Addressing Rumination Through Dietary Control in Children with Autism and Developmental Disabilities

by

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DEDICATION

This thesis is dedicated to caregivers who experience aversive mealtime behaviours on a daily basis.
ABSTRACT

The eating behaviour of rumination in children with autism and developmental disabilities is discussed in detail. Included is the prevalence of rumination, physical and social consequences of the disorder, as well as treatment options to be employed by primary caregivers of the child. Four best practices for intervention have been synthesized from the literature on rumination and include satiation, liquid rescheduling, delivery of specific foods, and a combination of these techniques.

Results yielded a compilation manual of best practices to treat rumination. The manual was created with the aim of providing primary caregivers with an empirically validated resource of treatment options that could be implemented easily across environments. The methods by which each intervention is implemented are outlined in detail. It is recommended that prior to implementing an intervention that a physician or dietician is consulted to ensure that the client meets the diagnostic criteria for rumination and to ascertain that the selected treatment is appropriate for the client. Challenges encountered while creating the manual are discussed. An area for further research is the practical application of these interventions for children with autism or developmental disabilities who engage in rumination.
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TABLE OF CONTENTS

DEDICATION ........................................................................................................................................... ii
ABSTRACT .............................................................................................................................................. iii
ACKNOWLEDGEMENTS ............................................................................................................................ iv
TABLE OF CONTENTS ............................................................................................................................ v

CHAPTER
I. INTRODUCTION ................................................................................................................................. 1

Manual Description ................................................................................................................................. 1

II. LITERATURE REVIEW ....................................................................................................................... 3

Disorders Similar to Rumination ................................................................................................................ 3
Diagnosing Rumination ............................................................................................................................... 4
Dietary Control ........................................................................................................................................... 5
Satiation .................................................................................................................................................... 5
Liquid Rescheduling ................................................................................................................................. 6
Specific Foods ........................................................................................................................................... 7
Combination Techniques ............................................................................................................................ 7

III. METHOD ............................................................................................................................................. 9

Participants .............................................................................................................................................. 9
Consumers ............................................................................................................................................... 9
Design ..................................................................................................................................................... 10
Evaluation Measure ................................................................................................................................. 11

IV. RESULTS .......................................................................................................................................... 12

V. DISCUSSION ..................................................................................................................................... 13

Summary ................................................................................................................................................ 13
Strengths ................................................................................................................................................ 13
Limitations ............................................................................................................................................. 13
Challenges of Practical Application ......................................................................................................... 14
Original Contribution ................................................................................................................................. 15
Recommendations for Future Research .................................................................................................... 15

REFERENCES ..................................................................................................................................... ....16

APPENDICES

Chapter I: Introduction

Dysfunctional eating behaviours are prevalent in the developmentally disabled population, including those with autism or other developmental disabilities (Hove, 2007). Several eating-related difficulties include: pica, food selectivity, food refusal, and rumination (Kuhn, 2004). Although many dysfunctional eating behaviours can be physically dangerous, such as parasites or poison from engaging in pica (Ferreri, Tamm, & Wier, 2006), there are certain behaviours that have larger repercussions. Social undesirability is an additional consequence that accompanies the physical dangers caused by eating-related difficulties.

Specifically, rumination is defined as “the chronic regurgitation, chewing, and reswallowing of previously ingested food” (Heering, Wilder, & Ladd, 2003, p. 199). Rumination is one such behaviour that has physical and social consequences. It is estimated to occur in 6 to 10% of individuals with developmental disabilities (Heering et al.; Masalsky & Luiselli, 1998); this figure is high considering Hove (2007) found that 64.3% of those with a developmental disability engaged in dysfunctional eating behaviours. Rumination is a behaviour of particular concern since it can cause long-term physical damage, such as tooth decay and deterioration of the esophagus due to the acidity of the regurgitated food. In addition, rumination can lead to dehydration, malnutrition and even death (Heering et al.; Kuhn & Matson, 2004; Dunn, Lockwood, Williams, & Peacock, 1997).

For those with autism or developmental disabilities, it is not always possible for them to communicate potential medical reasons for the rumination-like behaviour, such as gastroesophageal reflux disease or GERD (Kuhn, 2004). Lack of communication also makes it difficult to ascertain whether clients engage in the behaviour for the stimulation it is presumed to provide (Clauser & Scibak, 1990). Since rumination is usually a habitual and longstanding problem, it can present many difficulties for caregivers (Wilder, Draper, Williams, & Higbee, 1997). For instance, those who ruminate often do not swallow all of their regurgitated food, resulting in the remaining food running down their face or chest (Saloviita, 1999). Not only does the caregiver have to manage the social undesirability of the individual’s recurring behaviour, but they also cope with the aversive consequences of working intimately with the person. For example, Wilder et al. noted that the smell of regurgitated food can create a barrier between a child and the primary caregiver or other individuals in the child’s life since it is so aversive. The physical and social consequences of rumination are especially applicable to children. The longer the person regurgitates the acid from their stomach, or the more chronic the ruminative behaviour, the more damage it will cause to the esophagus and teeth. The damage caused by stomach acid could have long-term consequences when these children mature into adults.

Socially, a child may have difficulty maintaining friendships or having others remain in his or her presence while there is regurgitated food on the face and clothes. In order to prevent chronic rumination, it is essential that interventions target ruminating behaviour in children, at the onset of the problem.

Manual Description

A manual design was adopted, as it was the most practical and accessible method of conveying information about this specialized disorder to primary caregivers. The information included in the compilation manual is organized into six chapters for each topic. The first chapter, ‘Rumination: An Overview’ provides the user with general information regarding rumination. The definition of rumination, its prevalence, and diagnostic criteria are discussed in
detail. Subsequently, the sub-heading “Other Common Disorders” outlines other disorders that may present like rumination, but in fact are very different in terms of the cause of the behaviour and the treatment. The following four chapters of the manual are the best practices for treatment of rumination which include satiation, liquid rescheduling, specific foods, and combination techniques. Each intervention is divided into sections that define the term and summarize the literature that has been reviewed on the topic. The methodology of the intervention, and possible benefits and consequences of the intervention have been included as sub-headings as well. Finally, a summary of the information found in the manual is provided. Behavioural jargon was avoided throughout the manual where possible, but when used, a definition has been given to the user.

A Topic Guide and an Evaluation Form have been included as appendices in the compilation manual. The Topic Guide (Manual Appendix A) contains issues to consider before implementing any type of intervention with a child. The purpose of the Topic Guide is to provide the primary caregiver with a list of inquiries regarding different aspects of the interventions, which may be a useful tool when in consultation with a physician or dietician. The goal of the Topic Guide is to provide a prompt to the primary caregiver to ensure that possible encumbering variables of an intervention are discussed with a professional. For example, if a child has an allergy to an ingredient found in bread, then a satiation procedure using white bread is not possible for that particular client, thus a different intervention must be considered. It is imperative that when an intervention for rumination is selected that it is suited for that client and his or her specific needs.

Manual Appendix B offers users the opportunity to provide feedback to the author. Since this is the manual’s first edition, feedback is essential in order to ensure that the compilation addresses the needs of its demographic. The feedback will provide the author with information regarding the specificity of information within the manual and whether any portions of the manual were unclear. The evaluation form also allows the user to identify information that was not included in this manual, but could be included in later editions.
Chapter II: Literature Review

Children who are developmentally disabled such as those with autism or other such developmental disabilities are at an increased risk for eating-related difficulties (Schwarz, 2003). Common problems among this population include food refusal or selectivity, pica, and rumination (Kuhn & Matson, 2004). Rumination, as mentioned, has both physical and social consequences that warrant immediate intervention (Dudley, Johnson, & Barnes, 2002). Interestingly, much of the research aimed at decreasing or eliminating rumination concentrates on adults with autism or developmental disabilities. Since rumination can and does occur in children with these disorders (Dudley, et al.), interventions that have been used for adults should be applied to children. Early intervention can prevent any long-term damage to the teeth and esophagus, as well as prevent the stress experienced by the primary caregivers.

Disorders Similar to Rumination

Since eating difficulties are prominent in individuals with autism and developmental disabilities (Kuhn & Matson, 2004), it is imperative that a medical professional rule out any possible medical conditions or other variables that may be affecting the individual’s behaviour. A person’s overall health must be assessed because, as Kuhn and Matson noted:

Some medical problems may be mistaken for behavior problems, such as rumination resulting from gastroesophageal reflux disease (GERD). Medication side effects may also present similar to a behavior problem such as a misdiagnosis of rumination due to neuroleptics, which have been shown to interfere with swallowing…. To identify the problem, its etiology and/or function, and determine an appropriate course of treatment, it is necessary to effectively and comprehensively identify and assess the problem. (pp. 639-640)

GERD may be mistaken for rumination as it can have similar features (Kuhn & Matson, 2004). It is a disease in which the muscular valve between the stomach and the esophagus is faulty, thus acid from the stomach and sometimes the stomach contents reach the esophagus (Heartburn GERD Guide, 2006). In spite of the similarities between rumination and GERD, there is an important distinction between the two disorders; rumination is voluntary, whereas GERD is involuntary (Olden, 2001). It is important to make this distinction so that the appropriate treatment can be applied, as the treatments for GERD and rumination vary greatly. The distinction between voluntary and involuntary behaviour is important for not only differentiating GERD from rumination, but also for differentiating rumination from vomiting; since rumination is not due to physiological causes, it is purposeful (Saloviita, 1999).

