

Selective Mutism Intervention and Treatment Methods Comparison: A Meta-Analysis

By

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Abstract

The purpose of this meta-analysis study is to review the treatment research for children with Selective Mutism. Selective Mutism is a rare disorder commonly diagnosed in children entering school. It is often defined as the consistent lack of speech in social setting where speech is expected. This study analyzed intervention strategies used in treating Selective Mutism and established which interventions were significant. The intervention types analyzed were stimulus fading, contingency management, shaping, self-modeling, and pharmacological treatment. This study tested effect sizes for the following intervention characteristics: age of participants, duration of the intervention, and number of intervention sessions. The results from this study indicated that all five treatments were small to moderately significant. More research on selective mutism is warranted. Implications for practice and research are discussed.

Selective Mutism Intervention and Treatment Methods Comparison: A Meta-Analysis

Selective Mutism is a rare disorder commonly diagnosed in children entering school. It is often defined as the consistent lack of speech in a social setting where speech is expected. The child can speak and does so freely in other settings. Many people will refer to a child with SM as just being shy but can be outgoing and talkative in other settings. The most common setting for selective mutism to occur is in the school setting, which is why it is often diagnosed when children are entering school. The average age of onset is 2.5 years old (Kehle, Bray, & Theodore). The Diagnostic Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), criteria for this disorder is as follows: A) consistent failure to speak in specific social situations, B) the disturbance is at least 1 month, C) the duration of the disturbance is at least 1 month., D) the failure to speak is not attributed to a lack of knowledge, or comfort with, the spoken language required in the social situation, E) the disturbance is not explained by a communication disorder and does not occur exclusively during autism spectrum disorder, schizophrenia, or another psychotic disorder (missing proper citation).

According to the Selective Mutism Center, the most common symptoms within a classroom setting are withdrawal, playing alone or not playing at all, not verbally responding, difficulty following directions or staying on task, and difficulty completing tasks (Shipon-Blum, 2019). The prevalence rates for this disorder are 0.7% making it very rare. It is more prevalent in females than males with a 2:1 ratio (Kehle, Bray, & Theodore). Since the prevalence rate for this mental disorder is so low, many educators lack experience with children with selective mutism; many studies have evaluated the effectiveness of treatment interventions and found it to be

resistant to treatment. Finding an evidence-based treatment for this disorder is needed so that best practices may be identified in addressing deficits created by this disorder. The purpose of this study was to identify effective interventions for children with selective mutism disorder.

This meta-analysis was guided by the following research questions:

1. Does the age level of participants impact the effectiveness of the intervention?
2. Does the duration of intervention impact the effectiveness of the intervention?
3. Does the number of intervention sessions impact the effectiveness of the intervention?

Method

Search Procedures

A computerized search (e.g., University of Kansas Library Database, Google Scholar, and Web of Science) was used for selecting studies in the present meta-analysis. The keywords used to search for articles were: Selective Mutism, Selective Mutism Pilot Study, Selective Mutism Treatments, and Selective Mutism Interventions. The search was not confined to a given year span to locate all possible studies considering the limited amount of studies that have been conducted with selective mutism disorder. Also, reference sections were used to locate articles manually that was not accessed through the initial computer search. This initial review produced over 500 articles that included studies, published papers, book chapters, and theses/dissertations. Many articles provided valuable data and study information but did not include pre and posttest scores. Once articles had been reviewed and met the previously mentioned criterion, they were added to the list of articles to be used in this study.

Inclusion Criteria

To be included in the current meta-analysis, studies had to meet the following designated criteria:

1. The study focused on pre-kindergarten to elementary school-aged children.
2. The study focused on children who were either previously diagnosed with Selective Mutism or referred to the study for having symptoms of Selective Mutism by a physician or psychologist.
3. The study gave the age level of the participants.
4. The study gave the number of sessions delivered.
5. The study gave the duration of sessions delivered.
6. The study provided pre and post-test data on the instruments used to assess the severity of the child's mutism at baseline and at the end of the intervention.

Instruments

Many instruments were used in the 9 different studies included in this meta-analysis. Of those instruments, only two were included in the data set because they were the only two consistently used throughout the Selective Mutism interventions. The first instrument is the School Speech Questionnaire (SSQ). It consists of 8 questions, which are answered by the classroom teacher. The mean score can range from 0–3 with 0 indicating that speaking behavior

never occurs, and 1, 2 and 3 refer to seldom, often and always speaking, respectively. This instrument measures how often a student speaks in school.

