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# The expressed emotion of parents of children with developmental disabilities: A meta-analysis

Talia Thompson<sup>1</sup>, Jeanine Coleman<sup>2</sup> & Antonio Olmos<sup>3</sup>

## Abstract

*Parents of children with Developmental Disabilities (DD) face particular challenges interacting with their children and have been shown to have higher levels of stress than parents of children without disabilities. A number of studies have attempted to understand the emotional climate in the homes of children with DD by examining parental Expressed Emotion (EE), or parental attitudes about the child and their relationship. However, many of these studies have been small in sample size and have only worked with one subset of the DD population. This meta-analysis examined the proportion of parents of children with DD exhibiting High EE through a statistical aggregation of effect sizes across seven studies including 600 participants. The fixed effects size proportion was .39 (SE = .02;  $p < .0001$ ), indicating approximately 40% of the parents in the combined samples exhibited High EE. Results support efforts to address the needs of the whole family for children with DD in order to ensure a safe and supportive emotional climate in the home.*

**Keywords:** Expressed Emotion; Five Minute Speech Sample (FMSS); Developmental Disabilities; Meta-Analysis.

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## 1. Introduction

Child development theory and research indicate child outcomes are greatly influenced by the transactional relationships between children and parents (Bandura, 1978; Bronfenbrenner & Ceci, 1994). Interactions between the parent and the child take place within home and community settings and vary greatly depending on child and parent characteristics as well as societal influences (Bronfenbrenner & Ceci, 1994). Positive developmental outcomes are typically associated with parenting relationships that are responsive, warm and predictable (Dyches, Smith, Korth, Roper, & Mandlco, 2012; Kubicek, Riley, Coleman, Miller, & Linder, 2013).

Parents of children with developmental disabilities (DD) face particular challenges interacting with their children and have been shown to have higher levels of stress than parents of children without disabilities (Peer & Hillman, 2014). DD is an umbrella term that refers to lifelong physical and/or cognitive disabilities, affecting multiple systems in the body and beginning before the age of 22 (American Association of Intellectual and Developmental Disabilities – AAIDD, n.d.). DD encompasses a number of severe and chronic disabilities, including Down syndrome (DS), autism spectrum disorder (ASD), cerebral palsy (CP), Fragile X syndrome (FXS), and fetal alcohol spectrum disorder (FASD).

A number of studies have attempted to understand the emotional climate in the home of children with DD by examining parental Expressed Emotion (EE). EE is a construct that encompasses the familial emotional climate, particularly parental attitudes about the child and their relationship (Magana-Amato, 2015). High EE in parents and caregivers of children with disabilities may indicate problematic relations that could interfere with singular or combined intervention therapies intended to change behavior or adaptive functioning (Coleman & Riley, 2014). Family-centered interventions may be an appropriate focus for agencies and schools serving children with disabilities to help parents balance their EE and the potential influence on the success of developmental interventions.

The primary measure used to assess EE is the Five Minute Speech Sample (FMSS; Magana-Amato, 2015). This assessment tool was adapted from the Camberwell Family Interview (CFI) (Brown & Rutter, 1966), a longer parent interview originally used with the family members of individuals with psychopathology (Coleman & Riley, 2014). The FMSS measures EE with a brief interview, in which the parent speaks about the

child and the relationship for five uninterrupted minutes. A coding system is used to analyze the transcribed monologue for content and tone. Five categories are measured: initial statement, relationship, criticism, dissatisfaction, and emotional overinvolvement with an overall summary coding of High or Low EE (Magana-Amato, 2015).

## 2. Aims and research question

Although there have been a number of studies analyzing the EE in parents of children with DD, there has not been a systematic analysis of this literature. Furthermore, many of these studies have been small in sample size and have only worked with one subset of the DD population (e.g. young children, children with autism, and children with FXS). A meta-analysis may provide a more statistically robust and accurate analysis of parental EE in this population. For example, a meta-analysis synthesizes several studies to quantitatively aggregate the data into an overall effect size. This may allow us to generalize results to many subsets of DD, ages, gender, etc. Therefore, the research question for this meta-analysis was: What proportion of parents of children with DD exhibit High EE, as measured by the FMSS?

