

Running head: INTERVENTION TYPES AND PERCEPTIONS OF SUCCESS

Intervention Types and the Perceptions of Academic Success of Students with Attention  
Deficit Hyperactivity Disorder (ADHD)  
Sonia L. Miernicki and Justine Hukriede  
University of Wisconsin-River Falls

Abstract

Teachers' perceptions regarding the effectiveness of ADHD interventions were investigated. The different forms of interventions that were focused on included: stimulant medication, classroom/parent environmental interventions, a combination of stimulant medication and classroom/parent environmental interventions, and counseling. Elementary and middle school regular education teachers completed surveys revealing their perceptions of student success in a variety of areas while using one of these four interventions for ADHD. The results indicated that teachers perceive a student with ADHD to be most successful while using the combination of stimulant medication and classroom/parent environmental interventions. These findings support other research that has shown that stimulant medication is effective as a short-term intervention, environmental interventions are effective with longer lasting results and that a combination of the two is the most successful long-term.

## Intervention Types and the Perceptions of Academic Success of Students with Attention Deficit Hyperactivity Disorder (ADHD)

Attention Deficit Hyperactivity Disorder (ADHD), as defined by the American Psychiatric Association in the Diagnostic and Statistical Manual of Mental Disorders (fourth edition) (DSM-IV), is a persistent pattern of inattention and/or hyperactivity that is more frequent and severe than it is typically observed in individuals at a comparable level of development. According to the Diagnostic & Statistical Manual of the American Psychiatric Association, Attention Deficit Hyperactivity Disorder (ADHD) occurs in approximately 3 to 5% of school-aged children and is the most commonly diagnosed childhood psychiatric disorder. Scientists have come up with several theories about what causes ADHD, however there is still not a known cause. Presently, ADHD is a diagnosis applied to children and adults who display certain behavior characteristics over a period of time, the most common being, inattention, hyperactivity and impulsivity. People who are inattentive get bored easily and have a hard time focusing on one thing. People who are hyperactive can't sit still, they seem to always be in motion and people who are impulsive have a hard time thinking before they act and find it difficult to control their immediate reactions. Not everyone who displays these symptoms has ADHD. To assess whether a person has ADHD, there are several questions that a specialist must ask. Are the behaviors excessive? Are they long-term and pervasive? Do they occur more often than in other people of the same age? Do they occur in several settings or in just one specific place? According to the DSM-IV, characteristics of inattention include: becoming easily distracted by irrelevant sights and sounds, rarely following instructions carefully and completely, losing or forgetting things like toys, pencils, books and tools

needed for a task, and failing to pay attention to details and making careless mistakes. Some signs of hyperactivity and impulsivity are: blurting out answers before hearing the whole question, feeling restless, often fidgeting with hands or feet, squirming, having difficulty waiting in line or for a turn, and running, climbing, or leaving a seat, in situations where sitting or quiet behavior is expected.

Children who are diagnosed with ADHD are often treated with stimulant medication such as Ritalin, which is intended to alter perception, feelings and/or behavior and ultimately help students become more successful socially, emotionally and academically. Ritalin is the most common stimulant prescribed for treatment of ADHD in the United States.

Currently there are several misconceptions and controversy over the dramatic increase in identification of individuals with ADHD and the use of stimulant medication for treatment. There is considerable research that exists concerning the relationship between stimulant medication and its effects on academic achievement. Some studies exist that report a positive effect on academic achievement while others report that stimulant medication does not improve academic achievement, thus not having an effect at all. The most common perspective that seems to reoccur in the literature is that the major effect of stimulants appears to be manageability rather than improvement in academic performance.

The following reviewed studies reflect the varied results of interventions for ADHD. One study, conducted by Doherty, Frankenberger, & Fuhrer, (2000) used an anonymous questionnaire to see the self-reported effects of stimulant medication on academic, behavioral, physical and social dimension of students' lives. A sample of 925

students (486 males and 439 females) enrolled in public middle and junior high schools grades 7-9 and high school grades 9-12 from Minnesota and Wisconsin was used to determine the results. Students in general education and special education programs in all sample schools are included in the study. The researchers used a 45-item Likert scale questionnaire to determine the students' perceptions of the effects of stimulant medication. The questionnaire included questions that related to the students' experience when taking medication for ADHD. Of the students with ADHD who were being treated with stimulant medication, they reported that the medicine helped them to pay attention and earn better grades in school. However, the students were not convinced that they needed medication to complete homework or do things they liked to do such as a sports activity. Doherty and colleagues concluded that it was clear that students felt they did not need medication to be successful in school. In addition they stated that there is little evidence to support any long-term effects of stimulant medication on academic achievement and that it is important to provide academic interventions concomitantly with medical treatment.