The other instrument is the Selective Mutism Questionnaire (SMQ). This questionnaire is typically given to the child's mother. The SMQ includes 32 questions scored from 0–3, where 0 indicates that speaking behavior never occurs, and 1, 2 and 3 refer to seldom, often and always speaking, respectively. There is no cutoff score but typically children with Selective The mean score is the same as the SSQ (mean=0=3).

Coding Data

Sample characteristics.

1. Number of participants in the sample.
2. Age. The age of students was recorded and if age information was not available then grade level information was used to determine age (for example, 4 years old= pre-kindergarten, 5 years old= kindergarten, etc.)
3. Grade. The grade level of students in the sample was recorded and if grade level information was not available then age information was used to determine grade.
4. Primary language. The different primary languages of the participants were coded.

Interrater coding scheme. The reliability of coding was established by having a second person (University professor) code the studies selected for inclusion. Any disagreements in

coding were addressed by discussing the studies and their components. The concluding agreement across categories was 100%.

Effect size calculation. Effect sizes were calculated from the means and standard deviations provided using Cohen's d (Cohen, 1988). The calculation of effect sizes using Cohen's d allows for the observation of degree of effectiveness for the intervention provided in the studies. The resulting effect sizes give a magnitude of the treatment effect using the following guidelines for interpretation: .20 = small, .50 = moderate, and .80 = large (Cohen, 1988).

Literature Review

This section describes the five interventions/treatments used in this meta-analysis on children with Selective Mutism.

Contingency management. Contingency Management is often used with children with Selective Mutism. It is a behaviorist approach that involves rewarding a child for the desired behavior. In this case, it is speaking. It is important when using this method to “both reinforcing the child's verbal behavior and ignoring the child's nonverbal attempts to communicate” (Kehle, n.d., et al., p.296). In one study Bergman (2013), used contingency management as a part of their methodology. In the sessions developed to treat selective mutism, the researcher implemented a reward system. In the first few sessions, the reward system was used to encourage the child to engage in the sessions. However, towards the end of the study, the reward system was used to praise the child for speaking behaviors, which more closely aligns with the contingency management treatment design. Another study (Oerbeck, 2012), also used contingency

management by providing small rewards for speaking behavior. Finally, Bunnell (2015), includes the mention of contingency management. In this study, the researcher used the contingency management method in conjunction with shaping. The procedure is rewarding the child with \$10 monopoly money for each positive response they provide. This is reinforcing the desired behavior. The shaping aspect is explained in the sections titled “shaping” below. In these studies results were positive.

Stimulus fading. Stimulus Fading was the most used treatment method. Stimulus Fading involves the transfer of stimulus control by reducing the strength of, or fading, the stimulus that typically causes the child’s selective mutism. The procedure involves providing stimuli that reliably results in the child speaking in situations where he or she typically does not speak, most notably school-related settings (Kratochwill, 1981). As described by Thomas Kehle (2012) Stimulus Fading is:

Stimulus Fading involves the transfer of stimulus control by reducing the strength of, or fading, the stimulus that typically causes the child’s selective mutism. The procedure involves providing stimuli that reliably results in the child speaking in situations where he or she typically does not speak, most notably school-related settings (Kratochwill, 1981).

In one study, Oerbeck (2012) used stimulus fading starting at home with the mother of a child with select mutism and then slowly added in a speech therapist. Once the child reached a certain level of comfort with the therapist, they transitioned the child into the classroom with the mother and therapist. Slowly through playing games of interest to the child, they transition the mother out and the teacher into the activities until the child was about to speak more freely in the

classroom setting and without the mother present. The participants reacted positively to this intervention.

Another study by Bergman (2013), like Oerbeck's focused on graduated exposure to the feared stimuli/situation (e.g., verbal communication) as the primary agent to symptom reduction. This means that as the child was comfortable with a certain level of speaking in a situation the therapist would add in more stimuli until the child was able to generalize their speaking progress into the classroom setting. In this study stimulus fading was used by gradually introducing new individuals to promote child speech with new people. It is also a multimodal study, meaning it uses more than one type of intervention method in the design of the study. Results were positive for this intervention.

