A Parent-Early Adolescent Intervention to Reduce Sweetened Beverage Consumption through Home Environment Parenting Practices

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Dedication

This dissertation is dedicated to my Grandmother, Mayme E. Roth

Overweight and obesity are national health problems and are associated with increased prevalence of chronic diseases, such as diabetes mellitus and cardiovascular disease. Patterns of excessive intake of sugar-sweetened beverages (SSBs) during early adolescence can replace beverages with nutrients needed for growth and maturation and increase risk of poor bone modeling. As SSB preferences become stronger, they can develop into poor beverage consumption habits, contribute excess calorie intakes and increase risks for adverse health conditions.

Supportive parent actions can guide early adolescent (EA) (9-13 years) beverage choices at mealtimes and snacks at home. Parent management strategies to control beverage availability and accessibility at home include encouraging intakes of healthy beverages at mealtimes, setting rules and expectations for limiting SSBs, and role-modeling healthy beverage choices.

The social cognitive theory framework describes how the home environment may be influenced by interactive parent-child communications. Building parent and EA personal self-efficacy to make healthier beverage choices with meals at home can also lead to healthier beverage choices in challenging settings away from home. Similarly, EA preferences for healthy beverages can influence parent purchases which determine home availability. Therefore, nutrition intervention programs regarding beverage intakes to improve nutrition and lessen health risks in all family members should address 1) self-efficacy, 2) personal beliefs and attitudes about healthy beverages at home, and 3) parenting practices such as encouraging parent-child interactive conversations at shared mealtimes.

The Beverages 4 Health program is a 5-week parent-early adolescent nutrition education program designed to increase knowledge and behavioral skills at home and in unsupervised locations to reduce SSB consumption. The Beverages 4 Health program was developed and tested based on qualitative and quantitative research that required three Steps.

In Step 1, six focus groups (n = 49) were conducted to understand how parents of 10-13 year-old children encourage and enable healthy beverage consumption (milk, water, 100% juice in moderation) by setting and enforcing expectations and rules. Parent expectations for EAs were based on health beliefs, EA preferences and cost. Another important finding was that most parents did not view water as convenient because water had to be cold and in some cases, portable to be well accepted by EAs. Parents usually managed SSB consumption by

limiting home availability. Most parents managed beverage consumption at mealtimes and believed they could discourage SSB consumption but not directly control EA beverage choices away from home and when unsupervised. There were no consistent expectations for frequency of SSB intakes or perceptions of well-defined portion sizes. Parents requested that the "goods and the bads" need to be taught to their child based on positive and negative aspects of healthy and unhealthy beverages. Thematic results from qualitative focus group interviews were incorporated into EA-only and parent-EA intervention sessions.

Data from three, independent convenience samples of parent-child pairs (n = 146) were merged into a single dataset in Step 2 to create two valid and reliable evaluation instruments (one for parents and one for EAs). Each instrument was designed to assess self-efficacy, beliefs and expectations regarding intake of healthy beverages and perceptions regarding parenting practices. Principal components analysis with varimax rotation was used to group various statements into subscales. Parental self-efficacy subscales reflected parental sweetened beverage discipline and health conscious beliefs. One EA self-efficacy subscale described personal discipline regarding choices to select milk or healthy beverages. The parent evaluation tool addressed parenting practices of encouragement, SSB rules and expectations, role-modeling, and being permissive. Three EA subscales regarding beliefs and perceived rules and expectations at home were related to sweetened beverage rules, meal specific expectation and milk amount expectations. Parent and EA subscales had moderate to strong internal consistencies and test-retest reliability coefficients (.53 to .92).

Parent and EA self-efficacy subscales were significantly associated with their own milk consumption ($p \leq .05$). Parent health conscious self-efficacy was associated with EA water intake ($p \leq .05$). Parenting practices of encouragement, role-modeling and setting SSB rules were associated with less sugar-sweetened soda pop and fruit drink availability at home. As expected, permissive parenting practices were associated with soda pop and fruit drink availability and inversely associated with EA water intake ($p \leq .05$). EA self-efficacy and beliefs of mealtime beverage expectations were associated with EA milk and water consumption ($p \leq .03$). EA reported frequency of eating dinner meals together was associated with soda pop consumption.

Parent and EA questionnaires developed in Step 2 were intended for use in studies evaluating short term interventions targeting influences within the home environment. Specifically, parent and EA personal self-efficacy was associated with their own healthy

beverage consumption. In contrast, parental permissiveness was associated with SSB availability. Eating mealtimes together was beneficial for parents in terms of the healthfulness of beverages consumed.

In Step 3, a convenience sample of 29 mostly Native American and Hispanic parent-EA pairs participated in a 5-week intervention in community centers in the Minneapolis/St. Paul metropolitan area. Sessions one, three and five had EA and parent attendance, and sessions two and four had EA attendance only. The primary intervention outcome was to reduce SS soft drink and fruit drink consumption and promote adequate milk and water consumption. Joint parent and EA sessions focused on beverage label-reading, eating family meals together, encouraging parent-child discussions about beverage expectations and rules, and improving knowledge about healthy beverages, beverage availability and preparation. Secondary outcomes were parent and EA self-efficacy for making healthy beverage choices at home and away from home.

Milk availability at home was high at baseline and did not change over the 5 week period. EA beverage intakes were not changed but parents reported a significant decrease in SS soda pop intake that was equivalent to about one can per week ($\underline{M}$ = 10.6 oz/week). No changes were observed in EA reports of their confidence in being able to drink milk at meals and occasions with friends, or in beliefs about parent rules and expectations about setting limits on SSBs, and encouraging healthy beverage intakes. Parents reported an increase in self-efficacy for behaviors that limited less healthy beverage intakes in situations where SSBs would be given as treats or used as a reward ($p = .03$). Parents also significantly increased their personal subscale factor scores for knowing the differences between beverage types (juice or drink) and buying them even if they cost more ($p = .02$).

Parents had less intervention exposure, but reported improved self-efficacy to identify and buy healthier beverages, and reduced their soda pop consumption, whereas EAs did not decrease SSB consumption. These results suggest that positive role-modeling occurred and confidence was improved on the part of parents. Overall, this pilot program provides ideas and challenges to begin changing the momentum to drink less SSBs and more milk and water. This program was significant because in contrast to previous interventions, the Beverages 4 Health program focused primarily on reducing SSB consumption, had both parents and EAs experience the program together, and addressed parental expectations and rules.

Table of Contents

Acknowledgements i

Dedication ii

Table of Contents vi

List of Tables x

List of Figures xv

Chapter 1 – Introduction 1

Home Environment Influences on Beverage Consumption 1

Theoretical Framework 2

Overview 3

References 4

Chapter 2 – Review of the Literature 6

Healthy Beverage Guidelines 7

Sweetened Beverage Ingredients 8

Sweetened Beverage Guidelines 10

Prevalence of Sweetened Beverage Consumption 10

Beverage Food Frequency Intake Assessment Tools 12

Beverage Intake and Adiposity 13

Moderating Factors with Adiposity Risks 16

Health Behavior Change Model 17

Mealtime Challenges 21

Parenting Styles and Practices 23

Parent Explanatory Factors 24

Early Adolescent Explanatory Factors 28

Parents as Mediators of Change....29
Early Adolescents as Mediators of Change....32
Successful Parent-Early Adolescent Practices....32
References....33
Chapter 3 – Research Summary....45
Problem Statement....47
Social Cognitive Theory Model....48
Overall Purpose....48
Research Objectives by Step....49
Hypotheses....49
References....50
Chapter 4 – Step 1: Qualitative Focus Group Study....53
Introduction....56
Methods....57
Results....59
Discussion....61
Implications for Research and Practice....65
References....66
Chapter 5 – Step 2: Evaluation Tool Development and Validation....75
Introduction....79
Theoretical Framework....80
Research Framework....80
Overall Methods....81
Participants and Recruitment....81

Data Collection 82
Parent Evaluation Instrument Development 83
Early Adolescent Instrumental Development 86
Measures Completed by Parents and Early Adolescents 86
Beverage Methodology 87
Statistical Analysis 91
Results 91
Parent Subscales 96
Early Adolescent (EA) Subscales 103
Subscale Associations with Home Availability 108
Subscales Associations with Beverage Intakes 108
Beverage Associations with Eating Meals Together 120
Discussion 122
References 125
Chapter 6 – Step 3: Parent-Early Adolescent Intervention 129
Introduction 133
Theoretical Framework 134
Methods 135
Results 141
Process Evaluation 142
Main Outcome 143
Secondary Outcomes 144
Discussion 145
References 149

Chapter 7 – Summary and Future Research 177

Summary of Findings 178

Implications for Practice 185

Implications of Future Research 186

Strengths and Limitations 187

References 190

Chapter 8 – Overall References 192

Appendix A – Step 2 Evaluation Tools 215

Phase one: Psychometric Analysis 216

Parents 217

Early Adolescents 222

Beverage Survey, Parent and Youth 226

Phase two: Psychometric Analysis (parent) and Reliability 228

Parent Self-efficacy 229

Beverage Survey, Parent and Youth 231

Beverage Availability, Parent and Youth 232

Appendix B – Step 2 (phase three) and Step 3 Evaluation Tool 234

Phase three: Subscale Internal Consistency and Validity 235

Parent Evaluation Tool (Final) 236

Youth (EA) Evaluation Tool (Final) 249

Appendix C – Step 2 Evaluation Tool, Unused Subscales 257

Phase one: Parent Practice Subscales 259

Phase two: Parent Self-efficacy Subscale 261

Phase one: Early Adolescent Subscales 263

List of Tables

2.1	Healthy Beverages and Ingredients	6
2.2	Sweetened Beverage Ingredients	9
4.1	Focus Group Question Sequence	70
4.2	Demographic and Socio-economic Characteristics of Focus Group Participants	71
4.3	Main Focus Group Themes and Representative Quotes **(**1)	72
4.4	Main Focus Group Themes and Representative Quotes (2)	73
4.5	Main Focus Group Themes and Representative Quotes (3)	74
5.1	Parent Demographics	93
5.2	Parent Economic Indicators	94
5.3	Early Adolescent Demographics	95
5.4	Psychometric Properties of Parent Self-efficacy Subscale and Items: Sweetened beverage discipline	97
5.5	Psychometric Properties of Parent Self-efficacy Subscale and Items: Health conscious	98
5.6	Psychometric Properties of Parenting Practice Subscale and Items: Encouragement	99
5.7	Psychometric Properties of Parenting Practice Subscale and Items: Sweetened beverage rules and expectations	100
5.8	Psychometric Properties of Parenting Practice Subscale and Items: Parent role-modeling	101
5.9	Psychometric Properties of Parenting Practice Subscale and Items: Permissive parenting	102

5.10	Psychometric Properties of an Early Adolescent Self-efficacy Subscale and Items: Personal discipline	104
5.11	Psychometric Properties of an Early Adolescent Beliefs and Expectation Subscale and Items: Sweetened beverage rules	105
5.12	Psychometric Properties of Early Adolescent Beliefs and Expectation Subscale and Items: Meal specific expectations	106
5.13	Psychometric Properties of Early Adolescent Beliefs and Expectation Subscale and Items: Milk amount expectations	107
5.14	Parent Self-efficacy Subscale Score Associations with Perceptions of Beverage Availability at Home	109
5.15	Parenting Practice Subscale Score Associations with Perceptions of Beverage Availability at Home	110
5.16	Parenting Practice Subscale Score Associations with Perceptions of Beverage Availability at Home	111
5.17	Early Adolescent Self-efficacy and Beliefs and Expectations Subscale Score Associations with Perceptions of Beverage Availability at Home	112
5.18	Early Adolescent Beverage Beliefs and Expectations Subscale Score Associations with Perceptions of Beverage Availability at Home	113
5.19	Parent Self-efficacy Subscale Score Associations with Parent or Early Adolescent Healthy Beverage Intakes	114
5.20	Parent Self-efficacy Subscale Score Associations with Parent or Early Adolescent Unhealthy Beverage Intakes	115
5.21	Parenting Practice Subscale Score Associations with Parent or Early Adolescent Healthy Beverage Intakes	116

5.22	Parenting Practice Subscale Score Associations with Parent or Early Adolescent Unhealthy Beverage Intakes	117
5.23	Early Adolescent Self-efficacy and Beliefs and Expectations Subscale Score Correlations with Healthy Beverage Intakes	118
5.24	Early Adolescent Self-efficacy and Beliefs and Expectations Subscale Score Associations with Unhealthy Beverage Intakes	119
5.25	Family Meal Frequency Associations with Parent or Early Adolescent Healthy Beverage Intakes	120
5.26	Family Meal Frequency Associations with Unhealthy Beverage Intakes of Parents and Early Adolescents	121
6.1	Early Adolescent Nutrition Intervention Outcome Goals	156
6.2	Parent Nutrition Intervention Outcome Goals	157
6.3	Parent-Early Adolescent Intervention Objectives and Outcomes for Week 1	158
6.4	Early Adolescent Intervention Objectives and Outcomes for Week 2	159
6.5	Parent-Early Adolescent Intervention Objectives and Outcomes for Week 3	160
6.6	Early Adolescent Intervention Objectives and Outcomes for Week 4	161
6.7	Parent-Early Adolescent Intervention Objectives and Outcomes for Week 5	162
6.8	Parent Demographics	163
6.9	Parent Economic Indicators	164
6.10	Early Adolescent Demographics	165
6.11	Mean Beverage Intakes of Parent-Early Adolescent Pairs at Baseline	166

6.12	Mean Beverage Intake Changes from Baseline in Parent-Early Adolescent Pairs	167
6.13	Mean Self-efficacy and Beliefs and Expectation Subscale Score Changes in Early Adolescents	168
6.14	Mean Self-efficacy and Parenting Practice Subscale Score Changes in Parents	169
6.15	Response Changes in Mean Home Availability of Dairy Beverages by Early Adolescents	170
6.16	Response Changes in Mean Home Availability of Healthy Beverages by Early Adolescents	171
6.17	Response Changes in Mean Home Availability of Unhealthy Beverages by Early Adolescents	172
6.18	Response Changes in Mean Home Availability of Dairy Beverages by Parents	173
6.19	Response Changes in Mean Home Availability of Healthy Beverages by Parents	174
6.20	Response Changes in Mean Home Availability of Unhealthy Beverages by Parents	175
6.21	Response Changes in Early Adolescent Beverage Choices at Meals and Snacks	176
C.1	Phase one: Psychometric Properties of Unused Parenting Practice Subscale and Items (1)	260
C.2	Phase one: Psychometric Properties of Unused Parenting Practice Subscale and Items (2)	261

C.3 Phase two: Psychometric Properties of Unused Parent Self-efficacy Subscales and Items 262

C.4 Psychometric Properties of Unused Early Adolescent Self-efficacy Subscales and Items 264

C.5 Psychometric Properties of Unused Early Adolescent Beliefs and Expectations Subscale and Items (1) 265

C.6 Psychometric Properties of Unused Early Adolescent Beliefs and Expectations Subscale and Items (2) 266

List of Figures

2.1	Conceptual model of the social cognitive theory applied to factors that influence parent and early adolescent (EA) beverage consumption	19
5.1	A schematic summary of the phases in psychometric analysis	84
5.2	Phase one monthly to daily frequency responses for healthy beverages (water or milk)	88
5.3	Phase two monthly to daily frequency responses for water	89
5.4	Pre-intervention data collected for use in Phase three and representative of weekly to daily frequency responses for healthy beverages (water or milk)	89
5.5	Phases one and two monthly to daily frequency responses for unhealthy beverages (soda pop and fruit drink).	90
5.6	Pre-intervention data collected for use in phase thre**e** and representative of weekly to daily frequency responses for unhealthy beverages (soda pop and fruit drink).	90

CHAPTER 1

Introduction

Excessive total daily calories can lead to weight gain during childhood. Sweetened beverage consumption provides a plausible, opportunistic mechanism for positive energy balance. In children to older adolescents (2-19 years), mean percentage of total SSBs to total energy intake for Mexican American, non-Hispanic white and non-Hispanic black children were 7.4%, 7.7 % and 8.5%, respectively (Ogden, Kit, Carroll, & Park, 2011). The highest daily consumption was in 12-19 year-old boys with 250 calories/day (Ogden et al., 2011). Sweetened beverage consumption (caloric or non-caloric) is positively associated with energy intake in children [Collison et al., 2010; Libuda et al., 2008; United States. Department of Agriculture, National Evidence Library (NEL), 2010]. Frequency and volume have an effect on changing the amounts consumed by children and adolescents (Cullen, Ash, Warneke, & deMoor, 2002; Forshee, Anderson, & Storey, 2006; Hastert, Babey, Diamant, & Brown, 2005; Lien, Lytle, & Klepp, 2001; Smiciklas-Wright, Mitchell, Mickle, Goldman, & Cook, 2003). Comparison of national nutrition survey data from 2005-2006 with 2007-2008 [National Health and Nutrition Examination Surveys (NHANES)] indicated the percentage of children and EAs (6-11 years) with obesity [body mass index (BMI)] $\geq$30 kg/m^2] increased from 27% to 35% (Ogden & Carroll, 2010). Overall, early adolescence is an opportunity to develop healthy beverage consumption habits to prevent unhealthy weight gain risks.

