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A Discrete Choice Conjoint Experiment to Evaluate Parent Preferences for Treatment of Young, Medication Naïve Children with ADHD

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Abstract

The current study examined treatment preferences of 183 parents of young (average age = 5.8 years; SD = 0.6), medication naïve children with ADHD. Preferences were evaluated using a discrete choice experiment in which parents made choices between different combinations of treatment characteristics, outcomes, and costs. Latent class analysis yielded two segments of parents: (1) Medication Avoidant parents constituted 70.5% of the sample whose treatment decisions were strongly influenced by a desire to avoid medication; (2) Outcome Oriented parents constituted 29.5% of the sample whose treatment decisions were most influenced by a desire for positive treatment outcomes. Parents in the Outcome Oriented segment were more stressed and depressed, had lower socioeconomic status and education, were more likely to be single parents, and had more disruptive and impaired children. Simulations predicted that parents would prefer treatments with behavior therapy over treatments with stimulant medication only.

Attention-deficit/hyperactivity disorder (ADHD) is a serious mental health problem that is characterized by inattention, impulsivity and hyperactivity and is associated with serious impairment (American Psychiatric Association, 2000). Although there is now solid scientific evidence demonstrating that behavior therapy (BT) and stimulant medication (MED) are empirically supported interventions for ADHD (Pelham & Fabiano, 2008), relatively little is known about factors that influence patient implementation of and adherence to these treatments. This is an important area of research because there is considerable evidence that the rates of non-adherence are relatively high for both BT and MED (see Hoza, Johnston, Pillow, & Ascoug, 2006 for a brief review).

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A recent meta-analytic review found that patients assigned to their preferred treatment were 50% less likely to drop out of treatment (Swift & Callahan, 2009), suggesting that examining preferences for BT and MED treatments for ADHD may be an important step toward understanding and ultimately improving adherence to these treatments. Of particular import is examining parent preferences because parents generally determine what treatments are administered to their child. A number of studies have examined parental preferences for ADHD treatments (see Van Brunt, Matza, Classi, & Johnston, 2011 for a review). As a whole, these studies are informative but have at least two important limitations.

First, the vast majority of studies defined treatments globally, such as by asking parents whether they prefer BT or MED, rather than asking about specific treatment attributes. Using global definitions of treatments may mask differences that emerge when specific attributes of treatment are examined. For example, a handful of studies seem to suggest that when BT and MED are globally defined, parents prefer BT alone over MED alone (Johnston, Hommersen, & Seipp, 2008; Pelham et al., in preparation; Pham, Carlson, & Kosciulek, 2010). However, these studies do not clarify whether this is because of perceived positive attributes of BT or negative attributes of MED or because of other factors. Asking parents about specific attributes (both positive and negative) associated with BT and MED would begin to address this issue. Further, global evaluations of treatments likely do not mimic actual choice-making. That is, parents likely take multiple factors into account when selecting a treatment for their child, weighing the benefits and drawbacks of each treatment approach against other treatments. Asking parents to weigh specific attributes of different treatments against each other may more closely mimic this process.

To date, only three studies that we are aware of have examined specific treatment attributes when evaluating parent preferences. Two of these studies examined preferences only related to medication treatment and not behavior therapy (Matza et al., 2005; Secnik et al., 2005), and the third study examined both adolescent and parent preferences in a single sample without separately analyzing the two (Muhlbacher, Rudolph, Linke, & Nubling, 2009). Thus, there is a need for further research that examines what specific treatment attributes most influence parent preferences for treatment of their child with ADHD.

A second weakness of preference studies conducted to date is that they have generally view parents of children with ADHD as a homogenous group. In fact, there is likely considerable divergence among parents in their attitudes about treatments for ADHD. The few studies that have examined individual differences in parent preferences seem to bear this out. For example, studies suggest that Caucasian parents view medication treatment more favorably and behavioral treatment less favorably than do ethnic or racial minority parents (dosReis et al., 2003; Krain, Kendall, & Power, 2005; Pham et al., 2010). Likewise, there is some evidence that fathers have more negative opinions about BT treatments than do mothers (Chen, Seipp, & Johnston, 2008; Fabiano et al., 2009). Research that allows for the examination of such individual differences in parent preferences may be informative.

One experimental method that could address each of these limitations is a discrete choice conjoint experiment (DCE). In a DCE, participants make a series of choices between different attributes. By systematically varying the attributes across the different choices, DCEs determine which attributes are the most important influences on the respondent. Research has demonstrated that this type of choice task limits superficial decision-making, halo effects, and social desirability biases, thereby providing a more accurate prediction of how consumers make “real world” decisions (Caruso, Rahnew, & Banaji, 2009). These methods were originally developed by marketing research but have recently been extended to explore treatment preferences (e.g., Ahmed, Blamires, & Smith, 2008), including parent, educator, and mental health professional preferences for treatment delivery for children's

mental health problems (Cunningham et al., 2008; Cunningham, Deal, et al., 2009; Cunningham, Vaillancourt, et al., 2009). Considering their success as marketing research tools and in other areas of research, these methods hold promise for understanding parent preferences for the treatment of children with ADHD.

We hypothesized that treatment preferences would be influenced by three types of factors: components of treatment, anticipated outcomes, and potential side effects and costs. Little research has examined the role these factors play in preferences, but the available studies suggest they are important. For example, treatments rated as more acceptable before implementation produce better outcomes (Johnston et al., 2008; Von Brock & Elliott, 1987), suggesting that anticipated outcomes may be important to consider when evaluating parent treatment preferences. Likewise, interviews with parents of children with ADHD suggest that potential side effects are a primary concern about pharmacological treatment (Charach, Skyba, Cook, & Antle, 2006) and that cost may be a barrier to treatment (Bussing, Zima, Gary, & Garvan, 2003).

We also hypothesized that treatment preferences would be differentially related to parent and child characteristics. Theoretical and empirical reviews indicate that both child and parent factors are associated with treatment acceptability and with treatment outcomes (Hoza et al., 2006; Kazdin, 2000; Mah & Johnston, 2008). As stated by Kazdin (2000, p. 159) "...socioeconomic disadvantage, parent psychopathology and stress, and severity of child dysfunction influence the likelihood that children will remain in treatment, improve, and maintain their gains over time. Such influences may affect families' views about the treatments and treatment acceptability..." These same factors may also play a role in treatment preferences for parents of children with ADHD.

The purpose of this study was to examine parent preferences about treatments for their young child with ADHD using a discrete choice conjoint experiment. Parents were asked to make a series of choices between treatment attributes that varied along three dimensions: (1) components included in treatment, (2) outcomes that could be expected, and (3) side effects that could occur. These treatment attributes were systematically varied across the choice tasks, thereby providing information about what attributes were most important to parents when making their choices. The participants were parents of young, medication naive children with ADHD. We sought to answer three questions about their preferences regarding treatment for their child with ADHD. First, what aspects of treatment are most important? Second, are there individual differences in parental treatment preferences? Third, how do parent treatment preferences relate to current treatment models?