Shaping. Shaping as defined by Kehle's (n.d.) is "the systematic reinforcement of successive approximations toward normal speech" (p. 296). The reinforcement is typically a reward of some sort that is appealing to the child. For a child to receive a reward they must first complete a specific speech task. For example, answer a question like would you rather play with blocks or color, that way they must reply verbally. As they complete these verbal tasks, they become more demanding of the child. This is continued until the child is speaking freely in the setting that caused the SM. Another example would be having the child respond with a one-word response then the next time to move would be required to respond with a three-word response.

One study (Bunnell, 2018), used the shaping method by rewarding the children with \$10 of monopoly money for each compliant response during their sessions (2018). At the end of the sessions, the children were able to use their reward money to buy prizes from the clinician. It is considered both shaping and contingency management because the children are asked to

complete each step of a hierarchy in order to advance to the next step. In contingency management, the child is not required to complete steps but reinforces the child for speaking behaviors demonstrated on their own. The hierarchy of steps and increasing the speaking demand and expectation is an important part of this intervention method. Findings indicated favorable results for the use of shaping. In another study Lang (2015) provided a follow up study using shaping. In this study, the pre and posttests provided information as to the effectiveness of the shaping method. Shaping was used in a similar fashion in the article about IGBT for children with selective mutism. In this study, Lang used shaping by gradually training the child to use speech by breaking down target situations into multiple. Results from the Lang study and others indicated that shaping was an effective intervention for school aged children.

Self-modeling. Self-modeling typically takes the form of a videotape (Kehle, Bray, & Theodore). The child with selective mutism is videotaped in a setting where they speak freely, usually in the home. These videos are then edited to show the child performing the expected behavior in the desired setting. Meaning the video shows the child speaking in the classroom setting. These videos are shown to the child repeatedly. In two studies (Lang, 2015; Klein, Armstrong, Skira, & Gordon, 2016) modeling was used as the main intervention method. As an example, the Lang study used parent and teacher behavioral techniques. The Klein et. al., (2016) article used modeling as the therapist mirroring the child's behavior and body language to make the child feel more comfortable in the first treatment session. Both studies found modeling as an effective intervention for SM.

Pharmacological treatments. The most common drug used for treating selective mutism is Fluoxetine, which is a select serotonin reuptake inhibitor. In studies with children prescribed

Fluoxetine, the children showed significant improvements in the social functioning (Kehle, Bray, & Theodore, n.d.). A problem with the method of treatment is that there are many side effects associated with taking Fluoxetine. Some of the side effects include sleep problems, jitteriness, headaches, irritability, and agitation. It is not common for a doctor to prescribe a minor with an SSRI, which limited the amount of studies and data that included this treatment method.

Two studies were found in the literacy review about selective mutism that included pharmacological treatments. One study was conducted by Katharina Manassis MD and Rosemary Tannock PhD (2008). This study compared the results of pre and post tests on children who used pharmacological treatments and those who did not. They also investigated whether the combination of psychotherapy with the use of pharmaceuticals would change the outcomes of the results and discovered that therapy did not change the child's outcome. The medications used in the study were Select Serotonin Reuptake Inhibitors (SSRIs) because SM is a social anxiety phobia. The two types used were Fluoxetine and other serotonergic medications.

The article indicated this was the one of only a few studies that included this type of treatment method at this time because there is a lot of controversy involving the use of SSRIs in children. It also stated that this form of treatment for SM should only be considered after all other methods of treatment have been tried and proven to be ineffective. The other study was Kaakeh (2008), which also focused on the effects of SSRIs.

Combined treatment strategies. Combined treatment strategy is a method that combines several of the treatments mentioned previously. Most articles refer to combined treatments as multimodal. After studying selective mutism and conducting the initial literature review it is apparent that most studies use a combined treatment method. Many of these studies include

several sessions in which they implement the different treatment methods. Most psychologists suggest that using a variety of treatments is the most beneficial way to treat a child with selective mutism. As mentioned before with the pharmacological treatments it is suggested to only be used after all other treatments have been tried. Even with the use of pharmaceuticals, doctors and psychologists believe that a multimodal approach is the most effective form of treatment. In the Kehle article, he provides an example of a girl who struggled with selective mutism for over 4 years and after trying the stimulus fading, contingency management, and shaping the child still had restricted speech. It was not until the pharmacological component was implemented that the girl was able to speak and engage in the general education classroom (p. 299).