Home Environment Influences on Beverage Consumption

The family mealtime is an occasion where values, habits, and taste preferences for sweetened beverages may begin and where parents can influence habits of early adolescents. As stated by Larson, Branscomb and Wiley (2006), “Mealtimes provide opportunities for parents to model, coach, monitor and control children’s behavior” and where children are “apprentices.” Ideally, targeting the home environment, including mealtimes, provides opportunities to address overconsumption of sweetened beverages by adults and adolescents. Children and adolescents (9-14 years) who reported eating family meals together on most days were 15% less likely to be overweight compared to children and adolescents who reported they never or on some days ate meals together (Taveras et

al., 2005). Comprehensive statistical analyses of pooled data (which included Taveras et al., 2005) were completed by Hammons and Friese (2011). Children and adolescents who reported eating at least three family meals per week were 12% less likely to be overweight and 20% less likely to eat unhealthy foods (Hammons & Friese, 2011). More specifically, eating fewer family meals together was associated with self-reported higher soft drink consumption in adolescents (Neumark-Sztainer, 2006). Cullen, et al. (2000) suggested that families influence each other's food behavior through mealtime opportunities with parental conversations that encourage, guide, explain reasons and enforce boundaries. Therefore, providing beverage consumption guidelines at meals and use of "explanatory talk" (Larson, Branscomb & Wiley, 2006) may provide a successful strategy to promote healthy and energy-balanced food and beverage intakes.

Theoretical Framework

Social Cognitive Theory (SCT) identifies three types of determinants (personal, behavioral and socio-environmental) that influence behaviors (McAlister, Perry, & Parcel, 2008). SCT can be applied to explain how personal, behavioral and environmental factors influence beverage intakes in the home environment. Parents can influence sweetened beverage consumption by purchasing less to decrease availability, encouraging healthy beverage intakes at mealtimes, establishing rules and expectations that restrict or monitor consumption and role-modeling healthy beverage consumption. In contrast, early adolescents can learn asking skills and compliance with rules, and behavior regulation, as well as participate in family social milieu conversations to gain confidence to make decisions (Coleman & Karraker, 1997). Such tasks are necessary for adolescents to develop independence and autonomy and demand different parenting practices and roles from childhood. Therefore, tools designed to evaluate child-feeding practices need to be modified to reflect increased adolescent autonomy and self-efficacy building skills as well as changing parenting tasks and self-efficacy (Coleman & Karraker, 1997). In general, a limited number of validated measurement tools are available to test the effectiveness of family environment-based interventions to change beverage consumption patterns of early adolescents. Intervention programs with a specific focus on beverage intake for early adolescents are also limited since most available programs typically address nutrition or broader healthy lifestyle choices.

Overview

The review of literature supporting the proposed research provides comprehensive evidence describing beverage consumption patterns with varying parenting practices (chapter 2). The remaining chapters describe work regarding the development, implementation and evaluation of a parent-child intervention based on SCT. The overarching outcome of this work was to improve beverage consumption patterns in parent-child pairs. For example, parent discussions in focus groups informed the development of intervention objectives, content and activities. These results are reported in chapter 4. In chapter 5, principal components analysis with varimax rotation was used to create analytical variables for parent and early adolescent (EA) personal (self-efficacy) and beverage expectations and rules subsets for each tool (parent and EA). Both instruments also quantified intakes of healthy beverages (milk and water) and unhealthy beverages [sugar-sweetened (SS) soda pop and fruit drinks]. A third measure was home availability of various beverages that included SS-beverages, bottled water, plain and flavored milk. This chapter reports on psychometric testing for each tool and validates subscales against perceptions of home availability and reported consumption. In chapter 6, information about intervention sessions to change behaviors and the resultant behavior changes in parent-child pairs are reported. Successful intervention outcomes were to reduce sweetened beverage consumption and encourage milk and water consumption for several eating and snacking occasions found in the home and away from home. Evaluation tools also measured changes in parent and EA perceptions of changed beverage availability at home and perceived changes in parenting practices that included setting rules, communicating expectations, role-modeling and personal self-efficacy. Changes in EA perceived self-efficacy and forced choice about selecting a beverage away from home (after school, and at a friend's house) were also measured. The final chapter provides an overall discussion with respect to the development, implementation and evaluation of a parent-child intervention based on SCT to improve beverage consumption patterns and recommendations for practice and further research.

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CHAPTER 2

Review of the Literature

Consumption of healthy beverages by children and adults is important for several reasons. Water is a common ingredient found in healthy beverages and is important in diets to maintain hydration. Other physiological reasons for consuming healthy beverages are to provide energy and nutrients (such as protein, vitamins and minerals) to meet daily needs (Steyn, Myburgh & Nel, 2003). Fruit juices provide energy as simple carbohydrates and milk provides energy from intrinsic fat, simple carbohydrates (lactose) and protein. The pleasure of enjoying beverages and finding specific preferences are through flavors and within healthy beverages, 100% fruit juices offer a greater intrinsic flavor variety than milk and water (Table 2.1).

The American Academy of Pediatrics (AAP) named 100% fruit juice and low-fat milk as healthy beverages for children (AAP, Committee on Nutrition and the Council on Sports Medicine and Fitness, 2011). All beverages, except water, provide two important resources for health: energy and hydration.

Table 2.1

Healthy Beverages and Ingredients

Beverage	Food group and ingredients
100% Fruit juice	Fruit with intrinsic fructose (sugar); unsweetened 100% citrus or non-citrus juices of fruit
Milk	Milk with intrinsic lactose (sugar); fat content (whole, 2%, 1%, skim) and extrinsic sugar-flavored (e.g., chocolate and strawberry)
Water	No food group; sources of water (tap, drinking fountain, and container); carbonated; flavored (fruit flavored or extrinsic caloric or non-caloric sweetener)

Healthy Beverage Guidelines

National dietary reference intake (DRI) guidelines estimate 80% of water needs are provided through beverages [Food and Nutrition Board & Institute of Medicine (FNB-IOM), 2004]. Recommended adequate daily intakes for children and adults are ~5-14 cups and 11-15 cups of water/day, respectively. Since there is a wide volume range for adolescents (9-18 years), median intakes were used to estimate adequate daily water intakes for males (8-11 cups) and females (7-8 cups) (FNB-IOM, 2004). Early NHANES 1999-2002 survey data indicated children (4-18 years) drank, on average, 3 ¼ cups of plain water per day with females drinking two ounces less than males (Fulgoni, 2007). Combining foods with beverages (including water), children and adolescents (4-18 years) drank almost six cups/day (Fulgoni, 2007). Similar to children, adults drank four cups (32 ounces) of plain water daily and obtained 20 ounces from foods and beverages (Fulgoni, 2007). Most multi-ethnic adult participants in NHANES 1999-2002 surveys (88%) drank water daily (Duffey & Popkin, 2006). Daily intakes of adults and children fell within the large range for adequate water intake (FNB-IOM, 2004) and indicated hydration needs are met with foods and beverages.

The Institute of Medicine's Dietary Reference Intake (DRI) Committee members reported that the physiological thirst mechanism adequately regulates daily water intake and achieves physiological needs (FNB-IOM, 2004; Sawka, Cheuvront, & Carter, 2005). Sports participation and physical activity are significant determinants affecting hydration needs. Non-caloric and caloric sports drinks have been formulated to match sweat losses with water and nutrients (Table 2.2). Recent recommendations from the American Academy of Pediatrics (AAP) indicated that sports drinks be consumed only during "prolonged and vigorous sports" (American Academy of Pediatrics, 2011). Small observational studies supported little need for sports drinks in children, 9-13 years, after exercising for 90 minutes (Kenny & Chiu, 2001) and reported that EAs overhydrated with flavored drinks (Wilk & Bar-Or, 1996).

The 2010 Dietary Guidelines for Americans recommended that adults and EAs drink more low-fat milk or milk products daily [United States. Department of Agriculture (USDA). Department of Health and Human Services, 2010a]. When an individual does not consume any milk products, he or she cannot meet important nutrient goals for calcium, magnesium, phosphorus, vitamin A and vitamin D (USDA, 2010b). On average, EA

females and males consume approximately 1 ½ and 2 cups of milk daily, respectively [National Cancer Institute (NCI), 2010a]. Adult men and women (19-50 years) each consumed approximately one cup of milk/day (NCI, 2010a). Adults and children need to improve milk consumption to promote bone health while parents need to role model healthy beverage consumption behaviors.

Fruits that are consumed as 100% juices most often by children and adolescents are from non-citrus sources (44%) (NCI, 2010b). However, consumption of 100% fruit juices from citrus fruit is close behind (41%), while fruit drinks contributed 10% (NCI, 2010b). For fruit juice consumption among the U.S. population, half consume citrus juices and only ⅓ consume 100% fruit juice (NCI, 2010c). Therefore, adults may prefer citrus juices whereas their children prefer other fruit juices. This may be important when promoting healthy beverage as part of interventions among families lacking financial resources to buy several fruit juice flavors.

Sweetened Beverage Ingredients

In the past decade, various sweeteners, flavor components and nutritive components have been added to increase perceived healthfulness of beverage choices and improve "liking" (Table 2.2). Sun and Empie (2007) assembled a list of 73 sugar-sweetened beverage products consumed by adults that met the definition of having added sugar, sucrose and high-fructose corn syrup after reviewing two USDA national food intake data sets (Continuing Surveys of Food Intakes by Individuals (CSFII) 1989-1991 and 1994-1996) and three Centers for Disease Control (CDC) NHANES III data sets (1988-1994, 1999-2000, and 2001-2002). These multiple components can challenge parents trying to make beverage choices for several family members when a variety of flavors and sweetening agents exist.

Sugar and high-fructose corn syrup are controversial ingredients because of their caloric contribution to child and adult diets. A shopping survey contained questions about recognizing calorie-containing sweeteners and a non-calorie sweetener [International Food Information Council Foundation (IFIC), 2006]. Most adult respondents (88-94%) believed they could recognize sugar and glucose on the package label and a majority (65-78%) said they recognized added sugars, sucrose, high fructose corn syrup and aspartame. In a more recent IFIC survey (2011), 60% (n = 260) and 44% (n = 173) of American shoppers used

Table 2.2

Sweetened Beverage Ingredients

Beverage	Ingredient description
Calorically sweetened (Using glucose, fructose, sucrose, and/or maltose)	
Soft drink or soda pop	Water, flavoring, phosphoric acid, and carbonation; with or without cola; and with or without caffeine
Fruit drinks	Water-diluted fruit juice (powdered or frozen concentrates), flavoring (such as fruit punch, orange, iced teas and lemonade); with or without carbonation; with or without citric acid; and with or without added nutrients
Sports drinks	Water, flavoring, electrolytes (sodium and potassium), citric or phosphoric acid, and other nutrients (such as B-vitamins) or herbal compounds
Energy drinks	Water, flavoring, electrolytes (sodium and potassium), citric or phosphoric acid, other nutrients (such as B-vitamins), and caffeine, energy stimulants or herbal compounds
Non-calorically sweetened (sweetened with aspartame or sugar alcohols such as sorbitol)	
Diet carbonated soft drink or soda pop	Water, flavoring, phosphoric acid, and carbonation; with or without cola; and with or without caffeine
Diet fruit-flavored	Water-diluted fruit juice (powdered or frozen concentrates), flavoring (such as fruit punch, orange, iced teas and lemonade); with or without carbonation; with or without citric acid; and with or without added nutrients
Coffee	Water, caffeine, and added sweeteners, flavors, cream, nondairy cream, and/or milk (whole, 2%, 1%, and skim)

the ingredient listings to identify sugars and low-calorie/artificial sweeteners, respectively. In another survey, only six percent of shoppers who read the nutrition label for sugar content for the first time reported they did not buy sweetened soft drinks (Food Marketing Institute, 2005).

Sweetened Beverage Guidelines

Recent national guidelines specify recommended amounts of added sugars based on estimated daily calorie needs (USDA, 2010c). These national guidelines, however, did not quantify SSB servings but only gave a strong repeated message for children and adolescents to reduce intake and choose smaller portions (USDA, 2010c). Recommendations for energy from solid fats and added sugars are based on a percentage of estimated daily energy requirements for energy expenditure and growth in early adolescents. Limits for solid fats and added sugars at lower energy expenditures (1,400-1,800 calories/day) range from 8-10% and at higher expenditures (2,000 to 2,400 calories) are limited to 12-14% (USDA, 2010c). Overall, the total caloric limits for solid fats and added sugars are approximately 121-330 calories and represent an amount less than a can of soda pop.

Parents need education to understand their SSB limits as well as information about limits for their children. One 12-oz can of fruit or soft drink that contains 140 calories would provide nine teaspoons of sugar (Pennington & Douglass, 2005, pp. 3-10). This amount would make up all of the calories allowed from solid fats and added sugars solely from sugar for a 1,600 calorie energy level and exceed the recommended amount for estimated energy levels below this amount. Guidance about reasonable sweetened beverage portion sizes and how often they should be consumed for parents and adolescents are currently complex and highly restrictive. Education interpreting these guidelines is needed for parents and EAs to promote a healthy lifestyle.

Prevalence of Sweetened Beverage Consumption

Beverage consumption increases throughout adolescence and represents a greater proportion of total energy intake. Sweetened beverages as a 'food' group ranked fifth in contributing calories toward total mean energy intake in EAs aged 9-13 years (NHANES 2005-2006 accessed at National Cancer Institute (NCI, 2010d). Beverage consumption patterns change and SSBs increase in quantity between EAs (9-13 years)

and adolescents (14-18 years). SSBs represented 5% (106 calories) of total mean energy intake (2,035 calories) in EAs whereas adolescent SSB consumption was almost twice this amount and represented 9% (225 calories) of the total mean energy intake (2,427 calories). This moved SSB ranking for energy contribution to first place in adolescents. Therefore, this is a food group contributing more toward overall daily calories with minimal nutrients during a final period of growth and maturation and at a time where energy expenditure is the highest by age grouping.

NHANES 2005-2006 data were based on one 24-hour recall with the definition of sweetened beverages including "soft drinks, energy drinks, sports drinks, and sweetened bottled water, including vitamin water." This represents a compilation of beverage types similar to studies using food records to gather information on the variety of beverage types consumed. Cullen, Ash, Warneke, and deMoor (2002) analyzed 3 to 7 days of food records per child among 4-6th grade students. Mean total soft drink and fruit drink intakes ranged from 6.2 oz/1,000 calories in 4th grade to 7.8 oz/1,000 calories in 6th grade and represented 46% to 57% of the volume of total beverages consumed (Cullen et al., 2002). When soft drink and fruit drink intake volumes of sixth graders are combined and translated into calories per 1,000 calories (Cullen et al., 2002), the result is 87 calories per 1,000 calories which is similar to the NHANES, 2005-2006 data for adolescents. Without a doubt, sweetened beverage consumption in any type of drink is an unhealthy pattern throughout adolescence.

Poor beverage consumption habits are role-modeled by adults who may also be parents. In the NHANES, 2005-2006 data, SSB drinks ranked fifth and alcoholic beverages ranked third in contributing calories toward total mean energy intake (NCI, 2010d). When SSB drinks and alcohol drinks are combined, they represent 108 beverage calories per1000 calories and demonstrate that beverages can contribute unnecessary calories in adults. Availability and consumption of sweetened or alcoholic beverages by adults can influence beverage consumption habits of adolescents. These habits can persist throughout EA maturation when daily energy expenditures increase and with subsequent increases in food and beverage consumption. Once habits are established and energy expenditures are lower, reversal to healthier choices to maintain weight becomes more difficult.

Beverage Food Frequency Intake Assessment Tools

Cognitive development during early adolescence increases the ability to evaluate abstract constructs [United States. National Institutes of Health (NIH), 2009]. This skill is needed to report frequency of beverage consumption in an accurate and reliable manner. Beverage intake measurement tools can ask open-ended questions about the frequency (Serdula et al., 1993) or state a portion size and ask early adolescents to estimate how many servings of that size were consumed (Rockett, Wolf, & Colditz., 1995). A youth adolescent questionnaire lists four beverages [milk (chocolate or white), orange juice, fruit drink and soda pop] and identifies six or seven frequency options (Rockett, Wolf, & Colditz, 1995). This questionnaire has reported modest reliability for juice intakes in adolescents (Cullen et al., 2004). Harnack et al. (2006) used the National Cancer Institute diet history questionnaire layout to develop an evaluation tool for measuring calcium intake in early adolescents, 11-14 years, and included photographs. Nine frequency responses were given ("never or less than one time per month" to "three or more times per day") as the response options located near a standard glass of milk. Recalling how many glasses are consumed per day may be easier when adolescents are asked to consider intake during routine mealtimes or if they consume milk at all meals. In contrast, accurately recalling intake may be more challenging when milk is consumed between meals or if intake varies by day of the week. Energy needs increase during adolescence and more beverages are consumed away from home and with peers. Therefore, the ability to accurately measure beverage intakes becomes challenging.