Method

Participants

Participants were 183 parents or legal guardians of young (average age = 5.8 years; SD = 0.6), medication-naive children with ADHD, including 106 maternal caregivers (hereafter referred to as mothers) and 77 paternal caregivers (hereafter referred to as fathers). All other children in the family were also medication-naive. Children met diagnostic criteria for ADHD as independently judged by two Ph.D. or M.D. level clinicians using all available information from rating scales and semi-structured diagnostic interviews. All participants were enrolled in a larger study examining the influence of different levels of behavior therapy (Enhanced, Standard, or Monitoring) on the need for medication in children with ADHD (Pelham, Fabiano, & Waschbusch, 2009). Participants were recruited into the larger study using fliers distributed to local schools and physicians, direct mailings, and radio advertisements. As part of recruitment into the larger study, parents were told that the goals

of the study were to help them reduce or eliminate the need to use medication treatment with their child, but that medication treatment would be freely available for all children if needed.

All parents in the larger study were eligible for enrollment in this study. Of the families in the larger study, 75.2% of mothers and 78.6% of fathers elected to participate in this study, whereas 24.8% ($n=35$) of mothers and 21.4% ($n = 21$) of fathers did not. Participants differed from non-participants as a function of the randomly assigned behavioral treatment (BT) condition, $\chi^2(2) = 22.83, p < .001$, with a larger portion of the standard and enhanced groups participating (Rate of participation: Enhanced BT = 74.5%; Standard BT = 72.3%; Monitoring = 45.0%).

Measures and Procedures

All procedures were approved by the Child and Youth Institutional Review Board at the Women's and Children's Hospital of Buffalo. Written consent was obtained from parents prior to their participation. Demographic information (see Tables 3 and 4), rating scales to measure child functioning (see Table 4), and rating scales to measure parent functioning (see Table 5) were completed in the late spring or summer of 2006 as part of the baseline assessment of the larger treatment study. The psychometric properties of the measures are well supported, as reported in the studies cited for each measure (see notes for Tables 4 and 5). In this sample internal consistency estimates (Cronbach's alpha) for the scales ranged from .63 to .91, with an average of .86 for teacher ratings of children, .84 for parent ratings of children, and .81 for parent self-ratings (details available from the first author).

Survey Development—Following recommendations (Orme, 2009), the survey was developed in a four-step procedure completed by the authors of this study. First, a list of potentially important attributes was generated by the authors of this study, who are experts in treatment of children with ADHD, during several brainstorming sessions. Second, the list of potential attributes was narrowed to 18 by eliminating redundancy and then selecting those deemed to be of most interest. As shown in Table 1, the final 18 attributes were organized into three categories: (1) *Treatment components* (7 attributes) – these described techniques or procedures that could be used as part of treatment; (2) *Treatment outcomes* (8 attributes) – these described changes that could result from treatment; and (3) *Side effects* (3 attributes) – these described negative effects or costs of treatment. Third, each of the 18 attributes was operationalized into three actionable levels (see Table 2). In operationalizing the attributes the authors determined the upper, middle, and lower bound that parents are likely to encounter in natural settings. For example, the attribute “includes parent training” was operationalized as “I attend no sessions to learn to work with my child” (lower bound), “I attend 8 sessions to learn to work with my child” (middle), and “I attend 16 sessions to learn to work with my child” (upper bound) based on evidence that 8 and 16 sessions are the average and upper range of the number of sessions offered in parent training (Serketich & Dumas, 1996), whereas the fewest (lowest bound) would be none. Fourth, the attributes were presented to participants in a choice task that involved crossing the three levels of two attributes (see Figure 1 as an example).

Survey Administration—The survey was completed by parents during the first year of the treatment study, approximately 3 to 12 months after they completed the baseline evaluation. Surveys were completed on a computer using software from Sawtooth Software Incorporated called SSI Web (Sawtooth Software Inc, 2004, 2005). The majority of surveys were completed during visits to the research lab and the rest (8.7%) were completed over the internet. All parents completed the surveys when their child was medication naïve, but parents in the standard and enhanced treatment groups were enrolled in behavior therapy. Parents were told that they would complete 27 choice tasks, and that each task would require

them to read a brief description of 3 treatments and then pick the treatment they would prefer for their child. Parents were then given a definition of side effects defined as “a risk the treatment may: make children more irritable, be stressful for parents, give children stomach aches, affect children's appetites, make it difficult for children to fall asleep, slow children's growth in height slightly”. The majority of surveys were completed independently, though a small number of parents who were poor readers or had visual or other physical handicaps completed the survey with assistance.

Because it is not feasible for all participants to make a choice between all 153 possible combinations of the 18 attributes, the survey software presented a sample of the choices to each participant in a manner that ensured all possible choices were appropriately represented in the full sample. Thus the software generated individual choice tasks for each participant following three principles: (1) each attribute level appeared only once in each choice task; (2) across choice tasks, each attribute level appeared as close to an equal number of times as possible; and (3) attribute levels were chosen independently of each other. Each parent completed 27 choice tasks, consisting of 25 original items and 2 hold-out tasks for the purpose of evaluating reliability and validity. The two hold-out tasks consisted of the same two attribute combinations presented to all participants in two different parts of the survey.

Data Analyses

Data were analyzed following methods developed and commonly used by marketing researchers (Orme, 2009). All analyses were run using Sawtooth Software (Sawtooth Software Inc, 2004, 2005) or SPSS. First, the reliability and validity of the survey was evaluated using the hold-out tasks. Reliability was evaluated by computing the percentage of participants who responded the same way to the same hold-out tasks. Validity was evaluated by computing a randomized first choice simulation for each of the two hold-out tasks and comparing these to the participants' choices. Smaller differences between predicted and observed responses to the hold out tasks provide stronger support for the validity of the survey.

Next, Hierarchical Bayesian methods were used to compute utility coefficients for each participant. Bayes theorem and simulated Monte Carlo Markov Chain processes (e.g. Gibbs Sampling) were used to estimate conjoint utilities. The hierarchical Bayesian algorithm sampled from two distributions: (1) an upper level model which estimated part-worth utility averages and variances for the sample population, and (2) a lower level model drawing on the choices of each respondent in the study sample. Utilities were standardized (zero-centered), setting the average utility value range of all attributes to 100. Utility values reflect the relative influence of each attribute level on participant choices with higher values indicating stronger preferences. To estimate the relative influence of each attribute, importance scores were computed by converting each attribute's utility value range to a percentage of the sum of the utility value ranges of all attributes. Higher importance scores indicate greater influence on participant choices.