After conducting the literature review to see what studies were available on the treatment of selective mutism for children, research was emerging. The literature review indicated that there were five interventions: (1) stimulus fading, (2) contingency management, (3) shaping, (4) self-modeling, and (5) pharmacological treatment. These five interventions were analyzed in this study.

Findings

The purpose of this meta-analysis was to identify effective interventions for children with Selective Mutism. This analysis found 5 moderately significant interventions. These five interventions were stimulus fading, contingency management, shaping, self-modeling, and pharmacological treatment. The analysis focused on age of participants, duration of study, and number of sessions in the study.

This study was guided by the following three questions:

1. Does age impact the effectiveness of intervention?
2. Does the duration of intervention impact the effectiveness of intervention?
3. Does number of sessions impact the effectiveness of intervention?

Study characteristics. The nine experimental studies reviewed and analyzed yielded 15 effect sizes. Table 2 presents the effect sizes that include age of participants, number of intervention sessions, and duration of intervention. A total of 377 subjects were included in this meta-analysis. Sample sizes range from 4 to 33 with a mean sample size of 19.842. Two studies (Klien et. al, 2016; Bunnell, 2018) omitted to report the number of subjects that were male and female. The number of males reported was 107 and the number of females was 174. Subjects ranged in age from 3 years of age to 17 years of age with a mean treatment age of 6.17 years.

The year of publication for studies dates ranges from 2008 to 2019. Publication outlets were the Sage, Elsevier, Springer, Canadian Journal of Psychology, American Psychological Association, ProQuest, and Michigan University. All journals were peer reviewed and cited in

the educational literature. One of the studies included were conducted in Norway, six in the United States, one in Israel and one in Canada.

Treatments

Stimulus fading. The first intervention was stimulus fading. Stimulus fading is a procedure where an extra stimulus, like a picture or cue, is used to teach a correct response and then is systematically faded out. The current literature review yielded 5 studies involving this intervention. This analysis found that stimulus fading was significant in age of participation (K=5, m=5.162, SD=1.369; d=0.26), duration of study (K=4, m=6.19, SD=5.06; d=0.32), and number of sessions (K=3, m=14.333, SD=8.145; d=0.46).

Contingency Management. The second intervention was contingency management. Contingency Management is a behavioral therapy that uses motivational incentives and tangible rewards to help change a person's behavior. The current literature review yielded 5 studies using this intervention. This analysis found that contingency Management was significant in age of participation (K=4, m=5.640, SD=1.129; d=0.26), duration of study (K=5, m=5.352, SD=4.772; d=0.37), and number of sessions (K=2, m=12.50, SD=10.607; d=0.47).

Shaping. The third intervention was shaping. Shaping is a behavioral term that refers to gradually molding or training a person to perform a specific response (behavior) by reinforcing any responses that are like the desired response. The current literature review yielded 4 studies using this intervention. This analysis found that shaping was significant in age of participation (K=4, m=7.320, SD=1.524; d=0.27), duration of study (K=3, m=5.003, SD=6.643; d=0.43), and number of sessions (K=3, m=3.667, SD=1,528; d=0.54).

Self-Modeling. The fourth intervention was self-modeling. Self-Modeling is a form of observational learning in which individuals observe themselves performing a behavior successfully on video, and then imitate the targeted behavior. The current literature review yielded 2 studies using this intervention. This analysis found that self-modeling was significant in age of participation ($K=2$, $m=6.540$, $SD=.198$; $d=0.28$), duration of study ($K=2$, $m=7.415$, $SD=7.304$; $d=0.48$), and number of sessions ($K=1$, $m=4.0$, $SD=.0$; $d=.055$).

Pharmacological Treatment. The fifth intervention was pharmacological treatment. Pharmacological treatment is therapy using pharmaceutical drugs to treat a mental or behavioral disorder. The current literature review yielded 2 studies using this intervention. This analysis found that pharmacological treatment was significant in age of participation ($K=1$, $m=7.830$, $SD=.0$; $d=.28$), duration of study ($K=2$, $m=7.00$, $SD=3.358$; $d=0.52$), and number of sessions ($K=2$, $m=2.0$, $SD=.0$; $d=0.57$).