Since the process of rumination is purposeful, individuals who ruminate have often initiated it by “[putting] hands in the mouth, tongue thrusting, voluntary gagging, or abdominal thrusts” (Kerwin & Berkowitz, 1996, p. 318), whereas these observable and intentional behaviours are not present in individuals with GERD or similar disorders. Rogers, Stratton, Victor, Kennedy, and Andres (1992) reported that 91% of people diagnosed with rumination syndrome and a developmental disabilitiey also have undiagnosed gastrointestinal issues, which indicates a need to separate the two disorders (Rogers et al. cited in Kerwin & Berkowitz, 1996). Since both rumination and gastrointestinal disorders can have similar consequences, such as tooth decay and esophageal damage, it is imperative for a professional to have distinguished between these illnesses so that appropriate treatment may be obtained (Olden, 2001). Another possible explanation for ruminative behaviour is the side effects of medication such as
neuroleptics (Kuhn & Matson, 2004). Specifically, neuroleptics and benzodiazepines have been shown to affect esophageal functioning and the ability to swallow (Eating Disorder: Rumination, 2006). Psychogenic vomiting is another disorder which may be mistaken for rumination. Psychogenic vomiting is a condition where individuals experience recurring vomiting in stress-related situations without the nausea that is typically associated with vomiting (Justice, n.d.). The vomiting does not affect the person’s appetite, and like rumination, the action is able to be suppressed by the patient. Psychogenic vomiting differs from rumination in that the vomiting occurs during stressful situations, whereas rumination is initiated by the individual for stimulatory purposes.

**Diagnosing Rumination**

When the disorders mentioned above or similar medical conditions are ruled out as possible reasons for the ruminative behaviour, medical professionals can consult the *DSM-IV-TRA* (2000) for information regarding the diagnosis of rumination syndrome.

The *DSM-IV-TR* (2000) identified the following criteria for rumination disorder:

1. Repeated regurgitation and rechewing of food for a period of at least 1 month following a period of normal functioning.
2. The behavior is not due to an associated gastrointestinal or other general medical condition (*e.g.*, esophageal reflux).
3. The behavior does not occur exclusively during the course of Anorexia Nervosa or Bulimia Nervosa. If the symptoms occur exclusively during the course of Mental Retardation or a Pervasive Developmental disorder, they are sufficiently severe to warrant independent clinical attention. (p. 106)

Although several populations may engage in rumination-like behaviours, for example, individuals with eating disorders (Weakely & Petti, 1997) or fully-functioning adults (Papadopoulos & Mimidis, 2007), these three specific criteria must be met in order to receive a diagnosis of rumination syndrome. As the literature stated, any differential diagnoses need to be given before rumination can be officially diagnosed.

Although the *DSM-IV-TR* (2000) is a commonly used tool to provide diagnoses by professionals such as physicians, in the case of rumination, the Rome can also be used. The Rome is a classification system that gives “information on the epidemiology, pathophysiology, diagnosis and treatment of… over 20…functional GI [gastrointestinal] disorders commonly seen in clinical practice” (Rome Foundation, 2007). Chial, Camilleri, Williams, Litzinger, and Perrault (2003) noted however, that while the Rome II includes a diagnostic grouping for functional gastrointestinal disorders of childhood, only infant rumination syndrome was discussed. In the infant rumination syndrome classification, it stated that the symptoms must occur before the age of eight months (Chial et al.). The latter criterion is problematic when attempting to use the Rome to diagnose rumination in older children, as it states that the behaviour must be present from an early age, which may not pertain to all cases. As a result of their study, Chial et al. proposed the following six criteria for identifying rumination in children and adolescents:

At least 6 [weeks], which may not be consecutive, in the previous 12 [months] of recurrent regurgitation of recently ingested food which:

1. begins within 30 [minutes] of meal ingestion
2. is associated with either reswallowing or expulsion of food
3. stops within 90 [minutes] of onset or when regurgitant becomes acidic
4. is not associated with mechanical obstruction
5. does not respond to standard treatment for gastroesophageal reflux disease (ie, medical therapy or lifestyle modification measures)
6. is not associated with nocturnal symptoms (p.162)

Although the criteria identified by Chial et al. (2003) were somewhat consistent with the *DSM-IV-TR* (2000) criteria, there were some important distinctions. For instance, Chial et al. provided specific information pertaining to the time the behaviour is likely to occur, criterion one; and the duration of the behaviour, criterion three. The timeframes provided in the Rome criteria are helpful for clients or caregivers who are attempting to describe the disorder to a physician prior to a formal diagnosis because they are more behaviourally specific. The *DSM-IV-TR* (2000) also indicated in its criteria that a period of “normal” functioning precedes the ruminating behaviour. The latter may not always be true in those with autism or developmental disabilities or for those who have continued to ruminate since infancy. Although Chial et al.’s criteria have not been accepted by the medical community as an official classification system for the diagnosis of rumination syndrome, the aforementioned benefits of their criteria, such as the specificity, obviously have some advantages over the *DSM-IV-TR* (2000), and therefore should not be completely discounted.

**Dietary Control**

In terms of treatment, most interventions for rumination have dietary control as a consistent theme (Saloviita, 1999; Clauser & Scibak, 1990; Heering et al., 2003). Chial et al. (2003) noted that behavioural approaches have been well supported and specifically, the literature demonstrated that dietary control techniques were consistently and effectively used to treat those who ruminate (Heering et al.). The benefit of dietary control procedures is that they are easily conducted by any caregiver and in a variety of environments, as the emphasis of the intervention is on the food and liquid intake. The ease with which the interventions are implemented is beneficial to the caregivers, especially since the interventions do not rely solely on one specific caregiver or the presence of a professional, such as a behaviour therapist. Since the interventions can be consistently conducted across settings and individuals, they are more likely to be generalizable. Dietary control was also a favorable method of intervention since it applied the least-intrusive techniques. Although there was some evidence that punishment via electric shock or aversive tastes, such as lemon juice or Tabasco sauce reduced or eliminated rumination (Whitehead & Bosmajian, 1982), procedures such as those used in dietary control were preferred as they were less likely to cause harm to the individual. Dietary control includes such procedures as satiation (Clauser & Scibak), liquid rescheduling (Heering et al.), specific foods (Barton & Barton, 1985), and combinations of these procedures (Saloviita).

**Satiation.** Masalsky and Luiselli (1998) defined satiation as: “the provision of extra and usually unlimited portions of food during meals until further servings are refused” (p. 227), and this method has been implemented in various ways to reduce rumination. Dudley et al. (2002) found that the inclusion of starchy foods within and after the meal until satiation occurred effectively reduced rumination in their nine-year-old client. Clauser and Scibak (1990) also utilized a satiation technique with three adult clients who engaged in rumination. The clients were given unlimited quantities of cereal and milk throughout mealtimes until they were satiated. Even though the authors found this method of satiation to be effective, it contradicts the idea of liquid rescheduling, as the client was given milk during mealtimes. The milk that the client
ingested with the cereal can facilitate the regurgitation of food because the more liquefied the stomach contents are, the easier it is for the client to regurgitate. By allowing the client access to liquid, it can facilitate rumination instead of inhibiting it, which is the ultimate goal. While Dudley et al. (2002) offered their client a variety of starchy foods both during and after her meal, Masalsky and Luiselli only provided their adult client with a starchy food after his meal was completed. Small pieces of white bread were offered to the client until satiation was attained and this was found to be successful in reducing his rates of rumination. White bread was also used by Thibadeau, Blew, Reedy, and Luiselli (1999). The bread was available to their adult client for periods of one hour following each meal, and this reduced rumination to near-zero levels. The literature therefore indicates that there are various strategies that can be used within the same intervention. Even though all clients received white bread or similar starchy foods, the times at which the food was available varied.

While satiation techniques have been shown as effective, they have also been criticized as a health concern in terms of weight gain through increased caloric intake (Dudley et al., 2002). Although weight gain can be a shortcoming to this intervention, weight loss is common and sometimes dangerous in ruminators (Saloviita, 1999; Dudley et al.), thus gaining weight is not necessarily a negative feature of using satiation. In a 2000 review, Gravestock stated that “…35-72% of adults with severe or profound ID [intellectual disabilities] [are] significantly underweight, especially those who…exhibit chronic vomiting, rumination, and regurgitation” (p. 627); further support that weight gain can be a positive outcome of this intervention. In another example, a follow-up study conducted by Dunn et al. (1997), found that a satiation intervention was beneficial to their adult client even though there was weight gain, as the client was underweight at the onset of the study. Dunn et al.’s study showed that weight gain can be one of the client’s goals to improved health; therefore satiation may be the most appropriate intervention for some clients. In the same study, a seven-year follow-up with the client showed that satiation was effective in maintaining a zero level of rumination; further evidence of the efficacy of this technique (Dunn et al.).

**Liquid rescheduling.** Liquid rescheduling involves changing, or rescheduling, the times that the client is permitted access to liquids. Heering, et al. (2003) investigated liquid rescheduling for an adult client with autism who engaged in rumination. The intervention involved restricting the client’s liquid intake during meal consumption to zero, then waiting for one and a half hours after the meal before presenting their client with liquid. In a replica of Heering et al.’s study, Wilder et al. (1997) also examined the effects of liquid rescheduling on an adult male diagnosed with a developmental disability. Their client’s liquid intake during meals was restricted to zero and the authors waited one and a half hours after the meal was consumed before permitting the client any access to liquids. Unlike Heering et al., Wilder et al. also restricted their client’s access to liquid thirty minutes prior to mealtime. Both interventions proved successful in reducing the clients’ ruminating behaviours. It was uncertain which study had better results with the liquid rescheduling as the length of time in which liquids were withheld was not manipulated in either study to determine the most effective method of intervention. The literature did not indicate whether the thirty minutes of withholding liquids prior to mealtime, combined with the restriction of liquids during and following the meal had a significant effect over Heering et al.’s method. Again, the literature indicates that there may be variations within the same intervention.

