the ways that prevalence has been determined is related to arguments about the causes of autism and will provide a better understanding for the landscape in which the media have framed autism.

Autism Prevalence and Rates

Given the changing definitions and criteria for diagnosing autism or autism spectrum disorder (ASD) as discussed in the previous section, determining its (or their) prevalence has proven to be equally as challenging. Prevalence is the number of cases of a disease or condition among a defined group of people during a specific time period and provides an estimate of the probability that an individual will have the disease or condition at a point in time (Hennekens & Buring, 1987). Prevalence measures are useful for health providers, educators, and policy makers so that the public health impact of a specific disease within a community can be assessed to plan services (for example, education and therapies) for those living with the condition. Also, monitoring a condition in the same way over time allows scientists and researchers to find out whether the prevalence of a disease or condition is increasing, decreasing, or staying the same

(CDC, 2009b). Monitoring or determining prevalence over time to determine if autism or ASDs have been increasing, decreasing or staying the same has proven to be difficult.

The first attempt to determine prevalence of autism and autistic-like conditions in a large population of children living in a defined geographical area began in the mid-1960s with Victor Lotterôs study of eight-to ten-year olds in Middlesex County, England (Wing, 1993). It is important to review this first attempt because it illustrates how the lack of unifying criteria for diagnosing autism has shaped prevalence data and continued to shape prevalence data, which has implications for services and, perhaps, awareness of autism for the public and affected families. Despite the lack of unifying criteria for diagnoses, Lotter felt that determining prevalence would ñproduce data which indicate fruitful directions for further research, as well as providing useful administrative information and permitting the examination of clinical hypothesis,ò (Lotter, 1966/1985, p. 107). Lotter based his case definitions on criteria mainly developed by Kanner. Children were screened using a 22-item behavioral questionnaire that was sent to schools and other agencies who dealt with children in the area. The questionnaire covered speech, movements, social behavior, and repetitive-ritualistic behavior. To increase the thoroughness of his case-findings, he also screened medical, psychological, and educational records of ñhandicappedò children as defined by the Education Act of 1944, which included children who were blind, partially sighted, deaf, partially deaf, ñeducationally subnormal,ò epileptic, physically handicapped, or had speech problems. Within his prevalence rates, Lotter differentiated between the 2.0 per 10,000 that exhibited Kannerôs core criteria and the 2.5 per 10,000 with a less consistent pattern of the criteria. Further, he gave a prevalence of 2.8 per 10,000 for those he called ñnon-autisticò but who exhibited some autistic features. Researchers argue that if these data were analyzed using current ASD criteria, the overall autism prevalence

rate for Lotterôs study would be 7.3 per 10,000 as compared to the 4.5 per 10,000 Lotter reported (Rutter, 2005). This study exemplifies the problems of not having established consistent diagnostic criteria for decades of autism research. Similar problems arose as others attempted to determine prevalence in other populations.

In 1993, Lorna Wing reviewed sixteen studies of the prevalence of autism in defined populations in Europe, the U.S., and Japan and found prevalence rates varied from 3.3 to 16.0 per 10,000. She speculated that differences may have been the result of variations in interpretations of the diagnostic criteria, ñeven if real variations existò (Wing, 1993, p. 71). In fact, for many years, little was known about the prevalence of ASD in the U.S. because only four U.S. population-based studies of autism had been conducted in the 1980s and 1990s (Yeargin-Allsopp et al., 2003). Three of these studies (North Dakota, Utah, and Northern Arkansas) found very low prevalence rates (for example, 4 per 10,000 children). In 1998, the fourth study of prevalence took place in Brick Township, New Jersey, and reported a higher rate than any previous U.S. study. They found that 40 per 10,000 three- to ten-year-old children had autistic disorder. In 1999, Canadian psychiatrist and epidemiologist Eric Fombonne reviewed 23 studies from around the world that were published between 1966 and 1998. His research suggested that the rate for all pervasive developmental disorders was somewhere between 30 and 60 per 10,000 (Fombonne, 1999). From these data, advocacy groups and researchers began using the figure one in 166 as a generalizable number of people with autism, but the data were not U.S. specific. Many believed that these data were evidence that there is an epidemic of autism (Fombonne, 2001). An epidemic is the ñoccurrence of a disease in members of a defined population clearly in excess of the number of cases usually or normally found in that populationò (Friedman, 1980, p. 73). Further claims about the epidemic of autism were based on a report from Californiaôs

Department of Developmental Services (1999) that found between 1987 and 1998, the population of people with autism increased from 4.85 to 9.37 percent. Fombonne examined the methodology used by the California Department of Developmental services and found several problems, including a lack of consideration for changes in diagnostic criteria over time (Fombonne, 2001). To collect data for a more accurate prevalence of autism in the U.S., the Childrenôs Health Act of 2000 authorized the Centers for Disease Control and Prevention (CDC) to create the Autism and Developmental Disabilities Monitoring (ADDM) Network.

According to CDC, the ADDM Network is the largest multisite collaboration to monitor ASDs in the U.S. with the following goals:

- obtain as complete a count as possible of the number of children with ASDs in each project area;
- report comparable, population-based ASD prevalence estimates from different sites and to determine if these rates are changing over time;
- study whether autism is more common among some groups of children than among others; and,
- provide data to characterize those among the ASD population. (CDC, 2009b, p. 8)

Michael Rutter, who has been called the father of British child psychiatry (Pearce, 2005), argued that the difference in all prevalence data reported thus far, including those from around the world, ñclearly demands an explanationò (Rutter, 2005, p. 2). In 2005, he set forth five criteria for determining valid estimates of the incidence or prevalence of ASD:

1. A base population of sufficient size to provide a substantial number of individuals with an ASD (so that the confidence interval will be narrow);

2. A defined epidemiological population that covers all the individuals likely to be at risk for an ASD;
3. Systematic standardized screening of the total population;
4. A focus on an age group for which it is known that diagnostic assessments are reliable and valid; and,
5. Diagnosis by trained professionals using high-quality standardized research assessments. (Rutter, 2005, pp. 2-3).

Using Rutterôs criteria to guide its attempt to determine accurate ASD prevalence in the U.S., the CDC and its ADDM Network published its first report in 2007 that estimated approximately one in 150 eight-year old children living in 14 communities had an ASD in the year 2002.

In their press release for the report in 2007, the CDC stated that the data were consistent with the upper end of prevalence estimates from previously published studies (meaning the one in 166 data), and that some of the communities had an estimate higher than those previously reported (CDC, 2007a). However, CDC director Julie Gerberding stated that CDC was unable to determine if there was a true increase in ASDs. CDC funded 14 states to collect prevalence data through ADDM Network and said that these sites did not make up a nationally representative sample. They cautioned against generalizing rates to every community in the U.S., but stated that the study was designed to provide more consistent and reliable estimates (CDC, 2007b). Case determination was completed in two phases: case ascertainment and clinician review. ADDM investigators screened records at multiple sources that educated, diagnosed, treated, and provided services for children with developmental disabilities and then a panel of clinicians with expertise in identifying and assessing ASDs reviewed the abstracted information. They used the *DSM-IV-TR* definition of autism to determine whether the identified children met the requirements of the

monitoring program and had an ASD (CDC, 2009). The U.S., for the first time, had prevalence data from multiple sites that used the same methodologies and criteria for ASDs. Establishing that one in every 150 children has an ASD using consistent methodology and criteria seemed to be an important milestone in the history of the understanding of autism. In the report, CDC interpreted and framed the data as an indication that ASD prevalence ñis a continuing urgent public health concernò (CDC, 2007b, n.p.). That CDC framed the data as an urgent public health concern would seem to have implications for policy makers and healthcare providers, in terms of funding and providing services for the thousands of children with ASD. It would also stand to reason that it would have implications for the public, especially parents of young children, if it is communicated to them as a real health threat or as an epidemic.

In October of 2009, a report from a study funded by the Health Resources and Services Administration (HRSA) showed an autism prevalence of 110 per 10,000 children aged 3- to 17-years in 2007 (Kogan et al., 2009). Thatôs roughly one in 90 children. However, the prevalence was based on parental reports via a telephone survey. The studyôs authors noted several limitations including lack of clinical validation. Again, interpretation of these data and of the report seems to vary among advocacy groups and the media, but no formal analysis of either has been conducted to date. The HRSA report was followed by the second report from CDC and its ADDM Network, using the same methodology as its 2007 study, and stated that in 2006, approximately 1% or one in every 110 children living in 11 communities had an ASD. The report stated the following in regards to whether an increase could be determined from the 2007 to the 2009 reports:

> The average prevalence of ASDs identified among children aged 8 years increased 57% in 10 sites from the 2002 to the 2006 ADDM surveillance year. Although improved

> ascertainment accounts for some of the prevalence increases documented in the ADDM sites, a true increase in the risk for children to develop ASD symptoms cannot be ruled out. On average, although delays in identification persisted, ASDs were being diagnosed by community professionals at earlier ages in 2006 than in 2002 (CDC, 2009, p.1).

Despite the clarification on whether a true increase can be determined, as CDC states, there is no doubt that more children are being identified and diagnosed with ASD. They stated ñThese results indicate an increased prevalence of identified ASDs among U.S. children aged 8 years and underscore the need to regard ASDs as an urgent public health concernò (CDC, 2009, p. 1). As with their first report, CDC framed the data as an urgent public health concern. Interpretation of these data and of the report which frames the data as an urgent public health concern among various sources seems to vary among advocacy groups and the media, but no formal analysis of either has been conducted to date. How the public, policy makers, and healthcare providers interpret the prevalence data and perceive ASD as a health risk is important to analyze, but the first step is to understand how prevalence data are being framed by the media. How the media interpret and frame autism prevalence data can influence public perception of autism as well as the potential causes of autism. For example, if the media frame autism as an epidemic, it can potentially affect government policies and funding for funding autism research and services. Or, if the media present information that suggests that autism prevalence has increased over the same years that the number of required vaccinations have increased, then the argument for a vaccination-autism connection is strengthened, despite the lack of scientific evidence to support that claim. The next section explores the research that has been conducted about potential causes and risk factors.

Autism Causes of and Risk Factors

There has been research into the causes of autism, yet, it seems there is more controversy than conclusion (Donnellan, 1985). One of the most controversial hypotheses early in the history of autism research was around the cause of autism was the ñrefrigerator mother.ò As mentioned in a previous section, Kanner supposed that autism had a biological origin, but he also posited in his 1943 article that cold, emotionless parents could cause autism. Fombonne (2003) points out that Kannerôs observations could have indicated that there is a genetic cause, but the predominance of psychoanalytical theories and the concentration on maternal deprivation in post-World War II child psychiatry led to the ñrefrigerator motherò hypothesis that was perpetuated by Bettelheim. In 1964, research psychologist and father of a son with autism, Bernard Rimland, directly attacked the hypothesis with his book *Infantile Autism*. This sentinel publication laid the theory to rest ñso persuasively that no serious behavioral scientist has raised it againò (Donnellan, 1985, p. 5). Point for point, he reviewed the arguments for the psychogenic or emotional causes of autism and contended that the hypothesis lacked evidence-based scientific rigor: ñWe are not saying that psychogenesis is an imaginary influence, we are merely saying that there appears to be no evidence that it is anything but imaginaryò (Rimland, 1964/1985, pp. 91-92). He pointed to the numerous cases of attentive parents who had children with autism and the non-attentive parents who did not have children with autism. He also made the case for biological causation noting that ñthere are a number of points of information which support the hypothesis that autism may result from a rare recessive trait, or be otherwise determined by biological factorsò (Rimland, 1964/1985, p. 92). Among the nine points were two that suggested a genetic component: high sex ratio (three or four boys for every girl) and twins with autism. His

arguments have held the test of time and are regarded as the foundation for biological research in autism (Holmes, 1985).

The research that has been conducted to determine the causes of and risk factors for autism beyond emotional factors is vast and this review will try to cover them as succinctly as possible. That it appears autism prevalence has been increasing (whether it is a true increase or due to better diagnoses) has generated many hypotheses about the causes. Scientists are clearly not certain about what causes ASD, but it is likely that both genetics and environment play a role (National Institutes of Health, 2009). Regarding genes, twin studies, sibling studies, and other family studies establish that a genetic susceptibility exists (Newschaffer et al., 2007). Research is underway to identify specific autism risk genes; to date more than 100 genes have been studied for their association with ASDs. According to an autism fact sheet from the National Institutes of Health (NIH) (2009), studies of people with ASD have found irregularities in certain regions of the brain and other studies suggest that people with ASD have abnormal levels of serotonin or other neurotransmitters in the brain. All of this suggests that ASD ñcould result from the disruption of normal brain development early in fetal development caused by defects in genes that control brain growth and that regulate how brain cells communicate with each other, possibly due to the influence of environmental factors on gene functionò (NIH, 2009, n.p.). Prenatal exposure to viruses such as cytomegalovirus and rubella have been linked to autism, but most scientists agree that viral exposure is unlikely to account for all of the cases of autism (Newschaffer et al., 2007). Three medications have been identified as potential autism risk factors when given during pregnancy: thalidomide, prescribed in the 1950s and 1960s for morning sickness and anxiety; valproic acid, an anti-epileptic drug that is also used for bipolar

disorder and schizophrenia; and, misoprostol, which is used for labor-induced abortion and related to ASD among survivors of the procedure (Newschaffer et al., 2007).

Some of the most controversial hypotheses about causes have concentrated on demonstrating a link between vaccines and autism. As previously mentioned, Wakefield et al. (1998) reported in *The Lancet* that the parents of 8 of 12 children with ASD and bowel symptoms who were examined had the onset of behavioral symptoms within a mean interval of 6.3 days after receiving an MMR vaccine. Although the study never claimed to have definitively proven a link between the MMR vaccine and autism, Wakefieldôs interviews with the media sensationalized the study and seemed to ignite a public panic in Britain. The media coverage of this story and its effects will be discussed further in Chapter 2. Following the studyôs release and media hype, concerns about the study emerged. The reliability and validity of the study was criticized because ñthere were no controls and no case validationò (Taylor, 2006, p. 515). Despite the criticism, some parents and researchers remained concerned about the possible link. In the U.S., the CDC and NIH engaged the Institute of Medicine (IOM) to examine the hypothesized MMR-autism link and address other vaccine-safety issues ñin order to give some guidance to themselves, health care providers, researchers, and a concerned publicò (IOM, 2001, p. 1). In 2001, the IOM concluded that ñThe evidence favors rejection of a causal relationship at the population level between MMR vaccine and autistic spectrum disordersé .A consistent body of epidemiological evidence shows no association at a population level between MMR and ASDò (IOM, 2001, p. 2). In 2004, 10 of Wakefield's 13 co-authors disavowed the findings of the 1998 study. In February of 2010, *The Lancet* retracted the story following the finding of the British General Medical Council that said Wakefield and two colleagues acted dishonestly and irresponsibly in conducting their research (DeNoon, 2010).

The second controversial vaccine-autism link hypothesis centers around thimerosal, the mercury-based preservative that was used in some vaccines. In 1997, Congressman Frank Pallone attached an amendment to a U.S. Food and Drug Administration (FDA) reauthorization bill which gave the FDA two years to compile a list of drugs and foods that contained intentionally introduced mercury compounds (Offit, 2008b). The FDA asked for food and drug makers to list the amount of mercury in their products. The analysis of the compiled data found that by six months of age, infants could receive as much as 75 micrograms of mercury from the preservative thimerosal used in various vaccines. Environmental mercury or methylmercury has been shown to cause serious damage to the nervous system and the Environmental Protection Agency (EPA) has safety guidelines for it (Offit, 2008b). However, thimerosal contains ethylmercury. Unlike methylmercury, ethylmercury does not accumulate in the body or the brain and is metabolized and cleared by the body (Miller & Reynolds, 2009). But, the EPA, the Agency for Toxic Substances Disease Registry, and the World Health Organization do not have standard safety guidelines for ethylmercury (Offit, 2008b). Having no guidelines, the FDA used methylmercury-based standards to recommend that thimerosal be removed from routine infant vaccines in the U.S. The CDC and the American Academy of Pediatrics promptly released a joint statement on July 9, 1999 stating that while there was no evidence that thimerosal had caused any harm, the groups agreed that vaccines containing thimerosal should be removed given the concerns raised by EPAôs guidelines (Baker, 2008). The effort to remove thimerosal from vaccines was largely complete by the summer of 2001. IOM was asked to review the hypothesis that thimerosal-containing vaccines caused autism, adding to their previous charge to look at the MMR vaccine link. In 2004, the IOM released their report stating that they had reviewed the published and unpublished epidemiological studies regarding of potential biologic

mechanisms by which immunizations might cause autism. The committee concluded that ñthe body of epidemiological evidence favors rejection of a causal relationship between the MMR vaccine and autism. The committee also concludes that the body of epidemiological evidence favors rejection of a causal relationship between thimerosal-containing vaccines and autism. The committee further finds that potential biological mechanisms for vaccine-induced autism that have been generated to date are theoretical onlyò (IOM, 2004, p.1). Despite the IOMôs reports and the lack of scientific literature demonstrating a link between autism and vaccines, the controversy seems to persist especially among some communities of parents of children with autism and organizations promoting cures for autism (Baker, 2008).

Currently, organizations such as Generation Rescue (2010, n.p.), which is led by entertainer Jenny McCarthy, question the number and contents of vaccines given to children:

> Parents should know that vaccines are never tested for their "combination risk", despite the fact that children may get as many as 6 vaccines in a single visit to the doctor. And, when it comes to vaccines, how can it be possible that one size fits all? What may present as no risks for one child may present enormous risks for anotheré Many vaccines contain other toxic substances including ethylene glycol (antifreeze), phenol (a disinfectant dye), benzethonium chloride (a disinfectant), formaldehyde (a preservative and disinfectant), and aluminum (another known neuro-toxin).