The importance and utility scores were examined in four ways. First, latent class analysis was used to identify segments (groups) of participants with similar preferences. Latent class computes the probability of membership in each segment and yields solutions with a better fit than cluster or aggregate analyses. The latent class solution was replicated five times beginning at random starting points, assuming convergence when log-likelihood decreased by less than 0.01, and accepting an interpretable solution with the best fit as indicated by Consistent Akaike Information Criterion (CAIC) values (Ramaswamy & Cohen, 2007). Second, to understand the treatment preferences for the resulting segments, one-way MANCOVAs were computed with segment as the independent measure, assigned treatment group (standard BT: no vs. yes; enhanced BT: no vs. yes) as covariates, and importance

scores and utility values as the dependent measures. Statistically significant MANCOVAs were followed up with univariate ANCOVAs and by examining means, standard deviations, and effect sizes. Third, to evaluate the composition of the segments, ANCOVAs and logistic regressions were computed to compare the segments on parent and child demographics and on rating scales. Finally, randomized first choice market simulations were used to model parental responses to hypothetical treatments. Simulations begin with a maximum utility rule assuming that participants choose treatment programs with the highest composite and improve share of preference predictions by estimating attribute and program variability utility (Huber, Orme, & Miller, 2007). In other words, the simulations first estimated the proportion of parents that preferred each hypothetical treatment by assigning parents to the hypothetical treatment that maximized their preference score across the treatment attributions. These estimates were then corrected for random variability (error). More information about simulations and other methods used in the study are freely available at <http://www.sawtoothsoftware.com/education/>.

Results

Survey Reliability and Validity

The two hold-out tasks showed that 91.8% of the participants responded consistently to the two identical choice tasks supporting the survey reliability. The validity of the survey was examined using a randomized first choice simulation of the hold out tasks by comparing the observed and the predicted responses, known as the mean absolute errors (MAE). The MAE values were 1.7 and 1.3. These differences are small by conventional standards (Orme, 2006) and thus support the validity of the survey.

Segmentation Analysis

Fit indices from the latent class analysis supported a two segment solution (CAIC = 5437.85). Based on attribute importance scores (see Figure 2), the two segments were labeled: (1) *Medication Avoidant*, which included 129 participants (70.5% of the sample); and (2) *Outcome Oriented*, which included 54 participants (29.5% of the sample). To evaluate whether these segments differed in terms of their randomly assigned treatment condition, a 2 (segment) $\times$ 3 (treatment condition: monitoring vs. standard BT vs. enhanced BT) chi-square analysis was computed. Results showed the segments were marginally different, $\chi^2(2) = 5.78, p = .056$. This result was followed up by examining the adjusted standardized residuals, which suggested that the segments had similar rates of parents in the monitoring (Medication Avoidant = 21.7%; Outcome Oriented = 31.5%) and enhanced BT conditions (Medication Avoidant = 35.7%; Outcome Oriented = 44.4%), but the segments differed in rate assigned to the standard BT condition (Medication Avoidant = 42.6%; Outcome Oriented = 24.1%). To control for this difference, two dummy codes were created (Standard BT: 0 = no, 1 = yes; Enhanced BT: 0 = no, 1 = yes) and included as covariates in all subsequent analyses.

Segment Differences in Treatment Preferences

To determine how the two segments differed in terms of their treatment preference choices, we first graphed the standardized importance values for the 18 treatment attributes separately for each segment (see Figure 2). The graph suggested that the two segments differed on medication-related attributes and on outcome-related attributes. This was confirmed by a MANCOVA computed across the 18 importance scores that resulted in a significant multivariate effect of segment, $F(18, 162) = 16.73, p < .001$. Follow-up tests (see Table 1) showed that the segments differed on nearly every attribute, but the largest differences were on the three medication attributes and on the six treatment outcome attributes.

The analyses of importance scores demonstrated that the segments differ in what treatment attributes are the most important influences on parent choices, but these analyses do not clarify the nature or direction of the differences. To accomplish this aim, segments were compared on utility values (see Table 2). The MANCOVA across all utility values yielded a significant multivariate effect of segment, $F(36, 144) = 9.72, p < .001$, and follow ups (described next) showed that the segments differed on nearly every utility value (see Table 2).

Treatment components—Parents in the Medication Avoidant segment endorsed treatments in which medication was not included at home, at school, or with peers (see Table 2). When combined with the results of the importance scores (see Table 1 and Figure 2), these results indicate that avoiding medication was the most important influence on the choices of the Medication Avoidant parents, far exceeding the influence of all other attributes. In contrast, parents in the Outcome Oriented segment preferred treatments that included a low dose of medication at school and when interacting with peers, but they also preferred to avoid medication at home and to avoid high doses of medication in all settings. Overall, however, medication was not a large influence on the choices of parents in the Outcome Oriented segment.

Treatment outcomes—Both segments showed a preference for treatments that more often produced positive outcomes for their child (reduced inattention and hyperactivity/impulsivity, improved peer relationships and academic performance, increased cooperation with parents and teachers) as compared to treatments that sometimes or never produced these outcomes (see Table 2). However, the importance of achieving these outcomes was significantly greater to parents in the Outcome Oriented segment than to parents in the Medication Avoidant segment (see Table 1 and Figure 2).

Side effects and costs—Both segments preferred treatments with no side effects and no cost (see Table 2). However, avoiding short and long term side effects was more important to the Medication Avoidant than to the Outcome Oriented parents, whereas avoiding a high cost treatment was more important to the Outcome Oriented than to the Medication Avoidant parents. Relative to differences in treatment characteristics (medication) and outcomes, these differences were small and lower in the rank order of attributes that influenced choices (see Table 1 and Figure 2).

Parent and Child Characteristics in the Segments

Parent and child characteristics—As shown in Table 3, parents in the Medication Avoidant segment were more likely to be male and had a significantly higher socioeconomic status and educational attainment than parents in the Outcome Oriented segment. The Medication Avoidant parents were also more likely to be married or with a partner and less likely to be divorced or separated.

Comparison of the segments on child demographic and rating scale measures is shown in Table 4. To ensure that each child's data was included as a single case in the analyses, only mothers were used in these analyses. The same analyses using only fathers resulted in a highly similar pattern of findings (available from the first author). As shown in Table 4, there were no differences between the segments on demographic measures. However, children in the Outcome Oriented segment had more severe behavior and impairment than children in the Medication Avoidant segment.

Parent Functioning—As shown in Table 5, parents in the Medication Avoiding segment had lower Medication Willingness scores than parents in the Outcome Oriented segment,

providing additional support for the validity of the survey results. The Outcome Oriented parents reported significantly greater caregiver strain and depression than did parents in the Medication Avoidant segment.