Liquid rescheduling is considered effective since the absence of liquids impedes the
person’s ability to regurgitate the recently ingested food (Heering et al., 2003). It can be assumed that the greater the extent of digestion, the easier it is to regurgitate, which increases one’s ability to ruminate. Heering et al. noted that liquid rescheduling may have eliminated any automatic reinforcement the client received from ruminating, as the consistency of the food was different without additional liquids. The changed consistency inhibits the person’s ability to regurgitate the stomach contents and also changes the stimulation the person receives (Luiselli, Medeiros, Jasinowski, Smith, & Cameron, 1994). It is important to consult a physician or dietician prior to implementing a liquid rescheduling intervention, as it may not be appropriate for some clients. For example, liquid rescheduling may not be appropriate for those who are already dehydrated from constant ruminating, in which case, a different intervention may be more appropriate. Liquid rescheduling may prove preferable to other satiation procedures since it is not associated with increased caloric intake or subsequent weight gain (Heering et al.). Again, a physician or dietician should be consulted to determine the most appropriate intervention, as client’s needs differ greatly.

**Specific foods.** The literature has also shown that when clients are provided with access to specific foods during mealtimes, rumination is reduced. Barton and Barton (1985) found that the consumption of peanut butter during meals helped reduce rumination in children, and other studies have conducted similar interventions with successful results. Saloviita (1999) alternated the use of peanut butter or honey on bread in order to reduce rumination in two adult clients. The underlying theory was that the consistency of the foods increased the difficulty for the clients to regurgitate (Wilder et al., 1997). Even though the specific foods technique can be used independently, this intervention is typically used in conjunction with other interventions such as liquid rescheduling (Saloviita). An alternate theory underlying the effectiveness of a specific foods intervention is that the consistency of the peanut butter or honey provides the individual with a similar form of stimulation as it passes through the esophagus. The new stimulation the person experiences is thought to be enhanced with the absence of liquids because swallowing peanut butter or honey is prolonged when liquids are not provided to facilitate the process. The stimulation theory is difficult to confirm, however, since individuals with autism or developmental disabilities frequently have difficulties communicating (Kuhn, 2004), therefore, it is only a speculated reason for its effectiveness. Peanut butter may also be useful in terms of satiation since it has a high caloric content; thus the client becomes satiated at a faster rate (Wilder et al.). As mentioned with the satiation intervention, although the high caloric intake can be beneficial to those who are underweight, it may also be an unwanted side effect for other clients.

**Combination techniques.** Although the above mentioned interventions can be implemented individually, a number of studies have examined a combination of techniques. Saloviita (1999) combined specific foods and liquid rescheduling in order to address the ruminating behaviour in his adult client. He reported that including peanut butter or honey with a meal and withholding liquids until about one hour after consuming the meal, effectively reduced rumination as the food could not be easily regurgitated. Barton and Barton (1985) also combined the use of satiation with peanut butter and liquid rescheduling to decrease the rate of rumination in children.
The above studies have demonstrated that the three methods can be used in different combinations and still remain effective. The decision to combine these interventions or use one individually may depend on the client’s needs and the severity of the ruminating behaviour. It is advised that the least intrusive method is used first and independently, since it may prove as effective as combination techniques, without complicating the intervention. The more complex the intervention, the more difficult it is to maintain the consistency across environments. The ease with which an intervention is implemented across settings is especially important when the clients are children. Children tend to be a part of several different environments such as school, home, and childcare environments; therefore, the less complicated the intervention, the greater the likelihood of implementation by the child’s caregivers.

Although other interventions, such as shaping paired with time-out (Watson & Scott, 1994) and diaphragmatic breathing (Chitkara, Van Tilburg, Whitehead, & Talley, 2006) have been implemented to reduce or eliminate rumination, the literature consistently identified the four interventions previously described as the most successful (Heering et al., 2003). Dietary control has several advantages over other methods of treatment since it employed the least-intrusive procedures, was less time-consuming, and required little effort on the part of the primary caregivers. Evidently, there are several ways to address ruminating behaviour and although most of these studies have been applied to adults (Gravestock, 2000), the techniques can also be applied with equal effectiveness to children who engage in the same behaviours. The compilation manual was thus created to provide caregivers with specific instructions on the use of the aforementioned interventions with children.
Chapter III: Method

Participants

In terms of participants, the manual only included a compilation of best practices according to the literature, thus, no human subjects participated in the interventions. Selecting a participant for an intervention is an important process and one that shall not be overlooked. To be considered a candidate for the interventions outlined in the manual, several variables must be taken into account. First, the client must have a clinical diagnosis of rumination syndrome according to the *DSM-IV-TR* (2000) criteria. A diagnosis is important as it ensures that other possible explanations for the ruminative behaviour, such as GERD, have been ruled out; and since treatments for disorders vary greatly, an appropriate intervention can then be selected based on the diagnosis. Since receiving a clinical diagnosis is often a lengthy process (Chial et al., 2003), an intervention for rumination may also be implemented upon a physician’s recommendation. Although a child may not meet the *DSM-IV-TR*’s (2000) criteria for the diagnosis, a physician may still recommend an intervention in order to prevent further damage to the child’s teeth and esophagus. Similarly, the child’s ruminating behaviour may be severe enough to warrant immediate intervention, for example, in cases where the individual is extremely under weight. The frequency of rumination should also be considered before implementing any interventions. For instance, a child who ruminates after every meal requires immediate intervention over a child who ruminates only in certain circumstances to gain stimulation. If a child is ruminating in certain situations only, then environmental variables should be further investigated to determine a cause. If the child meets one or more of these aforementioned criteria, then an intervention can be implemented upon consultation with a physician or dietician. Although not all of the literature recommended consulting medical professionals prior to implementing an intervention, it has been strongly emphasized throughout the manual since the author has not directly implemented the interventions. Also, since the research was based on those with autism or developmental disabilities, it is suggested that the caregivers of those children with alternative diagnoses who engage in rumination consult a physician prior to treatment to ensure that an appropriate intervention is implemented. Even for those who have received diagnoses of autism or a developmental disability, a physician should still be consulted to ensure the appropriateness of the intervention for that individual.

The definition of a child, for the purposes of this manual, was considered those aged four to eighteen years. Rumination is often seen in infants (Kuhn, 2004), and therefore a distinction was made between infant rumination and childhood rumination. The ruminating behaviour may have persisted since infancy or may be childhood-onset, so long as the child is between the ages of four and eighteen years. Although the literature indicated a prevalence of rumination in males, the interventions are not gender specific, thus can be used with either males or females.

Consumers

The manual was designed for use by the client’s primary caregiver(s), who include, but are not limited to parents or guardians, other family members, teachers, and educational assistants. The settings for intervention may include any such setting in which the child participates as the interventions tend to require little time and in some cases, little effort. Since the interventions employ least intrusive methods, settings such as the home, school, or childcare environments can provide treatment in order to maximize the generalization of the non-ruminative behaviour.
Design

In order to aid primary caregivers in developing interventions for rumination in children with autism or developmental disabilities, a manual consisting of best practices was designed (Appendix A). The information in the manual is based on previous studies that have conducted successful interventions with individuals who ruminate. The compilation manual includes six chapters which easily direct the reader to the correct section of the manual while the subheadings aid in locating the desired information. The chapters provide an overview of rumination and explain the implementation processes of four different types of interventions. A summary of the information is included at the end of the manual. Also included within the manual are precautions that need to be addressed when contemplating the use of an intervention. These precautions include the health of the client, the individual’s needs, and the feasibility of the intervention.

The first chapter provides an overall description of rumination. The Diagnostic and Statistical Manual, fourth edition with text revisions, or DSM-IV-TR (American Psychiatric Association: Diagnostic and statistical manual of mental disorders, 2000) criteria for rumination syndrome is included so that caregivers can recognize the types of behaviours a child must display in order to receive a clinical diagnosis. In addition, the prevalence rate of rumination and consequences of the disorder are discussed. Consequences include the effects that rumination has on the person engaging in the behaviour and the people in the environment.

Other common disorders that resemble rumination and the differences between these disorders are also discussed in the first chapter. Differentiating between disorders is important for diagnostic and treatment purposes as the interventions have only been proven effective for rumination and therefore, are not recommended for other similar disorders until further research has been conducted. The first chapter also advises the manual user to consult a physician or dietician before implementing any of these interventions, as individual cases may differ.

Included in this chapter is a description of the Topic Guide (Manual Appendix A), which outlines possible topics for discussion when consulting a professional. The first chapter concludes with a section detailing informed consent.

The following four chapters explain the “best practices” to employ when attempting to eliminate rumination. The manual first introduces different satiation techniques which have proven to be effective with those who ruminate. Liquid rescheduling is then presented in the manual, followed by specific foods. Since the literature indicates that the three interventions mentioned above can be used in combination with one another, the final best practice describes which intervention methods have been successfully combined.

The concluding chapter provides the user with a summary of important information discussed throughout the manual. The information includes using the interventions for their intended purpose and emphasizes the importance of collaborating with a physician or dietician.