The number of shots a child may receive by age two has indeed increased from 11 in 1983 to as many as 23 (CDC, 2010). Furthermore, a child might receive up to six shots during one visit to the doctor. According to CDC,

> The available scientific data show that simultaneous vaccination with multiple vaccines has no adverse effect on the normal childhood immune system. A number of studies have

> been conducted to examine the effects of giving various combinations of vaccines simultaneously. These studies have shown that the recommended vaccines are as effective in combination as they are individually, and that such combinations carry no greater risk for adverse side effects. (CDC, 2010, n.p.).

Thus, despite the preponderance of scientific data to the contrary, the autism-vaccine debate continues. Baker (2008) argued that parents and clinicians ñwho have framed autism in biomedical terms (such as immune or gastrointestinal dysfunction) have been critical agents in promoting both the concept of the óautism epidemicô and the primacy of vaccines as its causeò (p. 248).

Framing autism as an epidemic can potentially affect government policies and for funding autism research and services. In simple terms, the bigger a problem it is perceived to be, the more government funding it generally receives. In December of 2006, President George W. Bush signed The Combating Autism Act, which authorized nearly one billion dollars in expenditures, over five years beginning in 2007, for autism research, screening, education, and early intervention. Framing vaccines as the cause of autism can potentially result in public health crises: 1 in 4 parents believe that vaccines cause autism and the number of measles cases reported in 2008 were the highest since 1996 due to parents not vaccinating their children. While some parents and advocacy groups have framed autism as an epidemic and caused by vaccines, it is important to point out that no authoritative government agency such as the CDC or healthcare provider organization such as the American Academy of Pediatricians has framed it in those terms. Parents, government agencies, healthcare provider organizations, and advocacy groups have certainly contributed the public discourse on a variety of autism issues including causes and prevalence. Considering the mediaôs effect on the decline of MMR vaccines in Britain (Lewsi &

Speers, 2003) and the recent survey reporting that 1 in 4 U.S. parents believe vaccines cause autism, 81% of whom reported that they had heard or read about problems with the MMR vaccine (Freed et al., 2010), this investigation seeks to understand the mediaôs contribution to the public discourse on autism-related issues such as causes and prevalence. The next chapter focuses on the analysis of mass media coverage of these autism topics thus far and the theoretical grounding for that research and this thesis: agenda setting theory and framing theory.

CHAPTER 2

THEORETICAL FRAMEWORK: AGENDA SETTING AND FRAMING

In order to examine the mass mediaôs contribution to the public discourse on autism-related issues such as causes and prevalence, it is important to understand the theoretical background that explains how mass media can influence public discourse. Agenda-setting theory provides a nice framework to understand how through the selection of news stories, news directors focus the publicôs attention on some issues more than others and influence perceptions of what are the most important issues. A related communication concept, framing, will be used to explain how the mass media promote a particular definition of an issue through selection, emphasis, exclusion, and elaboration. Current research related to mass media coverage of autism is also discussed to demonstrate what is currently known about how media frame autism and illustrate the gaps in knowledge around this specific topic that this thesis aims to fill.

Agenda-Setting

Decades of research on the long-term implications of journalism show that media audiences not only learn factual information from exposure to news, but that people also learn about the importance of topics in the news based on what topics the media covers. Cohen (1963) observed that the news media do not tell people what to think, instead they tell people what to think about. The ability to influence the importance or salience of topics on the public agenda is called the agenda-setting role of the media (McCombs, 2004). Maxwell McCombs (2004), one of the founding fathers of agenda-setting theory, explains that for all news media, the repetition of a topic on a daily basis is the most powerful message of all about its importance. Newspapers provide cues about the importance or salience of the topics on their daily agenda with their decisions on the lead story, the size of a headline, and the length of a story while television news

media provide cues by merely mentioning an issue in their broadcast because of the format as well as placement in the broadcast and by the amount of time spent on the story. McCombs (2004) explains how these salience cues affect the public: ñEstablishing salience among the public, placing an issue or topic on the public agenda so that it becomes the focus of public attention and thought ï and, possibly, action ï is the initial stage in the formation of public opinion.ò (p. 2). In terms of story length, the typical evening news segment runs, on average, between one-and-a-half to two minutes and may be extended for important news items (Watkins, 2001). Regarding placement, issues or news items perceived as the most important for that day are typically the lead story. ñHardò news items are generally presented near the beginning of the broadcast. According to Jamieson and Campbell (1997), ñhard news is the report of an event that happened or that was disclosed within the previous twenty-four hours and treats an issue of ongoing concernò (p. 40). ñSoftò news items are placed near the end and tend to address more human interest stories and may include more humorous or novel stories (Watkins, 2001).

Most of McCombsô research, as well as that of others who used agenda-setting theory to explain media effects, has focused on the mediaôs role in emphasizing political issues and subsequent voter behavior and political attitudes. But within the last 20 years, more agenda-setting researchers have been examining other issues, such as health-related behaviors and perceptions (Ogata Jones, Denham, & Sprinston, 2006). These include the agenda setting role of the media regarding smoking (Sato, 2003), health care reform (Hacker, 1996), AIDS policy (Backstrom & Robins, 1998), and breast cancer screening (Ogata Jones et al., 2006).

Given that many journal articles are published every month with research findings that have the potential to impact the publicôs health, and many organizations promote and advocate for thousands of health conditions, how do the media decide which journal articles or health

issues are newsworthy? This question is of particular interest for this study. In a recent survey of health and medical science reporters and editors, Viswanath et al. (2008) found that the initial idea for a health-related story most often originates from a news source suggestion. A news source is defined as ña person with whom the reporter is frequently in contact with to obtain informationò (p.769). Reporters also named resources such as press conferences or press releases and wire service items as generators of initial ideas. There were differences among reporters depending on their reach (national versus local) and medium (broadcast vs. print). National news reporters said they most often get their initial idea for a story from scientific journals; local news reporters said they rely most on suggestions from a source. Broadcast news journalists reported that they rely on a suggestion by a source or wire services more often than print reporters. Regarding news sources, national reporters mentioned using scientists and researchers most often. Broadcast journalists were significantly more likely to report using scientific journals for their initial ideas compared with print reporters. Broadcast journalists said that potential for public impact, new information and development, and ability to provide human interest were the most important criteria for determining newsworthiness. For the purposes of this research, which seeks to investigate television broadcast news, it is important to note that these three criteria were rated significantly higher for broadcast journalists than print reporters. This suggests that broadcast stories related to autism might differ from print stories, which have been the primary focus of previous research on media coverage of autism. Studies of how reporters ñdecideò what is news and how they ñconstructò news can be helpful in the understanding of the agenda-setting role of the media and provides a transition for a discussion in the next section on another communication concept: framing.

Framing and Second-Level Agenda Setting

That broadcast journalists determine newsworthiness of a health topic based on its potential for public impact, new information and development, and ability to provide human interest is not surprising because journalism is grounded in storytelling and is constructed as such. Walter Lippmannôs opening chapter of *Public Opinion* argued that public opinion responds not to the environment, but to the pseudoenvironment constructed by the news media (McCombs & Reynolds, 2002). He also argued that the news media are a primary source of the pictures in our heads (McCombs, 2004). Both of Lippmannôs arguments speak to the process by which the mediaôs stories are told and organized in addition to the mediaôs role in agenda-setting. Agenda-setting theory researchers have proposed that media messages contain an agenda of both objects and attributes. In the context of politics, objects are equivalent to issues or candidates and attributes are properties associated with the objects. For this study, the object or the issue is autism and the attributes include the controversy about what causes autism, the vaccine-autism hypothesis and the characterization that autism is increasing. McCombs and Ghanem (2003) argue that the objects and attributes presented in media vary in salience or importanceð that isð the media present some objects, such as autism, and attributes, such as the controversy related to vaccines causing autism as more important for the public than other attributes. Further, McCombs and Ghanem suggest that agenda setting has two levels: the first level is the transmission of object salience from the mass mediaôs pictures of the world to those in our heads; the second level is the transmission of attribute salience. This second level, attribute agenda setting, illustrates that in addition to the media telling us what to think about, they also tell us how to think about some objects. McCombs (2003) suggests that this is actually what other scholars refer to as framing and that framing is a dimension of agenda-setting.

McCombs (2004) defines framing as the central organizing idea for news content that supplies a context and suggests what the issue is through the use of selection, emphasis, exclusion and elaboration. Other scholars, such as Entman (1993), state that framing occurs when the media select certain aspects of a topic and make them more salient in a communicating text, in such a way as to promote a particular problem. Both, it seems, have similar definitions for framing. However, Entman (1993) adds that frames have at least four locations in the communication process: the communicator, the text, the receiver, and the culture. According to Maher (2003), framing scholarship concentrates on the communicatorôs framing or the journalistôs framing of the text and agenda-setting scholarship focuses on the transfer of framing salience between the text and the receiver (the public).

While many scholars have debated the differences, researchers from both traditions are recognizing their common ground and see advantages to using both frameworks: agenda-setting studies are increasingly measuring the transfer of framing from media to public and framing studies are increasingly measuring audience effects (Maher, 2003). For the purposes of this study, agenda-setting theory provides the framework for which to examine autism as a topic covered by the media. Has coverage increased over time? Is its placement in evening news broadcasts prominent? How much time do broadcasts devote to covering autism? Framing provides the lens for exploring how the media covers autism and related issues: causes and prevalence. According to Entman (1991, p.9), ñthe essence of framing is sizingð magnifying or shrinking elements of the depicted reality to make them more or less salient.ò Further, he says that in texts such as evening news broadcasts, frames ñare manifested by the presence or absence of keywords, stock phrases, stereotyped images, sources of information, and sentences that provide thematically reinforcing clusters of facts or judgmentsò (Entman, 1993, p. 52). Another

important concept described in the framing literature that is important for this study is the applicability effect. Applicability refers to the audienceôs acceptance that two concepts are related after exposure to a media message that suggests there is a connection between two concepts (Scheufele & Tewksbury, 2007). This effect is especially relevant for this study when considering whether the media have framed autism as potentially caused by vaccines and/or as an epidemic because of the potential public health implications associated with these frames. Before testing for audience effects, however, it is important to know how often the media connect autism with both vaccines and epidemics.

Like agenda-setting, much of the research related to framing has been conducted with political media coverage, but it has been used to better understand the role of media portrayals of a few health contexts (e.g., health reform, organ donation, breast cancer). Similar to the framing of other social issues such as poverty and crime, research on the framing of public health issues has shown once a health problem is discussed in the public sphere, responsibility for the health problem is a main focus (Lawrence, 2004). The discussion of who or what is responsible for the health problem can influence public opinion and policies. Nathanson (1999) adds that public health policies are adopted in response to perceived danger and identifies dimensions of how public health risks are framed for those purposes:

> In any given case, risks may be portrayed as acquired deliberately or involuntarily (and the victims as correspondingly culpable or innocent), as universal (putting us all at risk) or as particular (only putting them at risk), as arising from within the individual or from the environment, as visible or invisible. The most acceptable risks are universal, are attributable to the external environment, and are incurred involuntarily by innocent victims. (p. 446).

This is particularly important when thinking about the framing of autism. If the media frames autism as an epidemic, then that would imply that more children could be at risk than previously thoughtð that it is, in a sense, universal (depending on the mediaôs and the publicôs definition of an epidemic). If the media portray autism as caused by vaccines or emphasize the connection between autism and vaccines, then that would mean that autism is incurred involuntarily by innocent victims because many state governments mandate vaccinations: i.e., there is someone or something to blame. However, the general consensus among the scientific community around the causes of autism is that both genetics and something in the environment play a role (National Institutes of Health, 2009). The focus on genetics may not resonate as well with parents because it suggests that they (or their genes) play a roleð or that the parents are somehow to blame, which harkens back to the time of the ñrefrigerator motherò hypothesis. For the media, it seems that the autism-vaccine debate has set up a dramatic storyline ripe with just enough controversy worthy of reporting, regardless of the overwhelming scientific evidence that vaccines do not cause autism. Explaining the role of genetics may be too difficult for reporters and for the media audience because they are complicated scientific topics. Emphasizing the potential role of vaccines may be easier because the government requires most children to be vaccinated, which affects most parents and would mean that more parents would be engaged by a story of this nature. The next section will focus on the current literature related to both how autism has been framed by the media and the impact of the mass media coverage of autism on public perceptions and behaviors.

Mass Media Coverage of Autism

Interest in the analysis of news media coverage related to autism started when scientists and others began to see the impact of the previously mentioned Wakefield study in the *Lancet*. In

1998, the *Lancet* journal article presented findings that demonstrated a potential link between the measles virus and autism, suggesting that the vaccine for measles, mumps, and rubella (MMR) caused autism. After Wakefieldôs study was published in 1998, MMR vaccination rates in Britain fell from a high of 92% to below 80% in 2003 (Lewis & Speers, 2003). Attempts to explain the fall of vaccination rates point to the mediaôs coverage of the issue. Lewis and Speers (2003) conducted a content analysis of British print, television, and radio news coverage of the controversy from January to September 2002. The analysis revealed that 69% of MMR stories focused on a link between the MMR vaccine and autism and 58% of MMR stories mentioned Wakefieldôs proposal for three single vaccines. Despite the large body of scientific evidence that disputes Wakefieldôs findings, research indicating the safety of MMR was featured in only 37% of stories. Lewis and Speers observed that the MMR vaccine became controversial during this time period (January through September, 2002) because a BBC television program *Panorama*, aired a broadcast titled ñHow safe is MMRò on February 3, 2002, taking up Wakefieldôs theory regarding the MMR vaccine. Wakefield and other colleagues also pre-published a paper in *Molecular Pathology* that was made available when this broadcast aired. Reporting of a measles outbreak in a middle-class London suburb also highlighted the controversy during this period of time. Lewis and Speers note that this was not the first time the MMR vaccine had been under media scrutiny (i.e., 1998), but that these events threw the vaccine back into the public spotlight in 2002. To better understand whether a media agenda-setting effect was in play, Lewis and Speers (2003) supplemented their content analysis with two national surveys of British adults. Their surveys examined whether the general public was able to recall the dominant themes and overall frameworks of autism news coverage. In both surveys, two-thirds of the respondents (67%) indicated an awareness of the research showing that the MMR vaccine was unsafe and

recalled that autism was the focus of the research. Fewer than one in every four respondents were aware that the majority of scientific evidence shows no link between MMR and autism. The authors noted that the negative media attention and decline in public confidence in the MMR vaccine seemed largely a British phenomenon. This attention to analysis of British media coverage and effects related to autism and the MMR vaccine provides a starting point from which researchers began to examine media coverage related to autism in the U.S.

In 2007, one of the few analyses of autism and the media in the U.S. examined autism topics covered by the media from 1994 to 2004 and compared them to the autism topics covered in the scientific literature and the autism topics that were receiving funding (Singh et al., 2007). Brain and behavior research was identified as a main focus of new grants in autism research in all samples examined from the U.S., Canada, and Britain (42% of the total grants) and as a main focus in the scientific peer-reviewed literature (41% of papers). In stark contrast, brain and behavior research accounted for merely 11% of articles about autism research in major international print media in those same countries. The studyôs authors also noted a paradox in coverage of genetics research. Genetics research was identified as the second most frequently identified category of new grants in autism research and represented 34% of the focus of the scientific peer-reviewed literature. However, genetics research accounted for only 7% of the print press articles. The greatest paradox identified by the study was that the mediaôs intense focus on environmental causes and epidemiology research (48% of media articles) far exceeded research grants (7%) and scientific peer-reviewed literature (13%). Singh et al. (2007) found that this disproportionate reporting correlated with the high coverage of the Wakefield study. Among all media articles with an environmental focus, 70% discussed the MMR vaccine and 40% referred directly to the Wakefield study. Singh et al. (2007) point out that the media coverage of

MMR can be viewed as a ñreasonable reflection of the issues deemed most important by the publicé it could be argued that it is the funding agencies that are out of step: media coverage of autism based on the controversy of MMR not only stimulated awareness of autism but also highlighted the need for additional research in the causes and treatments of this disorderò (p. 158).

At the very least, the Singh et al. (2007) case study demonstrates that priorities of media, science, and government can diverge, at least in terms of autism. The authors argue that this in turn leaves the scientific community and government agencies at odds with the media in terms of the perception of scientific data, which can ultimately influence public perception. The authors conclude that their perspective is limited by several factors, including that their study did not account for the television coverage of the issue, in which the stories of advocacy groups, families, and celebrities are able to be told in a more captivating audio-visual format. Despite its limitations, this research contributes to the small growing body of autism-related media coverage analysis in that it highlights the importance of examining how media choose what is newsworthy as it relates to autism research.

Clarke (2008) analyzed major national newspaper coverage of the autism-vaccine controversy from February 1998 to June 2006 in Britain and the U.S. to better understand how the media frames and ñbalancesò the presentation of findings and coverage of the debate. Among the most noteworthy of the studyôs findings was the coverage pattern of the controversy: relatively low coverage from 1998-2000, increased attention from 2001-2002, falling coverage in 2003, a spike in articles in 2004, and a steady decline in 2005 and 2006. Clarke found the increased attention to those studies showing a link between autism and vaccines from 2001-2002 and 2004 among British newspapers especially troubling because it was a time when the

scientific consensus refuting vaccines was strengthened. According to the article, studies/claims refuting that vaccines cause autism were significantly more likely to appear in newspapers from the U.S. (41%) than in British newspapers (10%). Furthermore, newspapers from the U.S. did not devote significant attention to studies/claims that vaccines cause autism by themselves in any single year analyzed. In contrast, U.S. newspapers were far more likely to devote significant attention to studies/claims refuting that vaccines cause autism by themselves, especially in 2002 and 2004-2006.

While the analysis of news media coverage related to autism has provided some insights, it does not provide a complete picture of their contribution to the public discourse on the issue. Most analyses focus on print media coverage and/or coverage of the MMR vaccine controversy in Britain. The MMR vaccine and autism media coverage in Britain and the subsequent decline in vaccination rates demonstrate the power of the mass media to contribute to potential public health crises. Given that 1 in 4 parents surveyed in the U.S. believe vaccines cause autism (Freed et al., 2010) warrants further examination of how the U.S. media have framed the hypothesis along with potential causes that have received more scientific confirmation. As demonstrated in Chapter 1, there are other issues that have potentially shaped the publicôs understanding of autism; how the media interpret and frame autism prevalence data can influence public perception of autism as well as the potential causes of autism. For example, if the media frame autism as an epidemic, it can potentially affect government policies and funding for funding autism research and services.