Portion size estimation for beverages will be more accurate when tools present age-appropriate portion sizes in contexts that individuals experience drinking beverages (van Ittersum & Wansink, 2007). Current beverage packaging for children and adolescents includes cans, bottles, cartons, juice pouches and varieties of beverage glassware shapes. Differences between a serving that is purchased versus the portion that is consumed (Cullen, et al., 2003) may be misunderstood. No evaluation tools measuring beverage frequency have categorized fruit drinks and the variety of beverages or containers (i.e., glasses, pouches, cans, bottles and cartons) typically purchased away from home or in the home environment.

No studies have evaluated water intake portions in the home or away from home among early adolescents. An international randomized controlled trial reported early adolescent African-American females (8-12 years) underestimated beverage volume (reported as weight) by 46% when using a two-dimensional (2-D) glass picture or pouring water from a pitcher into one of three different glasses (Matheson, Hanson, McDonald, et al., 2002). Translated into volume, this reflects an error of approximately one ounce. In another component of the study, low-income early adolescents (10-13 years) representing black and white cultures, were shown ½ cup of a cold drink in a glass for 30 seconds. After removing the cold drink, they were asked to identify the amount using two, 2-D glasses as portion size aides. Early adolescents underestimated the amount by 10-12%, which was approximately ½ ounce. Therefore, a validated beverage frequency questionnaire that names several beverage containers may help EAs report SSB consumption more accurately. Moreover, adding frequency of water consumption will also provide information about drinking a non-caloric, low cost beverage.

Beverage Intake and Adiposity

Obesity prevalence has dramatically increased in childhood and adolescence (Ogden & Carroll, 2010) which increases cardiovascular and diabetes mellitus risk factors during adolescence (Camhi &Katzmarzyk, 2011; Rodriguez et al., 2006). Cardiovascular risks have been reported in overweight and obese children and adolescents. Lamb, Ogden, Carroll, Lacher, and Flegal (2011) reported that 35% of 8-11 year-olds ($n = 460$ of $N = 1,326$) were in the upper 75^{th} percentile for body fat percentage and had lower HDL levels than EAs within lower body fat percentiles ($p < .01$). Boys in the upper quartile also had high triglycerides and total cholesterol ($p < .01$) compared to lower quartiles (Lamb et al., 2011). These findings are different from earlier warnings of obesity risks in early to mid-adulthood (Baker, Olsen, & Sorensen, 2007; Guo & Chumlea, 1999). Public health concerns are heightened because if obesity occurs in childhood, Freedman, Khan, Dietz, Srinivasan, and Berenson (2001) reported that 77% remained obese in adulthood. In the same way, 20-60% of overweight adolescents will remain overweight in adulthood (as reported by three studies adhering to quality research standards in a systematic review) (Singh, Mulder, Twisk, Van, & Chinapaw, 2008).

Prevalence of obesity in U.S. adults is also alarming with 34% having a BMI ≥ 30 kg/m^2 (Shields, Carroll, & Ogden, 2011) which increases risk of cardiovascular diseases

with metabolic syndrome (Poirier et al., 2006). Similar to adolescents, overweight adults may continue to gain weight and increase cardiovascular risk factors (Lewis et al., 2009). These alarming statistics require evaluation of the energy contributions in beverages toward weight gain and health issues.

An association between intakes of sweetened beverages and adiposity measures among older children and early adolescents is multifaceted. Muckelbauer, Kerstin, and Muller-Norhorn (2011) describe a possible mechanism for a relationship between SSBs and weight gain as lack of adjustment for energy intakes in other foods and beverages and therefore contributing to a positive energy imbalance. This mechanism is supported in a longitudinal study of German adolescents where only 67 calories (-.28 MJ) per 240 calories (MJ) of soft drinks and fruit juices were compensated for in other food consumption (Libuda et al., 2008; Pereira & Jacobs, 2008). Muckelbauer et al. (2011) translates German food bank guidelines for soft drink definitions as "a heterogeneous group of carbonated and noncarbonated beverages including fruit drinks (defined as < 100% fruit juice), lemonades, and soda pop." Strengths of the Libuda et al. (2008) research are use of 3-day weighed food records and analyzing data using repeated measures regression methods (Pereira & Jacobs, 2008).

The 2010 Dietary Guidelines Committee (DGAC) evidence analysis of associations of SSBs with adiposity included 11 studies with adolescents (9-18 years) [United States. Department of Agriculture (USDA). Nutrition Evidence Library, 2010]. One of these studies reported that when evaluating beverage intake as a non-linear function (0, 1, 2 or 3+ servings sugar-added beverages and without adjusting for energy intake), EA males demonstrated a dose-response effect ($p < .05$) (Berkey, Rockett, Field, Gillman, & Colditz, 2004). Females gained a .07 BMI unit (standardized z-score) during the year by drinking 0.5 - 1.5 SSB servings/day compared to those not drinking sweetened beverages ($p < .02$) (Berkey et al., 2004). This study's generalizability applies to predominantly non-Hispanic, white females with higher socioeconomic status and education. Additional weaknesses included a low completion rate (60%) of dietary records.

In another study, females (8-12 years; 75% white, 14% Black and 11% other) drinking soft drinks in the top two quartiles as a percent of daily calories had BMI z-scores which were .17 units higher than females in the lowest quartile (Phillips et al., 2004). This analysis was adjusted for menarche age, daily servings of fruits and vegetables and parental

overweight (Phillips et al., 2004). Another longitudinal study of adolescents and young adults (11-20 years) indicated that added sugar intake was higher in Blacks ($p < .01$), lower in Asians ($p < .001$) and similar in Whites and Hispanics males and females (Xie, Gilliland, Li, & Rockett, 2003). Cross-sectional data indicated approximately ⅓ of multi-ethnic children (2-11 years) that predominantly drank carbonated soft drinks or fruit drinks were overweight or obese using BMI profiles (Larowe, Moeller & Adams, 2007). Studies that combined most types of SSBs (soft drink, fruit drink, and tea) demonstrated increased BMI risks with greater drinking amounts. Studies clarifying the role of fruit juices containing less than 100% juice and amounts of 100% fruit juice consumed by adolescents with adiposity measures are sparse and inconclusive. Additional studies that continue to evaluate all sweetened beverage types are important to determine energy contributions and associations with weight. Reducing sweetened beverage consumption can potentially reduce risk of weight gain and consequential health risks.

When all studies were evaluated together, positive associations of sweetened (caloric and non-calorically sweetened) beverage consumption with total energy intake were modest in adults ($r = .28$, confidence interval = .27, 0.30; 19 studies) and weaker in children ($r = .08$, confidence interval = .07, .09; 13 studies) (Vartanian, Schwartz & Brownell, 2007). Cross-sectional studies were the predominant study design evaluating children's intakes whereas short-term experimental studies evaluated the relationship between soft drink and energy intake in adults. The latter study design would better establish cause-and-effect associations. A few cohort study designs were also included in the adult analyses. This design provides associations between an energy dense component in sweetened beverages (added sugar or high fructose corn syrup) and weight over time but study design effects on overall meta-analysis results are indistinguishable. Analysis of cross-sectional studies with adults did not support the positive relationship between soft drink intake and body weight in adults (20-74 years) (Sun & Empie, 2007). A longitudinal study with female nursing professionals (included in the meta-analysis) independently reported that increases in soft drinks and fruit punch were associated with weight gain over four years (Schulze, Manson, & Ludwig, 2004). More recently, a cohort study reported strong associations of weight gains in non-obese men and women with increased daily SSB consumption over four years (Mozaffarian, Hao, Rimm, Willett, & Hu, 2011).

Changing a dietary component associated with energy intake may influence other behavior changes. Researchers in New Zealand indicated the percent of total energy intake adults consumed from sugary beverages was inversely associated with increased fat intakes (by quartile) (Parnell et al., 2007). In a prospective study, Ludwig, Peterson, & Gortmaker (2001) demonstrated that every additional SB serving increased obesity risks by 60% in EAs. Therefore, energy contributions from simple sugars in beverages do contribute calories toward daily energy consumption. Cross-sectional studies cannot provide associations with excess SSB consumption over time. Stronger evidence would control for other factors, such as fat and snack food intake and leisure time to determine sweetened beverage associations with weight. Successful adult and EA interventions would encourage lowering calorie intakes from SSBs occurring across many eating and drinking contexts.

Moderating Factors with Adiposity Risks

Moderating factors of adiposity risks are gender, family income and ethnicity (Gordon-Larsen, Adair & Popkin, 2003). In boys and girls living in families earning less than $29,000 from 2005-2008, 4.5 million (38%) children (2-19 years) were obese (Ogden, Lamb, Carroll, & Flegal, 2010). Fewer obese non-Hispanic white boys and girls were living in families earning $77,000 or more compared to families earning > $29,000 to <$77,000 and <$29,000 ($p < .05$). Results from the HEALTHY study also support minorities other than non-Hispanic whites having significantly greater overweight and obesity percentages measured by waist circumference (Rodriguez et al., 2006) and BMIs greater than the 85^{th} percentiles compared to non-Hispanic whites (The HEALTHY Study Group, 2009).

Family Income

Family income may determine added sugar intake from sweetened beverages in adolescents but was inconsistent depending on how income was measured. Frazao (2005) evaluated milk and soft drink consumption based on program participation or eligibility for the Food Stamp Program, and the Special Supplemental Nutrition Program for Women, Infants, and Children using NHANES III data. Food Stamp participants did not drink significantly different amounts of milk and soft drinks compared to ineligible non-participants. The only difference between income groups was in milk consumption where the lowest income group (130% of poverty level or less) drank less milk than the highest

income group (185% of poverty level). In another study, low-income families (< $15,000 per year in 1998) with adolescents (n = 3,201; 40% 11-13 years) had significantly higher added sugar intakes compared to moderate or high income families after adjusting for age, gender, and total energy (Xie, Gilliland, Li, & Rockett, 2003). A more recent study of low-income families consuming at least 3 cups of milk daily indicated that EAs consumed more milk (~ 1 ½ cups) and fruit juice/drink (~ 1 ½ cups) compared to their mothers (3/4 cup and 2/3 cup, respectively) during a time when they had the least amount of money within a month ($p < .03$, each) (Glanville & McIntyre, 2009). For EAs, sweetened beverages represented 63% of total beverages (Glanville & McIntyre, 2009). Mothers consumed more carbonated beverages than EAs regardless of money available (Glanville & McIntyre, 2009).

Education

Lower obesity prevalence was reported in non-Hispanic white and non-Hispanic black children having an adult with post-secondary training compared to children with an adult having a high school education or less (Ogden, Lamb, Carroll, & Flegal, 2010). No obesity prevalence trend was observed in Mexican American children with the head of household having post-secondary education compared with high school education (Ogden et al., 2010). Gordon-Larsen, Adair, & Popkin (2003) suggested that interpretation of SES associations with adiposity be done with caution because of other influences (such as diet, activity, and maturation). However, no significant association existed between energy intake from added sugars in 4th and 8th grade students and mother's or father's education in an international study (Overby, Lillegaard, Johansson, & Andersen, 2003).

Health Behavior Change Model

Social cognitive theory (SCT) explains behavior as influenced by interrelationships between environmental, personal and behavioral factors. The triadic nature of this influence reflects a dynamic parent-early adolescent interaction (McAlister, Perry, & Parcel, 2008). For example, parent knowledge about beverages, perceived abilities to set constraints about beverage consumption in the home and beliefs and attitudes about how to teach, encourage and limit portion amounts are personal factors that positively influence parental behavioral and socio-environmental factors (Figure 2.1). In the latter, SCT represents a socio-environmental interaction between parents and early adolescents such that parents are personally involved

(e.g., time, money or emotional nurturing) to create a home environment that proactively influences early adolescent determinants (personal, behavioral and social-environmental factors). When parents are viewed as mediators of change, they can actively role model healthy beverage consumption by being an example and they can support adolescent autonomy for making healthy beverage choices. Early adolescents respond and play a "very substantial active role" (Brewis & Gartin, 2006) by asking for specific beverage flavors, sweeteners or amounts. In this chapter, "parent" is defined as any of the following: mother, father, caregiver, or legal guardian.

Additional Moderating and Mediating Factors

Socio-economic status (SES), gender, race or ethnicity, and education are conditions that were previously discussed as potential influences on specific beverage choices. Other influential factors include availability and accessibility. Home availability and accessibility (combined) has been suggested to be a variable that influences food intake behaviors of children. The combined measure predicted baseline and post-intervention fruit and vegetable consumption and was associated with changes in fruit and vegetable preferences and changes in consumption (Jago, Barnaowski & Baranowski, 2007). Availability and accessibility (combined) is also a plausible influential factor regarding SSB and milk intakes and they are likely mediated by beverage preferences. Moreover, intervention goals to decrease SSBs will require EAs and family members to develop new beverage preferences and have parents buy beverages that are not consistent with past habits and preferences of all family members. Theoretically, establishing preferences for healthy beverages and baseline availability at home may be indistinguishable as moderating or mediating effects.

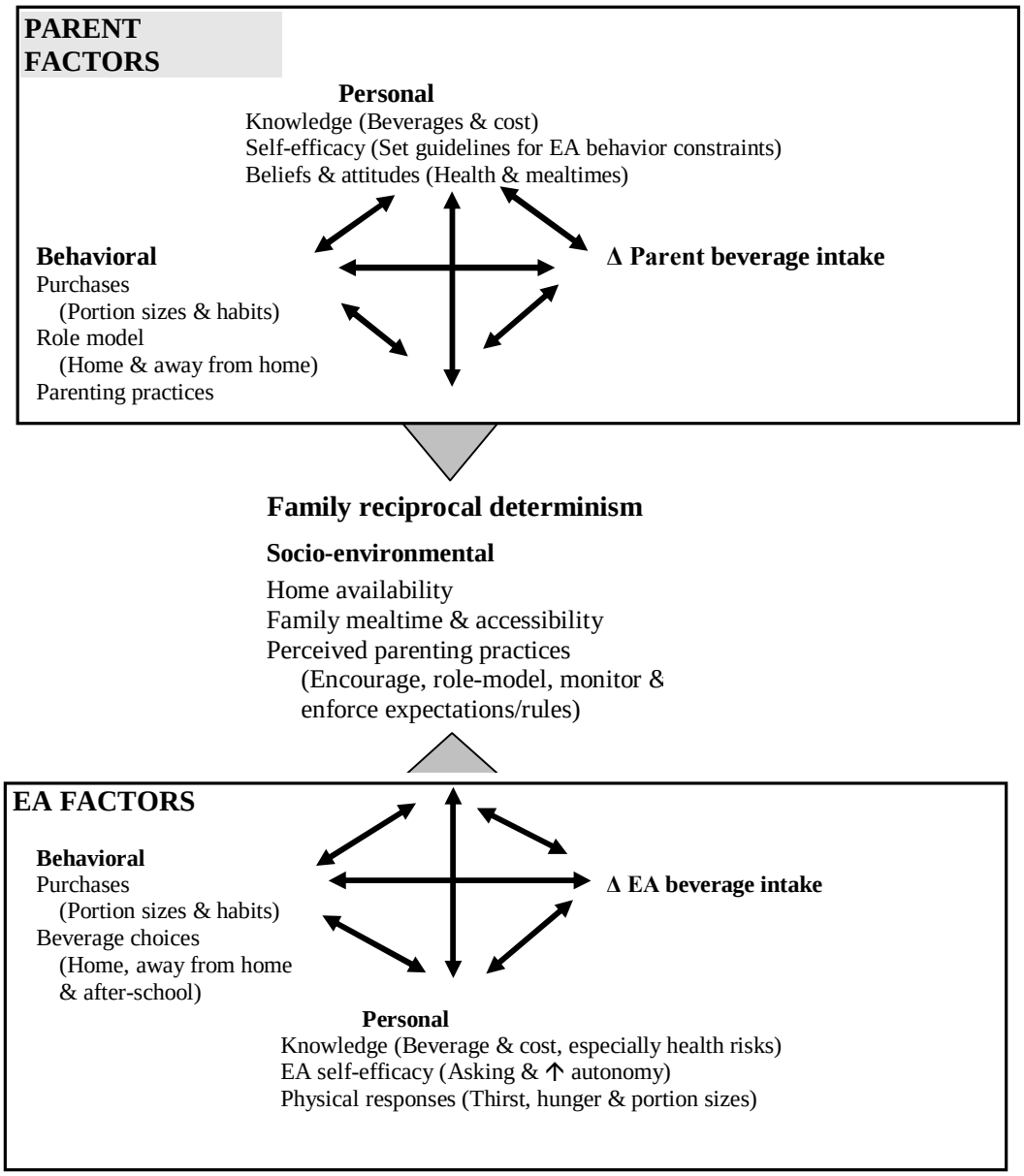

Figure 2.1. Conceptual model of the social cognitive theory applied to factors that influence parent and early adolescent (EA) beverage consumption

Notes**.** Conceptual model adapted from Larson, Story, Wall and Neumark-Sztainer, 2006 with original model available online at www.adajournal.org. Accessed May 15, 2008. Some modifications were interpreted from Ventura and Birch, 2008. Available at http://www.ijbnpa.org/content/5/1/15. Accessed June 01, 2008.