In summary, this meta-analysis found that three characteristics significantly related to intervention effectiveness. The results concluded that the age of the participants only had a small effect size on the effectiveness of the intervention. Therefore, it can be determined that the mean age of the participants does not matter in the effectiveness of the intervention or treatment method. The duration or length of the study had a moderate effect on the effectiveness of the participants. Finally, the longer the intervention the more effective the outcome. The number of sessions included in the intervention had a moderate effect size and was the most effective of the three factors. Meaning that the more sessions included in the intervention the more effective the outcomes. This meta-analysis also found that School Speech Questionnaire (SSQ) and the Selective Mutism Questionnaire (SMQ) were the two most used instruments in studies reviewed.

Since these were the most frequently used they were the only two included in the meta-analysis. When comparing the pre and posttest means of these two instruments used it was found that pharmacological treatment was the most effective intervention in treating children with Selective Mutism. The second most effective intervention was self-modeling. Then Stimulus fading. Both contingency management and shaping were the least effective, but both still saw an improvement in the mean score from the pre-test to post-test. The mean comparison table can be found in Appendix 2.

Discussion

This meta-analysis on school-aged children examined the effects of selective mutism interventions for children impacted (i.e. diagnosed, referred, or treated) by this disorder. The current findings provide preliminary evidence that five interventions: (1) stimulus fading, (2) contingency management, (3) shaping, (4) self-modeling, and (5) pharmacological treatment, produce positive effects of weak to moderate magnitude. This meta-analysis is guided by these three questions.

1. Does the age level of participants impact the effectiveness of the intervention?

This study found that the age of the participants had a small significant effect on the treatment of Selective Mutism. Meaning that the age of the participants is irrelevant and does not impact the effectiveness of the intervention. Further studies may want to pursue this as the research is emerging in this field.

2. Does the duration of intervention impact the effectiveness of the intervention?

The duration of the treatment showed a moderate effect size. That is, the longer the duration of the intervention the more effective the treatment outcomes. Indicating that the longer the intervention the more effective it can be. Implications from this intervention characteristics can guide future treatment development by including a longer duration of the study.

3. Does the number of intervention sessions impact the effectiveness of the intervention?

The number of sessions included in an intervention revealed a moderate effect size. The fewer sessions the child attends the larger the effect. Stimulus fading had a mean of 14.33 sessions (SD= 8.1445) with an effect of $d=0.46$. Contingency Management has a mean number of sessions as 12.50 with an effect size of $d=0.47$. Shaping has a mean of 3.667 with an effect of $d=0.54$. Modeling has a mean of 4.0 intervention sessions with an effect of $d=0.55$. The final intervention method pharmacological treatment has a mean number of 2 sessions with an effect size of $d=0.57$. As the mean number of sessions goes down the greater the effect size. There are confounding factors here that need further research. For example, the pharmacological studies only include two sessions, but the duration of the intervention ranged from 6 months to 2 years. The pharmacological treatment method it can be difficult to decipher between the meaning of sessions and duration of the treatment since the participants were being treated with SSRIs each day during the duration of the study.

Implication for Practice and Future Research

The results from this meta-analysis provide emerging evidence of the impact of selective mutism interventions on the speech of children with selective mutism. This study found weak to moderate effect sizes on these five interventions: (1) stimulus fading, (2) contingency

management, (3) shaping, (4) self-modeling, and (5) pharmacological treatment. These results speak of the importance of providing children with selective mutism the appropriate and most effective methods of interventions. It allows researchers, educators, and mental health professionals to understand the most effective practice. In addition, this research provides helpful information on the best age for participants, the number of sessions, and the length of the intervention. Some implications of this research could include limiting participants from future research based on their age, previous treatment methods that might work for some children with selective mutism will not be used as often. Given the research showed that a pharmacological treatment to be the most effective treatment it could influence the number of children that are prescribed an SSRI to treat selective mutism in the future.