Randomized First Choice Simulations

Finally, we conducted two simulations to model each segment's response to hypothetical treatment programs. The first simulation used attributes that were loosely based on the 14 month outcome from the Multimodal Treatment Study of Children with ADHD (MTA Cooperative Group, 1999). Three treatment conditions were simulated First, the medication only (MED-only) treatment consisted of a high dose of medication at home, school and with peers and produced highly positive outcomes on ADHD symptoms and moderately positive outcomes on parenting stress, relationships with peers, and cooperation with parents and teachers. There were also moderate short term side effects. Second, the behavioral treatment only (BT-only) consisted of 16 sessions with the parent, teacher and child and produced highly positive outcomes on parenting skills and moderately positive outcomes on parenting stress, relationship with peers, and cooperation with parents and teachers. There were no short term side effects. Third, the Combined treatment (COMB) consisted of a moderate dose of medication at home, school and with peers plus 16 sessions with the parent, teacher and child. Treatment produced highly positive outcomes on ADHD symptoms and parenting skills, and moderately positive outcomes on parenting stress, relationships with peers, cooperation with teachers, and academic achievement. There were low short-term side effects.

All other attributes were held constant across the treatments. Results showed that 58.9% of the parents were predicted to prefer COMB, 41.1% were predict to prefer BT-only, and none were predicted to prefer MED-only. However, these results differed as a function of segment (Fisher's Exact Test $p < .0001$). Specifically, all Outcome Oriented parents were predicted to prefer COMB, whereas the majority of Medication Avoidant parents (58.4%) were predicted to prefer BT-only. These results were largely unchanged (available from 1st author) when the simulation was recomputed after setting side effects to be equivalent (low) for all treatment conditions.

The second simulation was based on studies using within-subjects manipulations of medication and behavioral treatments (e.g., Pelham et al., 1993) that find similar positive outcomes when treatment consists of a high dose of stimulant medication, a high dose of behavioral treatment, or a moderate dose of medication combined with a moderate dose of behavioral treatment. Reflecting these findings, the following three treatments were compared. First, the Medication-only (MED-only) treatment consisted of a high dose of stimulant medication delivered at home and at school and with peers. Second, the behavioral treatment only (BT-only) consisted of a high dose (16 sessions) with the parent, teacher, and child. Third, the combined treatment (COMB) consisted of a moderate dose of medication delivered at home and school and 8 sessions (a moderate dose) of behavioral treatment with parents, teachers, and the child.

All other attributes were held constant, including treatment outcomes, based on research showing that similar outcomes are produced by these treatments (e.g., Carlson, Pelham, Milich, & Dixon, 1992; Pelham, 2005). Results showed that 86.0% of the sample was predicted to prefer BT-only, 14.0% were predicted to prefer COMB, and none were predicted to prefer MED-only. However, the results again differed as a function of segment (Fisher's Exact Test $p < .0001$). Specifically, the preferences of the Outcome Oriented parents were predicted to be equally split between the BT-only and COMB (BT-only = 52.5%; COMB = 47.5%), whereas every parent in the Medication Avoidant segment was predicted to prefer BT-only.

Discussion

Past research examining parent preferences for treatment of their child with ADHD have examined treatments at a global level, with little examination of individual differences across parents. This study addressed these limitations by examining parent preferences for specific treatment attributes and then using their responses to evaluate whether parents can be meaningfully subdivided based on their treatment preferences. The sample included mothers and fathers of young, medication-naïve children with ADHD who were participants in a larger study that examined whether behavior therapy implemented early in life would reduce or eliminate the need for medication treatment. Results showed that parents could be segmented into two groups: a Medication Avoidant segment, which accounted for 70.5% of parents, and an Outcome Oriented segment, which accounted for 29.5% of parents. Comparing the attribute importance scores (see Table 1 and Figure 2) and utilities (see Table 2) across the segments showed that Outcome Oriented parents were most influenced by reducing their child's problems, whereas Medication Avoidant parents were most influenced by a desire to avoid using medication with their child. Medication Avoidant parents were more likely to be fathers, had higher education attainment and socio-economic status, and were more likely to be married (see Table 3), whereas the Outcome Oriented segment included children who were significantly more disruptive and impaired (see Table 4) and included parents who self-reported greater depression and parental strain (see Table 5). As discussed later, these findings suggest ways that treatments could be tailored to match the preferences of families of children with ADHD.

These results provide clarity to past research on parent preferences for treatment of children with ADHD which has produced mixed findings. That is, some studies report that parents of children with ADHD provide positive evaluations of medication treatment (e.g., dosReis et al., 2003; Gage & Wilson, 2000), whereas other studies report that medication is not well accepted (Pescosolido, Perry, Martin, McLeod, & Jensen, 2007). Likewise, most studies report that parents rate behavioral treatments as acceptable (e.g., Johnston et al., 2008), but not all studies are consistent (Pemberton & Borrego, 2007; Stroh, Frankenberger, Cornell-Swanson, Wood, & Pahl, 2008). Our study suggests that these discrepancies may reflect heterogeneity among the parents in that, across parents, different attributes seem to be important in driving treatment decisions. Specifically, most parents (about 7 out of 10) in this sample were highly influenced by a desire to avoid medication treatment, whereas a subset (about 3 out of 10) was highly influenced by a desire to improve their child's behavior regardless of the treatment modality. To our knowledge, this is the first study to identify this difference among parents.

The heterogeneity among parents is also reflected in the finding that the two groups differed on several demographic and child behavior measures. Parents in the Outcome Oriented group were more likely to be single moms, had lower educational attainment and SES, higher stress and depression, and had children who were more impaired and disruptive. One interpretation of these results is that parents who face these challenges appear to be more focused on the ends (improving their child's functioning) rather than the means (how treatment is delivered) when making treatment choices. These findings are consistent with past studies which show that intense treatments are more acceptable when the child's behavior is more serious (Elliott, Witt, Galvin, & Peterson, 1984; Witt, Moe, Gutkin, & Andrews, 1984). They are also consistent previous theory and research that suggests low financial and personal resources, parental stress and psychopathology, and more severe child behavior are associated with worse adherence and response to treatment (Hoza et al., 2006; Kazdin, 2000). Our results extend these findings by showing that these factors are also relevant to understanding the decisions parents make when selecting treatments.