In another study, using a survey and screening process, Wolraich, Lindgren, Stromquist, Milich, Davis, & Watson, (1990) tried to determine the rate at which children with ADHD are diagnosed by practitioners and prescribed medication for treatment. A survey of questions was mailed to a random sample of 800 members of the American Academy of Family Physicians and parents of children with ADHD. The questionnaire included inquiries regarding the behavioral characteristics used to make a diagnosis of ADHD. 334 practitioners responded to the survey. It was reported in the surveys that most physicians do not make significant use of stimulant medication in their diagnosis.

In general, family practitioners reported that they limit their usage of medication to school-aged children younger than 6 or older than 13 years of age. By parent report, 22% of children diagnosed with ADHD were treated with behavior modification and an even fewer percent (11%) reported receiving counseling. Few to none of the parents believed that treatment without medication is effective socially, emotionally or academically.

Wolraich and colleagues concluded that when diagnosed by a primary care physician, children respond more favorably when treated with medication than when treated with behavioral modification.

A study conducted by Swanson, Cantwell, Lerner, McBurnett, & Hanna, (1991) focused on determining the effects of stimulant medication on the attention and learning of children with ADHD. Their hypothesis was that academic performance of students with ADHD taking stimulant medication is related to the dosage of medication being taken. Stimulant medication was combined with behavior modification in the classroom for the assessment. Capsules were filled with different doses of medication and some with a placebo dose, (0mg, just a lactose filler). The capsules were administered for 7 days in a row. Although Swanson et al. (1991) speculated that medication at different doses could improve learning and academic achievement in children with ADHD, they found that it was impossible to obtain a clear answer or explanation. Because there is an optimal weight for each dose of medication, the dose-responses were affected by each participant's weight and the dose they were administered.

Other researchers believe that stimulants are the key elements in the treatment of ADHD (Santosh & Taylor 2000). They maintained that the use of medication alone without the combination of psychosocial intervention is the most advantageous. Santosh

& Taylor (2000) found that improvement has been noted in 65 to 75% of patients who received stimulant treatment compared to 4 to 30% of ADHD patients who received a placebo. They attempted to prove their theory by evaluating several formal meta-analyses and published reviews. They established that stimulant medication is beneficial in about 75% of patients, and that stimulants produce significant improvements in class performance. In their research on comparisons of treatments that include stimulants and behavior therapy, they found that treatment with stimulants alone is more effective than behavioral treatment alone or a combination of both stimulant and behavioral treatment. This evidence was taken from a large multicenter treatment assessment (MTA) that was conducted by the National Institute for Mental Health in the U.S.A. In further research on stimulant use in different age groups, these researchers found studies that concluded young children respond less well to stimulant treatment than school-age children. In their conclusion they state that the use of stimulants over the last decade and the research conducted on their effectiveness has established that they are the most effective therapy for students with ADHD.

DuPaul & Barkley (1991) presented their perspective on stimulant treatment for children with ADHD as highly effective in enhancing academic performance as well as their attention span and impulse control. They also concluded that stimulants appear to exert greater effects when combined with other approaches such as behavioral modification. DuPaul & Barkley (1991) present their view through research on empirical literature. According to their research, an estimated 70 to 80% of children with ADHD who are treated with stimulants respond positively. They note that the remainder either worsen with treatment or exhibit no response at all. In regards to the effects of stimulant

medication on academic performance in students with ADHD, DuPaul & Barkley (1991) found that in general the greatest enhancement occurred only when high doses of stimulant medication were administered. In contrast to what they believed to be true when looking at stimulant use and academic achievement, they concluded that the effects on the academic performance of children with ADHD are not significantly impacted by stimulant use.