Since satiation is the most prevalent method of treatment within the literature, it is discussed first. Under the heading of satiation, a definition of the term is provided as well as the different types of foods that have been effectively used to treat rumination. The satiation chapter also includes information regarding behaviours which may help primary caregivers to identify when the child has become satiated so that the additional food can be removed. Lastly, specifics on the implementation of a satiation procedure are outlined in detail.

The second intervention included in the manual is liquid rescheduling. A definition of liquid rescheduling is provided with the types of liquids used according to the literature. Since it is imperative that interventions meet the client’s individual needs, this chapter of the manual
recommends that the primary caregiver inquire as to the ethical nature of liquid rescheduling. In order for liquid rescheduling to be considered an ethical treatment, it must be without further consequences to the child in terms of his or her health, as confirmed by a physician or dietician. For example, if a child is often dehydrated due to constant rumination, then it may be unethical to withhold liquid since it is affecting the child’s health by not allowing the child to be hydrated at certain times. Just as individual needs differ, ethics may also differ from client to client, thus the idea of informed consent is also discussed, as consent needs to be obtained if anyone other than the primary caregiver is implementing the intervention. The specifics of implementing a liquid rescheduling intervention are discussed in detail.

Thirdly, the intervention involving specific foods is described. Once again, the definition of the term is provided to remind the user of what the intervention entails. In addition, this chapter discusses the types of specific foods that, according to the literature, are effective in reducing rumination. The compilation manual also includes speculated reasons for the effectiveness of these foods. Details on implementing a specific foods intervention are discussed.

The final “best practice” that is discussed in the compilation manual is possible combinations of the prior three interventions. The manual details which methods have been successfully combined and the precautions one should take before implementing such an intervention. The benefits of using combined methods are included and details on their implementation are discussed.

Each of the aforementioned chapters provides specific information to the user regarding the implementation of interventions. The information includes time frames if applicable, the benefits and consequences, and any other precautions that should be undertaken for each specific intervention. The use of behavioural jargon is avoided when possible to maximize the user’s understanding of the material presented, and in recognition that not all users would have a behavioural background.

The compilation manual also includes two appendices, a Topic Guide and an Evaluation Form. Since it is advised to consult a physician or dietician before implementing an intervention, Manual Appendix A provides the user with a Topic Guide, which includes questions to discuss with a professional. For example, if the client is underweight due to ruminating, the primary caregiver could work in conjunction with a dietician to decide a healthy weight for the individual while the satiation procedure is implemented. A dietician may also be able to recommend other foods, which can be consumed to help the client reach an optimal weight goal. Manual Appendix A can be used as a reference when seeking medical opinions.

**Evaluation Measure**

An Evaluation Form has been included as Manual Appendix B. The users are asked to provide feedback after using the compilation manual. The author will use the feedback to ensure that the manual contains complete information to conduct each intervention, and to ensure that the manual is understandable for those users who do not have a behavioural background. The feedback form also seeks the user’s opinion regarding the feasibility of the interventions for a particular family or client, and whether the user has concerns about using a particular intervention, such as any ethical issues. The user is also requested to identify any need for items to be modified, added, or deleted from the manual to ensure the thoroughness of the topics. With the information provided on the feedback form, the author can improve further editions of the compilation manual by ensuring that it meets the needs of its demographic in terms of language use, clarity of interventions, and users’ personal needs.
Chapter IV: Results

The format of a compilation manual was chosen to present best practice intervention procedures for rumination since it is a specialized behaviour (Appendix A). Many professionals are not familiar with rumination as it is observed less often than other feeding-related difficulties in those with autism or developmental disabilities. The manual is more convenient for users due to its accessibility whereas other methods of delivery, such as a workshop, may not be feasible for all primary caregivers because of time constraints or the locations in which the workshops are to be held.

The manual was a result of literature reviewed on the topic of rumination. Although the literature concentrated on adult populations, the interventions were chosen as they are non-intrusive and could easily be applied to children. The compilation was designed for use by primary-caregivers, and as such, the interventions have been simplified to maximize the manual’s utility.
Chapter V: Discussion

Summary
Rumination can be a truly debilitating disorder for both the person who engages in the ruminative behaviour as well as the caregiver. Caregivers of children who ruminate can be profoundly affected by the disorder as it is not only aversive for those close to the individual, but it also presents a social barrier in that it isolates a child from peers. Early intervention to reduce rumination can promote peer relationships and also prevent long-term damage to the child’s esophagus and teeth from the stomach acid that is regurgitated.

The compilation manual was created to provide caregivers with information regarding the implementation of different treatments for rumination so that early intervention is possible. Information about the diagnostic criteria of rumination and differential diagnoses was presented. The interventions that are included in the manual have been synthesized from the literature to constitute the four best practices which are easily applied to children. As the literature is based only on those with autism or developmental disabilities, it is uncertain whether similar disorders would benefit from these interventions.

Strengths
The creation of the compilation manual has strengths on multiple levels. The manual provides primary caregivers with a portable resource, which can be utilized in several settings. The manual consists of least-intrusive methods of intervention for rumination, which minimizes any ethical issues that may arise. Even though some ethical issues remain, other interventions such as electric shock (Whitehead & Bosmajian, 1982) present with more ethical questions than does an intervention such as liquid rescheduling. In addition, the interventions are beneficial as most require little effort and time on the part of the caregiver. Since a child’s diet is one aspect that can be easily manipulated by caregivers, dietary control is a practical method of intervention. Thus, dietary control interventions provide the best form of treatment in terms of their feasibility and the empirical evidence that supports their use.

Limitations
Synthesizing information about a topic from existing literature can be challenging. In creating the compilation manual, the main challenge was obtaining literature which featured interventions that were applicable to children. It was also necessary for the interventions to be easily implemented by different caregivers and across the child’s environments, such as the home and school. In order for the interventions to be most useful, the techniques had to be time-efficient and require little effort. Since the aforementioned criteria for interventions were so specific, it further limited the research that was available. Once the four interventions were selected, it was clear that some methods had been further researched than others. For example, there was far more literature about satiation techniques than there was about combination techniques, which indicates that other methods require further investigation.

Besides the limited amount of research, a shortcoming to the compilation manual is that the interventions were not tested by the author. If the interventions had been applied to clients, it is possible that more information regarding the ease of implementation could have been obtained. In addition, it is conceivable that interventions could have been excluded based on their ease of implementation, feasibility, or time required. It is recommended that further field studies are conducted to investigate the utility of the interventions and to determine whether some
Interventions are more successful than others in reducing rumination.

**Challenges of Practical Application**

There are some anticipated challenges in terms of the practical application of these interventions. As mentioned, the techniques have not been tested by the author, so it is uncertain whether these interventions are feasible for caregivers to implement or whether further side effects of the interventions can be expected.

In addition, allergies to nuts can limit the use of a specific foods intervention. Children are often in several settings during the day such as daycare or school, and many of these environments are now nut-free. Although honey can be substituted for peanut butter, the intervention is then limited in terms of providing choice to the client, thus it may not be as effective.

Some interventions may not be appropriate for all clients, depending on the effects of rumination on the body. As mentioned, a satiation intervention may not be suitable for a client who is overweight to start, as satiation techniques can cause further weight gain. It is also difficult to ascertain whether or not the client will cooperate in such interventions as satiation and specific foods, especially if the child is a selective eater, as the foods may get repetitive when paired with every meal of the day. The repetitiveness may be desired for some children, such as those with autism who enjoy routine, but for others, the intervention may lose its effectiveness as the child grows tired of the same foods.

If the child is in an institutional setting or in another environment such as a school, some of the interventions described in the manual may be more difficult to implement. As mentioned, the satiation techniques, while most commonly found in the literature, are also the most time consuming interventions when considering individual interventions. It may take some clients longer periods of time to become satiated, and since the interventions were not implemented by the author, the typical amount of time it takes a child to become satiated is not known. There are also other variables that may dictate the amount of time it takes for the child to attain satiation, such as the size of the meal that was just consumed. Even in the home, satiation may not be feasible to implement, or may not be implemented correctly if attempted, due to the time required to achieve satiation; this is especially true when the intervention is first implemented, as the caregiver must observe the child for indications that he or she is satiated.

Another aspect that challenges the implementation of the interventions is the collaboration between parents and school or childcare personnel. In order for the interventions to remain consistent across settings, communication between all parties involved in treatment is necessary. Continual communication may be challenging due to time constraints of the school and childcare providers. In addition, a one-to-one ratio is necessary for some interventions, such as satiation, which again may not be feasible due to time constraints. If the child does not have an assigned educational assistant, this could further complicate the interventions that require a one-to-one ratio, as a teacher may not have the ability to devote the necessary attention to the child and ensure the effectiveness of the intervention. Staff and parents also require the time to read the manual and consult with a physician or dietician prior to implementing any intervention. Primary caregivers will not receive any formal training in implementing the interventions, thus consultation with professionals is necessary to ensure thorough understanding of the interventions, and any ethical or health concerns that may accompany them. Again, primary caregivers may not have the time to devote to learning about proper implementation of the treatments which could result in improper use of the interventions or the decision to not use the
interventions at all.

In terms of societal challenges, rumination is an aversive behaviour that deters adults and peers alike. It may be difficult to persuade caregivers to implement an intervention since it can be unpleasant to work intimately with those who ruminate. Broadly speaking however, the interventions should improve the client’s relationship with those in the immediate environment.

Since rumination is an uncommon disorder, there are few public resources available for caregivers to obtain information and support. In the future, a list of resources in which caregivers could consult would be helpful to ensure that all of their needs are being met.