Somewhat surprisingly, results also showed that neither group of parents placed high importance on including sessions targeting parenting skills as a part of treatment, although both groups preferred treatments that improved parenting outcomes (see Table 1 and Figure 2). Similarly, neither group placed high importance on including sessions targeting teacher's classroom management as part of treatment, although both groups placed high value on improving children's cooperation with teachers. These findings shed light on past research showing that less than 50% of parents of children with ADHD or related disorder utilize parent training, even when it is freely available in their own community (Barkley et al., 2002; Cunningham et al., 2000). Apparently, parents recognize the value of improving their parenting skills and improving the child's behavior toward teachers, but they do not connect this with seeking treatments that produce these outcomes. Successfully addressing this discrepancy could lead to improvement in treatment implementation, use, and ultimately efficacy and effectiveness.

Simulations were also conducted to model what choices parents are likely to make when asked to choose between different types of treatments, where the treatments were designed to simulate those offered in well-known ADHD effectiveness trials. Results of the simulation based loosely on the first (14 month) MTA outcome study (MTA Cooperative Group, 1999) showed that parents rejected the medication-only treatment in favor of behavioral-only and combined (behavioral plus medication) treatments. These results are similar to the treatment satisfaction data from the MTA study, which showed that parents preferred behavioral and combined treatments over the medication-only treatment (Pelham et al., in preparation). The second simulation tested parent preferences for high doses of single treatments (behavior therapy only, medication only) compared to each other and compared to a moderate dose of combined treatment (behavior therapy and medication). This simulation found that parents rejected the medication-only treatment in favor of behavioral and combined treatments. Both simulations provide further evidence that, when provided with alternatives, the majority of parents prefer non-medication treatment for their child with ADHD.

These results should be interpreted with several methodological limitations in mind. First, all families who completed the survey were participants in a study designed to use behavior therapy implemented early in life (starting in kindergarten or first grade) as a means of reducing or eliminating the use of stimulant medication in the future. Further, to be eligible for the study, children (as well as their siblings) could not have current or prior experience with stimulant medication treatment, although parents were told that medication treatment would be freely available for children during the study should the need arise. Conducting the survey in this specific population limits the generalization of this study. The results can only be safely generalized to families who have similar characteristics to those in this study; namely, those with no experience with stimulant medication treatment and who wish to avoid its use with their child, but who know that it is available if needed. Given these characteristics, it's unclear how representative our sample is of the general population of parents of children with ADHD. However, a recent review of studies examining preferences related to ADHD treatment found that about 20-25% of parents preferred BT-only versus 5% who preferred medication-only and 50- 65% who preferred a combined treatment approach (Van Brunt et al., 2011). This does not diminish the fact that using a sample recruited because they were interested in avoiding medication is a limitation of this study, but it does suggest that participants in this study may represent a sizeable portion of parents of children with ADHD.

Second, although all families completed the choice task prior to their child receiving stimulant medication, many of the families were participating in behavior therapy at the time that they completed the task. It is unclear whether this influenced their choices. We

controlled for this by including treatment assignment as a covariate in all comparisons of the two segments, but ideally the study would have been completed prior to the onset of any treatment. Third, the survey was developed by a panel of experts in the treatment of children with ADHD. Notably lacking were parents and teachers of children with ADHD who may have provided unique and potentially important perspectives. Fourth, side effects in the survey were globally defined rather than specifically defined. Similarly, only side effects associated with stimulant medication were included in the survey; no side effects of behavior therapy were examined. The study would have been stronger had side effects been evaluated individually (rather than lumping them together) and had side effects of behavior therapy (such as financial and time costs and social stigma) been incorporated into the survey.

Implications for Research, Policy, and Practice

Even with these limitations, we believe these findings hold promise for improving the dissemination and use of empirically supported treatment for children with ADHD. Treatments are only effective when they are used, and it is clear that use of and adherence to empirically supported treatments is far from perfect. Estimates of rates of stimulant medication use among children with ADHD have ranged from 12.5% (Jensen et al., 1999) to nearly 75% (Angold, Erkanli, Egger, & Costello, 2000), with nearly one-quarter receiving just one prescription (Habel, Schaefer, Levine, Bhat, & Elliott, 2005; Pappadopulos et al., 2009). Likewise, surveys show that parents and teachers report that they frequently use behavioral techniques (Fabiano et al., 2002), yet other data suggest that few children with ADHD receive formal behavioral treatments (Bussing et al., 2005; Leslie & Wolraich, 2007) and that the majority of parents who enroll in behavioral parent training do not complete the full course of treatment (Barkley et al., 2002; Cunningham et al., 2000). Parent treatment preferences may partially account for these findings.

There is growing consensus that parent treatment preferences represent a critical but understudied component of implementing empirically supported treatments for children with mental health problems such as ADHD. Published guidelines refer to the importance of considering parent treatment preference when designing a treatment plan for children with ADHD (American Academy of Pediatrics, 2001), and it has long been theorized that highly acceptable treatments are more likely to be used and implemented with high integrity, which will in turn produce more positive treatment effects (Witt & Elliott, 1985). Consensus statements by child mental health research groups state that treatment acceptability is as important as empirical evidence and clinical expertise when implementing treatment (Association for Behavioral and Cognitive Therapies & Society for Clinical Child and Adolescent Psychology, 2010). These factors are likened to a three-legged stool; if any one dramatically lags behind the others, the whole endeavor may collapse. From this perspective, gaining a better understanding of parent treatment preferences may be one key to providing empirically supported treatments for child mental health problems.

To date, most research on treatment preferences have used global definitions of treatment and measured preferences using Likert ratings (Elliott, 1988). Although these methods are useful, discrete choice experiments have several advantages over them. One of the main advantages is that respondents are forced to make trade-offs between different attributes of the treatments, more closely approximating the trade-offs parents make when considering treatment for children with ADHD. If these methods can be incorporated into treatment decision making, clinicians could quickly and accurately evaluate treatment preferences and use them to match parents and children to treatment options. Research on medical interventions suggest this approach is feasible (Fraenkel, Rabidou, Wittink, & Fried, 2007), but research is needed within the mental health field.

Research on patient preferences support the assertion that understanding parent treatment preferences may improve the use and effectiveness of treatments. Patients in randomized clinical trials who receive their preferred treatment show greater improvement and lower rates of drop out (Preference Collaborative Review Group, 2009; Swift & Callahan, 2009). Likewise, treatments rated as acceptable prior to intervention are rated as significantly more effective after the intervention (Elliott, 1988). These data suggest that treatments tailored to patient preferences improve adherence, outcomes, and rates of dropout. If so, then the results of this study suggest that treatment for children with ADHD should be tailored to two groups of parents: one group that is more concerned about the means (avoiding medication treatment) than the ends and another group that is more concerned about the ends (improving their child's treatment outcome) than the means. For the former group, which represented the majority of parents in our study, starting treatment with behavior therapy is likely the best match for their preferences. For the latter group, starting treatment with combined treatments (medication and behavior therapy) is likely the best match for their preferences.