## 3. Methods

### *3.1. Literature Search*

Studies selected for inclusion in this meta-analysis were written in English and contained quantitative (proportions) data. Subjects for the studies were parents (mothers or fathers) of children (birth through adulthood) with developmental disabilities. DD was defined to include disabilities that significantly impact the child's functional living skills in multiple areas of life. Studies had to utilize the FMSS to measure levels of EE and had to report the proportions of parents who scored as high EE. In terms of exclusion, studies that reported EE as measured by other assessment tools were not included. Studies that examined levels of EE in non-parent caregivers (teachers, grandparents, foster care providers) were also excluded. In addition, studies that examined EE in the parents of children with other disabilities (e.g. specific learning disabilities) were removed to focus the study on the unique experience of parenting children with significant, pervasive, and life-long disabilities. A comprehensive search for research included the identification of published and unpublished

studies. This included a search in academic databases such as PsycINFO, Education Research Information Center (ERIC), MEDLINE and the search engine of one western U.S. University's library system. In all database searches, some key terms were used to elicit studies with the inclusion criteria of expressed emotion for parents with disabilities. Searches had to include both "expressed emotion" and "five minute speech sample" in order to be included. Then, word stems were used to identify all of the variations of common words used to describe the desired sample population. These were separated by Boolean search operator "or" so that all variations were included in the search. Terms for population sample included *disab\**, *autis\**, *handicap*, *impair\**, Down syndrome, Fragile X syndrome, *developmental disab\**, *special need*, *special education*, *developmental delay*, *intellectual disab\**, *mental retardation* and *cognitive impair\**.

Citation lists were also examined in order to locate articles that came before those identified. This assisted in finding seminal studies that researchers were building upon with their current research, or studies that used a similar format with a slightly different sample. Furthermore, in some databases (e.g. PsycINFO and Google Scholar), forward searches were also conducted. Articles that were identified with the search criteria laid out above also came with a list of articles that included these studies in their own citations. A scan of these lists revealed more current studies that were examining the same or similar concepts. By conducting back-searching and forward searches, an exhaustive list of studies was generated for the meta-analysis. Publication bias and the file-drawer problem (Card, 2015) were addressed by utilizing a variety of study sources, as well as statistically testing for publication bias.

Eleven studies were initially identified through the inclusion criteria (Lam, Giles, & Lavender, 2003; Beck, Daley, Hastings, & Stevenson, 2004; Hastings, Daley, Burns, & Beck, 2006; Orsmond, Seltzer, Greenberg, & Krauss, 2006; Benson, Daley, & Karlof, 2011; Greenberg, Seltzer, Baker, Smith, Warren, Brady *et al.*, 2012; Kubicek *et al.*, 2013; Coleman & Riley, 2014; Lancaster, Balling, Hastings, & Lloyd, 2014; Griffith, Hastings, Petalas, & Lloyd, 2015; Abazari, Malekpour, Ghamarani, Abedi, & Faramarzi, 2016; Coleman, Riley, & Thompson, 2016). Four of the identified studies were excluded for their use of different measurements tools (e.g. CFI) or special versions of the FMSS (autism-specific) to assess EE (Lam *et al.*, 2003; Benson *et al.*, 2011; Abazari *et al.*, 2016;). Two studies did not report overall EE proportions (Greenberg *et al.*, 2012; Lancaster *et al.*, 2014). Seven studies were included in the final meta-

analysis (see Tab. 1) with a total N of 600. Six were published in peer-reviewed journals and one was a research poster presentation at an international academic conference.

Table 1 - *Studies included in meta-analysis*

Author(s)	Title	Source	N	Effect size (proportion)
Beck <i>et al.</i> , (2004)	Mothers' expressed emotion towards children with and without intellectual disabilities	Journal of Intellectual Disability Research	33	.61
Coleman & Riley (2014)	The expressed emotion of mothers of children with Fragile X Syndrome	Life Span and Disability	35	.31
Coleman <i>et al.</i> , (2016)	The expressed emotion of parents of children with intellectual disabilities	Research poster presentation-15 <sup>th</sup> NFXS International Fragile X Conference	74	.42
Griffith <i>et al.</i> , (2015)	Mothers' expressed emotion towards children with autism spectrum disorder and their siblings	Journal of Intellectual Disability Research	143	.19
Hastings <i>et al.</i> , (2006)	Maternal distress and expressed emotion: Cross-sectional and longitudinal relationships with behavior problems of children with intellectual disabilities	American Journal on Mental Retardation	75	.52
Kubicek <i>et al.</i> , (2013)	Assessing the emotional quality of parent-child relationships involving young children with special needs: Applying the constructs of emotional availability and expressed emotion	Infant Mental Health Journal	38	.40
Orsmand <i>et al.</i> , (2006)	Mother-child relationship quality among adolescents and adults with autism	American Journal on Mental Retardation	202	.29

### 3.2. Data Coding

Coding for this meta-analysis documented relevant data from each study that met the inclusion criteria. First, relevant characteristics about each study were noted (e.g. author, title, year of publication, and source). Proportions data was also coded, including the number of participants from each study with high EE, as well as total sample size for each study.