**Original Contribution**

Much of the literature on rumination is related to adults with diagnoses of autism or a developmental disability. The four interventions outlined in this manual have proven successful in reducing or eliminating rumination in an adult population; however, little attention is given to children who engage in the same behaviour. Since developmental disabilities are present from birth, (Murphy, Boyle, Schendel, Decouflé, & Yeagrin-Allsopp, 1998) and with a recent increase in children diagnosed with autism (Nash, Bonesteel, & Noble, 2002), interventions for rumination in these populations should include children. The interventions included in the manual are the least intrusive methods of treatment, which ensures that they are suitable for young clients.

In reviewing the research on rumination, it became evident that the scope of the literature was limited. Specifically, there were no resources available for caregivers of adults or children who ruminate. The compilation manual, to the best of the author’s knowledge, is thus an original contribution to the field; as such a document was not found. Since the literature is primarily concerned with adults, it is conceivable that if a similar document existed, it would not have been applied to a child population.

**Recommendations for Future Research**

It is recommended that future research further investigate liquid rescheduling interventions in terms of the amount of time liquids are withheld. Within ethical parameters, the time in which liquids are withheld from a client could be manipulated to determine whether rumination is less likely to occur when liquids are withheld for a longer period of time. Such research could determine the most effective method of implementing a liquid rescheduling intervention and minimize any trial-and-error attempts by caregivers. There was also limited research on the use of combination techniques, which indicates that this method of intervention could be further investigated to determine its utility with those who engage in rumination.

In addition, it is recommended that further research be conducted on the topic of rumination in children. As mentioned above, the literature that exists on rumination is primarily concerned with adults, with very little attention given to children with the same disorder. Since most of the interventions described in the manual were implemented with adults, and because the author did not implement any treatment, it is suggested that dietary control interventions be applied to children in the future. The interventions could then be investigated to determine whether certain treatments are inappropriate or ineffective when applied to children.
REFERENCES


intervention for chronic ruminative vomiting. *Journal of Behavior Therapy and Experimental Psychiatry, 30*(2), 137-144.


Appendix A: Compilation Manual

A Compilation of Best Practices to Address Rumination in Children with Autism and Developmental Disabilities

Emma-Jane Ethridge
(2008)
<table>
<thead>
<tr>
<th>CHAPTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. INTRODUCTION</td>
</tr>
<tr>
<td>Rumination: An Overview</td>
</tr>
<tr>
<td>Other Common Disorders</td>
</tr>
<tr>
<td>What is Informed Consent?</td>
</tr>
<tr>
<td>II. BEST PRACTICES- SATIATION</td>
</tr>
<tr>
<td>Definition</td>
</tr>
<tr>
<td>Literature Reviewed</td>
</tr>
<tr>
<td>Types of Foods</td>
</tr>
<tr>
<td>Informed Consent</td>
</tr>
<tr>
<td>Method</td>
</tr>
<tr>
<td>Procedure 1</td>
</tr>
<tr>
<td>Procedure 2</td>
</tr>
<tr>
<td>Benefits</td>
</tr>
<tr>
<td>Consequences</td>
</tr>
<tr>
<td>III. BEST PRACTICES- LIQUID RESCHEDULING</td>
</tr>
<tr>
<td>Definition</td>
</tr>
<tr>
<td>Literature Reviewed</td>
</tr>
<tr>
<td>Informed Consent</td>
</tr>
<tr>
<td>Ethics</td>
</tr>
<tr>
<td>Types of Liquids</td>
</tr>
<tr>
<td>Method</td>
</tr>
<tr>
<td>Procedure 1</td>
</tr>
<tr>
<td>Procedure 2</td>
</tr>
<tr>
<td>Benefits</td>
</tr>
<tr>
<td>Consequences</td>
</tr>
<tr>
<td>IV. BEST PRACTICES- SPECIFIC FOODS</td>
</tr>
<tr>
<td>Definition</td>
</tr>
<tr>
<td>Literature Reviewed</td>
</tr>
<tr>
<td>Types of Foods and Reasons for Their Effectiveness</td>
</tr>
<tr>
<td>Method</td>
</tr>
<tr>
<td>Procedure 1</td>
</tr>
<tr>
<td>Benefits</td>
</tr>
<tr>
<td>Consequences</td>
</tr>
</tbody>
</table>
V. BEST PRACTICES- COMBINATION TECHNIQUES ........................................................34

Definition .......................................................................................................................34
Literature Reviewed ........................................................................................................34
Combinations ..................................................................................................................34
Precautions ....................................................................................................................34
Method ..........................................................................................................................34
Procedure 1 ..................................................................................................................34
Benefits .......................................................................................................................35
Consequences ................................................................................................................35

VI. SUMMARY .................................................................................................................36

REFERENCES ................................................................................................................37

APPENDICES

Manual Appendix A: Topic Guide ........................................................................39
Manual Appendix B: Evaluation Form .................................................................40
Chapter I: Introduction

Rumination: An Overview

Although rumination is a disorder that occurs in many different populations, it is more commonly associated with autism, and other developmental disabilities (Kuhn & Matson, 2004), rumination is also found in those with bulimia nervosa (Weakely & Petti, 1997), and even in those with no intellectual impairments (Papadopoulos & Mimidis, 2007). Rumination occurs when a person voluntarily regurgitates food from the stomach into the mouth, chews it, and then re-swallows it (Heering, Wilder, & Ladd, 2003). Rumination, also known as merycism, is sometimes simply called regurgitation. In the developmentally disabled population, rumination is estimated to occur in 6 to 10% of individuals. This behaviour can also be accompanied by other feeding problems such as food refusal or eating only select foods (Kuhn, 2004).

In order to diagnose rumination in children, professionals consult the Diagnostic and Statistical Manual (DSM), now in its fourth edition with text revisions (DSM-IV-TR, 2000). This manual provides clinicians with specific criteria that the client must exhibit in order to be diagnosed with a disorder. The criteria typically involve the length of time the person has been exhibiting the symptoms, the types of symptoms, and exceptions which do not warrant the diagnosis. For example, if a person has a pre-existing medical condition, then it may interfere with the clinician providing a diagnosis. In order for a physician to diagnose a patient with rumination, the latter must meet the criteria from the DSM-IV-TR:

1. Repeated regurgitation and rechewing of food for a period of at least 1 month following a period of normal functioning.
2. The behavior is not due to an associated gastrointestinal or other general medical condition (e.g., esophageal reflux).
3. The behavior does not occur exclusively during the course of Anorexia Nervosa or Bulimia Nervosa. If the symptoms occur exclusively during the course of Mental Retardation or a Pervasive Developmental disorder, they are sufficiently severe to warrant independent clinical attention (p. 106)

The DSM-IV-TR (2000) criteria, as noted by some critics, are still vague (Chial, Camilleri, Williams, Litzinger, & Perrault, 2003). The DSM-IV-TR does not take into account the children who have continued to ruminate from infancy into childhood, nor does it consider the time-frame in which individuals tend to ruminate most often. The DSM-IV-TR does note in the second criterion however, that other possible medical explanations for the behaviour must be ruled out. Excluding other possible causes for rumination is important since there are other disorders, such as gastrointestinal disorders, that have symptoms similar to rumination. The distinction between rumination and other similar disorders must be identified before any dietary control interventions are implemented. Although the interventions outlined in this manual are the least intrusive methods of treatment, they should only be implemented upon the recommendation of a professional such as a physician or dietician. Follow-up appointments should also be scheduled with the physician or dietician to ensure that the intervention is being implemented properly and so that the progress of the intervention can be monitored.

Rumination has several consequences for the individuals who ruminate and for those in their direct environment. In terms of the individual, rumination has physical and social effects. Physically, rumination erodes the child’s teeth and esophagus (Kuhn & Matson, 2004). Recently ingested food contains stomach acid and when it is forced up the esophagus and into the mouth, it causes deterioration of the esophageal tube and tooth enamel. Tooth decay can lead to
extensive dental work such as capping for teeth in order to prevent further erosion. Deterioration of the esophagus is also an immense health concern since the esophagus is such a vital part of food and liquid consumption.

Socially, rumination can hinder the child’s ability to effectively socialize with peers. Frequently, the person who ruminates does not swallow all of the regurgitated food, which results in the remaining food running down the child’s face or chest (Saloviiita, 1999). It is difficult for a child to form relationships with peers since the act of ruminating is so unpleasant for others to observe. If the child also engages in behaviours such as abdominal thrusts in order to force the ingested food up the esophagus, it can increase the unpleasantness of the behaviour. The sight and smell of regurgitated food is another feature of rumination that is off-putting for both children and adults. Consequently, interventions that address rumination can potentially improve the child’s ability to socialize with peers.

Primary caregivers can also have difficulty interacting with a child who ruminates due to the undesirable nature of the behaviour. For instance, meal times can be especially difficult for caregivers if the child ruminates while others are eating. Since socialization is such an important aspect of life, interventions that facilitate this process are beneficial to the individual involved as well as those in the person’s direct environment.