Home Availability

Parents are motivated by wanting their children to be healthy when choosing foods whereas EAs are motivated by taste (Gibson, Wardle & Watts, 1998). A consumer survey indicated that taste and price were the highest ranked characteristics affecting grocery store purchases and therefore availability for consumption at home [International Food Information Council (IFIC) Foundation Food & Health Survey, 2006]. In addition, offering several beverage colors is "a logical option to increase intake" (Stroeble & de Castro, 2004) and please family members' perceptions of a "treat." Calorically-sweetened beverages taste good, can be lower in cost than dairy-based beverages, provide variety through different flavors and colors and are convenient (Drewnoski & Darmon, 2005). Adults making beverage purchases for the home are strongly motivated to buy sweetened beverages for the enjoyment of family members. A cross-sectional study identified that over half of families (60%) with a middle or high school adolescent in the home reported that soft drinks were usually or always available (Hanson, Neumark-Sztainer, Eisenberg, Story, & Wall, 2005). Home availability of soda pop (regular and diet), punches, lemonade and fruit drinks was moderately associated with self-reported adolescent soda pop consumption ($p < .0001$) (Larson, Story, Wall, & Neumark-Sztainer, 2006). Other cross-sectional studies demonstrated associations between availability and intake of healthier foods with several reporting positive associations between availability and fruit and vegetable intakes by early adolescents (Cullen, Baranowski, Owens, Rittenbury, & deMoor, 2003; Kratt, Reynolds & Shewcuk, 2000; Reynolds, Hinton, Shewcuk, & Kickey, 1999; Wind et al., 2006). While the cross-sectional design of these studies did not establish cause-effect, positive associations were observed between dietary intake of healthy foods and availability in the home. In the same way, increased availability of unhealthy beverages can potentially increase consumption.

Accessibility

The term "accessibility" denotes that a food or beverage is not only available but also is ready to consume and allowed (Cullen et al., 2000). Adolescents perceived more opportunities to drink beverages when available and easier to consume (Kassem, Lee, Modeste, & Johnston, 2003; Kassem & Lee, 2004). In another study (Bere, Glomnes, te Velde & Klepp, 2007), a scale measured soft drink accessibility in the home using three questions that asked about home availability, how often soft drinks were served at dinner

and how often served at other times besides dinner. Results indicated that adolescents (n = 2,870; 51% males) in 9th and 10th grades with high accessibility on all three questions were five times more likely to drink regular soft drinks two or more times/week; adjusting for gender, educational plans, grade and dieting (Bere et al., 2007). Adolescents with medium accessibility were three times more likely to drink regular soft drinks two or more times per week. With respect to non-caloric soft drinks, 9th grade adolescents were eight times more likely to drink diet soft drinks two or more times/week with greater accessibility; adjusting for gender, educational plans, grade and dieting (Bere et al., 2007). Establishing several household rules addressing availability and accessibility (e.g., serve fruit or 100% juice at breakfast) was associated with increased fruit and vegetable consumption and decreased fat consumption in adolescents, 11-15 years (Zabinski et al., 2006). Perceived availability and accessibility at mealtimes by adolescents facilitates intake of soft drinks or 100% fruit juice.

The highest quality study design to measure the effects of an intervention on behaviors is a randomized controlled trial (RCT). One study reported the effects of an intervention that targeted bottled water and diet beverage drink availability in families having an adolescent child, 13-18 years (Ebbeling, Feldman, Osganian et al., 2006). Researchers made weekly home deliveries of non-caloric beverages to families with container size ranging from 10-24 fluid ounces for 25 weeks. Direct parent contact was through an initial and monthly motivational telephone interview/counseling session and monthly refrigerator magnets. Intervention and control groups were stratified by gender and BMI for age in the random group assignment. Provision of five non-caloric beverages in portable containers (making easily accessible) significantly increased average consumption by approximately 12.5 oz (as measured by two 24-hour recalls) (Ebbeling et al., 2006). Beverage availability with accessibility helped obese adolescents (baseline BMIs in the upper third or > 30 kg/m^2) in the intervention group reduce their BMIs compared to the control group (Ebbeling et al., 2006).

Mealtime Challenges

Parents should strive to maintain their expectations of having EAs participate in family meals even with greater EA autonomy. EAs may lessen their compliance to mealtime routines as they get older and develop a greater level of independence (Kusano-Tsunoh et al., 2001; Neumark-Sztainer, Hannan, Story,Croll & Perry, 2003; Taveras et al.,

2005). A recent meta-analysis which merges several studies representing young children to adolescence confirmed age was not a statistically significant moderator of having family meals (Hammons & Friese, 2011). Therefore, parents should continue to encourage and plan family meals but also monitor frequency and maintain concern about beverages consumed away from home.

Frequency

Findings from a cross-sectional survey among multi-ethnic adolescents (11-18 years, n = 4,746) indicated high variability in the number of family meals eaten together (Neumark-Sztainer, 2006). A meta-analysis (n = 8 studies) comparing mealtime weekly frequency ($\leq$ 1 meal vs. 5 or more meals together) indicated that children and adolescents were 25% more likely to eat healthy when eating more meals together (Hammons & Fiese, 2011). In this same study, eating at least three meals together would reduce the odds of being overweight by 12% [.88, (95% confidence interval = .81 - .97)] (Hammons & Friese, 2011). A cohort study representing EAs (n = 7,784 girls and 6,647 boys) was the largest study in the meta-analysis (Taveras et al., 2005).

The frequency of breakfast meals may be different during the week than on weekends because of work and school schedules which may affect intakes of nutrient-rich beverages including milk and juice. Generally, serving milk at family mealtimes promoted a greater percent of calories from protein and calcium (Larson, Story, Wall, & Neumark-Sztainer, 2006). School breakfast meals also offer milk and 100% calcium-fortified fruit juices. Only one international study has reported an association between rarely eating breakfast with their families (Japanese middle-school males) and higher frequency of self-reported EA soft drink consumption (three or more times per week) (Kusano-Tsunoh et al., 2001).

Autonomy and Eating with Peers

Locations where beverages are consumed without parental presence include school and friend's houses. Milk is always served through school lunch programs so parents can be assured that healthy beverages are offered and they can communicate beverage expectations. Schools can also support parent expectations by managing healthy beverage availability. An example of this occurred recently in New York City. Foodservice personnel removed high fat milks and flavored strawberry and vanilla milks from cafeterias and only offered low-fat or fat-free plain or flavored chocolate milks (Alberti et al., 2010).

Comparing 2009 milk purchases (low-fat or fat-free and plain or flavored chocolate) to 2004 milk purchases [whole and/or sweetened, flavored (strawberry and chocolate)], students drinking plain or chocolate milk daily saved 5,960 calories and 619 grams of fat over the school year (Alberti et al., 2010). These findings illustrate that restrictions on school beverage availability can provide substantial energy savings to children who have established milk-drinking habits.

EA beverage intakes are less regulated when children spend time in the homes of friends. Elementary schoolchildren (3-5th grade) commonly reported drinking soft drinks (n = 298; 52%) and fruit drinks (n = 141; 25%) at friend's houses at baseline (Roth-Yousey, Caskey, May & Reicks, 2007). Classroom-based education lessons (one weekly for six weeks) decreased the percentage of children reporting drinking fruit drinks by 4% ($p \leq .05$) (Roth-Yousey et al., 2007). Once more, the home and school environments can encourage healthy beverage consumption at meals by having liked beverages available and accessible. Moreover, school-based regulations and education can improve beverage consumption among EAs.

Parenting Styles and Practices

Four parenting styles have been described as authoritative, authoritarian, permissive or neglectful (Baumrind, 1991; Maccoby, 1984). Parenting styles, in theory, have uniform approaches across several parenting domains (Shucksmith, Hendry & Glendinning, 1995; Hoover-Dempsey et al., 2005) and differences between these styles are distinct by level of parent emotional response to child behavior (Baumrind, 1991; Maccoby, 1984). An example from nutrition is determining whether a parent or child requests that a specific food be consumed (Cullen et al., 2000). An authoritative parenting style allows requests from the child or parent whereas the authoritarian style only allows for parent requests (Cullen et al., 2000).

The original parenting styles research was initiated in the context of defining parenting discipline and the levels of parent-child interactions (Baumrind, 1965). The four interactive levels developed from Baumrind's (1965) research were 1) parental control to help a child internalize parent values and principles, 2) parental expectations that are set to a child's growth and maturation levels, 3) interactive parent-child communications; and, 4) parental warmth (expressed by feeling, talking and respecting a child) and involvement (expressed as seeing decision-making through a child's view and protecting a child's well

being). Hennessy, Hughes, Goldberg, Hyatt, and Economos (2010) differentiate general styles from parent feeding styles. Feeding styles encompass four interactive levels (Baumrind, 1965) and describe the strength of parenting restrictions and application of emotionally-involved parenting practices (Hennessy et al., 2010). Van der Horst, Kremers, et al. (2006) and vanderHorst, et al., (2007) suggested that the manner in which household eating rules are established and enforced should be moderate in restrictions (or obligations) with high involvement. Feeding styles are unique measures that hold promise for future research. Figure 2.1 portrays the potential parent-EA interactive relationships described by these studies and various contexts where beverage consumption changes could be made.

Parent Explanatory Factors

Cullen et al. (2000) defined interactive home environment measures as having potential associations with child food behaviors. General authoritative parenting practices included monitoring and nurturing characteristics. Food management practices at mealtimes included encouragement, a consequence factor involving pressure to eat, and provisional conditions or rewards when eating healthier foods (Cullen et al., 2000). Personal parenting practices included self-efficacy, modeling, and setting food rules and expectations (Cullen et al., 2000; Cullen et al., 2003).

Self-efficacy

Coleman & Karraker (1997) cited Bandura's self-efficacy theory (1989) related to parenting as "the level of specific knowledge pertaining to the behaviors involved in child rearing and the degree of confidence in one's ability to carry out the designated role behaviors." Self-efficacy tasks mentioned by Coleman & Karraker (1997, pp. 59-60) are similar to Baumrind's (1965) concepts of warmth and involvement. Factors which may improve parenting confidence across more than one skill include affirming capabilities, increasing knowledge about development between childhood and adolescence, reducing mental and physical stress, and becoming sensitive to cultural influences (Coleman & Karraker, 1997, p. 75). No studies evaluating parent confidence in buying healthy beverages and ability to manage parent-EA conflicts surrounding sweetened beverage rules and expectations were found.

Modeling

Availability and a parent's ability to role model healthy beverage consumption are interdependent variables (Birch & Davison, 2001). For example, if certain beverages are

available then it is inevitable that parents would be more likely to consume these beverages. Parents who prefer sweetened beverages cannot teach EAs to avoid these beverages because their parental example and expectations are not consistent. For example, if parents of 8 to 13-year-old children drank carbonated soft drinks on a routine basis, then their children were approximately three times more likely to report consuming carbonated soft drinks five or more times per week (Grimm, Harnack, & Story, 2004). Mothers modeling fruit drink intake increased the odds that their adolescents (12-13 years) would also do the same (Kaur et al., 2006). Older adolescents (9^{th} and 10^{th} graders) reporting higher modeling frequency of drinking sweetened beverages by family and friends were four times more likely to consume calorically-sweetened soft drinks than those who reported low modeling frequency by family and friends ($p < .05$) (Bere, Glomnes, teVelde, & Klepp, 2007). As age increases the odds of drinking SSBs also increases which makes role-modeling an important factor to consider in interventions.

Parents can also serve as roles models of healthy beverage intakes which is positively correlated with child and adolescent healthy beverage consumption. For example, mothers modeling milk consumption was strongly associated with their child (5-17 years) drinking milk (Johnson, Panely, & Wang, 2001). Mothers modeling fruit juice intake increased the odds that their adolescents (12-13 years) would drink these (Kaur et al., 2006). Modeling of other healthy beverages such as unsweetened tea and water were not reported, but warrants further study to increase the repertoire of parent role-modeling behaviors when children are present at home and away from home.

Rules and Expectations

Parents attempt to structure child behaviors at home through encouragement and rules (Rhee, 2008). Rules can establish when, how much and how often unhealthy foods and beverages can be consumed. Debourdeaudhuij (1997) identified foods categorized into one of two rule types: those that children are pressured to eat and those that have restrictions because they are unhealthy. Calorically sweetened soft drinks were considered under the category of having restrictions (DeBourdeaudhuij, 1997). Hupkens, Knibbe, van Otterloo, & Drop. (1998) found that 70% of mothers from various economic levels implemented a rule to restrict intake of calorically-sweetened beverages. Studies that described setting rules for milk intake in families were not available. Most restrictive rules

for adolescents involved SSBs and were motivated by health reasons. No studies were available reporting parent rules and expectations for intake of water.

Pressure to Eat and Involvement as Moderators

Parenting styles describe a broader application of demanding expectations and levels of guiding EA behaviors, whereas parenting practice styles describe how parents support, control (type and amount) and structure expectations. Hennessy et al. (2010) have reported that a parenting practice of restriction is moderated by an involved parenting feeding style and was associated with lower child weight. This association was not significant, however, and possibly influenced by the fact that the majority of parents and EAs were overweight or obese (76%, n = 75; 68%, n = 67, respectively) (Hennessy et al., 2010). Parent-child pairs represented multi-ethnic families (White, African-American and Hispanic) and continued to define distinguishable parental beliefs and behaviors motivating parents to overly pressure EA to eat or restrict foods and beverages. In the Hennessey et al. study (2010), the term "feeding style" described parent behaviors by "how much" and "how" the parent encourages EAs whereas specific feeding practices were measured using the Child Feeding Questionnaire (CFQ) by Birch et al. (2001).

Practices such as monitoring, restricting, and pressuring to eat can also be specific to meals and snacks. Parental pressure to eat and concern about weight (without a measure of involvement) was positively associated with weight in white and African American families with early adolescents (7-14 years) (Spruijt-metz, Lindquist, Birch, Fisher, & Goran, 2002). In contrast, parental pressure to eat certain foods was inversely related to weight in multi-ethnic and Mexican-American early adolescents (Robinson, Kiernan, Matheson & Haydel, 2001; Matheson, Robinson, Varady & Killen, 2006). Overall, these studies indicate parent involvement can be general statements or specific practices with healthy and unhealthy foods (including beverages).

Monitoring

Dishion and McMahon (1998) described monitoring as "stating rules, supervising where a child is, knowing the people with [him/her] and assessing the environment." The goal for monitoring beverage consumption is to promote healthy beverage intakes and evaluate whether communicated expectations and rules are met. Parent monitoring (unspoken or openly) evaluates how much and how often beverages are consumed and the most opportunistic time for monitoring is at mealtimes.

Weight Concerns as an Environmental Moderator

Thirty years after Baumrind's (1965) research, Johnson and Birch (1994) developed a questionnaire (CFQ) that included measures of parental monitoring. Using this questionnaire, no associations were observed between EA weight and monitoring intake by parents (Birch, Fisher, et al., 2001). Another cross-sectional study found if one parent was lean or a parent was concerned about child weight (4-11 years), parents changed the environment by not eating in restaurants, decreasing availability at home, and not eating unhealthy foods in front of the child (i.e., positive role-modeling) (Ogden, Reynolds, & Smith, 2006). These hidden behaviors were associated with less snacking on unhealthy foods by children and explicit control was associated with greater intake of healthy snacks (Ogden et al., 2006).

Today, parent emotional responses through monitoring may have different levels of emotional warmth and motivational efforts because of the high prevalence of obesity in the U.S. Motivations for parent monitoring are associated with parent adiposity (Gray, Janicke, Wistedt, & Dumont-Driscoll, 2010) and child's weight including children as young as preschool age (deLauzon-Guillain, Musher-Eizenman, Leporc, Holub, & Charles, 2009). Monitoring patterns developed at young ages can become ingrained and resistant to change because of EA or parent weight. Parents may plan to use the controlling childhood feeding measures into adolescence but EA feelings and involvement in decision-making would be missing. This may promote an oppositional EA behavior when making unsupervised choices.