Research Questions

As noted in the literature review, television news media provide cues of an issueôs importance by placement in the broadcast and by the amount of time spent on the story.

Therefore, the first set of research questions were designed to capture the salience of autism related news stories.

RQ 1a: Did the frequency of autism-related television evening news stories increase, decrease, or remain relatively stable during the study period?

RQ 1b: Did the placement of autism-related television evening news stories become more prominent, less prominent, or remain relatively the same during the study period?

RQ 1c: Were there significant differences in the frequency of autism-related stories between the networks (ABC, CBS, or NBC) regarding length of story as well as placement?

As noted in the literature review, scientists are not certain about what causes autism, but agree that it is likely that both genetics and environment play a role. Some of the most controversial hypotheses about causes have concentrated on demonstrating a link between vaccines and autism. Therefore, this second set of research questions were designed to understand which hypotheses and research about potential causes have received the most coverage and how the causes were framed.

RQ 2a: How frequently did autism-related television evening news stories mention or focus on potential causes during the study period?

RQ 2b: What causes were addressed the most frequently?

RQ 2c: When an autism-related story included one cause, how frequently were other causes also discussed?

RQ 2d: How frequently was each cause presented as 1) likely to cause autism, 2) unlikely to cause autism, and 3) a potential cause, but with the suggestion that more information is needed to determine if it causes autism?

RQ 2e: Did the framing of vaccines as a likely cause of autism increase, decrease, or remain relatively stable during the study period?

RQ 2f: Were there significant differences in the frequency of vaccine-related autism stories between the networks (ABC, CBS, or NBC) during the study period?

RQ 2g: Were there significant differences in the frequency that the networks (ABC, CBS, or NBC) framed vaccines as a likely cause of autism?

As noted in the literature, how the media interpret and frame autism prevalence data can influence public perception of autism as well as the potential causes of autism. For example, if the media frame autism as an epidemic, then it can potentially affect government policies and funding for funding autism research and services. Therefore, the third set of research questions were designed to examine what prevalence numbers, rates, or statistics the media used in describing the number of people with autism, when they were used, and how they were framed (e.g., as increasing, representing an epidemic or a public health concern).

RQ 3a: What prevalence/rates of autism were cited each year?

RQ 3b: How frequently did television evening news coverage suggest that autism prevalence is increasing?

RQ 3c: How frequently was autism framed as an ñepidemicò in television evening news during the study period?

RQ 3d: How frequently was autism framed as a ñpublic health concernò in television evening news during the study period?

RQ 3e: Were there significant differences in the frequency that the networks (ABC, CBS, or NBC) framed autism as increasing, an ñepidemic,ò or a ñpublic health concern?ò

The fourth set of research questions were designed to examine who the media interviewed in news stories, and more specifically, who the media interviewed about causes and the hypothesis regarding vaccines causing autism. Although journalists sometimes are eyewitnesses to events, they tell stories primarily through sources rather than through their own observations (Singer & Endreny, 1993). According to Singer and Endreny (1993), journalists select individuals to interview for a story based on who has authoritative personal knowledge regarding an event and factors such as availability or access and suitability or newsworthiness. Journalists ultimately decide which interviews and material from those they have interviewed are incorporated into their news report. Examining who the media interviews, specifically about cause and the hypothesis regarding vaccines causing autism, can help understand how these issues are framed for the public. As noted in the literature review, despite the IOMôs reports and the lack of scientific literature demonstrating a link between autism and vaccines, the idea that vaccines causes autism seems to persist especially among certain communities of parents of children with autism (Baker, 2008). If the media consistently interviews parents who believe that vaccines cause autism and medical experts from the government or health professional organizations who say vaccines are safe, then this could be viewed as framing the issue as parents versus the government or the medical establishment for the public. The audience is left having to decide whether they find information from parents or the medical establishment/government more believable or credible based on interviews.

RQ 4a: Who was most frequently interviewed in autism-related stories in television evening news during the study period?

RQ 4b: Who most frequently was interviewed in stories that mentioned or focused on potential autism causes of autism in television evening news during the study period?

RQ 4c: Who was most frequently interviewed about vaccines in television evening news during the study period?

RQ 4d: Of those interviewed about vaccines, which categories of people were presented most frequently as making a case for vaccines as a cause for autism and most frequently making a case against vaccines as a cause of autism.

CHAPTER 3

METHODS

As indicated in the literature review, a recent survey conducted by Pew (2008) showed that 29% of respondents reported watching nightly network news. That is up slightly from the 2006 report showing 28% watched nightly network news. An equal number of respondents reported watching either NBCôs *Nightly News* or ABCôs *World News Tonight* (14% each) and 8% reported watching the CBS *Evening News*. Therefore, this study examined the content of television evening news broadcast from the largest networks: ABC, NBC, and CBS. Content analysis involves examining texts to understand what they mean to people, what they enable or prevent, and what the information presented to them does (Krippendorff, 2004). Content analysis of health-related messages has proven to be a useful tool for those researchers within communication and health fields especially for research that seeks to draw implications for audience effects (Kunkel, 2009).

Selection of Broadcast Transcripts

The news reports were selected through a *LexisNexis Academic Universe* search for the words ñautismò and ñautisticò in the headline of the broadcast transcripts section between January 1994, when autism was recognized as a spectrum of disorders in the *DSM-IV*, to April 2010, the time of this study. The primary goal of this study was to understand the frequency and prominence of autism-related stories throughout the study period and how autism prevalence and causes were framed. Only stories that had ñautismò or ñautisticò in their headline were analyzed (*N*=121). The focus of this study was to examine stories that have the greatest potential to impact public opinion about autism, which is more likely to happen when autism is the primary focus of

a news piece, and identified as such through a headline, than when autism is briefly mentioned within a news story.

To test accuracy of search results, the data obtained from *LexisNexis Academic Universe* were compared with the search results from the Vanderbilt Television News Archive. This archive contains recordings and summaries of U.S. television news broadcasts from 1968 to the present time. The Vanderbilt Television News Archive also provides an entire listing of all stories appearing during a specific broadcast and the order in which they appear as well as the amount of time spent on each storyð both of which are important for determining saliency, according to McCombs (2004), but neither of which were accessible through the transcripts provided by *LexisNexis Academic Universe*. Thus, both sources were used. Because the Vanderbilt Television News Archive provides the most extensive and complete archive of television news, it was considered the standard by which additional searches were conducted in *LexisNexis Academic Universe* to find transcripts that did not show up in the initial search. An initial search of *LexisNexis Academic Universe* for ñautismò and ñautisticò in the headline from January 1994 to January 2010 yielded 81 stories. In order to capture stories occurring after January 2010 that may have acknowledged the Lancetôs retraction of the initial Wakefield et al. study linking autism to vaccines on February 2, 2010, the study period was expanded from January 1994 to April 1, 2010. Cross-referencing the stories with the Vanderbilt Television News Archive and expanding the study period from January 1994 to April 2010 yielded 121 autism-related stories. Thus, the use of both sources ensured that more stories focusing on autism in television evening news coverage were captured and analyzed.

Coding Procedure

Each news broadcast story served as the unit of analysis for this study and the following variables were coded within each autism news story (see Appendix A for the Content Analysis Codebook and Appendix B for the Content Analysis Coding Sheet):

Prominence of autism-related stories. McCombs (2004) argued that television news media provide cues about the importance or salience of the topics by the placement in the broadcast and by the amount of time spent on the story. This study examined whether the placement of autism-related stories has increased, decreased, or stayed the same during the study period by coding each story as the lead story, before the first commercial or lead story after the first commercial, last story, or other (defined as placement anywhere not included in the other choices). This study also examined the length of autism-related stories during the study period by coding the duration in 30-second intervals.

Causes of and risk factors for autism. Given the controversial nature of the research on causes of autism, it is important to understand which hypotheses and research have received the most coverage. Stories that included causes were coded as either mentioned in the story (but not the main focus) or coded as the main focus of the story. If causes were either mentioned or the main focus of the story, then each potential cause or risk factor (below) was coded as not included, mentioned, or as the main focus of the story. The following potential causes were coded:

- Genetics or genesð Stories suggesting genes or genetic causes may include the words ñfamily history,ò genes from mother or father, and/or twins or siblings. These stories could also include the identification of ñriskò genes or genes that have been identified by scientist as increasing the risk for autism.

- Brain/Neurological Irregularitiesð Stories that suggest that irregularities in regions of the brain is a cause of autism. This may also include mention of abnormal levels of serotonin or other neurotransmitters as a cause of autism.
- Prenatal Exposure to Virusesð This is defined as prenatal exposure to viruses as a cause of autism. Some viruses that may be mentioned such as cytomegalovirus or CMV and rubella.
- Medicationsð This may include medications such as, but not limited to thalidomide, valproic acid, and misoprostol as potential causes of autism.
- Vaccinesð This includes vaccines, such as, but not limited to, the vaccine for Measles, Mumps, and Rubella or MMR; thimerosal, a preservative in vaccines; and/or the number of vaccines given as a cause of autism.
- Environmentð This may include something in the environment that can cause autism. This includes using the word ñenvironmentalò or ñenvironmentò and/or toxins, chemicals, pollutants or pesticides.
- Otherð Other is defined as a cause or potential cause of autism this was not mentioned above. The coder was asked to write in the cause if other was circled.

Then each factor that was coded as mentioned or main focus of the story was coded as the ñstory suggests that the cause or risk factor is unlikely,ò ñstory suggests that the risk factor is likely,ò or ñthe story suggests that not enough is known or it is inconclusive as a cause or risk factor.ò

Rates or prevalence of autism. Given the struggle to determine accurate criteria for an autism diagnosis, which has in turn affected the ability to determine true prevalence, it is important to examine how the prevalence data or rates/estimates have been characterized by the

media to better understand their contribution to the public discourse on the issue. It is also important to examine what prevalence numbers or rates the media uses in describing the number of people with autism and when they were used. The following numbers were coded based on prevalence rates identified in the literature review:

- 4.5 per 10,000 (first numbers reported in 1966 in England) (Lotter, 1966/1985)
- 67 per 10,000 (Brick Township, NJ numbers reported in 1998) (Yeargin-Allsopp et al., 2003)
- 60 per 10,000 (Fombonne, 1999)
- 1 in 166 (Fombonne, 1999)
- 1 in 150 (CDC, 2007a)
- 1 in 90 or 1 in 91 (Kogan et al., 2009)
- 1 in 110 (CDC, 2009)
- 1% or 1 percent (CDC, 2009)
- Other

After coding ñOtherò stories, the ñOtherò category was examined and when a figure was identified at least 5 times, a new category was created. The estimated rate of 500,000 or 560,000 children with autism was added and coded because it was identified in stories at least 5 times. This rate was previously identified in a CDC press briefing transcript when it released the 1 in 150 prevalence data. CDC stated that 1 in 150 prevalence corresponded to about 560,000 children ages 0 to 21 years (CDC, 2007c).

The stories were then coded as to whether or not they suggested that the rates/estimates or prevalence of autism are increasing [no/yes]. In addition, the U.S. government has called autism an ñurgent public health concern,ò while advocacy groups have used the term ñepidemic.ò

The stories were coded to identify the frequency that each of these terms/phrases was included in the stories.

Sources. Because this study is exploratory in nature and seeks to understand how the media have contributed to the public discourse on autism, it was important to examine who the media interviews in news stories. The following categories of people who were interviewed were coded:

- Government health officialsð including doctors, epidemiologists, and scientists from state governments as well as national government agencies such as the Centers for Disease Control and Prevention (CDC), National Institutes of Health (NIH), Environmental Protection Agency (EPA), the U.S. Department of Health and Human Services (HHS), or the U.S. Food and Drug Administration (FDA);
- Medical experts from hospitals, medical experts from advocacy or non-profit organizations such as Autism Speaks, Cure Autism Now, or Autism Society of America.
- Parents of or family members of people with autism were coded as well as people with autism.
- Celebrities were included as well given that the influence of celebrities or public figures on health knowledge, attitudes, and behaviors has been documented in the cases of Katie Couric and colon cancer screening (Cram, Fendrick, Inadomi, Cowen, Carpenter, & Vijan, 2003), óMagicô Johnson and HIV prevention messages (Flora, Schooler, Mays, & Cochran, 1996), and Nancy Reagan and choice of surgery for breast cancer (Nattinger, Hoffmann, Howell-Pelz, & Goodwin, 1998).

- Health professionals representing health professional organizations (such as the American Academy of Pediatrics) were coded.
- Leaders of advocacy or non-profit organizations such as Autism Speaks, Cure Autism Now, Autism Society of America, etc. who were not labeled as having medical degrees were coded. Researchers or representatives from universities were coded. The category of ñotherò was provided for those individuals who were identified in such a way that did not fit into the given categories.
- Multiple categories could be coded, if, for example, the person interviewed was identified in the transcript as a parent and a celebrity.

Each person interviewed was coded to identify whether they presented a message suggesting there is no link between autism and vaccines (anti-link), presented a message suggesting there is a link between autism and vaccines (pro-link), or presented no message related to the subject of vaccines. This study used the same methods as Clarke (2008) to code for ñanti-linkò or ñpro-link.ò ñAnti-linkò is defined as the person being interviewed indicates that a link between autism and vaccines is improbable, unsupported by evidence, or disproved. ñPro-linkò is defined as the person being interviewed indicates that the theory or idea of vaccines causing autism is possible, plausible, or probable. ñNot sureò was also coded if the person presented views that could be coded ñpro-linkò or ñanti-link.ò Following the coding of all stories, the study author decided to change those items coded as ñNot sureò to ñpro-link.ò The ñpro-linkò definition states that the person indicates the theory of vaccines causing autism is possible. The study author recognized that a person who was ñnot sureò whether vaccines caused autism could be categorized as believing the theory is possible since they discussed vaccines and did not rule them out as a potential cause.

Reliability

The author and a non-researcher[1], who was unfamiliar with the goals of the study, each coded a random selection of 10% (*N*=12) of the transcripts to be coded in the study in order to determine intercoder reliability. The non-researcher coder was trained by reviewing the codebook (Appendix A) and the coding sheet (Appendix B) with the author/researcher to ensure that both understood what they were coding in the stories. Cohenôs *kappa* was used to assess reliability for each variable coded. Kappa values ranged from .769 to 1, with an average of .959, indicating excellent agreement (Neuendorf, 2002; Banerjee, Capozzoli, McSweeney & Sinha, 1999). Table 3.1 provides the kappa values for each variable except for those that had a kappa value of 1, indicating perfect agreement. There were a total of 98 variables coded.

Table 3.1. Intercoder Reliability: Variables and corresponding kappa values (excluding variables with kappa value of 1)

Variable	Kappa value
Placement	.882
Causes: focus of the story	.838
Vaccines (cause)	.769
Rates/Prevalence: focus of the story	.867
Rates ñincreasingò	.871
ñPublic Health Concernò	.800
First person interviewed (category)	.874
Second person interviewed (category)	.875
Second person interviewed and their beliefs regarding vaccines (ñpro-linkò or ñanti-linkò)	.888
Third person interviewed (category)	.883
Third person interviewed and their beliefs regarding vaccines (ñpro-linkò or ñanti-linkò)	.891
Fourth person interviewed (category)	.860
Fifth person interviewed (category)	.855

[1] ñnon-researcherò is defined as someone who does not conduct quantitative or qualitative research to test hypotheses or answer research questions. In this case, the coder was an attorney and had no professional experience in conducting research, communication or other types.

Data Analysis

Frequency tables were used to provide descriptors for each variable at the nominal level: determining the salience of autism-related stories (placement and length of story), understanding which theories and research have received the most coverage regarding the causes of autism and how they are framed, understanding which prevalence data and numbers have been used by the media to describe the number of people with autism and how these numbers have been framed, and understanding who the media interviews the most regarding autism-related stories. Chi-square analyses were employed to determine if significant differences existed between the networksô coverage in the frequency of autism-related stories, vaccine-related autism stories, and the framing of vaccines as a likely cause. A one-way analysis of variance (ANOVA) was used to determine if significant differences existed between the networks in terms of length of autism stories. The next chapter focuses on the results of this data analysis.

CHAPTER 4

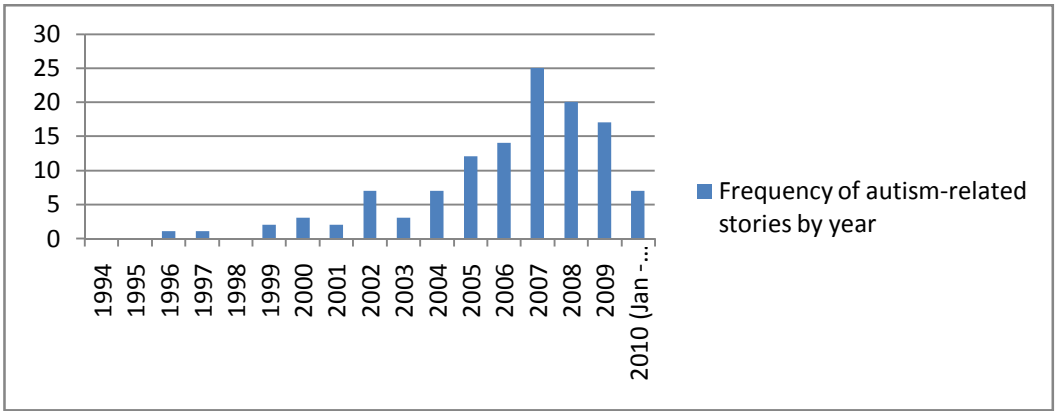
RESULTS

The sample included 121 transcripts of autism stories appearing in evening television news broadcasts between January 1994 to April 2010. Of these, 36.4% appeared on ABC (*N*=44), 32.2% appeared on CBS (*N*=39), and 31.4% appeared on NBC (*N*=38). The median length of story ranged from 2:01 to 2:30 minutes. More than three-fourths of the autism-related stories that were coded had a prominent placement in the newscast: 8.3% were the lead story (*N*=10); 42.1% were before the first commercial or lead story after the first commercial (*N*=51); and, 25.6% were the lead story after any other commercial than the first story (*N*=31).