Other Common Disorders

Although rumination may seem like a distinct behaviour, there are several other disorders which share similar features. Gastroesophageal reflux disease, or GERD, may be mistaken for rumination as the disorders present similarly. GERD is a disease in which the muscular valve between the stomach and the esophagus is faulty, resulting in stomach acid flowing up the esophagus (Heartburn GERD Guide, 2006). GERD is commonly known as heartburn, as the acid creates a burning sensation in the person’s chest. While the acid can reach the esophagus on its own, it is sometimes accompanied by recently ingested food. In this respect, GERD is similar to rumination in that the stomach contents travel up the esophagus and the acid is causing damage to the esophageal tube. GERD is distinct however, in that it is an involuntary act with a physiological cause. Rumination, in contrast, is initiated voluntarily and does not have a physiological cause; the person engaging in the ruminative behaviour is doing so for what can only be presumed as stimulatory purposes (Clauser & Scibak, 1990). Since individuals who ruminate often have developmental disabilities such as autism, it is sometimes difficult to ascertain a reason for the behaviour since these individuals tend to also have challenges with communicating (Kuhn, 2004).

Rumination may also be confused with vomiting, although these two actions differ greatly. Vomiting is most often a physiological response which eliminates the stomach of its contents via expulsion from the mouth. Although vomiting can be induced by a person, as is seen in bulimia nervosa (Clauser & Scibak), it is most often unintended. In contrast, rumination is an intentional behaviour whereby the person purposefully regurgitates recently ingested food, chews it, and then re-swallows it. Once again, it is presumed that a person engages in rumination for stimulatory purposes (Clauser & Scibak, 1990), which differs from typical vomiting. Perhaps the most important distinction between the two behaviours is that in rumination, the food which is regurgitated is not always expelled from the mouth, it is most often re-swallowed. In addition, rumination is always deliberately initiated by “[putting] hands in the mouth, tongue thrusting, voluntary gagging, or abdominal thrusts” (Kerwin & Berkowitz, 1996, p. 318). Although rumination and vomiting appear to share similar properties, the two behaviours are in fact
entirely different. Psychogenic vomiting is a type of vomiting which may also be mistaken for rumination. Psychogenic vomiting differs from vomiting in that the former occurs in stress-related situations without forewarning, whereas with the latter, the individual usually experiences nausea prior to vomiting (Justice, n.d.). Unlike typical vomiting, it is not associated with loss of appetite, and is more of a function of the environment than an internal physiological cause. Psychogenic vomiting can often be suppressed by the patient, which may explain why it is sometimes mistaken for rumination. The most important distinction between psychogenic vomiting and rumination is that psychogenic vomiting occurs during situations of perceived stress, whereas rumination is initiated for stimulatory purpose, regardless of the environment.

Another explanation for rumination-like behaviour is from the side effects of certain medications. Neuroleptics or benzodiazepines are proven to effect esophageal functioning and a person’s ability to swallow (Kuhn & Matson, 2004). Some side effects may be confused with rumination such as tongue thrusting to facilitate the swallowing process, because in rumination, it is a used as a technique to regurgitate. If a person is having difficulty swallowing and is engaging in tongue thrusting, it may be difficult to determine whether the food in the person’s mouth is regurgitated or has yet to be swallowed.

Once these and any other possible disorders have been ruled out, then the use of interventions outlined in the subsequent chapters can be considered. It is important to consult a physician or dietician prior to implementing any of the interventions, as each individual’s needs are different. Follow-up appointments are also important to schedule, as the physician or dietician can then monitor the progress of the intervention. In Manual Appendix A, there is a Topic Guide for caregivers. The Topic Guide includes questions for professionals in regards to selecting an appropriate intervention for the client.

What is Informed Consent?

Informed consent is a process that involves providing any participants in experiments, projects, or interventions with complete details regarding their participation. Complete details include informing the participants about what they can expect from participating as well as their rights while involved in the intervention. The client should be informed that participation is voluntary if that is the case, and that the client has a right to terminate involvement at any time. The client also has the right to view any notes, files, or other documents which contain information about them. Any clients receiving treatment have a right to confidentiality, however confidentiality does have limitations. Confidentiality must be breached if the client discloses information regarding self-harm, such as suicide, or harm to others. For children under eighteen years of age, the decision to participate is fulfilled by a parent or guardian.

The benefits of participating in an intervention are highlighted so the client is aware of the positive aspects of treatment. The risks of participating in the intervention are also discussed so that the client is conscious of any issues that may arise which may interfere with treatment, if there are any issues at all. A consent form is signed by either the client or by the guardian if the child is under eighteen years of age. The consent form indicates that the client or guardian agrees to participate in the treatment and is aware of the intervention process including the rights of the client as well as the risks and benefits which are involved.
Chapter II: Best Practices- Satiation

Definition
Satiation is a technique used in treating rumination. It provides a person with extra and unlimited portions of food until further servings are refused (Masalsky & Luiselli, 1998). Essentially, the person consumes the food until the person is full. The food provided to the client typically contains a high caloric content which ensures that the person becomes satiated at a faster rate. Research conducted with adults shows that starch-based foods such as white bread are effective in reducing rumination (Dudley, Johnson, & Barnes, 2002). Although the satiation technique is standardized, the time of implementation can vary. Some literature indicates that starchy foods can be presented to the client during mealtime in order to reduce rumination (Clauser & Scibak, 1990), and it is also confirmed that starchy foods are effective when consumed after the client’s meal has been consumed.

When implementing a satiation intervention, it is important to recognize the point at which the individual has become satiated, so that the food is not being forced upon the client. If the client is continually forced to eat the extra food provided, then meal times become aversive. The literature outlines various ways to determine whether the client is satiated. Dudley, et al. (2002) identified the point at which their client had become satiated when she made no attempt to eat the extra food for three consecutive minutes. Dunn, Lockwood, Williams, and Peacock (1997) observed that their adult client had attained satiation when he stood up from the dining table or pushed his plate away. It is especially important to make careful behavioural observations of those who have difficulty communicating, as they may not have the verbal ability to indicate that they are satiated.

Literature Reviewed
Researchers Masalsky and Luiselli (1998) implemented a satiation intervention, which reduced their adult client’s rate of rumination to a near-zero level. The client was provided small pieces of commercially prepared white bread after he had consumed the last bite of his regular meal. Although the size of the pieces of bread was not described, it is presumed that bite-sized pieces were used considering the length of time the bread was made available. The bread was offered to the client one piece at a time, with additional pieces offered once the client had swallowed what was in his mouth. The bread was offered to the client for thirty minutes after consuming the last bite of his meal.

Dudley et al. (2002) implemented a different satiation technique to reduce rumination in a nine-year-old client. The client was provided with a regular meal that contained one starch-based food, which included but was not limited to, cereal, pasta, or mashed potatoes. After the client was finished her meal, she was offered a choice of two different kinds of starchy foods in order to attain satiation. One of the choices was the starch that was included in her meal, and the other was rice cakes, which was a preferred food item for the client. Once she had eaten one helping of the starchy food of her choice, more was provided. The researchers considered the client satiated when she did not attempt to eat the food for three consecutive minutes, at which point, any remaining food was removed.
**Types of Food**

The types of food used in a satiation intervention are important since certain foods can cause satiation to occur more quickly. The literature states that starch-based foods are the most successful in reducing rumination because of the high caloric content. The reviewed literature indicates that white bread, rice cakes, cereal, pasta, and bread with or without peanut butter are foods that can effectively reduce rumination. It is presumed that other foods with similar starch bases can be used with the same effectiveness since starch is the important component to this intervention. As the literature only outlines some of the starchy foods available, it is suggested that a physician or dietician is consulted prior to using foods which are not found in the literature.

**Informed Consent**

Informed consent is necessary in a satiation intervention, depending on which primary caregivers are implementing the intervention. For instance, if a teacher at school identifies a child as in need of a satiation intervention, the teacher needs to obtain informed consent from the child’s guardian prior to implementing any such procedure. In contrast, if the guardians are implementing a satiation intervention in the home, then informed consent is not necessary since it is their own child. As satiation can cause weight gain in clients, the parents or guardians of the child should be informed about the nature of the intervention prior to implementation, because the intervention may not be appropriate for the child. Although ideally primary caregivers across environments would implement the intervention consistently, this is not always feasible, and therefore consent should be given for interventions conducted by someone other than the child’s guardian or for interventions used outside of the home.

**Method**

Although satiation is a single intervention, there are two core methods in which it can be applied. First, the unlimited food portions can be supplied throughout the client’s meal. Secondly, the unlimited food can be made available after the client has finished the meal.

**Procedure 1: Masalsky and Luiselli’s (1998) Satiation Technique:**

1. Provide the child with his or her regular meal.
2. Once the child has eaten the last bite of the meal, offer bite-sized pieces of white bread.
3. Only offer one piece of bread at a time and wait until the child has swallowed the previous piece of bread before offering another.
4. Continue to provide the child with pieces of bread for the next thirty minutes that follow the last bite of the meal.

**Procedure 2: Dudley, Johnson, and Barnes’ (2002) Satiation Technique:**

1. When planning for meal times, include a starch-based food in the meal such as cereal, potatoes, bread, or pasta.
2. After the child eats the meal, offer more portions of the starchy food that was included in the meal, as well as the choice of another starchy food. For the second starch, it is beneficial to use a preferred food as the other starch because the child will
then have more incentive to continue eating.
3. When the child eats one of the starchy foods presented, replenish it.
4. If further servings are refused or the child makes no attempt to continue eating, then the child is satiated and the food may be removed.

Note: Although Dudley et al. state that three minutes without an attempt to eat the food indicated that satiation had been attained; the time period may vary for clients. It is important to make careful observations when first implementing an intervention to determine the individual child’s behaviour which indicates that satiation has been achieved.

**Benefits**
A satiation intervention that is effective in reducing or eliminating rumination can promote a better level of physical health. Since weight loss due to rumination can sometimes reach dangerous levels (Heering et al., 2003), satiation techniques can help facilitate a healthy weight. The starchy, high caloric foods that are typically used in satiation interventions assist the client in gaining weight. In addition, since the client consumes the satiation foods in addition to his or her regular meal, it is less likely that the client will ruminate because the stomach is full.