### 3.3. Procedures-Computation of Effect Size Estimates

Among the seven studies included in this meta-analysis, all seven reported proportions statistics. In order to determine effect sizes for proportions, a transformation was required to convert proportions into a measure with stronger statistical properties. For the purposes of this study, a log-odds transformation was utilized (Card, 2015). This helped to normalize the data and stabilize the variance that can be present with proportions data. After the transformation, meta-analysis was conducted using transformed data to calculate effect size proportions across all seven studies. Effect size was analyzed with a fixed effects model using the *metafor* package (Viechtbauer, 2010) for R statistical analysis software. A fixed effect model was utilized because of the clearly defined population in all studies, as well as the consistency of measure used across the studies (Card, 2015). Finally, a back-transformation was conducted to convert the data back into proportions for ease of interpretation (Borenstein, Hedges, Higgins, & Rothstein, 2009).

### 3.4. Procedures-Assessment of Publication Bias

In order to estimate the effects of publication bias on the results of this meta-analysis, a number of calculations were conducted. First, a contour enhance funnel plot and radial plot were created to measure effect size proportions against the standard error (or inverse standard error) of each study. Furthermore, Eggers regression and an adjusted rank correlation were also used to assess publication bias. Multiple fail-safe N analyses were conducted to determine how many more studies would have to be included to get a non-significant p-value for heterogeneity. Finally, trim and fill analysis was used to determine the types of studies required for creating funnel plot symmetry.

## 4. Data Analysis

### 4.1. Effect Size Analysis

Results indicate that the effect size proportion of parents of children with DD with high levels of EE was .39 ( $SE = .02$ ;  $p < .0001$ ) (see Tab. 2 and Fig. 1). However, results should be interpreted with caution due to the significant amount of heterogeneity in the studies, as indicated by a statistically significant Q score. Figure 2 visually depicts the heterogeneity of the model using a radial plot. A qualitative analysis of the two lowest outlying studies revealed that both solely sampled mothers of children with ASD. These results support previous research which has indicated a need for an ASD-specific coding system for the FMSS due to disability specific differences in parenting (Benson *et al.*, 2011).

Table 2 - Model Results

Estimate	Standard Error	Zval	p value	CI lower	CI upper
.39	.02	16.20	< .0001	.34	.44
Test for Heterogeneity:					
$Q(df = 6) = 44.26$			$p < .0001$		

Figure 1 - Forrest plot for effect size. This figure is a visual depiction of effect sizes across all seven studies

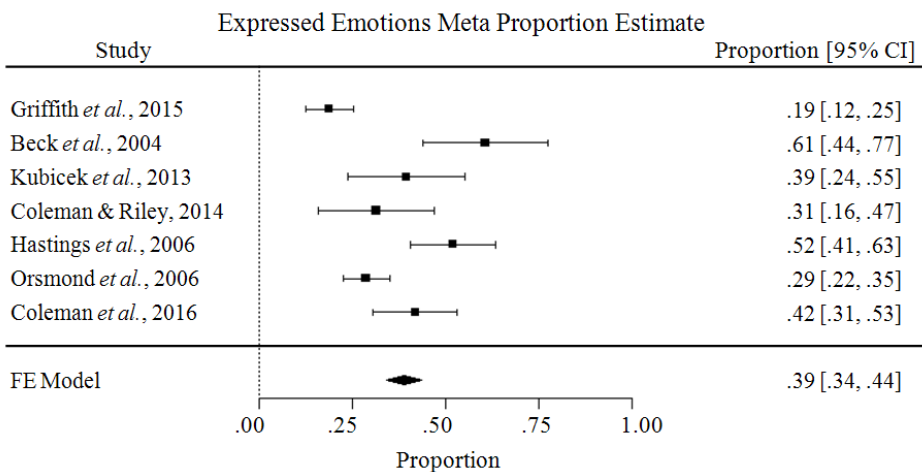
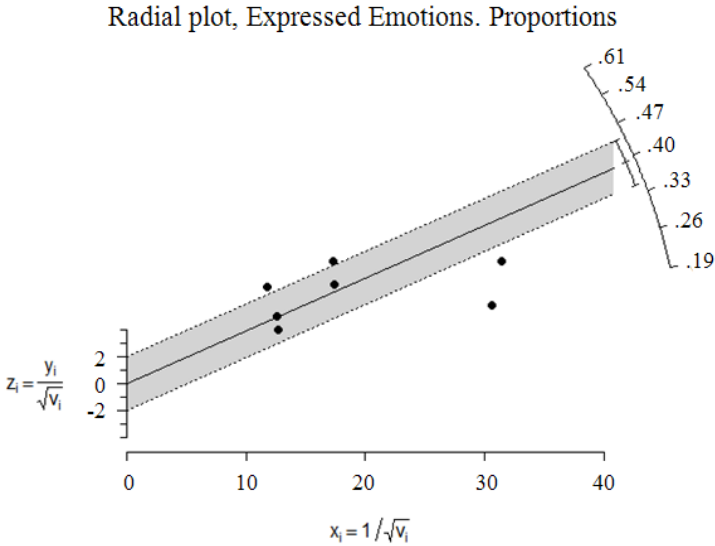