We emphasize “starting treatment” because it is possible that parental preferences are fluid rather than static. It may be that as children's behavior fluctuates over time, and as parental experiences with their child and with treatments change over time, parental preferences and subsequent treatment choices will change as well. In fact, past research suggests that preference for medication treatment increases as parents gain experience administering it to their child (Liu, Robin, Brenner, & Eastman, 1991). If preferences change over time, then treatment may also need to change to match parental treatment preferences. For example, parents in the Medication Avoidant segment may become more open to medication if their child's behavior becomes more severe and impairing or if their own stress and depression increases. Conversely, if a child experiences one or more side effect in response to medication, a parent who is initially open to medication treatment may shift their preference away from medication treatment. Evaluating these and other similar hypotheses using a longitudinal design is an important goal for future research on parent preferences.

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If these were your only options, click on the treatment you would prefer for your child with ADHD?

Option 1	Option 2	Option 3						
<table border="1"><tr><td>My child gets no medication at home</td></tr><tr><td>I attend 16 sessions to learn to work with my child</td></tr></table>	My child gets no medication at home	I attend 16 sessions to learn to work with my child	<table border="1"><tr><td>My child gets a low dose of medication at home</td></tr><tr><td>I attend 8 sessions to learn to work with my child</td></tr></table>	My child gets a low dose of medication at home	I attend 8 sessions to learn to work with my child	<table border="1"><tr><td>My child gets a high dose of medication at home</td></tr><tr><td>I attend no sessions to learn to work with my child</td></tr></table>	My child gets a high dose of medication at home	I attend no sessions to learn to work with my child
My child gets no medication at home								
I attend 16 sessions to learn to work with my child								
My child gets a low dose of medication at home								
I attend 8 sessions to learn to work with my child								
My child gets a high dose of medication at home								
I attend no sessions to learn to work with my child								
☐	☐	☐						

Figure 1.
A sample of the 27 choice tasks completed by each participant.

Figure 2.

Importance scores for the 18 treatment attributes as a function of participant segment. * = groups differ at $p < .05$.

Table 1
Standardized Importance Scores as a Function of Segment

Attribute	Medication Avoidant			Outcome Oriented			F-values	
	Rnk	M	(SD)	Rnk	M	(SD)	df = 1, 179	ES
<i>Treatment Components</i>								
Medication at home	1	10.26	(2.60)	12	4.75	(2.46)	172.38***	1.54
Medication at school	2	10.16	(2.89)	11	4.95	(2.04)	144.49***	1.46
Medication with peers	3	8.66	(1.95)	9	5.61	(2.05)	90.07***	1.27
Social skills	12	4.75	(1.23)	8	6.08	(1.67)	35.22***	-0.90
Parenting skills sessions	14	4.26	(1.38)	15	4.07	(1.32)	0.74	0.14
Classroom management	16	3.55	(1.12)	13	4.73	(1.29)	37.22***	-0.92
Recommended by others	18	2.26	(1.54)	18	2.80	(1.79)	4.14*	-0.33
<i>Treatment Outcomes</i>								
Inattention	4	6.27	(1.08)	1	8.31	(0.96)	140.24***	-1.46
Cooperation with teacher	6	5.83	(1.27)	2	7.59	(1.38)	68.09***	-1.15
Hyperactive / Impulsive	11	4.92	(1.54)	3	7.57	(1.82)	97.38***	-1.31
Academic performance	8	5.74	(1.18)	4	7.09	(0.96)	54.72***	-1.06
Peer relationships	9	5.52	(1.00)	5	6.59	(0.77)	47.92***	-1.01
Cooperation with parent	10	5.18	(1.27)	6	6.55	(1.37)	41.51***	-0.95
Parenting skills	5	6.03	(1.19)	7	6.29	(1.90)	1.30	-0.18
Parenting stress	15	3.60	(1.07)	14	4.34	(1.58)	13.36***	-0.58
<i>Side Effects and Costs</i>								
Long term side effects	7	5.79	(1.45)	10	5.42	(1.54)	2.30	0.25
Short term side effects	13	4.38	(1.34)	16	3.89	(1.40)	4.86*	0.36
Financial Cost	17	2.86	(1.10)	17	3.37	(1.70)	5.35*	-0.37

Note: Means are adjusted for the covariates (Standard BT, Enhanced BT). Treatment Component attributes are arranged by rank order of the Medication Avoidant segment. Treatment Outcome attributes are arranged by the rank order of the Outcome Oriented segment. Rnk = rank order of importance score within each segment. F-values are from one way ANCOVAs. df = degrees of freedom. ES = effect size (Hedges g) coded so that higher values indicate the mean is larger for the Medication Avoidant segment.

* = $p < .05$;

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Table 2

Standardized (Zero-Summed) Utility Values as a Function of Segment

Attribute / Content of Attribute Level	Medication Avoidant		Outcome Oriented		F-values	
	M	(SD)	M	(SD)	df = 1, 179	ES
<i>Treatment Components</i>						
<i>Medication at home</i>						
My child gets no medication for home	90.86	(27.28)	28.32	(30.54)	183.32***	1.56
My child gets a low dose of medication for home	2.93	(12.92)	15.15	(16.18)	28.54***	-0.82
My child gets a high dose of medication for home	-93.80	(20.84)	-43.47	(30.34)	162.44***	-1.51
<i>Medication at school</i>						
My child gets no medication for school	91.41	(30.84)	3.30	(32.24)	292.41***	1.72
My child gets a low dose of medication for school	-0.197	(13.67)	34.72	(22.38)	163.16***	-1.49
My child gets a high dose of medication for school	-91.22	(22.26)	-38.03	(29.13)	176.67***	-1.55
<i>Medication with peers</i>						
My child gets no medication for activities with other children	79.40	(22.45)	16.56	(24.37)	275.64***	1.71
My child gets a low dose of medication for activities with other children	-3.14	(16.34)	37.75	(23.37)	177.45***	-1.53
My child gets a high dose of medication for activities with other children	-76.25	(15.62)	-54.31	(24.49)	52.29***	-1.05
<i>Social skills</i>						
My child gets no sessions to learn to get along with other children	-52.45	(15.59)	-68.66	(20.24)	33.72***	0.83
My child gets 8 sessions to learn to get along with other children	22.75	(10.20)	31.70	(11.08)	26.93***	-0.80
My child gets 16 sessions to learn to get along with other children	29.70	(11.05)	36.96	(13.95)	13.73***	-0.59
<i>Parenting skills sessions</i>						
I attend no sessions to learn to work with my child	-45.45	(14.52)	-41.25	(16.29)	2.89	-0.28
I attend 8 sessions to learn to work with my child	16.73	(6.50)	12.64	(10.14)	10.23**	0.51
I attend 16 sessions to learn to work with my child	28.71	(14.38)	28.61	(15.71)	0.002	0.01
<i>Classroom management</i>						
Teachers get no training in how to work with my child	-36.13	(11.98)	-48.23	(14.43)	33.12***	0.88
Teachers get 8 sessions of training in how to work with my child	14.46	(13.43)	15.29	(15.35)	0.13	-0.06