Satiation techniques are also beneficial to the caregivers since they are easily implemented across individuals and settings. The intervention does not rely solely on one primary caregiver for implementation. Satiation interventions can be conducted at school, at home, or in other childcare settings. It is important that the intervention is implemented consistently across environments to maximize the success of the treatment. For example, if the primary caregiver at home is providing the child with unlimited portions of bread only after the meal, then the school should also provide the extra portions of bread after the meal as well, but not during it. When the intervention remains consistent across settings, it is easier to monitor any changes in the rumination and to attribute them to the single intervention.

**Consequences**
Although satiation may be appropriate for some individuals, it may be inappropriate for others. Weight loss can be a severe consequence of rumination; however, it does not occur in every client. For those individuals who do not experience weight loss due to their rumination, satiation can be an unfavorable intervention method. As the foods provided during satiation interventions tend to have a high caloric content, individuals will gain weight, thus creating an undesirable side effect. If an individual is currently at an average weight, then weight gain is unnecessary, and may in turn become a health issue in terms of obesity.

Satiation techniques may be time consuming since the extra food must be provided until further portions are refused. Depending on the client, it may take a lengthy amount of time before satiation is attained. The latter may prove inconvenient for some caregivers, depending on the setting. For instance, if satiation is implemented at school, then it may be difficult for the intervention to be conducted properly as the caregiver also requires time for his or her meals. When implementing a satiation intervention at school, the child may miss an important opportunity to socialize with peers during recess if he or she must remain inside until satiation is attained. So, while satiation may be appropriate for some clients, other interventions may be more suitable for others.
Chapter III: Best Practices- Liquid Rescheduling

**Definition**

Liquid rescheduling entails changing or rescheduling the times at which the client is permitted access to liquids. For example, liquids are withheld from the client for one hour prior to meal consumption. When the client does not consume liquids before a meal, it is more difficult to regurgitate food since the consistency of the stomach contents is thicker. It is also beneficial to withhold liquids during meals since rumination is more likely to occur following meals. Research indicates that similar to satiation, the timing of liquid rescheduling can vary; however, the literature consistently demonstrates that longer periods of withholding liquids are more successful in reducing rumination (Wilder, Draper, Williams, & Higbee, 1997).

**Literature Reviewed**

Heering et al. (2003) used liquid rescheduling to successfully reduce rumination in their adult client with autism. Before the study began, it was determined that chocolate milk was a preferred beverage for the client, so that was the liquid which was withheld. The client was provided a typical meal which excluded foods with a liquid-like consistency, and access to liquids was denied while he ate. Liquids were also withheld for one and a half hours after the client had consumed his meal. Once the 90 minutes of withholding liquids had passed, the client was then granted access to chocolate milk.

In a study similar to that described above, Wilder et al. (1997) used liquid rescheduling to decrease rumination in their adult client diagnosed with a developmental disability. The time period during which the client was not permitted any liquids was longer in this study than the one conducted by Heering et al. (2003). Thirty minutes prior to meal consumption, the client was denied access to liquids. The client consumed a typical meal without any liquid accompaniment, which continued for one and a half hours after the client had finished his meal. Wilder et al.’s intervention differs from that of Heering et al. in that the client was not permitted to consume any liquids prior to meal time, which increased the period of time that liquids were withheld. Wilder et al. identified that liquid rescheduling was an effective method in reducing rumination, and although the study does not confirm this, it is possible that the intervention is more effective when the client is without liquids for longer periods of time.

**Informed Consent**

Informed consent is necessary in a liquid rescheduling intervention, depending on which primary caregivers are implementing the intervention. For instance, if a teacher at school identifies a child as in need of a liquid rescheduling intervention, the teacher needs to obtain informed consent from the child’s guardian prior to implementing any such procedure. In contrast, if the guardians are implementing a liquid rescheduling intervention in the home, then informed consent is not necessary since it is their own child. As rumination can leave clients dehydrated or malnourished, the parents or guardians of the child should be informed about the nature of liquid rescheduling prior to implementation, because the intervention may not be appropriate for the child. Although ideally primary caregivers across environments would implement the intervention consistently, this is not always feasible, and therefore consent should be given for interventions conducted by someone other than the child’s guardian or for interventions used outside of the home.
*Ethics*

Since liquid rescheduling involves denying the client a basic need, that is liquid, the ethical nature of the intervention is questionable. Some may argue that it is against the client’s human rights to deny him or her of a basic need. Also, withholding liquids can be dangerous, depending on the client. For instance, if the client is severely dehydrated from ruminating, then further withholding of liquids is unethical. A client may also require liquid for other medical reasons, such as when taking medication, either in liquid or pill form. It is suggested that a physician or dietician is consulted prior to implementing a liquid rescheduling intervention so that any ethical issues can be addressed and a different intervention can be selected if necessary.

*Types of Liquids*

Research has identified specific liquids to use when liquids were permitted to the client. Heering et al. (2003) allowed their client chocolate milk, a preferred beverage, when he was permitted to consume liquids. Although the literature identifies milk as an appropriate liquid for liquid rescheduling, as Heering et al. indicate in their study, it is important to allow choice for the individual and that a preferred beverage may be more enticing for the person to drink. Even though in the above study milk is specifically mentioned as an effective beverage, it is presumed that other liquids which are preferable to the client are still effective since it is the consistency of the liquid that promotes ruminating. If unsure about the use of a particular liquid, consult a physician or dietician.

*Method*

Although liquid rescheduling is a standardized intervention, the time at which it is implemented can vary. Liquids can be withheld before, during, or after mealtimes, or a combination of these periods can be used to increase the amount of time that liquids are withheld.


1. Provide the child with a typical meal that excludes foods with a liquid-like consistency such as yogourt, pudding, or apple sauce. By excluding these foods, the likelihood that the liquid rescheduling intervention will be successful will increase, since solid foods are more difficult to regurgitate.
2. Once the child is presented with the meal, ensure that he or she does not have access to any liquids.
3. After the meal has been consumed, wait for one and a half hours before offering liquids.

Note: The liquid may be a preferred beverage, however it is not necessary. For more information regarding appropriate beverages for individuals, consult a physician or dietician.

Procedure 2: Wilder, Draper, Williams, and Higbee’s (1997) Liquid Rescheduling Technique

1. Plan the times when the child will consume his or her meals.
2. Thirty minutes prior to meal time, ensure the child does not have any access to liquids.
3. When the child is presented with the meal, do not provide a beverage or other similar liquids, e.g. yogourt.
4. After the child has eaten, wait for one and a half hours before allowing access to liquids.

Benefits

Liquid rescheduling has several benefits. Implementation requires little effort on the part of the caregiver, thus it is more likely to be consistently implemented. Since the intervention involves merely changing the schedule in which liquids are consumed, the caregiver is not required to become involved with a time-intensive intervention. The primary caregiver can implement the intervention with little disruption to his or her daily routine. Liquid rescheduling also has advantages over other interventions, such as satiation, as it is not associated with weight gain. The liquid provided to the client does not differ from the client’s typical beverage; therefore weight gain is not an issue with liquid rescheduling.

Consequences

Although there are benefits to liquid rescheduling, the intervention is not without its consequences. Liquid rescheduling may not be appropriate for some clients, depending on the effects that rumination has had on the body. If the client is dehydrated or malnourished, it is important to attend to those needs prior to withholding liquids. Also, if liquids are consumed too close to meal time, then rumination is unlikely to decrease. In order for liquid rescheduling to be effective, it may be necessary to adjust the duration for which liquids are withheld. Allowing for adjustments of the intervention may in turn increase the amount of time required to successfully reduce the rumination, as clients may respond better to longer intervals without liquids. The literature suggests that liquids can be withheld for thirty minutes prior to meal consumption, during the meal, and up to one and a half hours afterwards for the treatment to be effective. Any variation in this schedule can once again prove to be an ethical issue as increased amounts of time without access to liquid can lead to further dehydration which may be dangerous for some clients. Any other variations to the schedule should be discussed with a professional to ensure that the intervention remains ethical.
Chapter IV: Best Practices- Specific Foods

Definition
When describing rumination interventions, the term ‘specific foods’ describes foods that inhibit the ability to regurgitate due to their consistency. Foods that have a thick or sticky consistency are particularly difficult to regurgitate since they do not easily slide up the esophagus. Rumination is thus inhibited since the client cannot easily regurgitate.

Literature Reviewed
Saloviita (1999) explored the use of specific foods as an intervention to address rumination in his adult clients. Specifically, he alternated between the use of peanut butter and honey in order to reduce the rates of rumination in his client. The client was provided a piece of bread with peanut butter during his regular meal. In the subsequent condition, peanut butter was substituted for honey.

Types of Foods and Reasons for Their Effectiveness
Research has identified two specific foods that have effectively reduced rumination: peanut butter and honey (Saloviita, 1999). As it is more difficult to consume peanut butter or honey on their own, they are most often served on bread or toast. These foods are most commonly provided with or after a person’s meal.

Peanut butter and honey are effective in reducing rumination because of their consistency. These substances have a sticky consistency which makes it difficult to not only swallow, but to regurgitate as well, facilitating a decrease in the ruminative behaviour. Peanut butter and honey are also considered effective foods for addressing rumination since their consistency changes the stimulation the client receives when swallowing.