Adjusting to EA Maturation and Independence

Coleman & Karraker (1997) described the transition between childhood and adolescence as a period when parents are expected to evaluate personal tasks that include role-modeling healthy lifestyle choices, making balanced decisions and establishing structure and discipline within the family setting. Adults responsible for purchasing groceries (including beverages) must feel confident their purchases will satisfy various taste preferences, stay within financial

resources and stand firm to adolescent resistance with expectations and rules. Parenting practices of monitoring, setting beverage restrictions or encouraging healthier beverages change through early adolescent transitions. Parent-EA pairs can interactively encourage internalization of health as an overarching reason for choices. Parents may also need to respond differently as EA maturity increases (Baumrind, 1965). A narrative review evaluating parent-adolescent communication when the adolescent has diabetes mellitus demonstrates the importance of fluidity with expectations and rules. Dashiff, Hardeman and McLain (2008) reported a theme associating positive health outcomes with parental helping, problem solving support, and adapting parental pressure to improve care as needed. Within this review, one study (Mellin, Neumark-Sztainer, & Patterson, 2004) described successful coping with conflicts by "setting limits and rules" and "changing [parent] definition of successful opportunities to allow adolescents to make their own choices about how to manage diabetes (Dashiff et al., 2008, p. 151)." The ability to make healthy choices when faced with the broad and numerous beverage choices that are available to EAs and parents would be strengthened with interactive behaviors promoting internalization of healthy choices.

Early Adolescent Explanatory Factors

Self-efficacy

Personal and behavioral factors among adolescents can alter availability in the home environment and consumption of beverages. For example, parents and adolescents believed that they ate fewer snacks and drank fewer soft drinks if the foods adolescents requested were healthier (de Bourdeaudhuij & van Oost, 2000). In addition, adolescents reporting lower self-efficacy to drink less soft drinks was negatively associated with higher frequency of self-reported soft drink intake (-.61, $p < .001$) (de Bourdeaudhuij & van Oost, 2000). There were disagreements between adolescent and parent perceptions of whether parents actually bought snacks adolescents requested (van Assema, Glanz, Martens & Brug., 2007). For example, 80% of adolescents (12-14 years) believed parents bought snacks when they requested them whereas parents believed that they only purchased snacks 50% of the time when their adolescent requested them (van Assema et al., 2007).

Interventions with adolescents will need to build self-efficacy and develop positive attitudes toward healthy beverages. This would also include experiences with purchasing healthy beverages.

EA Beliefs and Expectations

Adolescents viewed parent encouragement at home and healthy foods at mealtimes as supportive when adopting healthy lifestyle choices (Shepherd et al., 2006). Yet, educational research indicated that as children move from elementary school age to middle school, they become more independent and parents respond with less involvement and less motivation to participate in school activities (Green, Walker, Hoover-Dempsey & Sandler, 2007). Plausibly, parent-child interventions could encourage adolescent asking skills as a measure to increase parent motivations for involvement.

Martens, van Assema & Brug (2005) showed that changing attitudes was critical to changing eating behaviors. Positive attitudes toward the ease of eating breakfast increased this behavior (Martens et al., 2005). Breakfast meals that include a healthy beverage may provide a target for nutrition education. Personal and behavioral factors (increased self-efficacy to drink less sweetened beverages and make healthy beverage purchases) will also improve healthy beverage consumption in early adolescents.

The challenge in changing from sweetened beverages to unsweetened beverages involves taste preferences. Mothers ranked taste of greatest importance in choosing foods and beverages for themselves whereas they ranked health more important when choosing for their children (Gibson, Wardle, & Watts, 1998). The mother-EA mismatch was that EAs ranked taste as the most important factor when choosing food and beverages for themselves (Gibson et al., 1998).

Results from two international studies of adolescents (12-18 years) showed that adolescents perceived restriction or rules about soft drinks and that this perception was negatively associated with soft drink intakes (deBourdeaudhuij & van Oost, 2000; van der Horst et al., 2007). Unfortunately, the details of the restrictions (i.e., frequency, volume, whether the beverage was flavored, purchased size and/or allowed as between meal snacks) were not delineated. This limits interpretation of EA belief and attitude interactions with parenting practices based on these studies.

Parents as Mediators of Change

Four randomized controlled studies and one longitudinal study provided evidence that parental actions can influence sweetened beverage consumption behavior outcomes. As discussed in earlier sections addressing availability, provision of non-sweetened beverages

over approximately six months decreased sweetened beverage consumption by 289 calories/day, especially in adolescents (13-18 years) in the upper third of BMI measures (Ebbeling et al., 2006). In another study, researchers implemented an intervention called "America on the Move" with families having a child at-risk for or overweight (n = 92) (Rodearmel et al., 2007). Families randomized into this group were taught how to reduce sweetener calories by 100 calories per day and to increase walking by 2,000 steps per day. The control group (n = 100) was asked to self-monitor steps and sweetened food and beverage consumption practices (Rodearmel et al., 2007). Families were taught how to read labels (increased knowledge), replace sweetened food and beverages with non-calorically sweetened foods or beverages (increased low-calorie availability), given free samples of non-caloric sweeteners (decreased cost to increase availability), and taught the benefits of family mealtimes, especially eating breakfast together. School-aged children reduced daily intake by 100 calories or 78% during the 6-month period (Rodearmel et al., 2007) and maintained or slightly reduced BMI (67% vs. 65%). Fewer children increased BMI in the intervention group (33% vs. 47%) compared to the control group. Therefore, six monthly meetings, purchasing guidance, increasing non-caloric sweetener availability with parents and children, increasing mealtimes together and recommending small changes attenuated BMIs in children at-risk for or overweight.

A 10-year, multi-center, randomized clinical trial (Dietary Intervention Study in Children; DISC) did not specifically target sweetened beverage consumption but did provide heart healthy diet education for a parent and child (8-9 years), separately (Friedman et al., 2007). Sessions were initially held weekly, then monthly and for the final five years, quarterly. Meal preparation skills were modeled at every session. Children in the intervention and control groups increased soft drink intake over five years (Friedman et al., 2007). Female consumption increased significantly more than male intake (10.5% vs. 8.5 %) whereas milk intake decreased in both groups (Friedman et al., 2007). Outcomes from this study indicated that education about healthy beverage consumption should include specific guidance on volume of expected intake. For example, children in the intervention group consumed more fruit juice than the control group and researchers estimated this was likely due to perceived health benefits of fruit juice (Friedman et al., 2007). Direct substitutions of the same volume of 100% fruit juice for fruit drinks does not reduce caloric intake as both beverages have the same amount of carbohydrate. Clear beverage consumption messages were not the study

focus but future messages should include information about how to substitute low-calorie drinks and appropriate beverage portion sizes.

One middle school-based randomized control intervention study included sweetened soft drink messages with reduced dietary fat intake and increased physical activity and a parent component (Haerens et al., 2008). In the first year, parents were asked to attend a meeting to discuss healthy food, physical activity and health associations. Indirect contacts were made by distributing an interactive CD that provided specific suggestions on ways to decrease fat intake and increase physical activity. Parents received three newsletters per year. In the second year, parents only received three newsletter articles. At the end of year two, there were no increases in water intake or decreases in sweetened soft drink intakes compared to the control group. Researchers suggested that availability of healthy and unhealthy beverages at school and at home prevented significant change. Adolescents who did not complete the year-long study (25%) were slightly older and drank more soft drinks at baseline (Haerens et al., 2008).

Three studies enrolled families with an overweight or obese child. The study by Golley, Magarey, Baur, Steinbeck & Daniels (2007) was a randomized controlled trial using three parental groups with research blinding. Families were eligible to participate if they had a child who was 6-9 years old. One parent group was given the initial intensive training sessions (four weekly sessions lasting two hours) and then followed with weekly and monthly contacts through telephone sessions. A more intensive parent intervention group received initial intensive training and also included seven additional intensive sessions. A greater percentage of children in the control group increased standardized BMI scores compared to both intervention groups (Golley et al., 2007). However, there were no significant BMI changes over 12 months between groups.

A randomized controlled study in a clinical setting improved parenting practices and resulted in a 7% mean weight decrease in obese children (6-11 years) compared to a traditional intervention targeting knowledge, adherence to a low calorie diet (1,500 calories), and biweekly education sessions with a dietitian (Golan, Weizman, Apter, & Fainaru, 1998). Seven years later, 60% of children in the parent only intervention group were non-obese whereas 31% of children were non-obese (Golan & Crow, 2004). A longitudinal study (10 years) also demonstrated long-term effectiveness of parent and child involvement in weight loss (Epstein, McCurley, Wing, & Valoski, 1999). Overall, successful interventions designed

to reduce sweetened beverage intakes through the home environment in families require addressing availability, role-modeling and increasing mealtimes together. Valid and reliable research measures of parent self-efficacy to reduce SSB availability and increase water, milk and 100% fruit juice intakes are missing from the literature.

Early Adolescents as Mediators of Change

Early adolescents can be influenced to change eating behaviors through observing others (family, friends, and parents), receiving encouragement, and increased availability of healthy foods (Cullen, et al., 2001; Baranowski, et al., 1993). In response, early adolescents can develop asking skills for beverages with tastes they like and that are low- or non-caloric choices. EA interventions that increase knowledge of how to identify healthy beverage choices and consume recommended amounts in youth would focus on parent-child interactions where healthier beverages are discussed. They would also focus on ways to influence parental purchases and increase the likelihood that healthy, liked beverages are available and accessible.

Successful Parent-Early Adolescent Practices

Home environments may have sweetened beverages available alongside healthier beverages. Parenting practices that establish boundaries and negotiate rules and expectations according to EA maturity and autonomy will guide choices that become habits. The "dynamic nature of parent-adolescent" in social cognitive theory (McAlister, Perry, & Parcel, 2008) defines how a parent or adolescent can independently build self-efficacy (knowledge and skills) and then influence the beverage choices at home and while eating away from home. Availability inside the household environment and limiting calorically sweetened beverages away from home is crucial for developing healthy parent-adolescent beverage consumption habits. In this exchange, reciprocal "warmth and involvement" described by Baumrind (1965) is needed to motivate significant changes limiting sweetened beverages as part of an overall lifestyle. Practices that include role modeling, increasing liking of healthy low-calorie sweetened beverages, encouraging water intake, and mealtime frequency expectations are potential parent-child interactive opportunities to decrease sweetened beverage consumption.

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CHAPTER 3

Research Summary

Sugar-sweetened beverage consumption is prevalent in EAs and adults and in recent national surveys, ranked fourth and fifth by food/beverage item, respectively in contributing calories (NHANES 2005-2006 accessed at National Cancer Institute NCI, 2010d). Consumption of these extra, non-nutrient calories has been associated with weight gain in adults (Mozaffarian, Hao, Rimm, Willett, & Hu, 2011). Sweetened beverage (non-caloric and calorically-sweetened) consumption was also weakly associated with adiposity measures in adults and children (Vartanian, Schwartz, & Brownell, 2007). Therefore, unhealthy beverage consumption patterns may lead to risk of adiposity.

Obesity prevalence has dramatically increased in childhood and adolescence such that a new term of "high BMI" was used to name adiposity at or above the 95th percentile for BMI (Ogden, Carroll, Lamb & Flegal, 2010). Increased prevalence of obesity in U.S. adults mimics that of children and is alarming with 34% having a BMI $\geq$ 30 kg/m^2 (Shields, Carroll, & Ogden, 2011). Many health risks are associated with child and adolescent obesity (Camhi & Katzmarzyk, 2011; Rodriguez et al., 2006; Lamb, Ogden, Carroll, Lacher, & Flegal, 2011) and adult overweight and obesity (Lewis et al., 2009; Poirier et al., 2006). Therefore, addressing adiposity in parent-EA pairs within a family setting may lessen overall health risks.

Recent dietary guidelines set limits on added sugars but have limited application to volume and frequency of SSB consumption. Beverage labels are confusing and can be misinterpreted as healthy even though they may have more added sugar than the guidelines for parents or EAs. One 12-oz can of fruit or soft drink that contains 140 calories provides nine teaspoons sugar (Pennington & Douglass, 2005, pp. 3-10). Therefore, interventions are needed to clarify and provide guidance to parents and EAs about beverage ingredients to distinguish between healthy and unhealthy beverages and how to set expectations for EA consumption (volume and frequency). Guidance about reasonable sweetened beverage portion sizes and how often they should be consumed for parents and adolescents are currently complex and highly restrictive.

Parents need education to understand their SSB limits and role-model good choices for their children. A parenting practice which has been effective in promoting healthier food and beverage consumption is managing availability (Cullen et al., 2003; Kratt,

Reynolds, & Shewcuk, et al., 2000; Wind et al., 2006). A randomized controlled study increased home availability of 'diet' beverages for all family members which increased non-caloric beverage consumption in EAs (Ebbeling et al., 2006). Parent-EA agreement on beverage availability is essential for decreasing or replacing SSBs with healthier choices.

Effective parenting practices are based on a balance of involvement and setting boundaries. Parents are viewed as change agents (Forshee, Anderson, & Storey, 2008; Golan, Weizman, Apter, & Fainaru, 1998) and can influence beverage consumption habits at home through involvement. Parent behaviors include role-modeling, monitoring home availability and beverage consumption and addressing disagreements with interactive communication. Eating family meals together has been associated with increased milk consumption (Neumark-Sztainer et al., 2003).

Early adolescence is a time when parents allow more independent choices and accordingly, also an important time to promote healthy beverage choices. Peer beliefs and attitudes toward foods and beverages become more important. Therefore, interventions also need to include educational sessions with EAs to develop positive attitudes toward healthy beverages and to build self-efficacy toward making healthy beverage choices when with peers. This should include experiences with purchasing healthy beverages. Overall, there is a need to develop an effective intervention to reduce sweetened beverage consumption in early adolescents that would change behavioral choices and practices in the home environment using a parent-early adolescent approach.

Another missing component is the existence of evaluation tools measuring parent-EA feeding practices. Most parent questionnaires were developed for parents of younger children or evaluated fruit and vegetable availability (Rhee, 2008; Ventura & Birch, 2008). Only two validated evaluation tools were available to measure changes in family environmental factors and parenting styles and practices in adolescents (10-19 years) (Kaur et al., 2006, Bere, Glomnes, teVelde, & Klepp, 2007). Measurement of specific adolescent parenting practices included monitoring of sugared beverage intakes, restricting junk foods through accessibility, guiding intake and regulating unhealthy foods (Kaur et al., 2006). The second questionnaire measured parent-adolescent feeding practices regarding availability/accessibility and modeling of soft drink consumption (Bere et al., 2007).

There are several weaknesses in these evaluation tools. Neither instrument specifically evaluated parenting practices of setting rules and expectations and

encouraging family mealtimes. One evaluation tool measured perception of tracking adolescent consumption of "sugared beverages" from the perspective of parents but not adolescents (Kaur et al., 2006). The other evaluation tool measured adolescent perceptions of availability and role-modeling of diet or regular soft drink intakes but did not measure perceptions regarding other drinks such as water and milk (Bere et al., 2007). None of the identified studies validated evaluation tools regarding beverage intake based on responses from both parents and their adolescents.

Nutrition intervention programs to reduce SSB consumption with evaluation tools that measure intervention effects on parent and EA healthy and unhealthy beverage consumption are needed. Following a parent-EA intervention, secondary measures of importance include changes in parental self-efficacy, parenting beliefs and practices and early adolescent self-efficacy and beliefs about parent expectations and rules.

Problem Statement

Beverages make an important contribution to energy and nutrient intakes in early adolescents. The home environment, especially mealtimes, can provide many opportunities to promote intakes of healthy beverages such as water, milk and 100% fruit juices. Early adolescence is a critical age to establish healthy beverage choices and parents with poor beverage consumption habits of their own are not positive role models. When this occurs, home availability of SSBs promotes unhealthy beverage consumption in all family members.

Parenting practices used in childhood, such as limiting availability and restricting beverage types or amounts, are challenged during early adolescence. Many parents and EAs fail to distinguish healthy beverages choices from unhealthy beverage choices. This occurs because beverages are purchased or served in varying containers, flavors, and with added nutrients. The consequences of excessive energy consumption from beverages create health risks associated with weight gain during adolescence which may continue into adulthood.

Evaluation tools specific to parenting practices associated with beverage consumption have not been developed or validated. There are also no tools which have assessed water intake frequency, while most tools do not include a range of containers/sizes commonly purchased by EAs. Evaluation tools asking about EA self-

efficacy and perceived parenting practices used at home and away from home to manage SSB consumption are also missing.

Parent-EA perceptions can be oppositional. Understanding EA perceptions about their self-efficacy, beliefs and attitudes, and self-reported beverage choices away from home without parent supervision will provide information about how concepts regarding healthy beverages are internalized as EAs become more independent. Overall, interventions involving parent-EA pairs can provide dual support at changing SSB home availability and improve interactive conversations promoting beverage consumption.

Social Cognitive Theory Model

The social cognitive theory (SCT) (McAlister, Perry, & Parcel, 2008) describes a framework outlining how individual and socio-environmental factors interact to influence behavior. In this dissertation project, a nutrition education intervention was developed and implemented. Evaluation tools were used to test for changes in beverage intake in early adolescents and parents mediated by parenting factors of availability, mealtime frequency, role-modeling, and rules and expectations. Research activities addressed parent and EA self-efficacy and beliefs and attitudes regarding parenting practices.