Attribute / Content of Attribute Level	Medication Avoidant		Outcome Oriented		F-values	
	M	(SD)	M	(SD)	df = 1, 179	ES
Teachers get 16 sessions of training in how to work with my child	21.68	(13.02)	32.93	(13.92)	26.19***	-0.79
Recommended by others						
Parent of another child with ADHD recommended this treatment	-0.28	(16.87)	3.80	(18.80)	2.03	-0.23
My child's teacher recommended this treatment	1.56	(17.56)	-5.27	(24.25)	4.36*	0.34
My child's doctor recommended this treatment	-1.28	(27.71)	1.47	(31.30)	0.33	-0.10
Treatment Outcomes						
Inattention						
Does not help my child focus attention	-60.23	(10.67)	-81.66	(8.90)	162.63***	1.52
Sometimes helps my child focus attention	9.03	(12.77)	14.70	(15.05)	6.47*	-0.41
Often helps my child focus attention	51.20	(14.08)	66.95	(14.53)	44.83***	-0.99
Cooperation with teachers						
Does not help my child be more cooperative with teachers	-54.13	(12.86)	-75.12	(14.19)	94.09***	1.28
Sometimes helps my child be more cooperative with teachers	4.31	(12.05)	15.19	(13.72)	27.57***	-0.80
Often helps my child be more cooperative with teachers	49.82	(14.24)	59.93	(17.02)	16.48***	-0.64
Hyperactivity / Impulsivity						
Does not help my child be less hyperactive / impulsive	-45.92	(17.02)	-74.65	(18.88)	98.63***	1.31
Sometimes helps my child be less hyperactive / impulsive	3.74	(10.29)	14.10	(12.94)	31.96***	-0.86
Often helps my child be less hyperactive / impulsive	42.18	(13.39)	60.55	(18.27)	54.97***	-1.07
Academic performance						
Does not help my child's grades	-54.44	(11.48)	-64.83	(9.33)	34.18***	0.88
Sometimes helps my child's grades	6.51	(13.09)	2.63	(16.84)	2.68	0.27
Often helps my child's grades	47.94	(14.44)	62.20	(14.39)	36.17***	-0.90
Peer relationships						
Does not help my child get along with other children	-54.02	(10.72)	-67.65	(7.17)	71.28***	1.17
Sometimes helps my child get along with other children	9.45	(10.03)	18.85	(12.59)	27.63***	-0.80
Often helps my child get along with other children	44.57	(11.99)	48.80	(13.23)	4.34*	-0.34
Cooperation with parents						

Attribute / Content of Attribute Level	Medication Avoidant		Outcome Oriented		F-values	
	M	(SD)	M	(SD)	df = 1, 179	ES
Does not help my child be more cooperative with me	-51.60	(14.30)	-68.77	(19.48)	42.90***	0.96
Sometimes helps my child be more cooperative with me	10.84	(9.88)	26.93	(13.10)	79.46***	-1.22
Often helps my child be more cooperative with me	40.76	(12.04)	41.84	(19.92)	0.20	-0.07
Parenting skills						
Does not help me manage my child more effectively	-59.69	(12.94)	-62.42	(19.92)	1.21	0.18
Sometimes helps me manage my child more effectively	11.34	(10.27)	12.17	(9.13)	0.25	-0.08
Often helps me manage my child more effectively	48.35	(11.31)	50.25	(16.58)	0.80	-0.15
Parent's stress						
Does not reduce my stress	-35.08	(13.53)	-44.00	(19.07)	12.45**	0.56
Sometimes reduces my stress	7.80	(11.39)	11.32	(11.22)	3.52	-0.31
Often reduces my stress	27.29	(10.40)	32.68	(14.08)	7.96**	-0.46
Side Effects and Costs						
Long term side effects						
No long term side effects	59.12	(16.56)	48.63	(18.36)	13.87***	0.59
Long term side effects cause 15 out of 100 parents to regret treatment	-15.04	(10.81)	-2.97	(13.34)	39.64***	-0.94
Long term side effects cause 30 out of 100 parents to regret treatment	-44.08	(13.18)	-45.66	(18.95)	0.40	0.10
Short term side effects						
No short term side effects	42.15	(15.88)	37.41	(17.57)	3.10	0.29
Short term side effects cause 15 out of 100 parents to stop treatment	-6.84	(11.38)	-8.192	(14.07)	0.45	0.11
Short term side effects cause 30 out of 100 parents to stop treatment	-35.31	(11.44)	-29.22	(12.41)	10.02**	-0.51
Financial Cost						
No Cost	28.58	(12.71)	30.22	(21.45)	0.40	-0.10
\$3000 per year	-7.11	(9.41)	-3.63	(15.08)	3.50	-0.30
\$6000 per year	-21.47	(10.84)	-26.59	(15.41)	6.29**	0.41

Note: Means are adjusted for covariates (Standard BT, Enhanced BT). F-values are from one-way ANCOVAs. df = degrees of freedom. ES = effect size (Hedges g) coded so that higher values indicate larger means for the Medication Avoidant segment.

* = $p < .05$;

** = $p < .01$;

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Table 3
Respondent Demographic Characteristics as a Function of Segment

	Medication Avoidant (<i>n</i> = 129)	Outcome Oriented (<i>n</i> = 54)	Statistical Comparison	ES
Age	38.13 (7.37)	36.40 (6.98)	$F(1, 177) = 2.09$	0.24
Socioeconomic Index ^a	43.49 (14.31)	36.60 (13.52)	$F(1, 160) = 7.77^{**}$	0.48
Parent sex (% female)	51.2%	74.1%	$B = -1.02^{**}$	0.36
Biological parent	88.4%	92.6%	$B = -0.37$	0.69
Racial minority	11.9%	16.7%	$B = -0.34$	0.71
Hispanic or Latino ethnicity	3.2%	5.6%	$B = -0.65$	0.52
Education				
High school grad or less	19.8%	35.2%	$B = -0.73^*$	0.48
Partial college / 2-yr degree	35.7%	37.0%	$B = -0.12$	0.88
4-year/graduate degree	44.4%	27.8%	$B = 0.74^*$	2.11
Marital status				
Single, never married	10.2%	9.3%	$B = 0.92$	1.10
Married / With a partner	83.5%	63.0%	$B = 1.01^{**}$	2.75
Separated or Divorced	6.3%	25.9%	$B = -1.53^{**}$	0.22
Lives with child	90.6%	94.4%	$B = -0.49$	0.61

Note: Values in tables are adjusted means (with standard deviations in parentheses) or percentages. F = F -values (with degrees of freedom in parentheses) from one way ANCOVA; B = regression coefficient from logistic regression, each of which is a single degree of freedom test. ES = effect size (Hedges g for ANCOVAs and odds ratios for regressions). Effect sizes coded so that higher values indicate the mean or percentage is larger for the Medication Avoidant segment. Odds ratios for variables with zero frequency cells were computed by adding a .5 constant to all cells.