Prominence of Autism-related Stories

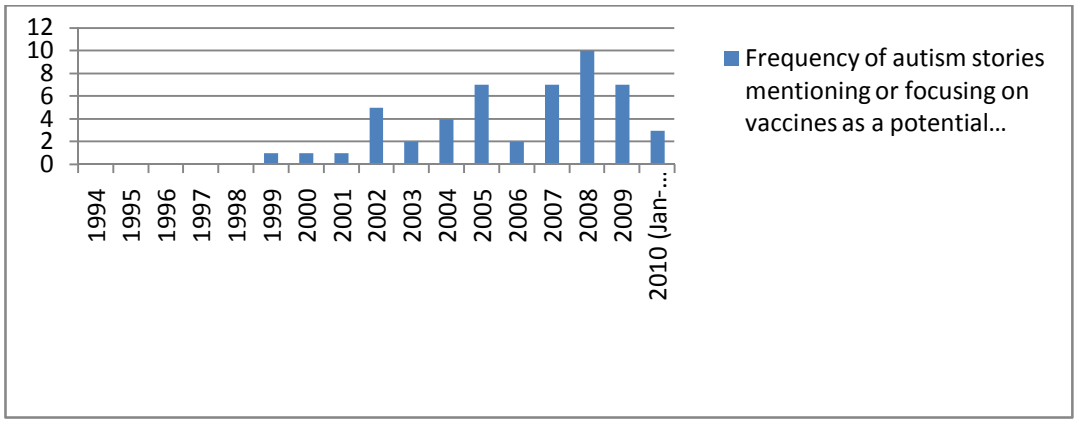
The first set of research questions were designed to capture the salience of autism related news stories. Research question 1a addressed whether the frequency of autism-related television evening news stories increased, decreased, or remained stable during the study period. As shown in Figure 4.1, the number of autism stories increased from 2001 (*N*=2) to 2002 (*N*=12). The number of autism stories also increased from 2006 (*N*=14) to 2007 (*N*=25), the most of all the years in the analysis (20.7%). There was a slight decrease from 2007 (*N*=25) to 2008 (*N*=20) as well as from 2008 (*N*=2008) to 2009 (*N*=17). No stories focusing on autism appeared on any of the major television networks evening news broadcasts in 1994, 1995, and 1998. Television evening news coverage of autism-related issues increased yearly starting in 2004 until peaking in 2007. Since 2005, between 12 and 25 autism-related news stories have appeared on television evening news programs per year.

Figure 4.1. Frequency of autism-related stories by year.



For comparison to other content analyses of autism media coverage of the vaccine/autism controversy, an analysis was run to establish whether stories mentioning or focusing on vaccines as a cause of autism by year, increased, decreased, or remained relatively stable during the study period. Figure 4.2 shows there was an increase from 2001(*N*=1) to 2002 (*N*=5) (similar to the overall increase in autism-related stories). There was also an increase from 2004 (*N*=4) to 2005 (*N*=7); a decrease from 2005 (*N*=7) to 2006 (*N*=2), followed by an increase in 2007 (*N*=7). Stories mentioning or focusing on vaccines as a potential cause of autism peaked in 2008 (*N*=10).

Figure 4.2. Frequency of autism stories mentioning or focusing on vaccines by year.



Research question 1b addressed whether the placement of autism-related television evening news stories had become more prominent, less prominent, or remained relatively the same during the study period. As seen in Table 4.1, more than three-fourths of autism-related stories were either a lead story (*N*=10, 8.3%), occurred before the first commercial or were the lead story after the first commercial break (*N*=51, 42.1%), or were the lead story after any other commercial break (*N*=31, 25.6%). Only 29 stories (24%) did not have a prominent placement.

Table 4.1. Frequency of autism-related story by placement in broadcast.

Placement	**Frequency**	**Percentage**
Lead story	10	8.3%
Before first commercial or lead story after first commercial	51	42.1%
Lead story after any other commercial	31	25.6%
Last story	10	8.3%
Other (defined as placement anywhere not included above)	19	15.7%

As the number of autism-related stories increased, the placement has remained relatively the same; however, there are some notable points in time where placement did change. From 1994 to 2006, there were no lead stories featuring autism. In 2007, autism-related stories were the lead story 7 times. That number has declined since that time, with only 3 additional lead news stories on autism. The majority of autism-related stories between 1994 and 2010 appeared before the first commercial break or were the lead story immediately after the break. From 1994 to 2004, autism-related stories presented before the first commercial break or lead story after the first commercial break ranged between 0 to 2, but in 2005, that number jumped to 7. From 2007 to 2009, autism-related stories were presented before the first commercial break or were the lead story after the first commercial break in at least 10 broadcasts per year. Research question 1c addressed whether there were significant differences between the networks regarding length of story as well as placement. Analysis using a one way analysis of variance (ANOVA) revealed no

significant differences between the networks regarding length of story, $F(2, 118) = .173$, $p = .842$. Analysis using a chi-square test revealed no significant difference between the networks regarding story placement, X^2 (8) = 4.90; p=.768.

Autism Causes and Risk Factors

The second set of research questions was designed to understand which potential causes of autism have received the most coverage and how they were framed. Research question 2a addressed the frequency that autism-related stories included a discussion of potential causes. Out of 121 stories, 61.2% (*N*=74) addressed causes. Of these stories that included causes, 78.4% (*N*=58) focused on causes as the main topic, where as 21.6% (*N*=16) just mentioned the causes within the story, but cause(s) was not the main focus of the story.

Research question 2b asked what causes were addressed the most frequently in autism-related stories. As shown in Table 4.2, when causes were included in autism-related stories (*N*=74), 68.9% (*N*=51) discussed vaccines, the most discussed of all causes. Genetics or genes was included in 35.1% (*N*=26) of the stories and environment was discussed as a potential cause in 21.6% of the stories (*N*=16). No other cause was mentioned in more than 10% of the stories that mentioned causes. It should be noted that out of all autism-related stories (*N*=121), 42.1% (*N*=51) either mentioned or focused on vaccines as a cause for autism.

Table 4.2. Frequency that specific causes were identified within stories that identified potential causes of autism.

Cause	**Frequency**	**Percentage of stories that mentioned a cause**
Vaccines	51	68.9%
Genetics/Genes	26	35.1%
Environment	16	21.6%
Brain irregularities	4	5.4%
Medications	0	0
Prenatal Exposures to Viruses	0	0
Other	6	8.1 %

Research question 2c asked when an autism-related story includes one cause, how often are other causes mentioned? Out of 121 stories focusing on autism, 51 discuss vaccines as a potential cause. Out of 51 stories discussing vaccines as a potential cause, 80.4% (*N*=41) of stories did not mention any other causes; 13.7% (N=7) mentioned one other cause; 5.9% (N=3) mentioned two other causes. When genes were mentioned as a potential cause (*N*=26), genes was included by itself with no other causes in 53.8% of stories (*N*=14), with one other cause in 38.5% of stories (*N*=10), and with two other causes in 7.7% of stories (*N*=2). The two causes most frequently discussed in the same news story were genes and environment (*N*=11). Genes and vaccines (*N*=9) and vaccines and environment (*N*=8) were also mentioned together.

Research question 2d addressed how each cause was most frequently presented: as likely, unlikely, or not enough is known to determine if it is a cause. As shown in Table 4.3, when vaccines were included in a story (*N*=51), they were framed as unlikely to be a cause of autism in 54.9% (*N*=28) of the stories, likely to be a cause of autism in 19.6% (*N*=10) of the stories, and that there is not enough known to determine whether or not it is a cause in 25.5% (*N*=13) of the stories. These results show that while most stories framed vaccines as unlikely to cause autism, nearly half of the stories that mentioned vaccines suggested that they could potentially be a cause or that more information is needed. When genes were included in a story (*N*=26), the majority of stories (80.8%) framed genes as a likely cause of autism, while no stories presented it as unlikely. This is consistent with the scientific community, where most agree that genes are a likely cause of autism (NIH, 2009). That 75% (*N*=12) of the stories about environmental causes (*N*= 16) of autism suggest that more information is needed is not surprising, given that while scientists agree that there are environmental factors that contributes to causing autism, there

needs to be more research to determine which environmental factors may cause autism, making it a current research priority.

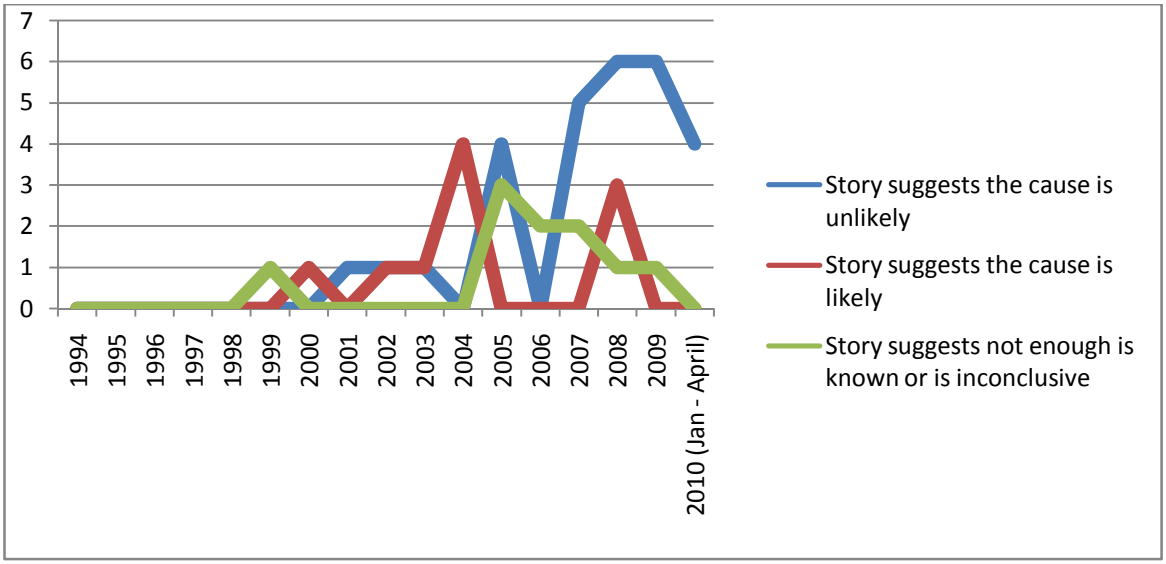
Table 4.3. Frequency that when a cause is included in a story, it is presented as a likely cause, an unlikely cause, or that more information is needed to determine if it is a cause of autism. *(Percentages within stories about each cause).*

Vaccines	**Frequency**	**Percentage**
Story suggests the cause is unlikely	28	54.9%
Story suggests the cause is likely	10	19.6
Story suggests not enough is known	13	25.5
Genetics/Genes		
Story suggests the cause is unlikely	0	0
Story suggests the cause is likely	21	80.8
Story suggests not enough is known	5	19.2
Environment		
Story suggests the cause is unlikely	0	0
Story suggests the cause is likely	4	25.0
Story suggests not enough is known	12	75.0
Brain		
Story suggests the cause is unlikely	0	0
Story suggests the cause is likely	3	75.0
Story suggests not enough is known	1	25.0
Other		
Story suggests the cause is unlikely	0	0
Story suggests the cause is likely	0	0
Story suggests not enough is known	6	100.0

Research question 2e asked if the framing of vaccines as a likely cause of autism increased, decreased, or remained relatively stable during the study period. As seen in figure 4.3, 2004 saw an increase in stories suggesting vaccines are a likely cause of autism (2003: *N*= 1; 2004: *N*= 4), whereas no stories suggested that it was unlikely that vaccines cause autism or that not enough is known or is it inconclusive whether vaccines cause autism. In 2005, there was an increase in stories suggesting it was unlikely vaccines cause autism, whereas no stories presented the cause as likely, and a few (*N*=3) suggested that not enough is known or is inconclusive. From 2007 to 2010, there was a marked increase in the number of stories suggesting that it is unlikely

that vaccines cause autism (2007: *N*= 5; 2008: *N*=6; 2009: *N*=6; 2010: *N*=4), whereas the number of stories suggesting the cause was likely dropped to zero, with the exception of 2008 (*N*=3) and the number of stories suggesting that not enough is known or it is inconclusive about whether vaccines cause autism remained relatively the same (2007: *N*=2; 2008: *N*=1; 2009: *N*=1; 2010 *N*=0).

Figure 4.3. Frequency that stories framed vaccines as a likely, unlikely or that not enough is known to determine it as a cause of autism by year.



Research question 2f asked whether the frequency of vaccineï related autism stories varied significantly between the networks (ABC, CBS, or NBC) during the study period. Analysis using a chi-square test revealed no significant difference in the frequency of vaccine-related autism stories between the networks, X^2 (2) = 2.08; *p*=.353. CBS either mentioned or focused on vaccines as a potential cause of autism (framed as likely, unlikely or inconclusive) 21 times, NBC 19 times and ABC 11 times. Research question 2g asked whether there was a significant difference in the frequency that the networks (ABC, CBS, or NBC) framed vaccines

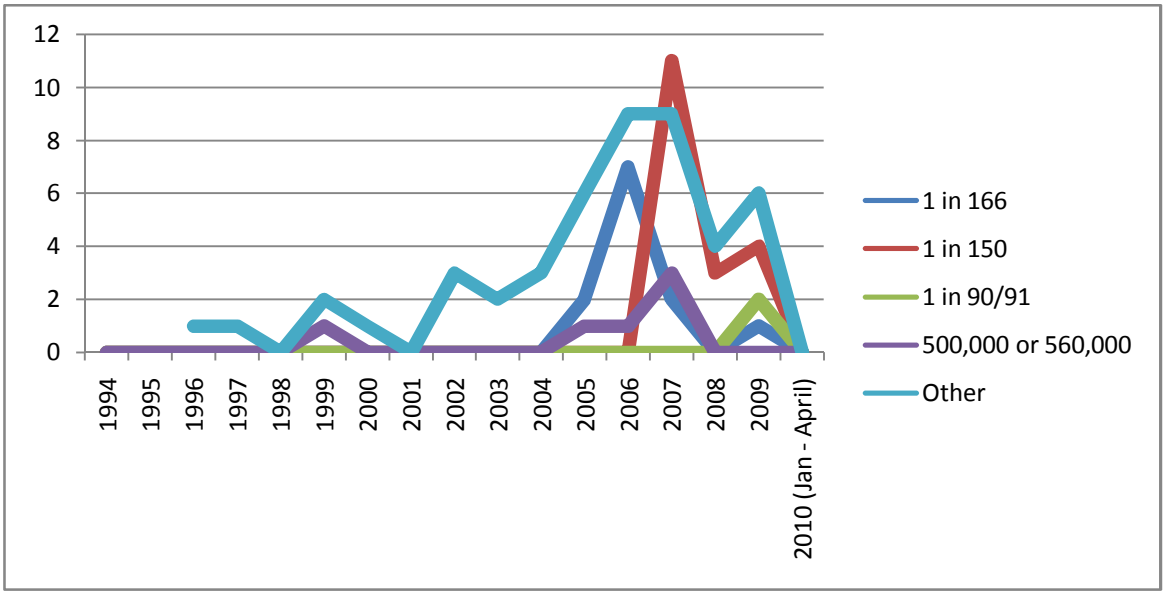
as a likely of autism. For the purpose of this analysis the number of stories indicating vaccines were likely a cause of autism were compared to those that presented an alternative framing (e.g., as either unlikely to cause autism or that more information is needed to determine if it is a cause). Analysis using a chi-square test revealed a significant difference in the frequency that the networks framed vaccines as a likely cause of autism, X^2 (2) = 8.195; p=.017. In the stories that discussed vaccines as a cause, ABC never suggested the cause was likely, CBS suggested the cause was likely in 28.6% (N=6) of its stories, and NBC suggested the cause was likely in 21.1% (N=4) of its stories. ABC suggested vaccines was unlikely to be a cause of autism or more information was needed to determine if vaccines are a cause in all (N=11) of its stories about vaccines, CBS suggested the cause was unlikely or more information was needed in 71.4% (N=15) of its stories about vaccines, and NBC suggested the cause was unlikely or more information was needed in 76.4% (N=15) of its stories about vaccines. The results show that of all the networks, CBS suggested that vaccines were likely a cause of autism more often than the others and ABC the least often.

Autism Prevalence and Rates

The third set of research questions was designed to examine what prevalence numbers, rates, or statistics the media used in describing the number of people with autism, when they were used, and how they were framed. Out of 121 stories, 46.3% (N=56) included statistics or estimates about the number of people with autism or the prevalence of autism. Research question 3a addressed what rates or statistics the media used in describing the number of people with autism each year. As seen in Figure 4.4, in stories that presented rates or prevalence of autism, 1 in 166 was presented 12 times during the study period, and was first cited in 2005; 1 in 150 was presented 18 times during the study period, and was first cited in 2007, when the data was

released; 1 in 90/91 was only cited 2 times, in 2009 when the data was released; 1 in 110 was not cited at all despite its release in 2009 as a follow up to the 1 in 150 prevalence rate. The results show that out of 56 stories including rates or prevalence of autism, 83.9% (*N*=47) used ñotherò rates or numbers differing from the numbers that were coded, most notably in 2007, when CDC released the 1 in 150 prevalence estimates for the U.S. and 2009, when HRSA and CDC released additional prevalence estimates.