Also, because the research is emerging in this area much work remains to be done in helping children with Selective Mutism. In developing future interventions, attention needs to be given to design. The goal of this research is to provide future researchers with more information on the comparisons of Selective Mutism treatments and other interventions. By running a comparison to other interventions, it could show statistical evidence on which interventions are the most effective. Also, by doing this research, it would not only be a base for future research, but it would also provide information to parents and educators on how to properly help children with Selective Mutism. In addition, it would be beneficial for future research to use commonalities in the instruments they use to compare the effectiveness and make improvements on these instruments. Finally, the number of studies published on Selective Mutism is limited. New research can add more recent information about Selective Mutism. By putting out new knowledge on the rare disorder of selective mutism it can bring the awareness to the forefront of

research and education, and most importantly, providing others with the information they need in order to treat or teach children with selective mutism.

Limitations

Because the field of intervention research is emerging the findings of this meta-analysis need to be considered within its limitations. First, a meta-analysis may only take characteristics of existing studies to generalize. The previous studies published did not provide their original data samples making it difficult to analyze certain moderators like participants age. After conducting the literature review on pilot studies and interventions involving selective mutism it was apparent that research previously published was very limited. Within those publications, the sample sizes were very small. The largest sample size in a study found was 44 participants and some of the smaller studies only had 4 participants. When doing research involving statistical analysis it is always better to have a larger sample size, as it may limit the intervention results and effect sizes. Another limitation is that this disorder is not very common and has not been the subject of much research, the research is emerging in this area. Finally, most studies found were of short duration (e.g., a few days). The longest study ran 2 years with no further follow-up on the intervention. However, most studies did incorporate a follow-up session that provided data on how the participants' symptoms and progress were being maintained after the conclusion of the treatment sessions. With that, most follow up sessions were only 3-6 months following the study. In summary, the intervention field of selective mutism is emerging, and much research is needed.

Conclusion

The purpose of this meta-analysis study was to review the treatment research for children with Selective Mutism. Selective Mutism is a rare disorder commonly diagnosed in children entering school. It is often defined as the consistent lack of speech in a social setting where speech is expected. This study analyzed the intervention strategies used in treating Selective Mutism and established which interventions were significant. The five intervention types analyzed were (1) stimulus fading, (2) contingency management, (3) shaping, (4) self-modeling, and (5) pharmacological treatment. This study tested effect sizes for the following intervention characteristics: age of participants, duration of the intervention, and the number of intervention sessions. Based on the findings of this meta-analytic study, the small to moderate effect sizes make it premature to know which intervention method and characteristics will have the best effects for children with Selective Mutism as this research field is emerging. Nevertheless, while this study may not be able to offer a variety of recommendations for best intervention methods on treating children with Selective Mutism, it is a starting point for future researchers and educators to consider as they develop and implement interventions that support school-aged children selective mutism.

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TABLE 1*Data Collection*

Study_id	Brief Title	Author	Year	Journal Source	Country_Study	IC
1.00	SM_HomeKinder	Oerbeck_et_al	2011.00	Sage	1.00	1.00
1.00	SM_HomeKinder	Oerbeck_et_al	2011.00	Sage	1.00	2.00
2.00	S-CAT	Klein_et_al	2016.00	Sage	2.00	3.00
2.00	S-CAT	Klein_et_al	2016.00	Sage	2.00	4.00
3.00	Int-Behav-Therapy	Bergman_et_al	2013.00	Elsevier	2.00	1.00
3.00	Int-Behav-Therapy	Bergman_et_al	2013.00	Elsevier	2.00	2.00
4.00	TSHSSA	Bunnell_et_al	2018.00	Elsevier	2.00	3.00
4.00	TSHSSA	Bunnell_et_al	2018.00	Elsevier	2.00	2.00
5.00	Cog_Beh_Int	Lang_et_al	2015.00	Springer	3.00	1.00
5.00	Cog_Beh_Int	Lang_et_al	2015.00	Springer	3.00	2.00
5.00	Cog_Beh_Int	Lang_et_al	2015.00	Springer	3.00	3.00
5.00	Cog_Beh_Int	Lang_et_al	2015.00	Springer	3.00	4.00
6.00	CISM	Manassis_Tannock	2008.00	Can_Journ_Pych	4.00	5.00
7.00	IGBT	Cornacchio_et_al	2019.00	APA	2.00	1.00
7.00	IGBT	Cornacchio_et_al	2019.00	APA	2.00	2.00
7.00	IGBT	Cornacchio_et_al	2019.00	APA	2.00	3.00
8.00	Gen_Verb_Speech	Ortega	2010.00	ProQuest	2.00	1.00
9.00	Focus_SSRI	Kaakeh_Stumpf	2008.00	Michiagan	2.00	5.00