A more recent study by Snider, Tracey, & Arrowood, (2003) was conducted using a survey to sample the teachers knowledge and experience related to the treatment of ADHD as well as other factors including it's diagnosis. A random sample of 200 special educators and 200 general educators from Wisconsin were surveyed. A questionnaire designed for their study asked respondents to rate statements using a 5-point Likert type scale. It was designed to reflect current knowledge about ADHD and treatment with stimulants. Teachers were asked to indicate their views about the effects of stimulant medication, what their involvement with students who have ADHD was, and how they obtained information on ADHD. They were also asked to check which interventions they had used with students with ADHD who were not taking stimulant medication. Of the entire sample, 145 teachers responded to the survey indicating that they had experience with students with ADHD. The respondents named teachers 92% of the time when asked who most recommended students for ADHD assessment. They indicated that in-service training (80%) and other professionals (60%) as the top two resources for obtaining information about ADHD. The interventions that were most frequently used were communication with parents through parent-teacher conferences (87%), phone calls or notes home (82%), daily reports (75%) and consequences for misbehavior (78%). Their



overall results revealed that teachers had limited knowledge about the use of stimulant medication for ADHD treatment. It also revealed that teachers were most frequently the one who recommended an assessment for ADHD. Most special and general educators were not well informed about the risks of stimulant medication or of possible side effects. These researchers suggested that if teachers knew more about the side effects of stimulant medication perhaps they could weigh the pros and cons more carefully. They concluded that although students with ADHD have reported that stimulant medication helps them do homework after school, be more organized and do better on tests, it does not seem to have long-term benefits in terms of academic achievement.

Of the studies reviewed, it seems as though the common theme is that stimulant medication as treatment for ADHD is an effective intervention but only in certain circumstances. The dosage administered (usually high doses), used without any other form of intervention and most importantly only as a short-term intervention seems to have an effect on academic achievement. The research reviewed did not indicate any measurable long-term benefits in terms of academic achievement. One possible explanation for this could be that we have not perfected the ways to measure learning, which makes it difficult to measure the gains in achievement. Most significantly it is important to recognize that medication is not always the only answer to treating students with ADHD.

The current study was developed to build on the ADHD intervention literature. While the research community is well informed on intervention effectiveness, the intent of this study was to find out if teacher perceptions matched those of the current

intervention literature. The following research questions were developed to help address this purpose:

*Research Question #1:* Out of four common choices for ADHD intervention, which one do teachers perceive to be the most effective in treating ADHD?

*Hypothesis #1:* Teachers perceive the most effective intervention in treating ADHD to be stimulant medication.

*Research Question #2:* Do teachers' perceptions regarding ADHD interventions match up with the current research regarding effective interventions for ADHD?

*Hypothesis #2:* There will be a difference between teachers' perceptions and current literature regarding the effectiveness of treatments for ADHD.

## Method

### *Participants*

One hundred and thirty one teachers (103 women and 28 men, 79% female and 21% male) from Wisconsin and Minnesota districts volunteered to participate. The geographic location of the schools was a combination of rural, urban and suburban, with 32% being rural, 18% being urban, and 50% being suburban. The participants were elementary and middle school teachers, with 74% being elementary school teachers and 26% being middle school teachers. One participant was of African American ethnicity, 2 Asian American, 125 White/Caucasian and 3 reported being of Other ethnicity. All of the participants hold a degree at the Bachelor of Arts or Bachelor of Science level or higher in various levels of education.

### *Materials*

One of four different vignettes was mailed out to 350 teachers in Wisconsin and Minnesota school districts (see Appendix A). Each vignette was followed by an “Optimism for Student Success Scale” that the participants were asked to complete (see Appendix B). The “Optimism for Student Success Scale” involved rating six statements regarding how the teacher felt the student would perform in certain areas while being placed on a specific ADHD intervention. The six areas addressed included; on-task behavior, attitude, social interaction with peers, long-term achievement, motivation, and self-esteem. The information gathered through this study was recorded in anonymous form.

### *Design and Procedure*

Surveys and vignettes were mailed to participants. Each participant received only one of four separate vignettes (see Appendix A). The vignettes were exactly the same except for the intervention plan that the student is on. The forms of interventions that were focused on within this study were stimulant medication, classroom/parent environmental interventions, a combination of stimulant medication and classroom/parent environmental interventions and counseling. Following the vignette, there was a six-item likert scale that the teacher completed after reading the vignette. The scale was used to analyze the perceptions of the teacher in regards to how they felt the child would respond to the different interventions.