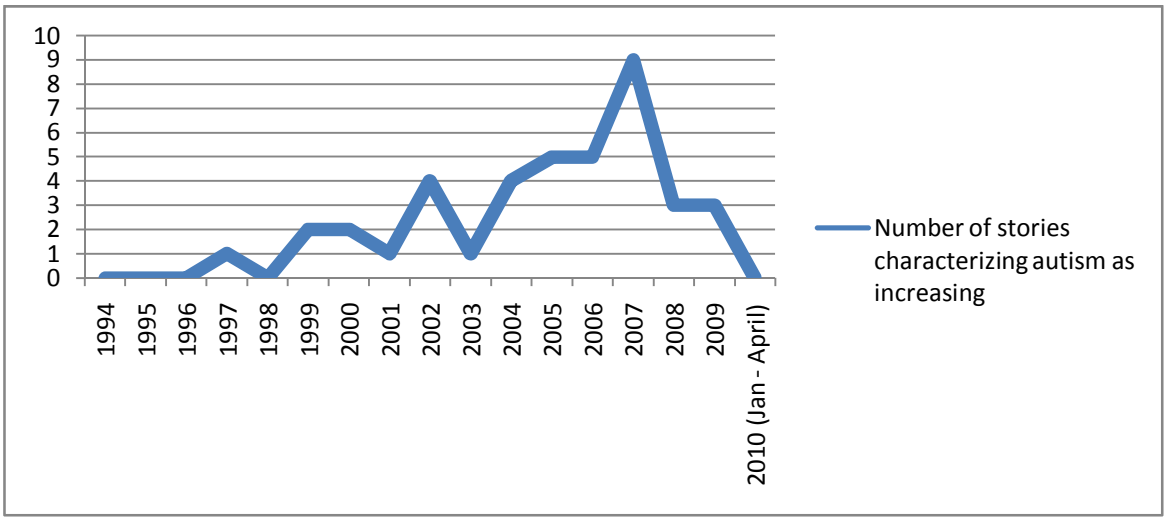
Figure 4.4. Frequency of prevalence, rates of autism included in autism-related stories, per year.



Research question 3b addressed whether the prevalence of autism was framed as increasing; 33.1% (*N*=40) of stories characterized autism as increasing. As shown in Figure 4.5, 1997 was the first year autism was characterized as increasing. 2007 had the highest number of stories characterizing autism as increasing (*N*=9), the year that CDC released its 1 in 150 prevalence data. Prior to that time, 2002 and 2004 had 4 stories each characterizing autism as increasing and 2005 and 2006 had 5 stories each characterizing autism as increasing. Analysis using a chi-square test revealed no significant difference in the frequency that the networks framed autism as

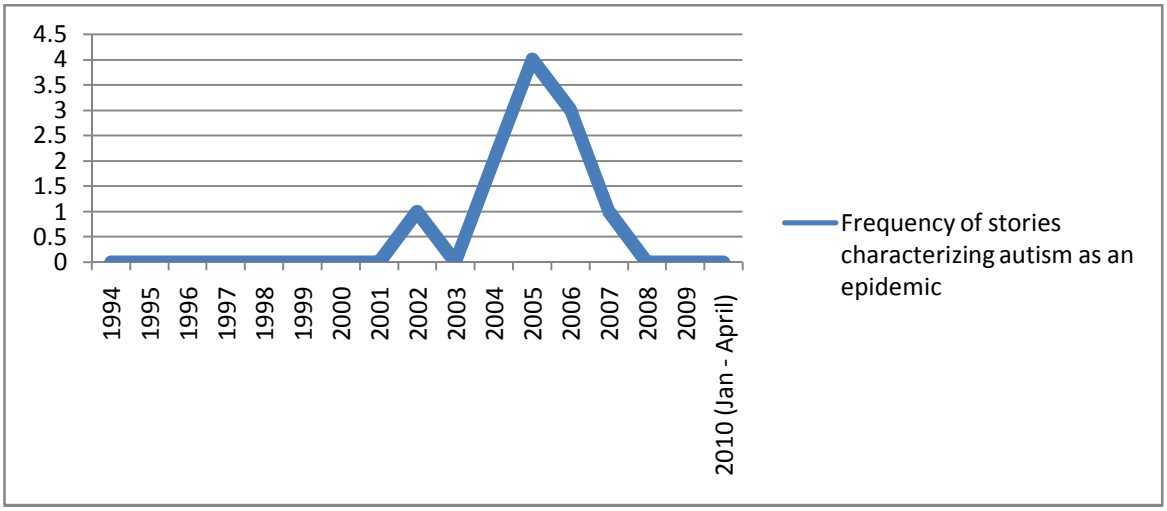
increasing, X^2 (2) = 2.05; p=.359. Of the 40 stories that framed autism as increasing, 15 appeared on CBS, 14 on NBC, and 11 on ABC.

Figure 4.5. Frequency of stories characterizing autism as increasing by year.



Research question 3c addressed whether autism was framed as an epidemic; 9.1% (N=11) of stories characterized autism as an epidemic. As shown in Figure 4.6, 2002 was the first year autism was characterized as an epidemic (N=1). The number of stories framing autism as an epidemic increased in 2004 (N=2), peaked in 2005 (N=4), and slightly decreased in 2006 (N=3). Only 1 story characterized autism as an epidemic in 2007, the year CDC released its 1 in 150 prevalence data. Analysis using a chi-square test revealed no significant difference in the frequency that the networks framed autism as an epidemic, X^2 (2) = 3.26; p=.196. Of the 11 stories framing autism as an epidemic, six appeared on NBC, three on CBS, and two on ABC. Research question 3d addressed whether autism was being framed as a public health concern; 2.5% (N=3) of stories characterized autism as a public health concern. It was characterized as a public health concern once in 2004, once in 2007 (the year CDC called autism a ñpublic health concernò), and once in 2009.

Figure 4.6. Frequency of stories characterizing autism as an epidemic by year.



Sources

The fourth set of research questions was designed to examine who the media interviews in news stories about autism. Research question 4a addressed what category of people were most frequently interviewed in autism-related television evening news stories. Those individuals who were interviewed could be coded into multiple categories. Out of all 121 stories, there were a total of 301 people interviewed. A separate data set was created so that each person interviewed could be treated as a separate case for the analysis in this section. As seen in Figure 4.7, 34.2% (*N*=103) of individuals interviewed were identified as a parent or family member of a person with autism; 12.3% (*N*=37) of individuals interviewed were identified as a researcher or representative from a university; 6.3% (*N*=19) of individuals interviewed were identified as a medical expert affiliated with a hospital; 5.6% (*N*=17) of individuals interviewed were identified as a government health official; 5.3% (*N*=16) of individuals interviewed were identified as a person with autism; 3.3% (*N*=10) of individuals interviewed were identified as a leader of an advocacy or non-profit organization not labeled as a medical expert; 2.7% (*N*=8) of individuals interviewed were identified as a medical expert affiliated with an autism advocacy organization;

2% (*N*=6) of individuals interviewed were identified as a health professional representing a health professional organization; 1% (*N*=3) of individuals interviewed were identified as celebrities; and, 28.2% (*N*=85) individuals were identified as ñother,ò indicating the person did not fit into any of the given categories. Of the 85 individuals interviewed that were identified as ñother,ò a few (*N*=4) were parents of children who refused to vaccinate their children; a few (*N*=4) were identified as members of congress; several (*N*=5) were identified as being a part of the developmental disabilities research and treatment center called the Kennedy Krieger Institute; several (*N*=6) were medical editors for the networks and were labeled as having medical degrees; and, several (*N*=11) were identified as health professionals, but with no affiliation to a health professional organization, advocacy organization, or with the government. The majority of the rest of the sources that were coded as ñotherò were labeled with first and last names and no other identifying information in the transcript, either by their name or by their own words.

Research question 4b addressed who most frequently was interviewed in stories that mentioned or focused on potential causes of autism. Out of 121 stories, 61.2% (*N*=74) addressed causes. There were a total 195 people interviewed in these 74 stories. As seen in Figure 4.8, of the 195 interviews, 34.3% (*N*= 67) individuals interviewed were identified as a parent or family member of a person with autism; 14.4% (*N*=28) individuals were identified as a researcher or representative from a university; 8.2% (*N*=16) individuals were identified as a medical expert affiliated with a hospital; 7.7% (*N*=15) individuals were identified as a government health official; 3.6% (*N*=7) individuals were identified as a leader of an advocacy or non-profit organization, not labeled as a medical expert; 2.6% (*N*=5) of the individuals were identified as a medical expert affiliated with an autism advocacy organization; 2.6% (*N*=5) of the individuals

were identified as a medical expert affiliated with a health professional organization; 1% (*N*=2) of the individuals were identified as a celebrity; and, 26.7% (*N*=52) of the individuals were identified as ñother,ò indicating the person did not fit into any of the given categories. No stories about causes of autism included interviews with individuals who were identified as a person with autism.

Figure 4.7. Frequency of individuals interviewed in all autism-related stories.

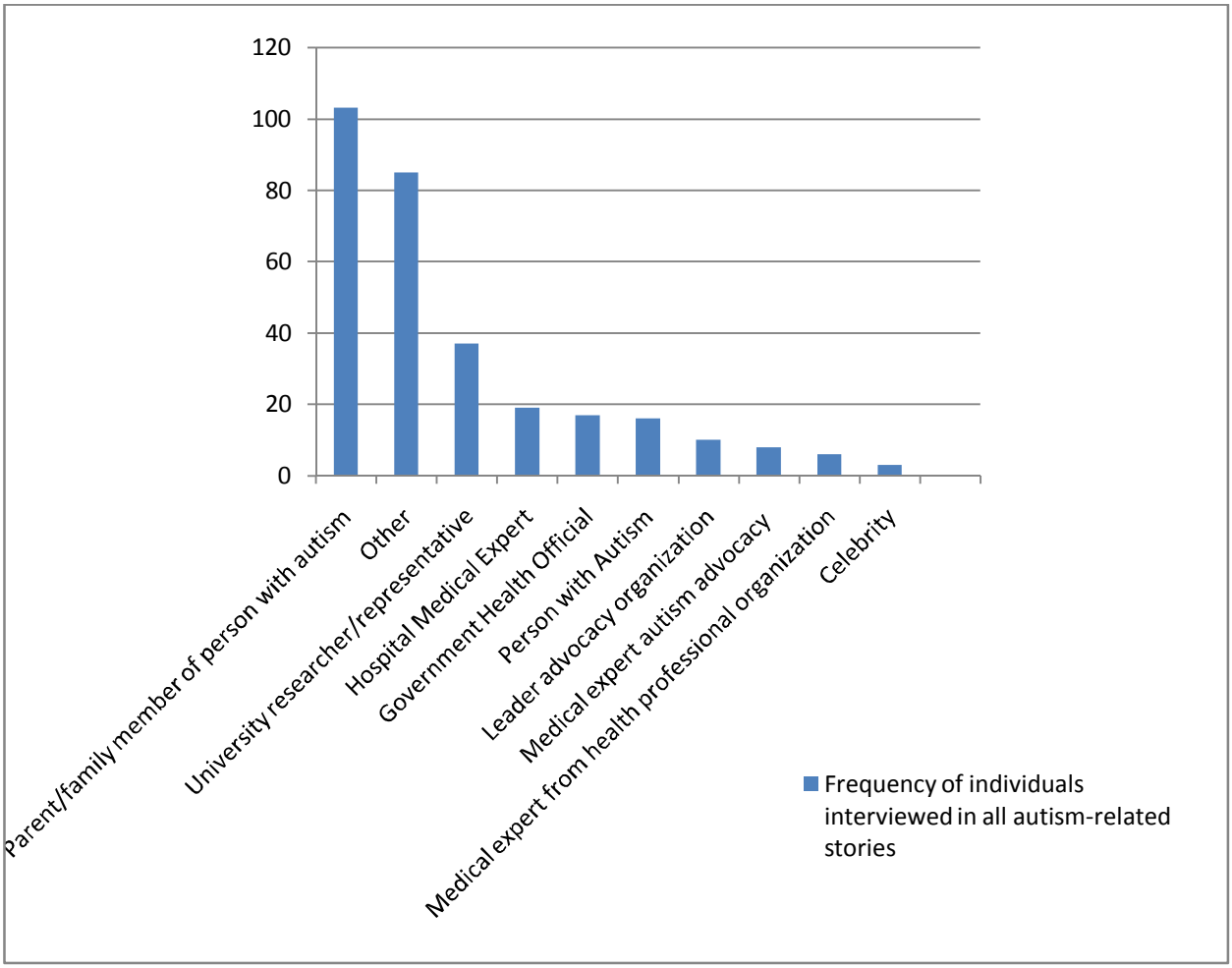
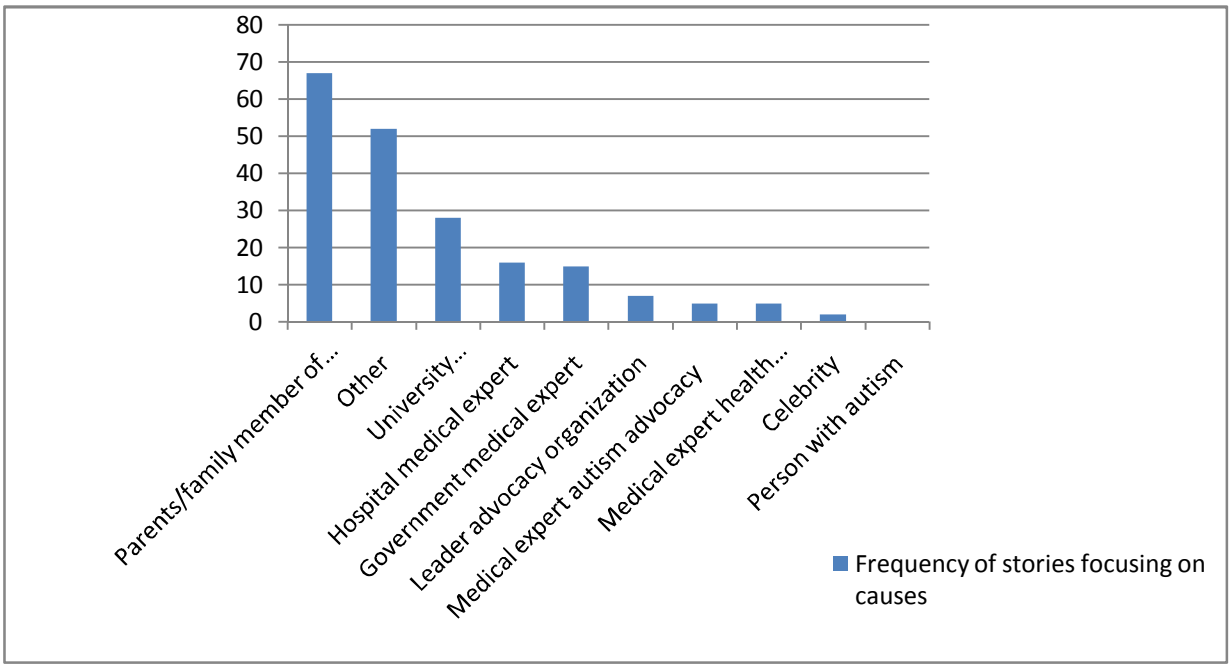


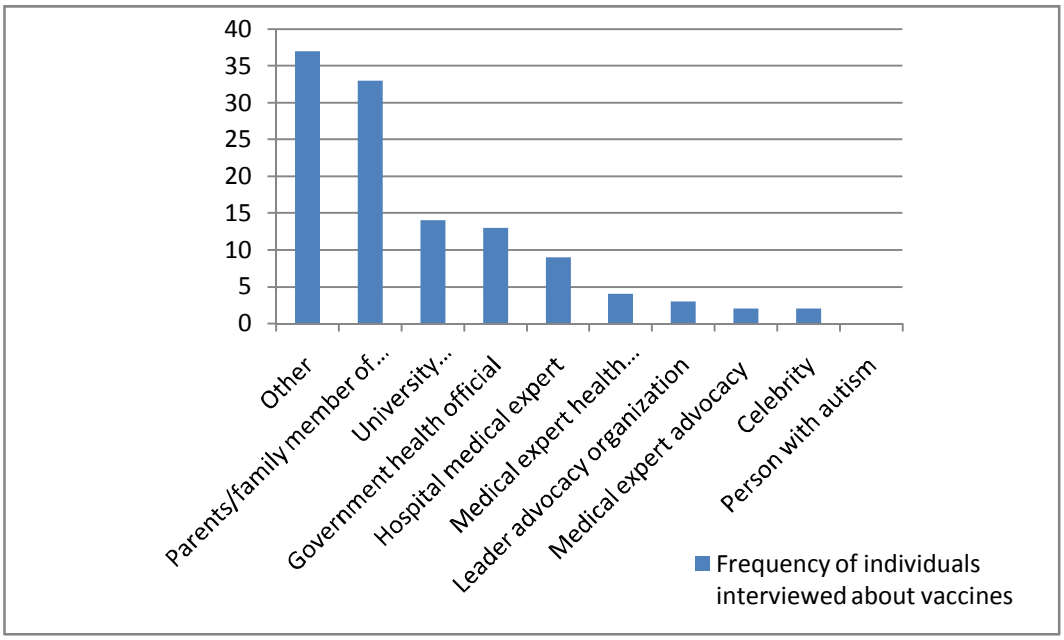
Figure 4.8. Frequency of individuals interviewed about causes.



Research question 4c addressed who most frequently was interviewed about vaccines. Out of 121 stories, 42 focused on vaccines. There were a total of 117 people interviewed in these 42 stories. As seen in Figure 4.9, of these 117 interviews, 28.2% (*N*=33) of the individuals were identified as a parent or family member of a person with autism; 11.9% (*N*=14) of individuals were identified as a researcher or representative from a university; 11.1% (*N*=13) of individuals were identified as a government health official; 7.6% (*N*=9) of individuals were identified as a medical expert affiliated with a hospital; 3.4% (*N*=4) of individuals were identified as a medical expert affiliated with a health professional organization; 2.6% (*N*=3) of individuals were identified as a leader of an advocacy or non-profit organization, not labeled as a medical expert; 1.7% (*N*=2) of individuals were identified as a medical expert affiliated with an autism advocacy organization; 1.7% (*N*=2) individuals were identified as a celebrity; and, 31.6% (*N*=37) individuals were identified as ñother,ò indicating the person did not fit into any of the given

categories. No stories focusing on vaccine as a cause of autism included interviews with individuals who were identified as a person with autism.