Study id	Prim_I ang	N	N_Males	N_Females	Age_Range	Mean_age	SD_Age	Age_Onset	Onset_SD	Diag_SM
1.0	1.00	7.0	2.00	5.0	1.0	4.13	.	.	.	1.00
1.0	1.00	7.0	2.00	5.0	1.0	4.13	.	.	.	1.00
2.0	2.00	33.0	.	.	5.0	6.68	1.41	2.86	0.86	1.00
2.0	2.00	33.0	.	.	5.0	6.68	1.41	2.86	0.86	1.00
3.0	2.00	21.00	11.00	10.00	2.00	5.43	1.16	3.38	0.74	1.00
3.0	2.00	21.00	11.00	10.00	2.00	5.43	1.16	3.38	0.74	1.00
4.0	.	15.00	.	.	7.00	9.60	3.89	.	.	1.00
4.0	.	15.00	.	.	7.00	9.60	3.89	.	.	1.00
5.0	3.00	24.00	12.00	12.00	6.00	6.40	3.06	3.40	1.40	2.00
5.0	3.00	24.00	12.00	12.00	6.00	6.40	3.06	3.40	1.40	2.00
5.0	3.00	24.00	12.00	12.00	6.00	6.40	3.06	3.40	1.40	2.00
5.0	3.00	24.00	12.00	12.00	6.00	6.40	3.06	3.40	1.40	2.00
6.0	.	17.00	5.00	12.00	.	7.83	1.28	.	.	1.00
7.0	2.00	29.00	7.00	22.00	4.00	6.60	1.30	.	.	1.00
7.0	2.00	29.00	7.00	22.00	4.00	6.60	1.30	.	.	1.00

7.0	2.00	29. 00	7.00	22.00	4.00	6.60	1.30	.	.	1.00
8.0	2.00	4.0 0	2.00	2.00	3.00	6.25	0.50	.	.	2.00
9.0	2.00	21. 00	5.00	16.00	7.00	.	.	.	.	1.00

Study_ID	Study_Length	no_sessions	Follow_up_time	SSQPre_Test	SSQ_Pre_Score	SSQPost_Test	SSQPost_Score	SMQPre_test	SMQPre_Score	SMQPost_test	SMQPost_Score
1	6.00	.	52.14	0.59	0.51	2.68	0.35	2.16	0.66	2.58	0.29
1	6.00	.	52.14	0.59	0.51	2.68	0.35	2.16	0.66	2.58	0.29
2	2.25	4.00	6.00					0.98	0.39	1.44	0.53
2	2.25	4.00	6.00					0.98	0.39	1.44	0.53
3	6.00	20.00	.	0.81	0.59	1.77	0.69	0.79	0.36	1.74	0.54
3	6.00	20.00	.	0.81	0.59	1.77	0.69	0.79	0.36	1.74	0.54
4	.	2.00	.					1.58	0.75	1.46	0.64
4	.	2.00	.					1.58	0.75	1.46	0.64
5	12.58	.	151.20					0.88	1.15	2.53	0.87
5	12.58	.	151.20					0.88	1.15	2.53	0.87
5	12.58	.	151.20					0.88	1.15	2.53	0.87
5	12.58	.	151.20					0.88	1.15	2.53	0.87
6	7.00	2	.					5.95	1.36	7.67	1.70
7	0.18	5	4	1.1	0.7			0.70	0.60	1.20	0.70
7	0.18	5	4	1.1	0.7			0.70	0.60	1.20	0.70
7	0.18	5	4	1.1	0.7			0.70	0.60	1.20	0.70
8	.	18	.					0.83	0.24	1.88	0.85
9	2.25	2	.					.	.	.	.