The participant variables included whether or not the participant was a regular education elementary or middle school teacher, their years of experience, their gender, their ethnicity, and the geographic location of the school in which they work. All of the

variables were coded into categorical data, except for the years of experience variable, which was a continuous variable. The optimism Scale completed by the participants included how the participants felt about the student's on-task behavior, attitude toward school, interaction with classmates, long-term achievement, motivation, and self-esteem while one of the four specific interventions was being used. A scale of 0-3 was used for each item, with 0 being strongly disagree, 1 being disagree, 2 agree, and 3 strongly agree.

### Results

An internal reliability analysis was first conducted on the six-item "Optimism Scale". The findings revealed an excellent alpha level of .90. These six items can be considered a very strong reliable estimation of the participants' rating of their optimism for the student. The items on the "Optimism Scale" were developed after a thorough review of current ADHD literature was conducted to determine appropriate items to include on the scale. Content appropriateness was also determined through consultation with a university school psychology faculty member.

Analyses were then conducted on demographic variables in order to identify any differences between the four participant groups that may impact the interpretation of the primary analysis results. Pearson Chi Square tests of independence were not significant for geographic location [ $\chi^2(9, N = 131) = 5.58, p > .05$ ] nor ethnicity [ $\chi^2(9, N = 131) = 8.94, P > .05$ ]. The Pearson Chi Square was also conducted on gender and found to be insignificant [ $\chi^2(3, N = 131) = .95, p > .05$ ]. These findings support the conclusion that the four groups being compared within this study were equivalent in terms of geographic location, ethnicity, and gender.

### *Intervention Impact on Teacher Optimism*

In order to answer the first research question, a one-way analysis of variance (ANOVA) was conducted on the participant's total optimism score between each of the four intervention groups. The F value (3, 131) was 8.61, which was statistically significant at the .01 level. To determine the effect size, a measure of association between the groups was calculated, based on the participant's total optimism score and the intervention read about in the vignette. The square of the correlation found was .170, suggesting that about 17% of the observed variance in teachers' optimism for the student with ADHD can be attributed to the type of intervention used.

Post-Hoc analyses were also conducted to determine any pair differences. The difference between the participant's total optimism score was statistically significant between the interventions of stimulant medication and environmental interventions combined and environmental interventions alone ( $p < .01$ ), and between stimulant medication/environmental interventions combined and counseling alone ( $p < .01$ ). The teachers in this study reported higher optimism for the student who is receiving stimulant medication and environmental interventions combined within each pairwise comparison. This also indicated significantly lower optimism for the student who is receiving environmental interventions alone, counseling alone, or stimulant medication alone.

### *Impact of Geographic Location*

A one-way analysis of variance (ANOVA) was also conducted on the participant's total optimism score between each of the three geographic locations regardless of the intervention reviewed. The F value (3, 131) was 3.34, which was statistically significant at the .05 level. The Bonferroni correction method was used to

reduce the likelihood of Type I error. A statistical significance was found at the .05 level between the suburban and rural geographic location. The suburban geographic location group (N = 65) reported higher optimism as a whole (M = 10.95) than the rural group (N = 44) reported lower optimism as a whole (M = 9.07).

### *Gender Analysis*

An independent samples *t*-test was used to analyze gender and the six items on the optimism scale and the total score. No statistically significant difference was found between males and females in regards to each independent survey question on the optimism scale nor the total score.

### Discussion

Our primary hypothesis was that teachers would perceive the most effective intervention in treating ADHD to be stimulant medication. The results concluded that elementary and middle school teachers view stimulant medication combined with environmental interventions to be the most beneficial ADHD intervention for a student. All information within each vignette was held constant (other than the type of intervention used) therefore, the results reflect teachers' perceptions regarding only ADHD interventions. Geographic location was found to be a factor in teachers' level of optimism regarding a student and ADHD interventions. Teachers within the suburban schools held a higher optimism for the student than teachers within the rural schools.