Figure 4.9. Frequency of individuals interviewed about vaccines.



Research question 4d asked, of those individuals who were interviewed about vaccines, who most frequently presents a case for vaccines as a cause of autism (pro-link) and who most frequently makes a case against vaccines being a cause (anti-link). Note, there were some individuals interviewed who did not present a case for or against a cause of autism in these stories and they were excluded in this analysis. Analysis using non parametric chi-square tests for each interview source type revealed:

- Parents or family members of a person with autism were significantly more likely to present a case for vaccines as a cause of autism (pro-link) when interviewed, $X^2(1) = 18.24$; p=.000. Of the 29 parents or family members of a person with autism presenting an opinion, 89.7% (N=26) were pro-link, while 10.3% (N=3) were anti-link.

- Government health officials were significantly more likely to present a case against vaccines as a cause of autism (anti-link) when interviewed, $X^2(1) = 7.36$; p=.007. Of the 11 government health officials presenting an opinion, 90.9% (N=10) were anti-link, while 9.1% (N=1) were pro-link.
- Medical experts from hospitals were significantly more likely to present a case against vaccines as a cause of autism (anti-link) when interviewed, $X^2(1) = 5.44$; p=.020. Of the 9 medical experts from hospitals presenting an opinion, 88.9% (N=10) were anti-link, while 11.1% (N=1) were pro-link.
- Researchers or representatives from universities were not significantly more likely to present a case to present a case for (pro-link) or against (anti-link) vaccines as a cause of autism when interviewed, $X^2(1) = 2.57$; p=.109. Of the 14 researchers or representatives from universities presenting an opinion, 71.4% (N=10) were anti-link, while 28.6% (N=4) were pro-link.
- Leaders of advocacy or non-profit organizations (non-medical) were not significantly likely to present either a case for (pro-link) or against (anti-link) vaccines as a cause of autism when interviewed, $X^2(1) = .333$; p=.564. Of the 3 leaders of advocacy or non-profit organizations (non-medical) presenting opinions, 66.7% (N=2) were pro-link, while 33.3% (N=1) were anti-link.
- People identified as ñOtherò were not significantly more likely to present either a case for (pro-link) or against (anti-link) vaccines as a cause of autism when interviewed, $X^2(1) = 2.455$; p=.117. Of the 33 identified as ñotherò pres^{e}nting opinio$n$s, 63.6% (N=21) were pro-link, while 36.4% (N=12) were anti-link.

- Of the 2 interviews with medical experts from advocacy or non-profit organizations, both presented pro-link (*N*=2) cases.
- Of the 4 health professionals representing health professional organizations presenting an opinion, all (*N*=4) were anti-link.
- Of the 2 celebrities presenting an opinion, all (*N*=2) were pro-link.
- No people with autism were interviewed about vaccines, therefore no opinions about vaccines as a cause were presented.

The next chapter discusses the findings and limitations of this study as well as suggestions for future research and conclusions.

CHAPTER 5

DISCUSSION

The medical and scientific communities have faced significant challenges in understanding and establishing autism as a distinct condition and its causes and risk factors. How the public understands this condition and the research conducted thus far via media and other sources can have public health implications, as demonstrated in Britain with the increase in measles cases (Lewis & Speers, 2003). The increase in measles cases in Britain was a result of the decline of measles, mumps, and rubella (MMR) vaccinations, which has been attributed to the mediaôs coverage of the debate over whether the MMR vaccine causes autism (Lewis & Speers, 2003). To understand the U.S. mediaôs contribution to the public discourse on autism, this study analyzed television news media coverage using agenda-setting theory and media framing concept perspective. Agenda-setting theory provided the framework to examine the prominence of autism in evening news broadcasts and media framing scholarship provided the framework to examine how these evening news broadcasts characterize certain aspects (prevalence and causes) of autism and make them more salient. A content analysis was conducted of autism-related stories featured in national television evening news broadcasts airing on ABC, CBS, and NBC from 1994, when autism was first recognized as a spectrum disorder in the *D SM -IV*, through April 2010, the time of this study. The data provided a descriptive look at how television evening news broadcasts feature autism in terms of salience and framing of causes and prevalence.

Prominence of Autism-related Stories

This study captured the prominence of autism-related news stories by examining the frequency of stories during the study period, the placement of stories during the study period, and the length of stories during the study period. According to the results, autism-related stories

have increased over time and have maintained prominent positions within television evening news broadcasts. In 2007 the numbers of autism related stories peaked and achieved the most prominence by serving as the lead story in several broadcasts. Length of autism-related stories remained the same, but the median of 2:01 to 2:30 minutes is more than the average of most stories (Watkins, 2001). The analysis suggests that autism has become more salient in television evening news over time. There were a total of 121 stories focusing on autism from 1994 through April 2010. No television evening news stories focused on autism in 1994, 1995, and 1998. The frequency of stories quadrupled from 2001 (*N*=2) to 2002 (*N*=12) and nearly doubled from 2006 (*N*=14) to 2007 (*N*=25). The number of autism-related stories in evening news broadcasts peaked in 2007, the year CDC released its first multi-site autism spectrum disorder (ASD) prevalence data, stating that 1 in 150 eight-year-olds had an ASD. This suggests that the release of the prevalence data may have elevated autism as an important issue in the eyes of the media and thus for the public.

Given the controversial nature of the hypothesis that vaccines cause autism, the frequency of stories either mentioning or focusing on vaccines during the study period was examined for spikes in coverage as well. The results revealed no or low coverage from 1998 to 2000; increases in coverage from 2001 to 2002 and from 2004 to 2005; a decrease from 2005 to 2006, followed by an increase in 2007. Stories mentioning or focusing on vaccines as a potential cause of autism peaked in 2008. Future qualitative analysis studies of these stories could reveal exactly what news items caused the spike in terms of vaccines and autism, but there are a couple of points in time worthy of mentioning based on events written about in this studyôs literature review. In 1998, the Wakefield et al. (1998) study was published in *The Lancet*, and it did not seem to garner any coverage in U.S. television evening news that year. In 1999, the U.S. Food

and Drug Administration (FDA) recommended that thimerosal be removed from routine infant vaccines in the U.S., but it did not seem to garner much coverage in U.S. television evening news that year. In 2001, the Institute of Medicine issued its first report on the hypothesized link between the MMR vaccine and autism and it did not seem to generate much coverage in U.S. television evening news that year. In Britain, Lewis and Speers (2003) observed that the MMR vaccine became controversial between January and September of 2002 because a BBC television program, *Panorama*, aired a broadcast titled ñHow safe is MMRò on February 3, 2002, taking up Wakefieldôs theory regarding the MMR vaccine. Wakefield and other colleagues also pre-published a paper in *Molecular Pathology* that was made available when this broadcast aired. Reporting of a measles outbreak in a middle-class London suburb also highlighted the controversy during this period of time. Perhaps, the attention on the subject in Britain generated coverage of the debate in the U.S. as well in 2002. Again, a thorough qualitative analysis of the broadcast transcripts would reveal what news items garnered attention related to vaccines and autism. In 2004, the IOM released their report stating that they had reviewed all scientific evidence to date and rejected the causal relationship between autism and the MMR vaccine and thimerosal-containing vaccines, which might explain the increase in coverage that year. As for 2008ôs increase in coverage of vaccines and autism, there is nothing in the literature review that points to significant events taking place; however, a qualitative analysis study of these stories could reveal exactly what news items caused the spike in terms of vaccines and autism. Clarkeôs (2008) content analysis of U.S. and British newspapers (February 1998 to June 2006), in fact found similar results in terms of increasing and decreasing coverage of vaccine/autism stories: relatively low coverage of the vaccine/autism controversy from 1998 to 2000, increased attention from 2001 to 2002, a spike in articles in 2004, and a steady decline in 2005 and 2006. This

suggests that newspapers and evening news coverage are similar in terms of when they increased and decreased coverage of autism stories that discuss vaccines.

Regarding placement in the broadcast, three-fourths of all autism-related stories were either a lead story, occurred before the first commercial or were the lead story after the first commercial, or were the lead story after any other commercialsð considered prominent positions within a television evening news broadcast according to the literature review. Over the study period, placement remained relatively the same with the exception of two points in time. From 1994 to 2004, autism-related stories presented before the first commercial or lead story after the first commercial ranged from 0 to 2, but in 2005, that number jumped to 7.. From 1994 to 2006, no lead story had ever featured autism, but in 2007, autism was featured as a lead story 7 times. CDCôs released of its 1 in 150 prevalence data that year would seem to have elevated its importance in the eyes of the media. While the length of autism-related stories remained relatively the same throughout the study period, the median of two to two and a half minutes was more than the average of most stories: one-and-a-half to two minutes (Watkins, 2001) as noted in the literature review. There were no significant differences in the frequency of autism-related stories between the networks in terms of length of story and placement reveals that the networks view autismôs prominence in a similar manner. For the public, they are receiving a consistent message from the networksô evening news coverage: it is an important issue that they should be concerned about, especially since 2007.

This study sought to understand how through selection of news stories, the media focus the publicôs attention on some issues more than others and influence perceptions about what the most important issues are using agenda-setting theory as a framework. This study did not compare autism with other issues during the study period to determine its salience relative to

other topics, but the increase in the number of stories and increase in the number of stories with prominent position within the broadcast indicates that autism has become more salient in television evening news stories over time. Therefore, the mediaôs increasing coverage of autism may result in the publicôs perception that it is something they should think about. The second-level of agenda setting, attribute agenda setting, suggests that in addition to the media telling us what to think about, they also tell us how to think about some objects. In this framework, the results show that the frequency of all stories featuring autism that included vaccines as a cause of autism were quite highð nearly half the time. It can be said, then, that the attribute, in this case the potential for vaccines causing autism, is salient.

Autism Causes and Risk Factors

As noted in the literature review, scientists are not certain about what causes autism, but agree itôs likely that both genetics and environment play a role (NIH, 2009). Some of the most controversial hypotheses about causes have concentrated on demonstrating a link between vaccines and autism. Considering the mediaôs effect on the decline of MMR vaccines in Britain (Lewis & Speers, 2003) and the recent survey reporting that 1 in 4 U.S. parents believe vaccines cause autism, 81% of whom reported that they had heard or read about problems with the MMR vaccine (Freed et al., 2010), this investigation sought to understand the mediaôs contribution to the public discourse on potential causes, and how it framed them, especially vaccines. This study captured which causes of autism have received the most coverage and whether the media framed the causes as likely or unlikely.

This study found that nearly half of the time that television evening news media report on autism, they are associating it with vaccines. The association of autism with vaccines has the potential of having an applicability effect. In media framing research, an applicability effect

refers to an audienceôs acceptance that two concepts are related after exposure to a media message that suggests there is a connection between two concepts (Scheufele & Tewksbury, 2007). Future studies with media audiences could examine whether an applicability effect has indeed occurred as a result of television evening news associating autism with vaccines. This study also found that stories focusing on causes of autism are not mentioning other scientifically accepted causes of autism. The data revealed that vaccines were the only cause discussed in the overwhelming majority (80%) of stories that mentioned vaccines. The stories that frame vaccines as either unlikely as a cause or suggest that more research is needed to determine if it is a cause of autism should at least mention the causes that have been accepted by the scientific community, but did not consistently do that. There was an increase after 2004 in stories suggesting vaccines were an unlikely cause of autism, which is to be expected given the release of the 2004 IOM report rejecting causal relationships between vaccines and autism. However, the repetitious association between autism and vaccines, even when framed as unlikely, in television evening news could have a potential audience applicability effect, especially when other potential causes are not being discussed. Audience research is needed to determine whether the public is willing to accept the causes established as more likely by the scientific community. For the public, they are receiving a consistent message from the networksô evening news coverage: autism and vaccines are an important issue that they should be concerned about.

The National Institutes of Healthôs (NIH) (2009) stated that it is likely that both genetics and some environmental factor(s) play a role in causing autism. The data revealed the two causes most frequently discussed together were genes and environment. Stories that discussed genetics as a potential cause always presented it as likely or that more research was needed. The fact that no story framed genetics as an unlikely cause of autism was an interesting finding when

compared to vaccines (which were framed as a likely cause in almost half the stories) and speaks to the controversial nature of the hypothesis that vaccines cause autism: because it is controversial it will receive more coverage than something than is not controversial.

The analysis revealed no significant difference in the frequency of vaccine-related autism stories between the networks. The public is receiving a consistent message from the networksô evening news coverage: autism and vaccines are an important issue that they should be concerned about. However, there was a significant difference in the frequency that the networks (ABC, CBS, or NBC) framed vaccines as a likely of autism. : ABC was significantly less likely to frame vaccines as a cause of autism (no pro-link stories appeared on the network) as compared to CBS and NBC.

Autism Prevalence and Rates

This study also examined what prevalence numbers, rates, or statistics the media used in describing the number of people with autism by year and how the number of people with autism or the prevalence of autism was framed. The results showed that the majority of stories mentioning prevalence rates cited numbers that had not been identified in the literature review. One third of stories framed autism as increasing regardless if data were cited. Furthermore, television evening news has not significantly contributed to the framing of autism as an epidemic. In terms of the rates or statistics used by the media, the one in 166 prevalence data (Fombonne, 1999) was presented 12 times during the study period; it was first cited by television evening news in 2005 and Fombonne published the data in 1999. Another noteworthy finding was that CDCôs one in 150 prevalence data was presented 18 times during the study period, and was first cited in 2007, when the data were released. The Health Resources and Services Administration (HRSA) study reporting one in 90 children had autism was included in two

stories in 2009, the time of its release. CDCôs one in 110 prevalence data was published in 2009 after HRSAôs data release, as a follow up to the 2007 prevalence report of one in 150, but received no coverage despite that its methods (use of clinical and education records) are more highly regarded than those used in the HRSA study (a survey of parental reports), although they are considered to be complimentary methods of determining the number of people with autism. For the media, reporting a prevalence of one in 90 in October and then to turn around and report a prevalence of one in 110, perhaps, did not make sense. It suggests that the media feel like they have established autism as a prevalent condition and that backtracking and using the CDCôs data would have been confusing for the public. Which prevalence data the media uses moving forward will prove to be interesting, given that CDC and HRSA are funded to and have plans to report on their respective studies again in two years.

The data also revealed the mediaôs use of ñotherò rates of or prevalence of autism was quite high (i.e., prevalence rates that differed from the numbers that were coded, which were based on published reports cited in the literature). Nearly 84% of stories mentioning prevalence rates cited numbers that had not been identified in the literature review, some occurring after 2007 when CDC established its prevalence rate of 1 in 150. It should be noted that ñotherò numbers coded included state level data (e.g., Oregon and California) and could account for the large percentage of pieces that cite ñotherò prevalence rates. It also speaks to the fact that there were no accepted prevalence rates of autism for the U.S. prior to 2007. Given the number of ñotherò numbers cited after 2007, future research should consider how media interpret prevalence data. For example, the media may be more comfortable reporting a concrete number of people with autism (e.g., 1.2 million) versus reporting it as a one in 110 or one in 90. Future studies should also examine autism advocacy organizations and their use of the prevalence data

to better understand when and how these numbers have been used to draw attention to autism issues.

This study also examined how the prevalence data or rates/estimates have been framed by the media in terms of whether autism is increasing, an epidemic, or an urgent public health concern. The framing of prevalence data can potentially affect government policies and for funding autism research and services. Also, by framing it as increasing over the same years that the number of required vaccinations has increased, then the argument for a vaccination-autism connection may be strengthened. The data revealed that one third of stories framed autism as increasing regardless if data were cited. Very few stories framed autism as an epidemic (most occurring around 2006, before CDC established prevalence data) and even fewer framed autism as a public health concern. While one third of stories framed autism as increasing, it appears that television evening news has not significantly contributed to the framing of autism as an epidemic. That only a couple of stories framed autism as a public health concern reveals that television evening news has not adopted the CDCôs frame.

Sources

Because journalists tell stories primarily through those who have authoritative personal knowledge of an event (Singer & Endreny, 1993), this study also examined who the media interviewed in news stories about autism. Ultimately, this study found that television evening news has framed the issue of vaccines causing autism as one where parents/family members of children with autism believe that autism is caused by vaccines and where the medical establishment does not believe that autism is caused by vaccines. These findings suggest that the audience has to determine who they trust more ï parents/family members of children with autism or the government and medical community.

Parents or family members of people with autism were most frequently interviewed in television evening news stories about autism. In this case parents or family members of a person with autism have authoritative personal knowledge of autism and it would serve to reason that they are most interested in autism issues. This research revealed that when interviewed, parents of children with autism were significantly more likely to present a case for vaccines as a cause of autism than against it. Government health officials and medical experts from hospitals were significantly more likely to present a case against vaccines as a cause of autism than for it. Health professionals from health professional organizations presented a case against vaccines as a cause of autism every time they were interviewed on the subject. This analysis reveals that television evening news has framed this issue of vaccines causing autism as one where parents or family members of children with autism nearly always side with the non-scientifically accepted views that autism is caused by vaccines even though more than half of the stories frame vaccines as an unlikely cause. It is troubling that television evening news continued to cover the vaccine/autism issue even after the 2004 IOM report declared vaccines were not a cause of autism, considering that the majority of the medical and scientific communities have accepted that it is not a cause. Perhaps advocacy groups and parents of children with autism who continue to believe that there is a link are framing their messages in a more compelling way than the government and medical establishment. Future research should include a content analysis of materials, Web pages, and other texts from these advocacy groups as well as a quantitative study of the knowledge, attitudes and beliefs of parents of children with autism to determine what messages are resonating with them. This analysis also revealed that celebrities were not often interviewed in television evening news stories about autism. Jenny McCarthy, a celebrity and mother of a child with autism, has become a pseudo-spokesperson for the belief that vaccines

cause autism, yet television evening news has not featured her in this way. Future research should include a content analysis of daytime and primetime talk shows as well as morning news shows where celebrities are more likely to be interviewed.