Overall Purpose

The overall purpose of this research project was to develop, implement and evaluate a short term, pilot intervention based on social cognitive theory using parents as mediators to improve beverage consumption patterns of parents and their EA child. A non-control, pre-post test design was used. The project was completed in three separate steps with Steps 1 and 2 having overlapping periods. In Step 1, focus group discussions were conducted with low-income multi-ethnic parents or caregivers of early adolescents to inform the development of separate parent and EA intervention activities as well as parent-child pair intervention activities at home. In Step 2, separate evaluation tools for early adolescents and parents were developed and tested for reliability and validity. In Step 3, EA intervention activities were pilot tested, and following revisions, nutrition education intervention sessions were implemented for parents and early adolescents using the evaluation tools created and tested in Step 2.

Research Objectives by Step

Based on the literature review and using SCT, research objectives by step are:

In Step 1, research outcomes will be an improved understanding of how parents of 10-13 year-old children encourage and enable healthy beverage consumption (milk, water, 100% juice in moderation) by setting and enforcing expectations and rules.

In Step 2, research outcomes will be the development of two evaluation instruments (one for parents and one for EAs) that assess changes in self-efficacy, practices, and beliefs/expectations regarding intake of healthy beverages attributed to intervention effects, and establishment of reliability and convergent validity of the instruments.

In Step 3, research outcomes will include the development and implementation of a nutrition intervention to change beverage intakes in EAs and parents from low-income communities to be consistent with dietary recommendations.

Hypotheses

The primary hypothesis was based on changing beverage consumption habits. This was supported by complementary hypotheses for parents and EAs which included measuring personal and socio-environmental factors. The hypotheses are listed in the following paragraphs.

1. Primary hypothesis #1 (parent and EA): Parent and EA beverage consumption will change following a five-week intervention (with lowering SSB intakes and improving healthy beverage intakes).

2. Complementary hypothesis # 2 (parent and EA): Improvements will be observed in (a) parent and EA self-efficacy to choose healthy beverages and (b) parent and EA beliefs and attitudes.

3. Complementary hypothesis #3 (parent). Improvements in parenting practices will be observed in (a) setting sweetened beverage rules and expectations, (b) decreasing sweetened beverage availability and (c) offering milk at family mealtimes following a five-week intervention.

4. Complementary hypothesis # 4 (EA). EA practices will improve because of perceived parent changes in (a) sweetened beverage rules and expectations and (b) requiring EAs to drink milk at family mealtimes. EA intentions to choose healthy beverages over SSBs will improve.

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CHAPTER 4

Step 1 - Qualitative Focus Group Study with Parent or Caregiver

Article Type: Research Brief

TITLE: A qualitative study to explore how parental expectations and rules influence beverage choices in early adolescence

Article Type: Research Brief

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Objective: To understand parent beverage expectations for early adolescents (EAs) by eating occasion at home and in various settings.

Methods: Descriptive study using focus group interviews and the constant comparative method for qualitative data analysis.

Results: Six focus groups were completed with two conducted in Spanish. Participants (n=49) were mostly female (86%) and non-Hispanic white (49%) and Hispanic (33%). Parent expectations for EA beverage intake were based on health beliefs, EA preferences and cost, while those related to portion sizes and frequency varied by beverage type. Parents managed beverage expectations at home and away from home by making healthy beverages available and accessible, or by offering or only allowing specific beverages.

Conclusions and Implications: Results from this qualitative study involving a small sample of parents showed that expectations were influenced by practical concerns and managed primarily through availability practices. These issues could be addressed to improve EA beverage consumption.

Key Terms: Parent-early adolescent relations, Beverages, Qualitative research

CHAPTER 4
INTRODUCTION

Approximately 230 different types of beverages sweetened with sugar were consumed among a nationally representative sample of children and adolescents (National Health and Nutrition Examination Survey, (NHANES, 1988-2004) and a majority of these were consumed at home (Wang, Bleich, & Gortmaker, 2008). More recently, the average per capita daily energy provided from sweetened soda and fruit drinks almost doubled between childhood and adolescence with calorie contributions from sweetened soda and fruit drinks greater than milk (NHANES 2005-2006) (Lloyd-Jones, et al., 2009). Poor beverage consumption habits at home among early adolescents (EAs) can extend into young adulthood (Popkin, 2010; Demory-Luce, et al, 2004; Lien, Lytle, & Klepp, 2001) and are associated with future health concerns (Lien, Line, Leyerdahl, Toreson, & Bjertness, 2006; Must, Barish, & Bandini, 2009; Fiorito, Marini, Frances, Smiciklas-Wright, & Birch, 2009).

The micro-level nature of the home food environment is a setting where family interactions influence child behaviors (Rozenkranz & Dzewaltowski, 2008). For example, EAs consumed healthier beverages when parents encouraged EAs to drink milk at meals and limit soda pop (DeBourdeaudhuij, 1997; Debourdeaudhuij & van Oost, 2000). Parent-child discussions with approaches that negotiate expectations and rules are more likely to have better outcomes than "intrusive or psychologically controlling" patterns (Petit, Laird, Dodge, Bates, & Criss, 2001).

Studies that focus on parental expectations and rules regarding beverage consumption for EAs from a qualitative perspective are limited (Hart, Bishop, & Truby, 2003). More often studies address the quantitative relationship between rules and beverage consumption (van der Horst, et al., 2007). For example, restrictive parenting practices were inversely associated with sugar-sweetened beverage consumption among adolescents (van der Horst, et al., 2007) while an association was observed between soft drink intake and low restriction rules (Verzeletti, Maes, Santinello, & Vereecken, 2010) or permissiveness (Vereecken, Legiest, DeBourdeaudhuij, & Maes, 2009). These studies do not allow for an in-depth understanding of underlying motivations or practices used to monitor and enforce expectations and rules at home and away from home. The objective of this qualitative research study was to

understand how parents of 10-13 year-old children encourage and enable healthy beverage consumption (milk, water, 100% juice in moderation) by setting and enforcing expectations and rules.

METHODS

Participants and Recruitment

The inclusion criterion for participation was to be a parent or caregiver of a child within the age range of 10-13 years. Participants were recruited using fliers posted in middle schools and community centers in low-income neighborhoods within a large Midwestern metropolitan area. Recruitment methods were selected so the results could be applied to the development of an intervention program for low income families.

Participants completed a consent form and short demographic survey that included self-reported weight, height and ethnicity. Parent weight and height data were used to calculate body mass index (BMI kg/m^2) to ensure that participants with a range of BMIs were represented to eliminate potential bias. Parents were also asked to provide height and weight data for their child; however, a significant proportion (~25%) did not provide these data or indicated they could only provide estimates. Therefore, these data were not reported. Focus group interviews were conducted with 6 to 10 participants in each group. Participants were compensated for participation. The University of Minnesota Institutional Review Board approved the study.

Measures

A qualitative study design using focus group methodology outlined by Krueger and Casey (2009) was used with the social cognitive theory (SCT) as an organizing framework. The SCT framework has been used to describe how parenting factors (personal and behavioral) may influence the home environment (socio-environmental) (Bandura, 1986). SCT reflects the socio-environmental influence of shared mealtimes and home environment interactions with parents guiding food and beverage intake behaviors (McAlister, Perry, & Parcel, 2008, pp. 169-185). Focus group questions (Table 4.1) were developed to explore how parents enforced expectations and rules for beverage consumption at-home and away from home. The script was pilot-tested with one parent group. Minor word changes were made and two questions were deleted. An introductory question asked parents to identify beverages their EA liked based on a set of 10 cards with pictures of beverages. Water, milk, 100% fruit juice, iced tea, and lemonade were illustrated in glassware. Fruit and sports drinks

were represented in bottles. A generic can labeled as "soda pop" represented carbonated soft drinks and an adolescent caricature holding a generic covered beverage cup was identified as "Other beverage." Volume measurements were not identified on any card. Key questions then characterized parental expectations and rules for intake of beverages (type and amount) based on those identified as being liked by EAs. Exploratory probes were used to elicit detailed discussion regarding expectations and rules based on eating occasion and by setting. Final questions asked parents to identify changes in beverage consumption they would like to make at home. An ending question probed for parent interest and critique in a beverage label reading educational activity. All focus groups included questions about beverage consumption within environmental contexts of home, school and restaurants. Due to time constraints, questions pertaining to beverage consumption on weekends and at friend's houses were not asked in all focus groups and results are not included.

Procedures

Two researchers conducted focus groups in English and assisted with recording. An experienced, bilingual researcher conducted two focus groups in Spanish and two bilingual undergraduate students were recorders. All focus group leaders (n = 3) were trained in focus group methodology and the recorders were given instructions on expectations. Discussions were tape-recorded and transcribed verbatim with the Spanish-speaking discussion translated and transcribed by an experienced bilingual undergraduate student.

Data Analyses

The lead researcher (LRY) conducted line-by-line substantive and theoretical coding (Holton, 2007, pp.265-289) of one focus group transcript. The codes were given to a second researcher to apply to the first transcript. Researchers then discussed differences which resulted in a revised coding scheme. The remaining transcripts were independently coded by both researchers. Inter-coder reliability was evaluated by checking every 10^{th} statement on each focus group transcript. Percentage agreement was defined as number of agreements/agreements + disagreements. Inter-rater reliability ranged from 83% - 92% for each transcript. The constant comparative method was used independently by two researchers to identify conceptual themes (Holton, 2007; Miles & Huberman, 1994). Differences in themes generated were reconciled prior to summarization. Two researchers independently identified representative quotes and differences regarding selection of specific quotes as being representative were reconciled prior to inclusion in this paper. Researchers agreed that

saturation was achieved when no new major dimensions and/or information was evident after six group discussions.

Some differences in findings were noted between the English and Spanish-speaking parent groups. These differences were acknowledged where they occurred. Demographic survey data were analyzed using descriptive statistics (Statistical Analysis Software, version 9.1.3, 2003-2004, SAS Institute Inc, Cary, NC).

RESULTS

Six focus groups were conducted (n = 49) (Table 4.2). Parents were predominantly, non-Hispanic white or Hispanic females whereas the gender of EAs was equally represented by males and females (20 and 27, respectively, with two parents not providing this information). The majority of families had two or three adults in the household, 59% and 16%, respectively. Over half (53%) reported participating in a federally funded food assistance program. All weight categories including normal weight BMI < 25 (18%), overweight BMI ≥ 25 and < 30 (29%) and obese BMI ≥ 30 (41%) were represented in men and women with six participants not providing height and weight information.

Parent Expectations

Parents most often reported expecting the consumption of beverages such as milk, and water by EAs for health-related reasons (Table 4.3). Several participants wanted their EA to drink juice but only a few mentioned specific nutrients related to health found in juices or fruit drinks. Some parents did not have any limits for water consumption, while a few indicated that EAs were expected to drink 6-8 glasses of water daily. Expectations for fruit juice intake ranged from 0-2 glasses daily, while expectations for fruit drink intake ranged from “none” to “lots” daily. Parents described a variety of serving amounts such as “small glass,” “pouch,” “box,”, and “small drink bottle.” Some parents mentioned beverages served in a variety of glassware sizes while others did not quantify their expectations using beverage containers. There was general consensus that cost was related to the amount of various beverages that were expected to be consumed, with some parents being able to state exact prices per serving.

Expectations for EAs at breakfast and school lunches were slightly different between English- and Spanish-speaking parents. Spanish-speaking parents identified different flavors, such as papaya, pineapple and tamarind juices when they described their breakfast expectations. English-speaking parents expected juice intake but did not mention a flavor.

English-speaking parents most often expected milk intake at school lunch whereas Spanish-speaking parents expected either milk or juice intake. All parents expected that school lunch guidelines would include offering healthy beverages to children.

Parent Practices Used to Manage Expectations and Rules

In general, parents reportedly managed expectations and rules for EA beverage consumption at home by controlling availability of unhealthy beverages and increasing accessibility to healthier options (Table 4.4). Some parents intentionally purchased a preferred brand or added flavoring to beverages to improve acceptance of beverage choice availability. Examples of flavorings included individual packets of non-caloric fruit flavors, fresh lemon wedges, or flavored teas. Some parents managed mealtime and snack beverage choices by limiting choices between healthier options. This reduced some decision-making for their child and decreased the frequency of negative interactions at home. The most common choices were between traditional healthy beverages which included water or milk.

A majority of parents believed that water was not always "convenient" and required several actions that would improve likeability and accessibility. For example, parents believed EAs liked water better if it was cold, flavored, or portable. Acceptance of several beverages was related to being chilled to a cold temperature. Most parents indicated that when they ate with their children, they could compare EA intake to their expectations. However, some also indicated that their own poor role-modeling may have interfered with managing expectations for healthy beverage intake by EAs.

A majority of parents described that they permitted less healthy beverage choices in restaurants when they ate out as a family. They also perceived that their child drank sugar-sweetened beverages such as carbonated soft drinks, fruit and sports drinks when they were unsupervised and outside of the home (Table 4.5). In general, parents wanted to encourage EAs to make beverage decisions independently and preserve healthy parent-child communications. Overall, several parent practices promoted healthier EA beverage consumption at home but were absent when families ate meals together outside of the home. Most parents also perceived they were less effective in managing their expectations for healthy EA beverage intake with increasing early adolescent autonomy.

Intervention Program

In all focus groups, some parents indicated that intervention topics should teach "the goods and the bads." The "goods" were described as water, choice, calories, and vitamins.

"Bads" were defined as effects of beverage components on health (such as strong bones, teeth, and diabetes) and ingredients (such as caffeine, sodium, and 'sugar' which was a label for caloric or non-caloric sweetener). Most parents indicated their child needed to learn appropriate portion sizes and to read nutrition labels. Several parents suggested that ways to "prove it" to their child was to use visual aides. This topic was associated with parents wanting to "balance the quantities" of healthier beverages for EAs and themselves. A few individuals in each of the Spanish-speaking groups requested information about how to control sweetened-beverage intakes at parties or family gatherings within cultural expectations and preferences. In contrast, English-speaking participants wanted their EA to gain the ability to manage beverage costs and substitute healthy beverages in place of unhealthy beverages.

DISCUSSION

Recent studies have examined predictive associations between parental influences (including permissiveness and food rules) and soft drink consumption throughout adolescence (DeBourdeaudhuij & van Oost, 1997; Nickelson, Roseman, & Forthofer, 2010; Vereecken, Legiest, DeBroudeaudhuij, & Maes, 2009; Verzeletti, Maes, Santinello, & Vereecken, 2010). The focus of the current study was to explore similar types of influences from a qualitative perspective with parents of children in a narrower age range (10-13 years) involving a variety of beverages including those perceived by parents to be healthy and less healthy for children. While the viewpoints of a limited number of parents do not allow for direct application to a larger population, some insights were generated that could be further investigated in quantitative studies.

In the current study, parents viewed some sugar-sweetened beverages (primarily carbonated soft drinks) negatively due to personal beliefs about sugar and caffeine content. These perceptions may be similar to those influencing parental expectations and rules in quantitative studies where associations were observed between expectations and rules and soft drink intake. In adolescents, a negative association was observed between soft drink consumption and obligation rules (where positive food behavior was demanded in family settings) (DeBourdeaudhuij & van Oost, 1997). Similarly, a positive association was observed between soft drink intake and low restriction rules (Nickelson, Roseman, & Forthofer, 2010; Vereecken, Legiest, DeBroudeaudhuij, & Maes, 2009) or permissiveness (Verzeletti, Maes, Santinello, & Verecken, 2010). Perceiving a stricter family food rule was

also associated with decreased soft drink intake among adolescents from baseline to four-month follow-up (Ezendam, Evans, Stigler, Brug, & Oenema, 2010). In contrast, reviews of child feeding practices have generally shown that restriction was positively associated with palatable food intake, higher preferences for these foods, greater dietary disinhibition and eating in the absence of hunger (Faith, Scanlon, Birch, Francis, & Sherry, 2004;Ventura & Birch, 2008). The majority of studies reviewed were cross-sectional and involved children < 6 years-old where restriction was measured according to limiting access and making sure children did not eat palatable foods. The concept of parental restriction for older youth and adolescents has more often been represented in the context of family food rules and expectations. For example, fruit and vegetable intake was positively associated with a demanding family rule among 11 year-old children (Kristjansdottir, et al., 2006). Household eating rules regarding healthful foods among adolescents were also positively associated with fruit and vegetable intake and negatively associated with fat intake (Zabinski, et al., 2006). In general, family food rules and expectations have affected intake in the anticipated direction for older youth and adolescents. For example, when a positive food behavior was demanded, older children and adolescents complied by drinking less soft drinks (Ezendam, Evans, Stigler, Brug, & Oenema, 2010; DeBourdeaudhuij & van Oost, 2000) or eating more fruits and vegetables (Kristjansdottir, et al., 2006; Zabinski, et al., 2006).