As useful as some stimulants might be there is still much controversy over whether they are necessary for treatment of ADHD. Many doctors feel that the potential side effects should be weighed before any stimulant is prescribed. Some dangerous side effects include, weight loss, loss of appetite, slowing of growth and insomnia. It is also

important to keep in mind that many things can produce the same symptoms as typical ADHD symptoms. Chronic fear or mild seizures can make a child seem overactive, impulsive or inattentive. A middle ear infection can make a child seem distracted and uncooperative. Living with family members who are abusive or addicted to alcohol or drugs can also cause a child to seem unfocused. Outside of the causes for certain behaviors teachers and other professionals should realize that the majority of children in certain stages of development tend to be inattentive, hyperactive or impulsive. They do not always have ADHD. It is important that teachers and doctors first look at other causes of behaviors before diagnosing and treating a student for ADHD.

Some therapists prefer to use other intervention approaches for treating children with ADHD. Psychotherapy can help people with ADHD by helping them accept themselves despite their disorder. In psychotherapy, patients talk about upsetting feelings and thoughts and explore self-defeating patterns of behavior. They can also learn alternative ways to handle their emotions and behaviors. The therapist can help them understand how they can change and gain control of their symptomatic behaviors. Cognitive-behavioral therapy helps people work on immediate issues. Rather than helping people understand their feelings and actions it supports them directly in controlling and changing their behavior. Social skills training can help children learn new behaviors. Appropriate behaviors such as waiting for a turn, sharing with other students and asking for help are discussed with the therapist. This kind of therapy gives children a chance to practice appropriate behavior. In order for a child to experience success in school it may be necessary for a teacher to use more than one approach to accommodate each child's needs.

Based on our results and the other literature reviewed, successful ADHD interventions are perceived differently among educational professionals. There is no single answer to effectively assisting a child with ADHD within the classroom. It is important to consider all aspects of the individual child when attempting to implement a successful intervention.

Although the size of this sample was sufficient, a limitation of this study exists within the lack of cultural diversity of the respondents. The majority of the participants were White/Caucasian. Also, 50% of the respondents were from suburban schools, while 18% were from urban schools. Future researchers could investigate how teachers' perceptions change regarding ADHD interventions when given a more detailed vignette to review. Details could be added to include more extensive background information and interventions that have been tried in the past. The age of the child could also be modified to see how teachers perceive the effectiveness of interventions among younger versus older students.



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## Appendix A

### Research Vignettes

Emily is an eleven-year-old, sixth grade student at White Hill Middle School. A local psychologist has previously diagnosed her with Attention Deficit Hyperactivity Disorder (ADHD). White Hill's school psychologist has received a letter from Emily's doctor stating the diagnosis and recommending that the school psychologist and Emily's parents and teachers come to an agreement on what the best intervention will be for Emily based on her past behaviors. In the past and currently, Emily has had a hard time staying on-task. She is constantly looking around the classroom, tapping her pencil on her desk and disrupting other students. She does not get along with her peers very well and has been caught several times hitting and starting fights with other students. She is unmotivated and refuses to complete class assignments on time and shows signs of low self-esteem. She has been seen playing alone at recess and has been found numerous times crying on the playground. Emily also has had several poor test scores and displays a bad attitude towards school in general. After a list of interventions were discussed, Emily's parents decided that they preferred that moderate levels of stimulant medication be prescribed and administered twice daily, once in the morning before school and once in the afternoon at 2:30. No other interventions were implemented at this time.

Using the likert scale of 0-3 on the "Optimism for Student Success Scale" (0 being strongly disagree, 1 disagree, 2 agree and 3 strongly agree), please rate your perception of what you think you will see in Emily's behaviors following three months of stimulant medication only: (See Appendix B)

Emily is an eleven-year-old, sixth grade student at White Hill Middle School. A local psychologist has previously diagnosed her with Attention Deficit Hyperactivity Disorder (ADHD). White Hill's school psychologist has received a letter from Emily's doctor stating the diagnosis and recommending that the school psychologist and Emily's parents and teachers come to an agreement on what the best intervention will be for Emily based on her past behaviors. In the past and currently, Emily has had a hard time staying on-task. She is constantly looking around the classroom, tapping her pencil on her desk and disrupting other students. She does not get along with her peers very well and has been caught several times hitting and starting fights with other students. She is unmotivated and refuses to complete class assignments on time and shows signs of low self-esteem. She has been seen playing alone at recess and has been found numerous times crying on the playground. Emily also has had several poor test scores and displays a bad attitude towards school in general. After a list of interventions was discussed, Emily's parents decided that Emily's teachers would use behavioral techniques each day. Positive reinforcement and logical consequences are part of the plan. Specific components include a sticker chart with stickers used hourly to reinforce on-task behavior, completion of assignments, and positive peer interaction. Over time, stickers could be used in exchange for things that Emily enjoys. Logical consequences include loss of free time or

making up assignments as deemed appropriate. No other interventions were implemented at this time.