Limitations of the Study

A significant limitation of this study was that it examined only the television evening news transcripts as opposed to viewing the broadcasts in addition to the transcripts. Viewing the broadcasts would have allowed the author to code for items featured in video footage such as children with autism or children being vaccinated. Coding video footage would enable researchers to better understand how broadcasts are telling the story of autism.

Another limitation of this study is its examination of one particular category of television program: the evening news. A recent survey conducted by Pew (2008) showed that 29% of respondents reported watching nightly network news, but that still leaves about two-thirds of [insert who was the focus ï US adults?] who are not exposed to the news messages through these channels. That does not mean that more people were not exposed to these news messages. Networks have multiple formats for their programming and often times repeat stories in those various formats. Examining a networkôs morning news shows, primetime news magazine shows, and network websites could provide a more complete picture of how autism is framed and through these networks. Also examining cable news outlets for their evening news coverage of autism would provide a more complete picture of what message U.S. adults are receiving on television news programs. Unfortunately, transcripts were not available for the entire study period in order to conduct a complete content analysis. Having transcripts for cable news shows would have enabled the study to provide a more complete picture of how television news frames autism causes and prevalence.

This study could have provided more descriptive information about how autism stories were framed through a qualitative examination of stories. In addition to coding for specific items, a thorough reading of the transcripts would have revealed, what topics related to vaccines causing autism were garnering coverage (e.g., MMR vaccine, thimerosal, or number of vaccines).

Finally, this study only examined the framing of two autism-related issues: causes and prevalence. Certainly, there are other issues that warrant analysis and have received media attention: early identification, treatment, and services. Examining these issues would have presented a more complete picture of how the media frames autism overall.

Suggestions for Future Research

The purpose of this study was to conduct a content analysis to understand how television news media framed autism causes and prevalence and contributed to the public discourse on these issues from 1994, when autism was first recognized as a spectrum of disorders in the *DSM-IV,* through April 2010. In order to provide a more complete picture of how mass media frame autism causes and prevalence, researchers could conduct a content analysis of other television news programming on the major networks, including their morning news shows as well as their primetime newsmagazine shows. Doing so would allow a better comparison of how the individual networks frame autism-related issues. A content analysis of cable news shows such as CNN and FOX would be helpful as well. Aside from network and cable shows, researchers should consider analyzing talk shows such as ñOprah,ò ñThe View,ò or ñThe Doctors,ò which feature health topics. Researchers should also conduct a content analysis of newspaper and online coverage using a similar coding scheme to compare how other media frame these issues. An examination of press releases released by autism advocacy organization might provide

further understanding of how these issues are framed. A complete content analysis of all mass media and autism advocacy organizations press releases should lay the foundation for additional media effects research to understand, what, if any, role U.S. mass media plays in influencing beliefs, attitudes, intentions, or behaviors of audiences in relation to autism. Conducting media effects research with audiences using surveys, experiments, focus groups, or in-depth interviews will also provide a true sense of whether salience has been transferred from the media to the audience, a key component of agenda-setting theory.

Conclusion

This study advances the scholarship on agenda setting and media framing by examining the salience of autism and related topics and addressing the news mediaôs portrayal of autism causes and prevalence. The study examined the frequency of these autism-related issues from 1994 through the first few months of 2010 to better understand how television evening news framed autism and whether the networks differed in their coverage and framing of autism. The data show that autism has become increasingly salient in television evening news. Furthermore, the data revealed that coverage of the vaccines/autism controversy is a salient issue in television evening news. They also show there were no significant differences between the major networks (ABC, CBS, and NBC) in terms of how frequently they covered autism-related stories, the median length of those stories or the placement in the broadcast (prominent). There was a significant difference in the frequency that the networks framed vaccines as a likely cause of autism. The results showed that ABC never framed vaccines as a likely cause of autism in any of their coverage of the topic during the study period as compared to CBS and NBC, whose network news programs said it was a likely cause of autism in roughly 21 to 28% of their stories. The majority of news stories tended to frame vaccines as an unlikely cause of autism, but they also tended to include interviews with parents who believe that vaccines cause autism. The

medical establishment was more likely to present the case for vaccines not causing autism, which means that the audience has to determine who they trust more ï other parents or the government and medical community. The major networks ultimately frame autism causes and prevalence in similar ways, providing some dominant frames for the public that should be examined in terms of interpretation and effects. In the U.S., it is important for health communicators interested in autism to examine the interpretation and effects of these dominant frames because of the public health implications, especially regarding vaccines. Health communicators should use this studyôs findings and future audience effects research to develop strategies that ensure accurate information about autism is communicated to the media and other channels that resonate with the public.

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APPENDIX A: CONTENT ANALYSIS CODEBOOK

Television Evening News Transcripts
Content Analysis Codebook

Please read carefully all directions for coding each item. For reliability reasons, once you start the coding process, there will be no time for more questions and discussions. Make sure to address all your questions BEFORE you start coding. When coding, please be advised to read the entire transcript before coding. Please write your initials in the top right hand corner of the code sheet.

1. Transcript ID

Directions: Write down the transcript ID number, which can be found at the top right-hand corner of first page: Vanderbilt Television News Archive.

_____

2. Network

Directions: Look at the first page: Vanderbilt Television News Archive. Which network did the story appear on? (Circle one)

0) ABC 1) CBS 2) NBC

3. Year of the story

Directions: Look at the first page: Vanderbilt Television News Archive and write down the year of the story. For example, if the year is 1996, write 1996.

Year:

4. Story length/Time spent on story

Directions: Look at the first page: Vanderbilt Television News Archive Summary Look for the text that says Program Time. To the right of Program Time, you will see the word Duration. It will be written in minutes and seconds. Circle one below.

0). 0 to 00:30

1). 00:31 to 01:00

2). 01:01 to 01:30

3). 01:31 to 02:00

4). 02:01 to 02:30

5). 02:31 to 03:00

6). 03:01 to 03:30

7). 03:31 to 04:00

8). 04:01 to 04:30

9). 04:31 to 05:00

10). Longer than 05:01

6. Broadcast placement

Directions: Look at the second page titled: Vanderbilt Television News Archive. At the top of the page, the title should say ñTelevision News Archive: Display Complete Broadcast.ò Find summary of the story about autism highlighted in yellow on the page. Is it the lead story (defined as first story); Before the first commercial or lead story (first story) after the first commercial; lead story (first story) after any other commercial; last story; or other (defined as placement anywhere not included in the above places). Please circle one:

Placement in broadcast:

0). Lead story (defined as first story)

1). Before the first commercial or lead story (first story) after the first commercial

2). lead story (first story) after any other commercial

3). Last story

4). other (defined as placement anywhere not included in the above places)

7. Topics Covered in Autism Story: Cause(s)

Directions: Following the ñVanderbilt Television News Archive Display Complete Broadcastò pages, you will find a transcript of a news story. Read the transcript. Does the story discuss or mention causes, risk factors, or potential causes or risk factors for autism?

Circle 0). No or 1). Yes

Note: If 1) Yes is circled, please continue with Question 6a. Otherwise, skip to Question 7.

6a. Is the main focus of the story about causes, risk factors, or potential causes or risk factors for autism? Or does it mention causes, risk factors, or potential causes or risk factors for autism?

Directions: **Circle one.**

0). Causes/risk factors for autism were <u>mentioned in the story, but not the main focus.</u>
This is defined as not being the main focus of the story, but mentioned somewhere within the story.

1). Causes/risk factors for autism were the <u>main focus of the story</u>
This is defined as being discussed throughout the story and is the main focus and point of the story.

6b. Specify whether each cause or risk factor of autism was not included, mentioned, or was the primary focus of the story.

Then, if the cause or risk factor of autism was either mentioned or was the primary focus of the story, indicate whether story suggests that it is likely, unlikely, or inconclusive as a cause or risk factor for autism support it as a cause.

Directions: For each cause or risk factor circle
0) not included; 1) mentioned; or 2) primary focus of the story

For each cause or risk factor where 1) mentioned or 2) primary focus of the story is circled, please circle one:

0) <u>story suggests that the cause or risk factor is unlikely</u>
This is defined as the story suggesting that the cause or risk factor is improbable, not plausible, disproved, or unsupported by evidence, science or the majority of scientists or unsupported by the medical community or the majority of doctors.
1) <u>story suggests that the cause or risk factor is likely</u>
This is defined as the story suggesting that the cause or risk factor is probable, plausible,

proven, or supported by evidence, science or the majority of scientists or supported by the medical community or the majority of doctors.

2) story suggests that not enough is known or it is inconclusive as a cause or risk factor
This is defined as the story suggesting that not enough is known yet to consider whether it is a cause or risk factor for autism.

A). Genetics or genes:
Genes or genetic causes may include the words family history or genes from mother or father. This could also include the words twins or siblings. This could also include ñriskò genes or genes that have been identified by scientists as increasing the risk for autism**.**

0) not included; 1) mentioned; or 2) primary focus of the story

If 1) mentioned or 2) primary focus of the story is circled, please circle one:

0) story suggests that the cause or risk factor is unlikely

1) story suggests that the cause or risk factor is likely

2) story suggests that not enough is known or it is inconclusive as a cause or risk factor

B). Brain/Neurological Irregularities:
This is defined as irregularities in regions of the brain as a cause of autism. This may also include abnormal levels of serotonin or other neurotransmitters as a cause of autism.

0) not included; 1) mentioned; or 2) primary focus of the story

If 1) mentioned or 2) primary focus of the story is circled, please circle one:

0) story suggests that the cause or risk factor is unlikely

1) story suggests that the cause or risk factor is likely

2) story suggests that not enough is known or it is inconclusive as a cause or risk factor

C). Prenatal Exposure to Viruses:
This is defined as prenatal exposure to viruses as a cause of autism. Some viruses that may be mentioned include cytomegalovirus or CMV and rubella.

0) not included; 1) mentioned; or 2) primary focus of the story

If 1) mentioned or 2) primary focus of the story is circled, please circle one:

0) story suggests that the cause or risk factor is unlikely

1) story suggests that the cause or risk factor is likely

2) story suggests that not enough is known or it is inconclusive as a cause or risk factor

D). Medications:
This may include medications such as, but not limited to, thalidomide, valproic acid, and misoprostol.

0) not included; 1) mentioned; or 2) primary focus of the story

If 1) mentioned or 2) primary focus of the story is circled, please circle one:

0) story suggests that the cause or risk factor is unlikely

1) story suggests that the cause or risk factor is likely

2) story suggests that not enough is known or it is inconclusive as a cause or risk factor

E). Vaccines:
This includes vaccines, such as, but not limited to, the vaccine for Measles, Mumps, and Rubella or MMR; thimerosal, a preservative in vaccines; and/or the number of vaccines as a cause of autism.

0) not included; 1) mentioned; or 2) primary focus of the story

If 1) mentioned or 2) primary focus of the story is circled, please circle one:

0) story suggests that the cause or risk factor is unlikely

1) story suggests that the cause or risk factor is likely

2) story suggests that not enough is known or it is inconclusive as a cause or risk factor

F). Environment:
This may include something in the environment can cause autism. This includes using the word ñenvironmentalò or ñenvironmentò and/or toxins, chemicals, pollutants or pesticides.

0) not included; 1) mentioned; or 2) primary focus of the story

If 1) mentioned or 2) primary focus of the story is circled, please circle one:

0) story suggests that the cause or risk factor is unlikely

1) story suggests that the cause or risk factor is likely

2) story suggests that not enough is known or it is inconclusive as a cause or risk factor

G). Other:

Other is defined as a cause of autism not on this list.

0) not included; 1) mentioned; or 2) primary focus of the story

If you circled other, please write the cause in this space:

_____

If 1) mentioned or 2) primary focus of the story is circled, please circle one:

0) story suggests that the cause or risk factor is unlikely

1) story suggests that the cause or risk factor is likely

2) story suggests that not enough is known or it is inconclusive as a cause or risk factor

7. Topics Covered in Segment on Autism: Estimates/Prevalence

Directions: Does the segment present statistics or estimates about the number of people with autism or the prevalence of autism? Prevalence is a measure of the number of cases of a disease or condition in a defined group of people over a defined period of time and is usually given in this manner 1 in 10 people have xxxx condition.

Circle one

0). No or 1). Yes

Note: If 1) Yes is circled, please continue with Question 7a. Otherwise, skip to Question 8.

7a. How many statistics or estimates of the number of people with autism or prevalence rates are mentioned in the story?

Directions: Write how many different statistics or estimates of the number of people with autism or the prevalence rates of autism are mentioned in the story (1, 2, 3, 4é .) below**.**

_____

7b. Is the main focus of the story about data presenting statistics/estimates or prevalence of autism? Or does it just mention the data?

Directions: Circle one answer.

0). Statistics/estimates or prevalence of autism is <u>mentioned in the story, but not the main focus.</u>
This is defined as not being included in the leading paragraph or sentences/or in the headline, but mentioned somewhere else in the story.

1). Statistics/estimates or prevalence of autism is the <u>main focus of the story</u>
This is defined as being discussed in the leading paragraph or sentences and/or in the headline of the transcript and may include the words ñnew dataò or ñnew numbers.ò

7c. According to the news story, what is the prevalence of autism or what is the statistic or estimate given regarding the number of people with autism?

Directions: Circle the statistic/estimate or prevalence numbers provided by the news story. Please circle or write in the exact number that appears in the story. You do not need to make any calculations.

1. 4.5 per 10,000

2. 67 per 10,000

3. 60 per 10,000

4. 1 in 166

5. 1 in 150

6. 1 in 90 or 1 in 91

7. 1 in 110

8. 1% or 1 percent

9. other: please enter number mentioned_____

7d. Does the story indicate whether the autism rates are increasing or growing?
Directions: Does the story indicate whether the rates of people with autism are increasing or growing? Circle 0). No or 1). Yes
8. Is autism identified as an "epidemic" in the news story?
Directions: Is autism identified as an ñepidemicò? [story uses this word specifically with regard to autism]. Circle 0). No or 1). Yes
9. Is autism identified as an ñurgent public health concernò or a ñpublic health concernò or a ñpublic health problemò?
Directions: **Is autism identified as an "urgent public health concern" or a "public health concern" or a "public health problem" or a "public health danger" or a "public health concern"? [story uses one of these phrases with regard to autism]. Please circle** 0). No or 1). Yes
10. Was anyone interviewed for the segment?
Directions: Is anyone interviewed for the segment? **Circle** 0) No or 1). Yes Note: If 1) Yes is circled, please complete Question 10(a) for each different person who is interviewed. If not, the coding for this transcript is complete
10a. Who is interviewed for the segment? Person 1.
Directions: **Person 1:** This refers to the first person interviewed. Circle all that apply. For example, if the person interviewed is a parent of a child with autism and is identified as associated with an advocacy organization, circle both. A person must be actually interviewed and speaking, not

just shown.

1. Government Medical/Scientific Expert
A government medical or scientific expert is defined as a doctor, epidemiologist, or scientist who is identified as currently a part of state government or national government agency such as the Centers for Disease Control and Prevention (CDC), National Institutes of Health (NIH), Environmental Protection Agency (EPA), the U.S. Department of Health and Human Services (HHS), or the U.S. Food and Drug Administration (FDA).

2. Medical Expert from a Hospital
A medical/scientific expert from a hospital could be a doctor or a nurse or another health provider such as a therapist or psychologist or psychiatrist. The expert is identified with a hospital.

3. Medical Expert from an autism advocacy organization
A medical/scientific expert from an advocacy is defined as a doctor, nurse, epidemiologist, or scientist from an organization such as Autism Speaks, Cure Autism Now, or Autism Society of America. The expert is identified with an autism advocacy organization.

4. Medical Expert from a health care professional organization
A medical/scientific expert from a health care professional organization is defined as a doctor, nurse, therapist, psychologist from an organization such as the American Academy of Pediatrics, the American Academy of Family Physicians, or the American Academy of Nursing. The expert is identified with a health care professional organization.

5. Person with autism

6. Parents of or family member of a person with autism

7. Celebrity
A celebrity is defined as a person who is identified as an entertainer or in the entertainment industry such as an actress/actress, singer, reality television star, etcé This also may include professional athletes such as a basketball or football player. If a celebrity is interviewed, please list that personôs name on the line below:

_____

8. Leader or someone associated with an advocacy organization.
This is defined as anyone associated with an advocacy organization who is not explicitly defined as a medical/scientific expert who works at an advocacy organization such as Autism Speaks, Cure Autism Now, Autism Society of America, etcé

9. Other
Please list any other identifying information for the first person interviewed that do(es) not fit into a category from above:

_____

Note: If another person is interviewed, please proceed to question 10(b). If not, please proceed to question 11.

10b. Who is interviewed for the segment? Person 2.

Directions:
Person 2: This refers to the second person interviewed. Circle all that apply. For example, If the person interviewed is a parent of a child with autism and is identified as associated with an advocacy organization, circle both. A person must be actually interviewed and speaking, not just shown.

1. Government Medical/Scientific Expert
A government medical or scientific expert is defined as a doctor, epidemiologist, or scientist who is identified as currently a part of state government or national government agency such as the Centers for Disease Control and Prevention (CDC), National Institutes of Health (NIH), Environmental Protection Agency (EPA), the U.S. Department of Health and Human Services (HHS), or the U.S. Food and Drug Administration (FDA).

2. Medical Expert from a Hospital
A medical/scientific expert from a hospital could be a doctor or a nurse or another health provider such as a therapist or psychologist or psychiatrist. The expert is identified with a hospital.

3. Medical Expert from an autism advocacy organization
A medical/scientific expert from an advocacy is defined as a doctor, nurse, epidemiologist, or scientist from an organization such as Autism Speaks, Cure Autism Now, or Autism Society of America. The expert is identified with an autism advocacy organization.

4. Medical Expert from a health care professional organization
A medical/scientific expert from a health care professional organization is defined as a doctor, nurse, therapist, psychologist from an organization such as the American Academy of Pediatrics, the American Academy of Family Physicians, or the American Academy of Nursing. The expert is identified with a health care professional organization.