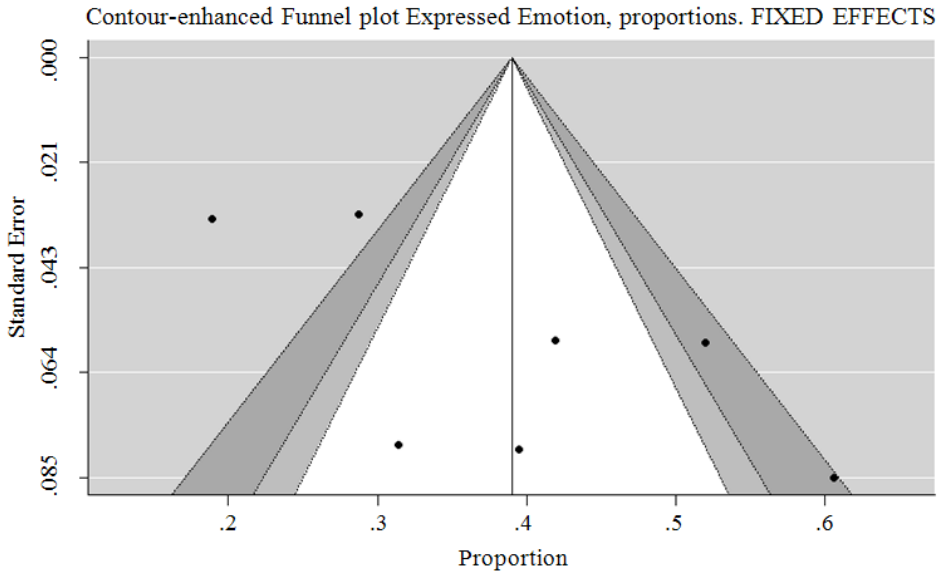
Figure 2 - Radial plot of heterogeneity. This figure represents the heterogeneity that is not accounted for in the model



#### 4.2. Publication Bias Analysis

Several procedures were conducted to assess the possibility of publication bias contributing to the heterogeneity of effect sizes. A contour enhanced funnel plot of the effect size (x-axis) by the standard error (y-axis) (see Fig. 3) indicated asymmetry and the possibility of missing studies. Egger’s regression analysis was significant ( $z = 3.83; p = .0001$ ), however, adjusted rank correlation was not significant (*Kendall's tau* = .33;  $p = .38$ ). Fail-safe N testing produced mixed results. The Rosenthal method indicated that there would need to be 649 more studies in order for  $p$  values to be insignificant. This is an unlikely number considering the limited number of studies conducted in this rare area of research. However, The Orwin method indicated only 7 more studies would be required- a more likely and feasible conclusion.

Figure 3 - *Contour enhanced funnel plot. This figure depicts the asymmetry of the studies included in the meta-analysis*



## 5. Discussion

Results from this meta-analysis indicate that approximately forty percent of the parents in the combined samples exhibited High EE. This proportion is concerning in that it indicates an emotionally charged climate in a sizeable number of the homes of children with significant disabilities. Furthermore, children with significant disabilities require complex and varied amounts of support and can have many troubling behaviors and limited skills. Parents with high EE may struggle to meet the demands of their children and may require more emotional supports in the home setting.

### 5.1. Limitations

A major limitation for this meta-analysis was the limited number of studies included in the calculations. The lack of studies likely led to heterogeneity and publication bias. Overall, results were mixed, but indicated the likely possibility of publication bias. Including more studies would likely be useful in explaining more of the variance. This would also allow for a meaningful moderator analysis as well, since numbers of subgroups were too small in the present studies to make conclusions about the effect of disability category, race, SES, parent and child age, or other

meaningful variables on EE. Future meta-analysis in the area of EE of the parents of children with DD should include more unpublished and non-significant studies with lower levels of EE.

## 6. Future Directions and Conclusion

Possible sources for more studies might include conference presentations (including posters) and professional networking. Conference proceedings on the websites of research organizations for specific disabilities could be used to try to locate more unpublished studies (e.g. International Fragile X conference, Global Down Syndrome Education Series). Professional networking could also be utilized to ask experts in the area of any known research examining EE in the parents of children with disabilities. Finally, the FMSS author (Magana-Amato, 2015) is a valuable source, as she provides the training and certification to teams who use the assessment tool and frequently assists in research projects by providing reliability checks for FMSS coding.

In all, research regarding EE in the parents of children with DD indicates that a sizable proportion experience high EE. This knowledge can help service providers with assessment and treatment plans. Addressing the needs of the whole family is critical to ensure a safe and supportive emotional climate in the home that leads to meaningful outcomes for the child and family. More research in the area is needed, and future meta-analyses will require digging deeper into the body of unpublished research to identify more studies with a broader range of results.

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