^a = (Hauser, 1994).

* = $p < .05$;

** = $p < .01$;

*** = $p < .001$

Table 4
Child Characteristics for Female Respondents as a Function of Segment

	Medication Avoidant (<i>n</i> = 66)	Outcome Oriented (<i>n</i> = 40)	Statistical Comparison	ES
Age	5.82 (0.58)	5.70 (0.63)	$F(1, 101) = 1.07$	0.20
% Male	29.2%	20.0%	$B = 0.65$	1.91
Racial minority	23.1%	22.5%	$B = 0.19$	1.20
Hispanic or Latino ethnicity	7.8%	5.1%	$B = 0.60$	1.83
Teacher Ratings				
ADHD-inattention ^a	1.64 (0.75)	1.77 (0.87)	$F(1, 100) = 0.60$	-0.16
ADHD-hyperact/impulse ^a	1.67 (0.84)	2.02 (0.80)	$F(1, 100) = 4.08^*$	-0.42
Oppositional defiant ^a	1.03 (0.80)	1.45 (0.82)	$F(1, 100) = 6.24^*$	-0.51
Conduct disorder ^a	0.36 (0.46)	0.54 (0.57)	$F(1, 99) = 3.00$	-0.35
Peer relationships ^b	3.48 (1.93)	3.65 (2.03)	$F(1, 93) = 0.16$	-0.09
Getting along with teacher ^b	3.47(2.04)	3.47 (2.21)	$F(1, 90) = 0.00$	0.00
Academic progress ^b	3.66 (1.94)	4.18 (1.92)	$F(1, 92) = 1.50$	-0.27
Classroom behavior ^b	3.99 (1.79)	4.22 (1.73)	$F(1, 91) = 0.38$	-0.13
Overall impairment ^b	4.05 (1.68)	4.21 (1.69)	$F(1, 94) = 0.20$	-0.10
Parent Ratings				
ADHD-inattention ^a	1.58 (0.57)	1.86 (0.60)	$F(1, 98) = 5.19^*$	-0.47
ADHD-hyperact/impulse ^a	1.78 (0.61)	2.25 (0.45)	$F(1, 98) = 15.82^{***}$	-0.78
Oppositional defiant ^a	1.25 (0.60)	1.74 (0.80)	$F(1, 98) = 12.35^{**}$	-0.71
Conduct disorder ^a	0.24 (0.27)	0.42 (0.33)	$F(1, 98) = 9.25^{**}$	-0.60
Peer relationships ^b	3.12 (1.90)	3.70 (1.79)	$F(1, 99) = 2.16$	-0.31
Getting along with sibs ^b	3.24 (1.96)	3.36 (2.15)	$F(1, 88) = 0.07$	-0.06
Getting along with parents ^b	3.52 (1.71)	4.28 (1.39)	$F(1, 99) = 5.11^*$	-0.47
Academic progress ^b	3.69 (1.83)	4.22 (2.02)	$F(1, 96) = 1.77$	-0.28
Effect on family ^b	3.48 (1.66)	4.41 (1.62)	$F(1, 98) = 7.21^{**}$	-0.55
Overall impairment ^b	4.05 (1.39)	4.80 (1.24)	$F(1, 99) = 7.11^{**}$	-0.55

Notes: Values in tables are adjusted means (with standard deviations in parentheses) or percentages. F = F -values (with degrees of freedom in parentheses) from one way ANCOVA; B = regression coefficient values, each tested with a single degree of freedom. ES = effect size (Hedges g for ANCOVAs and odds ratios for logistic regressions). Effect sizes coded so that higher values indicate the mean or percentage is larger for the Medication Avoidant segment.

^a = mean symptom score (range: 0 to 3) on the Disruptive Behavior Disorders Rating Scale (Pelham, Gnagy, Greenslade, & Milich, 1992).

^b = impairment rating (range: 0 to 6) on the Impairment Rating Scale (Fabiano et al., 2006).

* = $p < .05$;

** = $p < .01$;

*** = $p < .001$

Table 5
Parent Characteristics as a Function of Segment

	Medication Avoidant	Outcome Oriented	F-value	ES
<i>Treatment Readiness</i>				
Readiness for change ^a	3.60 (0.50)	3.53 (0.72)	$F(1, 149)=0.46$	0.12
Medication willingness ^b	15.82 (5.80)	21.55 (6.49)	$F(1, 147)=27.59^{***}$	-0.87
Counseling willingness ^b	38.19 (5.70)	39.87 (4.82)	$F(1, 147)=2.94$	-0.31
Counseling feasibility ^b	15.94 (3.63)	16.43 (3.97)	$F(1, 147)=0.53$	-0.13
<i>Experience of Caregiving</i>				
Objective strain ^c	2.00 (0.65)	2.64 (0.92)	$F(1, 148)=23.30^{***}$	-0.81
Internalized subjective strain ^c	2.92 (0.87)	3.42 (0.95)	$F(1, 146)=9.65^{**}$	-0.54
Externalized subjective strain ^c	2.09 (0.75)	2.74 (0.76)	$F(1, 146)=22.59^{***}$	-0.81
<i>Caregiver Functioning</i>				
Self-Report Depression ^d	10.62 (8.17)	14.63 (12.75)	$F(1, 147)=5.12^*$	-0.40
Self-Report ADHD ^e	4.84 (4.06)	5.69 (4.06)	$F(1, 147)=1.34$	-0.21

Note: Values in tables are adjusted means (with standard deviations in parentheses). ES = effect size computed as Hedges g coded so that higher values indicate the mean is larger for the Medication Avoidant segment.

^a = Parent Readiness for Change Questionnaire (Cunningham, 1997).

^b = ADHD Knowledge and Opinion Survey-Revised (Bennett, Power, Rostain, & Carr, 1996; Rostain, Power, & Atkins, 1993). The ADHD-knowledge subscale from the AKOS-R was not analyzed due to low internal consistency.

^c = Caregiver Strain Questionnaire (Brennan, Heflinger, & Bickman, 1997).

^d = Centers for Epidemiological Studies of Depression Scale (Radloff, 1977).

^e = Adult ADHD Self-Report Scale (Kessler et al., 2005).

* = $p < .05$;

** = $p < .01$;

*** = $p < .001$