5. Person with autism

6. Parents of or family member of a person with autism

7. Celebrity
A celebrity is defined as a person who is identified as an entertainer or in the entertainment industry such as an actress/actress, singer, reality television star, etcé This also may include

professional athletes such as a basketball or football player. If a celebrity is interviewed, please list that personôs name on the line below:

_____

8. Leader or someone associated with an advocacy organization.
This is defined as anyone associated with an advocacy organization who is not explicitly defined as a medical/scientific expert who works at an advocacy organization such as Autism Speaks, Cure Autism Now, Autism Society of America, etcé

9. Other
Please list any other identifying information for the first person interviewed that do(es) not fit into a category from above:

_____

Note: If another person is interviewed, please proceed to question 10(c). If not, please proceed to question 11.

10c. Who is interviewed for the segment? Person 3.

Directions:
Person 3: This refers to the third person interviewed. Circle all that apply. For example, if the person interviewed is a parent of a child with autism and is identified as associated with an advocacy organization, circle both. A person must be actually interviewed and speaking, not just shown.

1. Government Medical/Scientific Expert
A government medical or scientific expert is defined as a doctor, epidemiologist, or scientist who is identified as currently a part of state government or national government agency such as the Centers for Disease Control and Prevention (CDC), National Institutes of Health (NIH), Environmental Protection Agency (EPA), the U.S. Department of Health and Human Services (HHS), or the U.S. Food and Drug Administration (FDA).

2. Medical Expert from a Hospital
A medical/scientific expert from a hospital could be a doctor or a nurse or another health provider such as a therapist or psychologist or psychiatrist. The expert is identified with a hospital.

3. Medical Expert from an autism advocacy organization
A medical/scientific expert from an advocacy is defined as a doctor, nurse, epidemiologist, or scientist from an organization such as Autism Speaks, Cure Autism Now, or Autism Society of America. The expert is identified with an autism advocacy organization.

4. Medical Expert from a health care professional organization
A medical/scientific expert from a health care professional organization is defined as a doctor, nurse, therapist, psychologist from an organization such as the American Academy of Pediatrics, the American Academy of Family Physicians, or the American Academy of Nursing. The expert is identified with a health care professional organization

5. Person with autism

6. Parents of or family member of a person with autism

7. Celebrity
A celebrity is defined as a person who is identified as an entertainer or in the entertainment industry such as an actress/actress, singer, reality television star, etcé This also may include professional athletes such as a basketball or football player. If a celebrity is interviewed, please list that personôs name on the line below:

_____

8. Leader or someone associated with an advocacy organization.
This is defined as anyone associated with an advocacy organization who is not explicitly defined as a medical/scientific expert who works at an advocacy organization such as Autism Speaks, Cure Autism Now, Autism Society of America, etc…

9. Other
Please list any other identifying information for the first person interviewed that do(es) not fit into a category from above:

_____

Note: If another person is interviewed, please proceed to question 10(d). If not, please proceed to question 11.

10d. Who is interviewed for the segment? Person 4.

Directions:
Person 4: This refers to the fourth person interviewed. Circle all that apply. For example, If the person interviewed is a parent of a child with autism and is identified as associated with an advocacy organization, circle both. A person must be actually interviewed and speaking, not just shown.

1. Government Medical/Scientific Expert
A government medical or scientific expert is defined as a doctor, epidemiologist, or scientist

who is identified as currently a part of state government or national government agency such as the Centers for Disease Control and Prevention (CDC), National Institutes of Health (NIH), Environmental Protection Agency (EPA), the U.S. Department of Health and Human Services (HHS), or the U.S. Food and Drug Administration (FDA).

2. Medical Expert from a Hospital
A medical/scientific expert from a hospital could be a doctor or a nurse or another health provider such as a therapist or psychologist or psychiatrist. The expert is identified with a hospital.

3. Medical Expert from an autism advocacy organization
A medical/scientific expert from an advocacy is defined as a doctor, nurse, epidemiologist, or scientist from an organization such as Autism Speaks, Cure Autism Now, or Autism Society of America. The expert is identified with an autism advocacy organization

4. Medical Expert from a health care professional organization
A medical/scientific expert from a health care professional organization is defined as a doctor, nurse, therapist, psychologist from an organization such as the American Academy of Pediatrics, the American Academy of Family Physicians, or the American Academy of Nursing. The expert is identified with a health care professional organization

5. Person with autism

6. Parents of or family member of a person with autism

7. Celebrity
A celebrity is defined as a person who is identified as an entertainer or in the entertainment industry such as an actress/actress, singer, reality television star, etcé This also may include professional athletes such as a basketball or football player. If a celebrity is interviewed, please list that personôs name on the line below:

_____

8. Leader or someone associated with an advocacy organization.
This is defined as anyone associated with an advocacy organization who is not explicitly defined as a medical/scientific expert who works at an advocacy organization such as Autism Speaks, Cure Autism Now, Autism Society of America, etcé

9. Other
Please list any other identifying information for the first person interviewed that do(es) not fit into a category from above:

_____

Note: If another person is interviewed, please proceed to question 10(e). If not, please proceed to question 11.

10e. Who is interviewed for the segment? Person 5.

Directions:
Person 5: This refers to the fifth person interviewed. Circle all that apply. For example, If the person interviewed is a parent of a child with autism and is identified as associated with an advocacy organization, circle both. A person must be actually interviewed and speaking, not just shown.

1. Government Medical/Scientific Expert
A government medical or scientific expert is defined as a doctor, epidemiologist, or scientist who is identified as currently a part of state government or national government agency such as the Centers for Disease Control and Prevention (CDC), National Institutes of Health (NIH), Environmental Protection Agency (EPA), the U.S. Department of Health and Human Services (HHS), or the U.S. Food and Drug Administration (FDA).

2. Medical Expert from a Hospital
A medical/scientific expert from a hospital could be a doctor or a nurse or another health provider such as a therapist or psychologist or psychiatrist. The expert is identified with a hospital.

3. Medical Expert from an autism advocacy organization
A medical/scientific expert from an advocacy is defined as a doctor, nurse, epidemiologist, or scientist from an organization such as Autism Speaks, Cure Autism Now, or Autism Society of America. The expert is identified with an autism advocacy organization.

4. Medical Expert from a health care professional organization
A medical/scientific expert from a health care professional organization is defined as a doctor, nurse, therapist, psychologist from an organization such as the American Academy of Pediatrics, the American Academy of Family Physicians, or the American Academy of Nursing. The expert is identified with a health care professional organization.

5. Person with autism

6. Parents of or family member of a person with autism

7. Celebrity
A celebrity is defined as a person who is identified as an entertainer or in the entertainment industry such as an actress/actress, singer, reality television star, etcé This also may include professional athletes such as a basketball or football player. If a celebrity is interviewed, please list that personôs name on the line below:

_____

8. Leader or someone associated with an advocacy organization.
This is defined as anyone associated with an advocacy organization who is not explicitly defined as a medical/scientific expert who works at an advocacy organization such as Autism Speaks, Cure Autism Now, Autism Society of America, etcé

9. Other
Please list any other identifying information for the first person interviewed that do(es) not fit into a category from above:

_____

11. For each person interviewed, please indicate whether he/she presents a message that suggests that there is no link between autism and vaccines (anti-link) or a message that suggests that there is a link between autism and vaccines (pro-link)?
If the story did not include any mention of vaccines, then you are done coding this story.

Directions: For each person interviewed, were they pro-vaccine or anti-vaccine or not sure?

A). Person 1:

0). Anti-link.
This is defined as the person being interviewed indicating that vaccines do not cause autism or that a link between autism and vaccines was considered improbable, unsupported by evidence, or disproved.

1). Pro-link.
This is defined as the person being interviewed indicating that the theory or idea of vaccines causing autism is possible, plausible, or probable.

2). Not sure
This is defined as the person being interviewed indicating that he/she is conflicted by the theory or idea of vaccines causing autism.

3). N/A
This person does not discuss vaccines.

B) Person 2:

0). Anti-link.
This is defined as the person being interviewed indicating that vaccines do not cause autism or that a link between autism and vaccines was considered improbable, unsupported by evidence, or disproved.

1). Pro-link.
This is defined as the person being interviewed indicating that the theory or idea of vaccines causing autism is possible, plausible, or probable.

2). Not sure
This is defined as the person being interviewed indicating that he/she is conflicted by the theory or idea of vaccines causing autism.

3). N/A
This person does not discuss vaccines.

C) Person 3:

0). Anti-link.
This is defined as the person being interviewed indicating that vaccines do not cause autism or that a link between autism and vaccines was considered improbable, unsupported by evidence, or disproved.

1). Pro-link.
This is defined as the person being interviewed indicating that the theory or idea of vaccines causing autism is possible, plausible, or probable.

2). Not sure
This is defined as the person being interviewed indicating that he/she is conflicted by the theory or idea of vaccines causing autism.

3) N/A
This person does not discuss vaccines.

D) Person 4:

0). Anti-link.
This is defined as the person being interviewed indicating that vaccines do not cause autism or that a link between autism and vaccines was considered improbable, unsupported by evidence, or disproved.

1). Pro-link.
This is defined as the person being interviewed indicating that the theory or idea of vaccines causing autism is possible, plausible, or probable.

2). Not sure
This is defined as the person being interviewed indicating that he/she is conflicted by the theory or idea of vaccines causing autism.

3) N/A
This person does not discuss vaccines.

E) Person 5:

0). Anti-link.
This is defined as the person being interviewed indicating that vaccines do not cause autism or that a link between autism and vaccines was considered improbable, unsupported by evidence, or disproved.

1). Pro-link.
This is defined as the person being interviewed indicating that the theory or idea of vaccines causing autism is possible, plausible, or probable.

2). Not sure
This is defined as the person being interviewed indicating that he/she is conflicted by the theory or idea of vaccines causing autism**.**

3). N/A
This person does not discuss vaccines.

APPENDIX B: CONTENT ANALYSIS CODE SHEET

1. **Transcript I.D.:**

   _____

2. **Network:** ***(Circle one)***

   0). ABC

   1). CBS

   2). NBC

3. **Year of Story:**

   _____

4. **Length of Story:** ***(Circle one)***

   0). 0 to 00:30

   1). 00:31 to 01:00

   2). 01:01 to 01:30

   3). 01:31 to 02:00

   4). 02:01 to 02:30

   5). 02:31 to 03:00

   6). 03:01 to 03:30

   7). 03:31 to 04:00

   8). 04:01 to 04:30

   9). 04:31 to 05:00

   10). Longer than 05:01

5. **Broadcast Placement:** ***(Circle one)***

   0). Lead story (defined as first story)

   1). Before the first commercial or lead story (first story) after the first commercial

   2). lead story (first story) after any other commercial

   3). Last story

   4). other (defined as placement anywhere not included in the above places)

6. **Topics Covered: causes/risk factors-- Does the story discuss or mention causes, risk factors, or potential causes or risk factors for autism?**

   0). No

   1). Yes

   [If 1) Yes is circled, please continue with Question 6a. Otherwise, skip to Question 7.]

   6a. Topic Covered: Cause – were causes not included, mentioned, or main focus of story?

   0). Causes/risk factors were mentioned in the story, but not the main focus

   1). Causes/risk factors for autism are the main focus of the story

6b. Topic Covered: Cause – specific causes

A). Genetics/Genes

0) not included
1) mentioned
2) primary focus of story

If 1) mentioned or 2) primary focus of the story is circled, please circle one:

0) story suggests that the cause or risk factor is unlikely

1) story suggests that the cause or risk factor is likely

2) story suggests that not enough is known or it is inconclusive as a cause or risk factor

B). Brain/Neurological Irregularities

0) not included
1) mentioned
2) primary focus of story

If 1) mentioned or 2) primary focus of the story is circled, please circle one:

0) story suggests that the cause or risk factor is unlikely
1) story suggests that the cause or risk factor is likely
2) story suggests that not enough is known or it is inconclusive as a cause or risk factor

C). Prenatal Exposure to Viruses

0) not included
1) mentioned
2) primary focus of story

0) story suggests that the cause or risk factor is unlikely
1) story suggests that the cause or risk factor is likely
2) story suggests that not enough is known or it is inconclusive as a cause or risk factor

D). Medications

0) not included
1) mentioned
2) primary focus of story

If 1) mentioned or 2) primary focus of the story is circled, please circle one:

0) story suggests that the cause or risk factor is unlikely
1) story suggests that the cause or risk factor is likely
2) story suggests that not enough is known or it is inconclusive as a cause or risk factor

E). Vaccines

0) not included
1) mentioned
2) primary focus of story

If 1) mentioned or 2) primary focus of the story is circled, please circle one:

0) story suggests that the cause or risk factor is unlikely
1) story suggests that the cause or risk factor is likely
2) story suggests that not enough is known or it is inconclusive as a cause or risk factor

F). Environment

0) not included
1) mentioned
2) primary focus of story

If 1) mentioned or 2) primary focus of the story is circled, please circle one:

0) story suggests that the cause or risk factor is unlikely
1) story suggests that the cause or risk factor is likely
2) story suggests that not enough is known or it is inconclusive as a cause or risk factor

G). Other:

Write the cause in this space:
_____

0) not included
1) mentioned
2) primary focus of story

If 1) mentioned or 2) primary focus of the story is circled, please circle one:

0) story suggests that the cause or risk factor is unlikely
1) story suggests that the cause or risk factor is likely
2) story suggests that not enough is known or it is inconclusive as a cause or risk factor

7. Topic Covered: Statistics/Prevalence-- Does the segment present statistics or estimates about the number of people with autism or the prevalence of autism?

0). No
1). Yes

[If 1) Yes is circled, please continue with Question 7a. Otherwise, skip to Question 8.]

7a. Topic Covered: Statistics/Prevalence– How many rates of autism are mentioned?

_____

7b. Topic Covered: Statistics/Prevalence– main focus of story or mention?

0). Statistics/prevalence of autism was mentioned in the story, but not the main focus.

1). Statistics/prevalence of autism was the main focus of the story.

7c. Topic Covered: Statistic/Prevalence– what is (are) statistics/estimates or the prevalence number(s) given in the story?

1. 4.5 per 10,000

2. 67 per 10,000

3. 60 per 10,000

4. 1 in 166

5. 1 in 150

6. 1 in 90 or 1 in 91

7. 1 in 110

8. 1% or 1 percent

9. other: please enter number mentioned_____

7d. Topic Covered: Statistics/Prevalence– does the story indicate whether the rates of people with autism or prevalence is increasing?

0). No

1). Yes

8. Is autism identified as an "epidemic"?

0). No

1). Yes

9. Is autism identified as an "urgent public health concern," "public health concern," or "public health problem" or "public health danger" or "public health concern"?

0). No

1). Yes

10. Was anyone interviewed for the story?

0). No

1). Yes

10a. Interviewed: Person 1

1. Government Medical/Scientific Expert

2. Medical Expert from a Hospital

3. Medical Expert from an autism advocacy organization

4. Medical Expert from a health care professional organization

5. Person with autism

6. Parents of or family member of a person with autism

7. Celebrity
If a celebrity is interviewed, please list that personôs name on the line below:
_____

8. Leader or someone associated with an advocacy organization.

9. Other
Please list any other identifying information for the first person interviewed that do(es) not fit into a category from above:
_____

10b. Interviewed: Person 2

1. Government Medical/Scientific Expert

2. Medical Expert from a Hospital

3. Medical Expert from an autism advocacy organization

4. Medical Expert from a health care professional organization

5. Person with autism

6. Parents of or family member of a person with autism

7. Celebrity
If a celebrity is interviewed, please list that personôs name on the line below:
_____

8. Leader or someone associated with an advocacy organization.

9. Other
Please list any other identifying information for the first person

	interviewed that do(es) not fit into a category from above: _____
10c. Interviewed: Person 3 1. Government Medical/Scientific Expert 2. Medical Expert from a Hospital 3. Medical Expert from an autism advocacy organization 4. Medical Expert from a health care professional organization 5. Person with autism 6. Parents of or family member of a person with autism 7. Celebrity If a celebrity is interviewed, please list that personôs name on the line below: _____ 8. Leader or someone associated with an advocacy organization. 9. Other Please list any other identifying information for the first person interviewed that do(es) not fit into a category from above: _____ **10d. Interviewed: Person 4** 1. Government Medical/Scientific Expert 2. Medical Expert from a Hospital 3. Medical Expert from an autism advocacy organization 4. Medical Expert from a health care	6. Parents of or family member of a person with autism 7. Celebrity If a celebrity is interviewed, please list that personôs name on the line below: _____ 8. Leader or someone associated with an advocacy organization. 9. Other Please list any other identifying information for the first person interviewed that do(es) not fit into a category from above: _____ **10e. Interviewed: Person 5** 1. Government Medical/Scientific Expert 2. Medical Expert from a Hospital 3. Medical Expert from an autism advocacy organization 4. Medical Expert from a health care professional organization 5. Person with autism 6. Parents of or family member of a person with autism 7. Celebrity If a celebrity is interviewed, please list that personôs name on the line below: _____ 8. Leader or someone associated with an advocacy organization.

professional organization 5. Person with autism	9. Other Please list any other identifying information for the first person interviewed that do(es) not fit into a category from above: _____
11. For each person interviewed, pro-link or anti-link (vaccines and autism) **A). Person 1** 0). Anti-link 1). Pro-link 2). Not sure 3). N/A (This person does not discuss vaccines) **B). Person 2** 0). Anti-link 1). Pro-link 2). Not sure 3). N/A (This person does not discuss vaccines) **C). Person 3** 0). Anti-link 1). Pro-link 2). Not sure 3). N/A (This person does not discuss vaccines) **D). Person 4** 0). Anti-link 1). Pro-link	**E). Person 5** 0). Anti-link 1). Pro-link. 2). Not sure 3). N/A (This person does not discuss vaccines)

2). Not sure 3). N/A (This person does not discuss vaccines)	