Given the negative perceptions parents held regarding sugar sweetened beverages in the present study, they tended to report addressing environmental factors to control intake, including making only specific beverages available and accessible to EAs. While these findings were based on a small sample of parents, they were consistent with previous reports by others (Cluskey, Auld, et al., 2008; Cluskey, Edlefsen, et al., 2008; Edlefsen et al., 2008) based on data from individual interviews with 200 multiethnic parents of EAs across 12 states regarding calcium-rich foods. These researchers found that parents had positive perceptions regarding beverages such as milk and water for EAs, but were less positive about sugar-sweetened beverages. Parents indicated that milk should be an option at meals at home along with water or juice, similar to findings in the current study. This appears to be a positive parental practice given that intake of soda has been associated with a lower intake of milk at meals among middle and high school students (Ranjit, Evans, Byrd-Williams, Evans, & Hoelscher, 2010). Another qualitative study based on interviews with parents also indicated that sugary drink consumption among adolescents could be managed by controlling

availability or access, and providing alternatives (particularly water) (Hattersley, et al., 2009). Results from group interviews involving parents of low and high socioeconomic status (SES) indicated that high SES parents were more likely to report restricting soft drink intake in the home than parents from low SES groups whom were concerned with having pleasant family mealtimes and that an adequate quantity of food was consumed (Hart, Bishop & Truby, 2003). This disparity between parents based on SES was not apparent in the current study; however, data were not analyzed separately according to SES. While the cost of healthy beverages was reported to influence the type of beverages made available to EAs in the current study, at least half of the sample of parents may have been constrained in food choice by income. It may be helpful to further study how income affects beverage availability in the home for EAs so the issue can be addressed effectively in family nutrition education programs regarding healthy beverages.

Beverage expectations for school lunch in the current study were somewhat different between Spanish-speaking and English-speaking groups with a greater emphasis on fruit juice among Spanish-speaking parents. However, results from a previous school-based study indicated that juice consumption among EAs of different ethnicities was not different (Evans, Springer, Evans, Ranjit, & Hoelscher, 2010). Furthermore, national data from children and adolescents showed that while fruit intake was higher among Mexican-Americans compared to other race/ethnic groups, fruit juice intake was not significantly different (Lorson, Melgar-Quinonez, & Taylor, 2009). National data also showed that adolescents who consumed 6 ounces of 100% fruit juice or more daily obtained significantly more nutrients (potassium, magnesium, copper, and dietary fiber) than those who drank less than 6 ounces, indicating that fruit juice makes a significant contribution to diet quality (O'Neil, Nicklas, & Kleinman, 2010). Mothers of a 5-17 year-old child of Mexican descent indicated in interviews that the easiest approach to make their family's diet healthier was adding an extra glass of fruit juice because it was convenient and well-liked by family members (California Department of Health and Human Services. Public Health Institute, 2000). Mothers also mentioned they purchased a variety of juice flavors which is consistent with the findings from the present study. Therefore, while fruit juice intake did not differ in previous studies by ethnicity, results from other studies suggest that Spanish-speaking parents view 100% fruit juice as having positive qualities supporting the practices of making juice available and expecting intake by EAs at meals.

Findings in the present study also indicated most parents were somewhat ambiguous about maintaining control or monitoring intake of less healthy beverages when EAs were away from home. This could be an important consideration for parents given that families are eating meals away from home more often (United States. Department of Agriculture. Economic Research Service, 2011) and may contribute to greater intake of less healthy beverages. For example, soft drink intake was associated with fast-food restaurant use among middle school students (Wiecha, Finkelstein, Troped, Fragala, & Peterson, 2006). Requests for information from Spanish-speaking parents regarding controlling EA intake of sugar-sweetened beverages at family gatherings may be associated with concerns of overweight given the increased incidence among Hispanic adolescents compared to non-Hispanic White youth (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010) and therefore increased risk of type 2 diabetes (Li, Ford, Zhao, & Mokdad, 2009).

In the current study, little consistency in the description of beverage portion sizes was observed throughout all groups which may present a challenge regarding setting healthy beverage expectations for EAs. This challenge was reflected in survey results regarding labels for beverage products available in a large supermarket in a metropolitan area where 106 different calorically-sweetened, carbonated, flavored beverages were available with 31% available in multiple sizes (Walker, Woods, Rickard, & Wong, 2008). The limited understanding of appropriate beverage portion size could therefore be a focus of education for parents and EAs, particularly given the wide array of beverage types and sizes available.

In summary, focus group interviews were useful in generating insights into parental expectations for early adolescent beverage consumption in various settings that could be explored in further studies. Expectations were influenced by health concerns and cost, and managed by parental practices based on physical and socio-environmental factors.

Limitations

The current study represented a small, non-random convenience sample from one metropolitan area; however, the sample was fairly diverse based on participation in federally-funded food assistance programs and race/ethnicity. Male parents were under-represented; however, females typically have more responsibility for food preparation in the home than males (McLaren, Godley, and Mac Nairn, 2009) and are therefore more likely to be primarily responsible for beverage purchasing and preparation.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Nutrition professionals could consider strengthening educational programs for parents by clarifying the health properties of beverages and helping them set limits for EAs (amount and frequency) at home and away from home. Educational strategies that change parent perceptions about making water accessible may also be used to promote water consumption, especially among families with limited income.

The current study provided some insight into motivation underlying expectations and parental practices to manage expectations for beverage intake of EAs. This information could be used in longitudinal parent-child intervention studies addressing health concerns and cost, and availability and accessibility of healthy beverages at home and away from home, as well as positive role modeling to improve beverage intake of EAs.

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Table 4.1. Focus Group Question Sequence

Introductory
1. You each have received a set of 10 cards with pictures of beverages[1]. Would each of you go through the set of cards, think about your child, and find the beverages your child **likes** to drink.
2. Looking at the cards, in general, think about what beverages **you expect your child to drink** (or **believe** your child "should drink") throughout the day.
3. Keep the cards that show the beverages you believe your child **should** drink. What are the reasons you believe he/she should drink these beverages?
Key Questions
4. Let's talk more about your expectation for beverages that you expect or believe your child should drink. **How much** and **how often** should your child drink these beverages? a. **Beverage probes**: milk, fruit juice, water, if not mentioned b. **Clarify** as a rule or expectation? Negotiable or non-negotiable? c. **Beverage probe** for beverages without expectations (those not kept): Are there any situations where your child can drink these?
5. Now, let's look at your expectations about beverages in various settings. a. **Breakfast**: Describe what beverages your child may drink at breakfast. b. **School Lunch**: What are your expectations about what beverages your child will drink at school? c. **After-school snacks**: Tell me about what you beverages you expect your child to drink after school? d. **Restaurants**: What are your expectations and rules about beverages when your family is eating at a fast food or sit-down restaurant? e. **Friends House**: Are your expectations at a friend's house different than what you expect at home?
6. Of all the types of beverages we discussed, would you like to make changes at home in how much or how often your child drinks any beverage? What might keep you from doing this?
Ending
7. If we offer an educational program to children and parents, would you be interested in learning how to read beverage labels to identify the amount of added sugar in a serving size? Would your child be interested in this information?
8. What beverage consumption habits do you think a program should address?

[1]Beverage pictures included water, milk, 100% fruit juice, iced tea, and lemonade illustrated in glassware; fruit and sports drinks in bottles; a generic can as "soda pop" and an adolescent cartoon holding a generic beverage cup identified as "Other beverage."

Table 4.2. Demographic and Socio-economic Characteristics of Focus Group Participants (n = 49)

Characteristics	n (%)
Age group, y [a]	
18-30	7 (14)
31-40	22 (45)
41-50	14 (29)
51+	6 (12)
Sex	
Female	42 (86)
Male	7 (14)
Racial/Ethnic group [b, c]	
American Indian or Alaska Native	5 (10)
Black or African American	6 (12)
Hispanic or Latino	16 (33)
White	24 (49)
Employment [a]	
Student	1 (2)
Homemaker/house husband	13 (27)
Not employed	7 (14)
Employed part-time	11 (22)
Employed full-time	16 (33)
Retired	1 (2)
Education [a]	
Not completed high school	4 (8)
High school or GED	12 (25)
Some college or technical school	24 (49)
College or advanced degree	7 (14)
Participate in Federally-funded food assistance programs	
(WIC, free/reduced-price school lunch[d] and food stamps[e]) [f]	26 (53)
No participation	23 (47)

WIC indicates Special Supplemental Nutrition Assistance Program for Women, Infants and Children; y, years

[a] Percentages do not add to 100% due to missing data.

[b] Total percentage is greater than 100% due to individuals representing more than one ethnicity.

[c] Focus group members participating in Spanish-speaking groups indicated that all participants resided in the United States > five years.

[d] EA received free or reduced-price school lunch through the National School Lunch Program.

[e] Now known as the Supplemental Nutrition Assistance Program.

[f] Participant was only counted once even if participation was in >1 program.

Table 4.3. Main Focus Group Themes and Representative Quotes (1)

Concept	Themes	Representative Quotes
Parent health and cost beliefs and beverage expectations for EAs	Beliefs varied by beverage type.	(Milk) "*Build strong bones*"
		(Water) "*Hydrated," "Minerals," "Build healthy bodies," "Strong and alert," "Sharp in class*"
	Cost influenced availability of beverages in the home.	*"The fruit drinks are a LOT* [*emphasis by parent*] *cheaper than the real fruit juices."*
		"*Water is free*!"
		"You can buy 2-24 packs [of fruit drinks] *for a dollar and for one container of fruit juice, it's almost $4."*
		"I would like my daughter to drink 3 – 12 ounce glasses [of milk] *a day . . but during the summer because the cost of milk . . we can't do it in the summer."*

Table 4.4. Main Focus Group Theme and Representative Quotes (2)

Concept	Themes	Representative Quotes
Parent management of beverage expectations for EAs at home	Making beverages available controlled intake or encouraged independent choices.	*"I have all different things in my house like pop and soda. . .but it's only for certain occasions and they've learned that only on occasion, so it's not like everyday 'can I have pop?"* *"Try to make things available to them and if they make, you can't make their decisions for them at this age, you have to try to start letting go and try to let them make their own decisions."*
	Making selected beverages accessible promoted intake.	*"Put water in the refrigerator," "Wash and fill water bottle," "Filter water," "Add ice to a jug," "Add lemonade packets for flavor,"* *"Put tap water in empty water bottles to make it look like bottled water*
	Offering/allowing specific beverages at mealtimes promoted healthy beverage intake and decision making by EAs.	*"Do you want water or milk?"* *"If milk isn't the answer, water."*
	Intake was monitored at home meals.	*"Milk just equals meal."* *"You're looking at your kid drinking something healthy. As opposed to what they're drinking all day, now you know at least they're drinking something healthy"*
	Role modeling was not always consistent with expectations for EAs	*"I'd want them to drink more [milk] because I don't drink milk and I never have. And, that's something, I don't want them to grow up into, no drink milk."*

Table 4.5. Main Focus Group Theme and Representative Quotes (3)

Concept	Themes	Representative Quotes
Parent management of beverage expectations for EAs away from home	Availability and/or accessibility was dictated by away from home setting.	"*When we go out to eat, they can drink what they want. They like root beer, Coke, Hi-C, Sprite, because it's something special. We are not in the house where I tell them "drink this."*
		"*They have pop machines* [at the school]. *They have juice and water, Gatorade, and juice in the vending machine in the hallway-outside the hallway."*
	Offering or allowing specific beverages promoted unhealthy beverage choices for EAs.	"*I use soda pop as a treat.*"
		"*If we go to a restaurant, it's a treat. So you can have whatever you want to drink.*"
	Certain practices were used when parents were not able to monitor intake away from home.	(Unequivocal rule): "*You jus gotta say 'No' and if I catch you, you are grounded."*
		(Ambiguity) "*It's going to get down to the point where they aren't going to talk to you anymore* [in the context of telling you the truth]. *Cause I want mine to. Then all of sudden it gets to the point that, 'Okay, I just told mom I had four sodas so now the consequence is that I can't go back there [to friend's house] so then the next time he has four sodas, he's not going to say anything.*" [All parents in focus group agreed].
		(Acquiescence) "*They wanna be an 'adult' kind of, they want to be on their own and make their own decisions. Something like a drink, like an easy 'out.'*"

EAs –Early adolescents

CHAPTER 5

Step 2 – Evaluation Tool Development and Validation

TITLE: Development and testing of parent and early adolescent measures of beliefs, expectations and self-efficacy to drink healthy beverages within a family environment

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Introduction. Parent-early adolescent (EA) interactions change through growth and maturation when EA calorie needs also increase. Beverage choices made at this time can develop into habits which escalate concern regarding the increase in unhealthy beverage consumption during early adolescence. Parent practices are less direct and more successful through modifications of the home environment which may involve controlling availability and monitoring intake at mealtimes. Valid and reliable questionnaires measuring paired parent and EA beliefs/expectations, self-efficacy and practices regarding beverage intakes are not available to evaluate effectiveness of interventions to improve beverage consumption.

Objective. The objective of Step 2 in this dissertation study was to develop two measurement tools (parent and EA) that evaluated beliefs/expectations, self-efficacy, and parenting practices surrounding healthy and unhealthy beverages in the home and EA supervised and unsupervised eating occasions away from home.

Methods. Data were merged from three, independent, convenience samples of parent-EA pairs who were participants in after school programs in a large metropolitan area. Questionnaire data were available from a total of 146 parent-EA pairs (n = 81 from phase one of Step 2, n = 29 from phase two of Step 2, and n = 36 which included the baseline sample from Step 3). Principal components analysis with varimax rotation (PCA-V) was applied to parent (n = 26) and EA (n = 28) items in phase one to create EA self-efficacy and beliefs and expectation subscales and parenting practice subscales. In phase two, parent self-efficacy subscales were developed (n = 20 items using PCA-V) and test-retest reliability of the remaining parent and EA subscales was measured using Spearman's rank correlation. In phase three, internal consistency was measured using Cronbach α correlations for all subscales. Spearman-rank correlation was used to measure associations between parent or EA subscales with perceived beverage availability at home, frequency of eating meals together, and reported intakes of healthy and unhealthy beverages.

Results. Parent and EA self-efficacy subscales had internal consistencies ranging from .47 to .79 and most test-retest reliability coefficients (.63 to .74). All other subscale internal

consistencies and test-retest reliabilities were acceptable (α or $r_s \geq .69$) with parent role-modeling having the strongest psychometric properties. Parent self-efficacy subscales and an EA subscale were associated with their own milk intakes [(parent = milk, r_s .24 and .30, $p \geq .05$) and (EA = milk, r_s .45, $p < .001$)]. No parent self-efficacy or parenting practice subscales were associated with parent water intake. However, parent self-efficacy for health consciousness was associated with greater water and lower fruit drink intakes in EAs.

Parent responses regarding practices of encouragement, role-modeling and setting sweetened beverage (SB) rules were significantly correlated with self-reporting less soda pop availability (r_s = -.26, -.22, and -.20, respectively, all $p \leq .05$). Parent role-modeling and setting SB rules were negatively associated with parent report of fruit drink availability at home (-.27 and -.31, $p < .001$). Permissive parenting practices were related to higher self-reported soda pop and fruit drink availability (r_s = .32 and .27, $p \leq .001$), with greater EA fruit drink consumption ($r = 20$, $p \leq .02$), and lower EA water intake. EA self-efficacy and beliefs about meal-specific expectations were positively correlated with milk (r_s = .45 and .50, respectively; all $p \leq 0.001$) and water consumption (r_s = .18 and .23, respectively; $p \leq .03$). EA perceptions of eating meals together were not associated with their milk or water intakes whereas the frequency of parent-reported meals together was weakly correlated with their milk and water consumption. EA reported frequency of eating dinner meals together was moderately associated with soda pop consumption (r_s = .40, $p = .02$).

Conclusion. Parent and EA questionnaires developed in this study may be used for studies evaluating short term interventions targeting reciprocal parent-EA interactions at home and at mealtimes. Parent and EA personal self-efficacy have important associations with their own healthy beverage reports of home availability and consumption. Permissive parenting and SSB availability are important foci for parent-child interventions to increase water consumption. Eating meals together is beneficial for parent beverage intakes.

Introduction

Children and early adolescents are more likely to consume healthier beverages such as milk and fewer sugar-sweetened beverages (SSBs) when families eat meals together (Larson, Story, Wall, & Neumark-Sztainer, 2006; Woodruff, & Hanning, 2009). A meta-analysis of thirteen studies indicated that slightly over half (52%) of families with children and adolescents eat meals together 5 to 7 nights per week (Hammons & Fiese, 2011). Families that ate at least three meals together increased the odds by 24% of their children and adolescents having healthy dietary habits 2 to 5 years later (Hammons & Fiese, 2011).