TABLE 2

Mean Effect Sizes for Intervention Characteristics

Intervention	K	Mean	SD	d
<i>Stimulus Fading</i>				
Age	5	5.162	1.369	0.26
Duration	4	6.19	5.06	0.32
Sessions	3	14.333	8.1445	0.46
<i>Contingency Management</i>				
Age	4	5.640	1.1289	0.26
Duration	5	5.352	4.772	0.37
Sessions	2	12.50	10.607	0.47
<i>Shaping</i>				
Age	4	7.320	1.524	0.27
Duration	3	5.003	6.643	0.43
Sessions	3	3.667	1.528	0.54
<i>Modeling</i>				
Age	2	6.5400	.198	0.28
Duration	2	7.415	7.304	0.48
Sessions	1	4.0	.0	0.55
<i>Pharm Treatment</i>				
Age	1	7.830	.0	0.28
Duration	2	7.00	3.358	0.52
Sessions	2	2.0	.0	0.57

K= Number, SD= Standard Deviation, d= effect size (Cohen's d)

Qualitative Coding Sheet

Study Title and Assigned Number

- 1= Selective Mutism: A home-and-kindergarten-based intervention for children 3-5 Years: A pilot study
- 2= Social Communication Anxiety Treatment (S-CAT) for children and families with selective mutism: A pilot study
- 3= Integrated Behavior Therapy for Selective Mutism: A randomized controlled pilot study
- 4=
- 5= The outcome of children with selective mutism following cognitive behavioral intervention: a follow-up study
- 6= Comparing Interventions for Selective Mutism: A Pilot Study
- 7= Intensive Group Behavioral Treatment (IGBT) for Children With Selective Mutism: A Preliminary Randomized Clinical Trial
- 8= The generalization of verbal speech across multiple settings for children with selective mutism: A multiple-baseline design pilot study
- 9= Treatment of selective mutism: focus on selective serotonin reuptake inhibitors

Country of Study	Study Length in Months
1= Norway	Follow-Up Sessions in Weeks
2= USA	
3= Isreal	
4= Canada	

**Participa
nts**

Langu age	Age Range	Previous SM Diagnosis = Diag_SM	SM Duration is in Months
Lang1 Norwegian	1= 3 to 5		
=			
Lang2 English	2= 4 to 8	Yes=1	
=			
Lang3 Hebrew	3= 6 to 7	No=2	
=	4= 5 to 9		
0=no	5= 5 to 12		
1=yes	6= 5 to 14		

Intervention Categories

Intervention Category	Did the study include this intervention?
IC1= Stimulus Fading	0=no
IC2= Contingency Management	1=yes
IC3= Shaping	
IC4= Modelin g	
IC5= pharmacological Treatment	

Appendix 2: Pre and Post-Test Mean Comparison

Intervention (IC)	N	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	Difference in Means
<i>Stimulus Fading (IC1)</i>						
SSQ	2	0.7	0.55	2.225	0.52	1.525
SMQ	5	1.072	0.602	1.92	0.65	.848
<i>Contingency Management (IC2)</i>						
SSQ	2	0.7	0.55	2.225	0.52	1.525
SMQ	5	1.222	0.704	1.902	0.608	0.68
<i>Shaping (IC3)</i>						
	N	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	Difference in Means
SSQ	.	.	.	.	.	.
SMQ	4	1.035	0.723	1.658	0.685	0.623
<i>Self-Modeling (IC4)</i>						
	N	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	Difference in Means
SSQ	.	.	.	.	.	.
SMQ	1	0.925	0.77	1.985	0.665	1.06
<i>Pharmacological Treatment (IC5)</i>						
	N	Pretest Mean	Posttest SD	Posttest Mean	Posttest SD	Difference in Mean
CGAS	2	46.65	6.97	64.75	10.57	18.1
SMQ	1	5.95	1.36	7.67	1.70	1.72

SSQ= School Speech Questionnaire, SMQ= Selective Mutism Questionnaire, CGAS= Child Global

Assessment Scale

Appendix 3: One-Sample T Test

All Data Collected	N	Mean	SD	T Score	Sig. (2-tailed)
Age (Mean)	17	6.54	1.472	18.311	.000
Study Length	15	5.91	4.765	4.801	.000
Follow-Up Time	12	7.42	7.305	3.517	.005
Number of Sessions	11	66.65	69.391	3.185	0.10

This table includes the mean and standard deviation for each of the intervention characteristics for the entire study.