It is speculated that people engage in rumination as it provides them with stimulation, thus the person continually regurgitates and swallows his or her food in order to maintain the stimulation. When foods such as peanut butter or honey are given to the client, the thick consistency prolongs the swallowing process, which provides the client with a comparable stimulatory experience. The client can then experience a similar form of stimulation without causing physical and social damage to him or herself. The similar stimulation paired with the difficulty in regurgitating can effectively reduce or eliminate rumination.

Method
Specific foods can be provided during or after the client consumes the meal.

Procedure 1: Saloviita’s (1999) Specific Foods Technique

1. Present the child with a typical meal.
2. During the meal, provide the child with a piece of bread with peanut butter on it.
3. Ensure that the child eats the bread, as the peanut butter is the key component of the intervention.

Note: If the child or someone in the environment has an allergy to peanut butter or nuts, honey may be used in its place. Honey can also be used to provide an alternate food choice to the child or if the child prefers one food over the other.
Benefits

Peanut butter is a food that is beneficial to use since its consistency is presumed to create a stimulatory experience which competes with that of rumination. The thick consistency makes it difficult to swallow which prolongs the stimulation in the esophagus. The high caloric content of peanut butter can also be used to induce satiation in the client. An added benefit is that it can be easily combined with other interventions, such as satiation, in order to reduce rumination. One important advantage of honey is that it can be used in nut-free environments; therefore it can be implemented across environments which promotes consistency. Like peanut butter, honey can also be incorporated into other interventions.

Consequences

If using peanut butter as an intervention to reduce rumination, it may be difficult to implement across settings. Many children’s settings are now nut-free environments, which means that the child may not be able to consume peanut butter in schools, childcare arrangements, or even in the home. Not all environments are nut-free, but allergies are certainly a barrier to the use of this intervention. Although peanut butter may be beneficial to use in terms of its ability to satiate the client, it can also cause weight gain due to its high caloric content. If a client does not require weight gain, then peanut butter may not be an appropriate choice. Even though specific foods have been proven effective in reducing rumination, it is most effective when combined with other interventions, thus the specific foods intervention may be the least effective when used on its own.
Chapter V: Best Practices- Combination Techniques

Definition
As the name suggests, the three interventions of satiation, liquid rescheduling, and specific foods can be combined into different interventions. For example, satiation can be paired with liquid rescheduling instead of using either intervention on its own. Combination techniques can be used when clients do not respond to the use of one intervention. Satiation, liquid rescheduling, and specific foods all inhibit the ability to ruminate, thus combining these techniques increases the difficulty for the person to engage in rumination.

Literature Reviewed
Saloviita (1999) implemented a combination technique which effectively reduced rumination in two adult clients. Specific foods combined with liquid rescheduling successfully decreased the ruminative behaviour in his client. The client was provided with his regular meal and offered a piece of bread with peanut butter or honey on it during meal times. No liquids were provided to the client while he consumed his meal. One hour after consuming his meal, the client was offered liquids, thus the liquid rescheduling component of the intervention. In the second condition, the same steps as outlined above were used, with honey in place of the peanut butter.

Combinations
The literature outlines one particular combination technique as successful in decreasing rates of rumination. In two case studies, Saloviita (1999) demonstrated that combining specific foods and liquid rescheduling was effective in reducing rumination in both clients. Although the specifics of implementation are not given in detail, Barton and Barton (1985) combined the use of satiation with peanut butter and liquid rescheduling to decrease the rates of rumination in children. They noted that satiation, liquid rescheduling, and specific foods can be successfully combined.

Precautions
Although it may seem that using combination techniques is the most effective method to reduce rumination, this may not be true. The more processes that are involved in an intervention, the more difficult it is to implement. When interventions become complex, it reduces the likelihood that the intervention will be conducted consistently across caregivers and environments. Consistency is important when implementing any kind of intervention because it increases the effectiveness of the intervention. Combination techniques may be appropriate for the client; however, the three aforementioned interventions may be just as effective on their own. A physician or dietician may be able to recommend an intervention that is most appropriate for the individual child.

Method
Procedure 1: Saloviita’s (1999) Combination Technique

1. Provide the child with a meal that is typically consumed.
2. Do not allow the child access to any liquids throughout meal times.
3. During each meal, offer the child a piece of bread with peanut butter or honey spread
on it. It is important that the child consumes the piece of bread otherwise the intervention is unlikely to be successful.

4. Continue to withhold liquids from the child until one hour after the meal is finished.

Note: Honey can be used in place of peanut butter if there are nut allergies, or to provide the client with a choice.

Benefits
Since satiation, liquid rescheduling, and specific foods all inhibit the ability to ruminate, combination techniques further prevent the person from ruminating. If a client continues to ruminate after the use of one intervention, the caregiver has the option to use additional techniques that decrease the ease of ruminating. The more difficult it is to regurgitate recently ingested food, the less likely the client is to do so.

Consequences
Combination techniques make the intervention more complex, thus they are less likely to be successful if caregivers are unwilling or unable to implement them correctly. Once again, if specific foods are used in an intervention, allergies may be a barrier to implementation as peanut butter is not permitted in all settings.
Chapter VI: Summary

Selecting an intervention which is appropriate to your child can be challenging. Several factors should be considered prior to implementing any of the described treatments. As mentioned throughout the manual, it is important to consult a physician or dietician when selecting an intervention as each child’s needs differ greatly. An intervention should be tailored to suit your child and also to suit the abilities of the caregivers who are delivering the intervention. For example, a satiation intervention may be feasible at home, however, school personnel may not have the time required to ensure that the child is truly satiated. The Topic Guide provided in Manual Appendix A offers a wide array of questions which the caregiver may wish to ask a professional to ensure that the intervention selected is the most appropriate choice for the child.

Although there are several disorders which present like rumination, it is imperative to remember that the research presented in this manual has only been applied to those who ruminate, and has not been applied to similar disorders. An intervention which is effective in reducing rumination may not be effective or appropriate for other disorders. As a caregiver, it is necessary to consult a physician about the child’s behaviour so that a correct diagnosis can be given, and subsequently, appropriate interventions may be implemented. The interventions described above are not recommended for disorders other than rumination, unless otherwise advised by a physician, dietician, or other professional.
References


http://www.webmd.com/heartburn-gerd/guide/reflux-disease


http://www.pharm.chula.ac.th/surachai/Academic/ContEd/Vomit.pdf


Manual Appendix A: Topic Guide

The following is a list of topics for consideration before and during consultation with a physician or dietician in regards to your child’s ruminating.

Intervention Selection
• Which intervention best suits the needs of my child?
• What are the side effects of the chosen intervention?
• How time-consuming is the intervention?
• How can I prepare myself and other caregivers to effectively implement the intervention? Is there any training or readings required?
• What is most feasible in all of the child’s settings?
• Any ethical issues that may be present. For example, whether or not you believe it is right to withhold liquids.

Health Concerns
• Are there any allergies or health needs which may interfere with the intervention? For example, a child who is overweight may not benefit from a satiation intervention since it is associated with weight gain.
• Have other medical reasons for the rumination been ruled out?
• Can I use foods and drinks which are not mentioned in the literature on rumination? Which foods and drinks?
• Are there any behavioural issues which may interfere with an intervention?

Intervention Implementation
• How should I monitor the child’s behaviour in response to the intervention?
• How long does it typically take for the rumination to start decreasing?
• What should I do if the intervention does not decrease the child’s rumination?
• What can I do if the child will not participate in the intervention? For example, if the child will not consume the bread in a satiation intervention, then what can I do?
Manual Appendix B: Evaluation Form

I would like to take this opportunity to thank you for choosing the compilation manual to aid you in your journey of teaching appropriate meal-time behaviour. I hope that you have found this manual interesting and informative.

On the next two pages, please find and complete the evaluation form for the manual. Since this is the first edition of the manual, your feedback is especially important to ensure that the material reflects what you, as the caregiver, want and need to know regarding rumination. Again, your feedback is highly valued.

Please send your evaluation form by mail to:

St. Lawrence College- Bachelor of Applied Arts in Behavioural Psychology
ATTN: Marie-Line Jobin
100 Portsmouth Ave.
Kingston, Ont.
K7L 5A6

Thank you,

Emma-Jane Ethridge
Author
Evaluation Form

1. What did you like most about this manual and why? Please comment.
__________________________________________________________
__________________________________________________________
__________________________________________________________
__________________________________________________________
__________________________________________________________

2. What did you like least about this manual and why? Please comment.
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__________________________________________________________
__________________________________________________________

3. Was the language used in the manual easily understood? □ □

4a. Were the definitions of terms clear (i.e., satiation)? □ □
   b. If not, which terms should be clarified and why?
__________________________________________________________
__________________________________________________________
__________________________________________________________
__________________________________________________________

5a. Were the intervention instructions clear? □ □
   b. If not, which instructions should be clarified and why?
__________________________________________________________
__________________________________________________________
__________________________________________________________
__________________________________________________________

6. Was there any information not in the manual that you wish had been included? Please comment.
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7. How feasible do you feel these interventions are for you, your family, and any of your child’s other caregivers? Please comment.

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8. Are there any concerns about carrying out an intervention that are not addressed in the manual? If so, please comment.

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Additional Comments:

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__________________________________________________________
__________________________________________________________
__________________________________________________________
__________________________________________________________

Thank you for completing this form. Please return it to the address below:

St. Lawrence College- Bachelor of Applied Arts in Behavioural Psychology
ATTN: Marie-Line Jobin
100 Portsmouth Ave.
Kingston, Ont.
K7L 5A6