Using the likert scale of 0-3 on the “Optimism for Student Success Scale” (0 being strongly disagree, 1 disagree, 2 agree and 3 strongly agree), please rate your perception of what you think will see in Emily’s behaviors following three months of classroom environmental interventions only: (See Appendix B)

Emily is an eleven-year-old, sixth grade student at White Hill Middle School. A local psychologist has previously diagnosed her with Attention Deficit Hyperactivity Disorder (ADHD). White Hill’s school psychologist has received a letter from Emily’s doctor stating the diagnosis and recommending that the school psychologist and Emily’s parents and teachers come to an agreement on what the best intervention will be for Emily based on her past behaviors. In the past and currently, Emily has had a hard time staying on-task. She is constantly looking around the classroom, tapping her pencil on her desk and disrupting other students. She does not get along with her peers very well and has been caught several times hitting and starting fights with other students. She is unmotivated and refuses to complete class assignments on time and shows signs of low self-esteem. She has been seen playing alone at recess and has been found numerous times crying on the playground. Emily also has had several poor test scores and displays a bad attitude towards school in general. After a list of interventions was discussed, Emily’s parents decided that Emily’s teachers would use behavioral techniques each day in addition to moderate levels of stimulant medication. Positive reinforcement and logical consequences are part of the plan. Specific components include a sticker chart with stickers used hourly to reinforce on-task behavior, completion of assignments and positive peer interaction. Over time, stickers could be used in exchange for things that Emily enjoys. Logical consequences include a loss of free time or making up assignments as deemed appropriate. In addition, Emily will be administered stimulant medication twice a day, once in the morning before school and again in the afternoon at 2:30. No other interventions were implemented at this time.

Using the likert scale of 0-3 on the “Optimism for Student Success Scale” (0 being strongly disagree, 1 disagree, 2 agree and 3 strongly agree), please rate your perception of what you think will see in Emily’s behaviors following three months of a combination of stimulant medication and classroom environmental interventions: (See Appendix B)

Emily is an eleven-year-old, sixth grade student at White Hill Middle School. A local psychologist has previously diagnosed her with Attention Deficit Hyperactivity Disorder (ADHD). White Hill’s school psychologist has received a letter from Emily’s doctor stating the diagnosis and recommending that the school psychologist and Emily’s parents and teachers come to an agreement on what the best intervention will be for Emily based on her past behaviors. In the past and currently, Emily has had a hard time staying on-task. She is constantly looking around the classroom, tapping her pencil on her desk and disrupting other students. She does not get along with her peers very well and has been

caught several times hitting and starting fights with other students. She is unmotivated and refuses to complete class assignments on time and shows signs of low self-esteem. She has been seen playing alone at recess and has been found numerous times crying on the playground. Emily also has had several poor test scores and displays a bad attitude towards school in general. After a list of interventions was discussed, Emily's parents decided that counseling would be the best option for Emily before any other interventions took place. Counseling will include individual counseling at school, once a week for 30 minutes. The counseling sessions will include social skill techniques, attention development plans, and sharing time. The school counselor will also address motivation, self-esteem, and on-task behavior issues with Emily. No other interventions were implemented at this time.

Using the likert scale of 0-3 on the "Optimism for Student Success Scale" (0 being strongly disagree, 1 disagree, 2 agree and 3 strongly agree), please rate your perception of what you think will see in Emily's behaviors following three months of only counseling: (See Appendix B)

## Appendix B

**Optimism for Student Success Scale**

	SD	D	A	SA
• Emily's on-task behavior will probably increase.	0	1	2	3
• Emily will likely have a better attitude toward school. 3	0		1	2
• Emily will probably get a long better with her classmates.	0	1	2	3
• Emily's long-term achievement will probably be enhanced.	0	1	2	3
• Emily's motivation to succeed will likely improve.	0	1	2	3
• Emily will likely feel better about herself.	0	1	2	3