A challenge during early adolescence is the negative influence of media advertising during family meals. A cross-sectional study presents data indicating 40% of families have the television on four or more times per week during the evening meal (Boutelle, Lytle, Murray, Birnbaum & Story, 2001). Seventy percent of low-income, African-American EAs reported daily sedentary activities of 2 or more hours (watching television, playing video games and computer time) and the same percentage reported drinking two or more soft drinks per day (Wang et al., 2006). Similarly, EAs were twice as likely to drink soft drinks every day if they reported watching television for 3 ½ hour or more (Grimm, Harnack, & Story, 2004) or over 14 hours/week (Platat et al., 2006). Media distractions during family meals may create a more permissive atmosphere that influences EA food and beverage choices at meals. The top four calorically-sweetened beverages providing the greatest total calories (in descending order) for children and adolescents were: soft drink, juice drinks, whole milk and juice (NHANES 1989-1994 and 1999-2006 analyzed by Fletcher, Frisvold, & Tefft, 2010). Therefore, negative beverage consumption behaviors established at younger ages raise concerns about continuing habits during early adolescence and increasing frequency and amount in young adulthood.

Dishion and McMahon (1998) identify three "dynamic, interrelated dimensions" of parent behaviors that are important in preventing health risks in families. These components are personal motivation, knowing and structuring a child's environment and managing child behaviors. For the latter, parent practices include giving rewards, setting limits and solving problem behaviors which occur in supervised and unsupervised situations. Parents can exert more direct control over food and beverage choices at home by managing beverage availability and accessibility. They also influence beverage intake in a less direct manner through role-modeling. When parents role model intakes of SSBs, healthy beverage

consumption among EAs and adolescents is discouraged (Bere, Glomnes, teVelde, & Klepp, 2007; Campbell, et al., 2007; Elfhag, Tholin, & Rasmussen, 2008). The practice of monitoring and setting restrictions for EAs are inter-related and can promote healthier beverage and snack intakes (Verzeletti, Maes, Santinello, & Vereecken, 2009).

Theoretical Framework

The social cognitive theory (SCT) (McAlister, Perry, & Parcel, 2008) describes a framework outlining how individual and socio-environmental factors interact to influence behavior. Applying this theory to beverage consumption of EAs would indicate that parents influence the home environment through both controlling and permissive strategies. Application of SCT would include supportive listening and interactive parent-child discussions to establish beverage rule contingencies when children are with peers and in multiple settings. Parents still need to establish boundaries for EA behaviors through rule-setting and communicating expectations but the appropriateness of these boundaries relies on parent-EA interactions and adoption by EAs. In addition to socio-environmental influences, personal characteristics such as self-efficacy and beliefs/expectations can influence beverage intakes.

Several studies have reported on the development and testing of instruments to measure psychosocial influences on healthy and unhealthy food or beverage choices from the perspectives of parents and EAs (Birch et al., 2001; Gattshall, Shoup, Marshall, Crane & Estabrooks, 2008; Lazarou, Kalavana, & Matalas, 2008; Verzeletti, Maes, Santinello, & Vereecken, 2009). Only one of these studies recruited parent-EA pairs (Gattshall, et al., 2008) but only examined parent perceptions of home availability and accessibility of sweets, parent role-modeling behaviors and policies to encourage low-fat, reduced sugar foods and beverages.

Research Purpose

The purpose of Step 2 within this dissertation study was to 1) develop two evaluation instruments (one for parents and one for EAs) to assess changes in self-efficacy, practices, and beliefs/expectations regarding intake of healthy beverages which could be attributed to intervention effects, and 2) measure reliability and convergent validity of the instruments in three phases. Specifically, the instruments were intended to assess:

1) Parent self-efficacy to purchase healthy beverages and limit sweetened beverages,

2) Parent practices to encourage and role-model intake of healthy beverages, permissiveness regarding SSB intakes and parent-EA conversations that communicate rules and expectations,
3) EA personal self-efficacy to drink healthy beverages at meals, after-school, at friends' houses and special events, and
4) EA perceived belief and expectations about sweetened beverages, meal-specific beverage expectations and expectations to drink milk at home and away-from-home.

Overall Methods

The development of parent and EA evaluation tools was completed in three phases. This process was comprised of three samples with phases one and two having independent population sampling. The final phase (phase three of Step 2) represented an overall sample that was created by merging the first two samples with baseline sampling taken from the intervention (Step 3). A schematic summary of phases in psychometric analyses is presented in Figure 5.1.

Participants and Recruitment

The study was cross-sectional using convenience sampling of parent-child (9-13 years) pairs from suburban areas of the Minneapolis/St. Paul metropolitan area and rural south-central Minnesota (Hutchinson and Marshall, Minnesota). Participants were recruited using fliers, verbal announcements, written announcements in bulletins or newsletters, personal contacts, and presentations at groups. Organizations and groups involved in this study included Cooperative Extension Service (e.g., Expanded Food Nutrition Education Program, Supplemental Nutrition Assistance Program [SNAP] Education, and 4-H), faith-based groups, after-school programs, sports teams, scouting groups, and adult groups. The University of Minnesota Institutional Review Board, Human Subjects Protection Committee approved this study as an added component to an existing multi-state calcium project being conducted across 10 states. Parental consent and child assent were obtained before participation.

Each Phase

Phase one was completed with a convenience sample recruited as part of the multi-state calcium project which used questionnaire data to determine associations between parenting practices and calcium-rich food and beverage intakes. A validated calcium-

specific food frequency questionnaire (Jensen et al., 2004) included frequency questions to measure consumption of common beverages. The multi-state project targeted parent-EA (10-13 years) pairs self-identifying as non-Hispanic white, Hispanic or Latino, or Asian or Asian American, or a mixture of any of these three groups. Other inclusion criteria for the multi-state project included being the primary food preparer for the child, having lived in the U.S. for at least 12 months and able to read/speak English. Race or ethnic recruitment goals reflected the distribution within Minnesota. Additional questionnaire items were developed in phase one and used to construct subscales measuring EA self-efficacy, parent and EA beliefs/expectations, and parent practices associated with beverage consumption at home and outside the home environment.

A new sample of parent- child pairs was recruited from December 2007 through May 2008 in phase two of Step 2. This phase was completed to evaluate tool stability over time. In addition, parent self-efficacy items were added to the parent evaluation tool.

In the third phase of Step 2, the baseline measures from Step 3 (a five-week intervention) were merged with the two samples obtained in previous phases. The final data set was used to test associations between SCT factors (self-efficacy, perceived beliefs/expectations and parent practices in varying environments) with reported availability and reported healthy and unhealthy beverage consumption.

Data Collection

Researchers met with parents and children to distribute questionnaires which were designed to be self-administered in community settings (community centers, churches, and libraries). However, in some cases when the primary food preparer was not in attendance, researchers also used mailed packets to collect completed questionnaires. When mailed packets were distributed, each packet contained consent forms for parents and assent forms for EAs. Instructions were given on the first page of parent or EA questionnaires. Parents took an average of 30 minutes to complete the questionnaire in individual or group settings. In return for participation, parents were given gift cards. Most questionnaires were completed in English but in Step 3, English to Spanish and English to Hmong translation services were available.

Each Phase

Phase one data were collected from parent-child pairs enrolled in a multi-state calcium project in 2006-2007. Of the questionnaires returned, four were unusable due to the child being 14 years or older (n = 3) or missing a parent questionnaire matched to a child. Principal components analysis was used to determine the makeup of subscales for parents and early adolescents based on these data.

In phase two, questionnaires from phase one were revised and parent self-efficacy items were added to the parent questionnaire. These packets were mailed to a new group of parents and children from December 2007 through May 2008. The purpose of this phase was to test stability of responses over time. When the initial questionnaires were returned, another packet containing a second questionnaire was mailed to each participant seven to fourteen days later. Three holidays extended postal delivery by one to two days. Three parent-child pair questionnaires were returned two to four months after completion of the questionnaire.

In the phase three, the data set represents samples from phase one and two and baseline measures of parent-EA pairs recruited for participation in a five-week intervention to improve beverage intakes in Step 3 (identified as "pre-intervention data"). In this sample, data from seven parent-child pairs were unusable due to missing parent questionnaire or the EA missing more than one session (n = 1). These questionnaires were collected August 2008 through February 2009.

In the combined (all phases) data set, convergent validity was measured by examining associations between responses to parent and EA subscales and perceived home availability, self-reported parent and EA beverage intakes, and frequency of family meals (Figure 2.1).

Parent Evaluation Instrument Development

Subscales to measure personal and behavioral parenting practices for beverage consumption at home and locations away from home were created by adapting parent items used in previous questionnaires or from previous parent research (Cullen et al., 2000). Research questions designed to ask adolescents about what parents do to promote fruits and

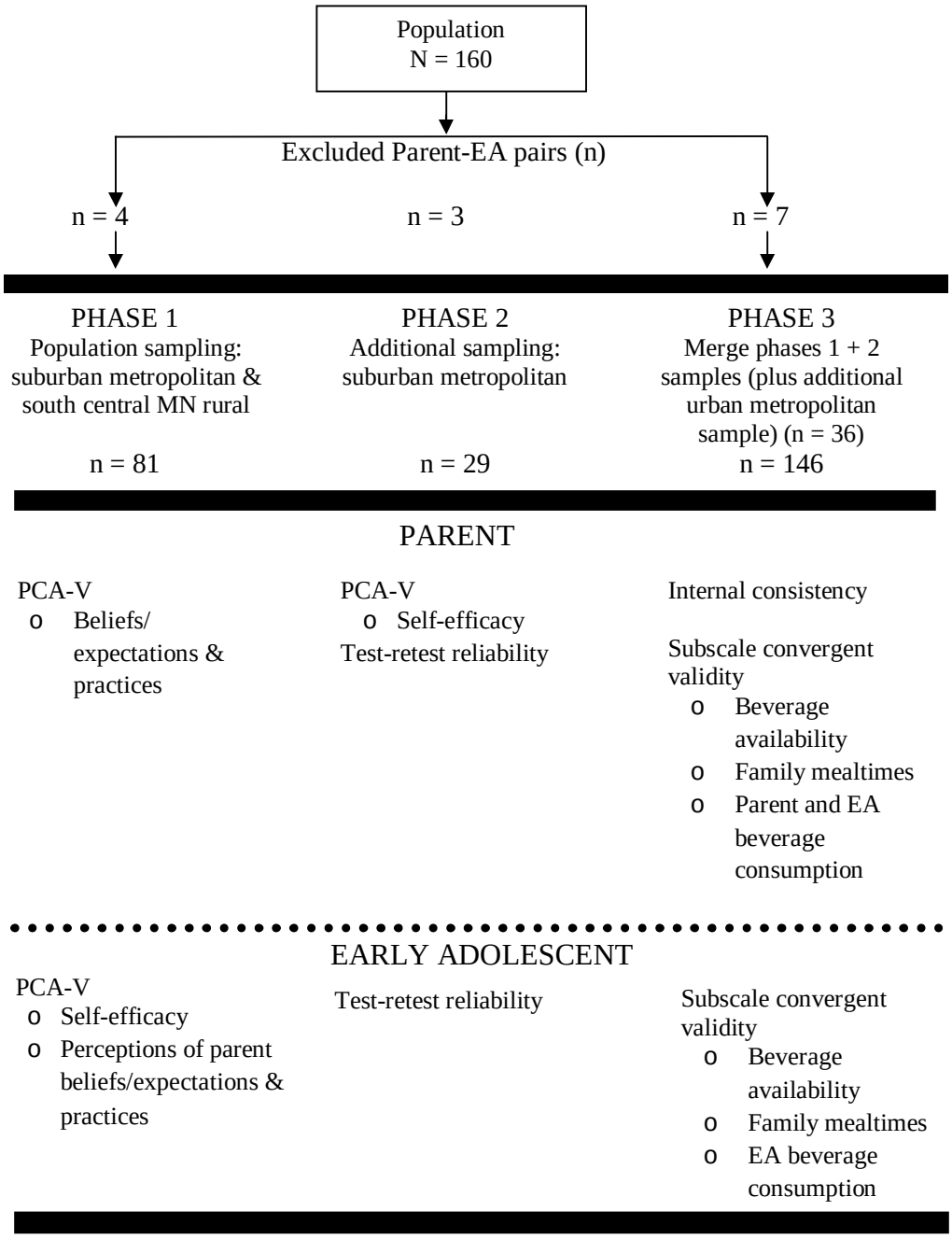


Figure 5.1. A schematic summary of phases in psychometric analysis.

Note. PCV-A = Principal Components Analysis with Varimax Rotation

vegetables were changed to ask parents if they have these behaviors for SSBs (Vereecken, van Damme, & Maes, 2005). Modifications included naming specific beverages (e.g., milk) or using broader beverage categories (e.g., healthy beverages) and providing definitions in the instructions.

Phase One

Response options regarding personal and behavioral parenting practices about beverages ranged from "agree a lot" to "disagree a lot" using a five-point scale. Coding responses ranged from "5" to "1" where the highest score of five indicated "agree a lot." The parent questionnaire had a Fleish-Kincaid Readability score of 7.2 and a reading ease score of 65%. This is slightly higher than suggested for readability for low-income clients participating in government food and nutrition education programs (Townsend, Sylva, Martin, Metz, & Wooten-Swanson, 2008). The parent beliefs and practices items used in phase one is found in Appendix A (pp. 217-221). Unused parenting practice scales are found in Tables C.1 and C.2 (pps. 259-260).

Phase Two

Parent self-efficacy statements were not developed for phase one. However, in phase two, ten statements (items) were created for parents regarding confidence in their ability to limit sweetened beverages based on experiences when they were a child, serving healthy beverages with specific foods and limiting purchases when stressed. Response options for self-efficacy statements ranged from "very sure" to "unsure" using a five-point scale. Coding responses ranged from "5" to "1" where the highest score of five indicated "very sure." See Appendix B for the original parent self-efficacy items (pp. 229-230). Unused parenting self-efficacy subscale is found in Table C.3 in the Appendix (p. 261).

Phase Three

The final analysis evaluated parent subscale associations with their beverage intake, their early adolescent's beverage intake, eating family meals together, and beverage availability. In this phase, a pre-intervention sample of parent-EA pairs was added into the data set. The final parent evaluation instrument implemented in phase three can be found in Appendix B (pp. 236-248). This instrument was also used in Step 3 (chapter 6).

Early Adolescent Evaluation Instrument Development

Phases One and Two

Measures for EA self-efficacy (n = 11 items) were developed by adapting items from physical activity and eating behavior scales (Baranowski, et al., 2000; Resnicow, et al., 1997; Sallis, Patterson, McKenzie, & Nader, 1988; Sallis, Pinski, Grossman, Patterson, & Nader, 1988) and response options ranged from "very sure" to "unsure." In addition, statements measuring EA beverage beliefs and expectations (n = 17) were developed from prior research (Cullen, et al, 2001; Neumark-Sztainer, Wall, Perry & Story, 2003). Response options ranged from "agree a lot" to "disagree a lot." The Flesch-Kincaid Reading level for the adolescent questionnaire was 7.0 with a reading ease of 65%, indicating adolescents, 13-15 years could easily understand and those 10-12 years would understand most sentences. Appendix A includes the evaluation tool developed for phase one (pp. 222-225). In phase two, the only addition to the EA instrument were questions measuring EA perceptions of beverage availability at home (Appendix A, p. 232).

Phase Three

Questions asking about eating meals together were added to the EA measurement tool in phase three. Five forced choice questions designed to assess which beverage choice EAs would choose in different social environments (e.g., when with friends, after school and home) were also added. These questions asked EAs to choose between two beverages (e.g., healthy and less healthy beverage) and can be found in Appendix B (p. 255).

EA questionnaires were translated into Hmong and Spanish and available if EAs requested. Only one Hmong EA required oral translation and one Spanish-speaking EA requested a printed questionnaire in Spanish to help with completing the questionnaire in English.

Measures Completed by Parents and Early Adolescents

In summary, parents completed home availability for unhealthy beverages in phase one using a five-point scale rating. Parents and EAs completed home availability questions in phase two (Appendix A, p. 233) and phase three (p. 249 and 255, respectively) using a four-point scale.

Parents also completed frequency of family meals (breakfast, lunch and dinner) in the national survey study in phase one. There were no questions asking about family mealtime frequency in phase two and family meal frequency questions were added on the parent and EA questionnaires in phase three. The five-point, monthly scale was simplified by reducing choices to four (Appendix B. pp. 245). Neumark-Sztainer, Wall, Perry, & Story (2003) reported successful use with parent -adolescent pairs.

Beverage Methodology

Parent-EA Beverage Frequency Measures

The questionnaire used to measure beverage intakes in phase one of this dissertation study was a questionnaire used in the multi-state project. This is a validated calcium-specific food frequency questionnaire (Jensen et al., 2004) and contains beverage questions asking about monthly to daily milk, fruit drink, orange juice, and soda pop consumption.

Healthy beverages. Responses options for milk had seven frequency choices and the lowest frequency was "never or less than once per month. " A water frequency question was not on the multi-state questionnaire. Therefore, the milk response options were used to ask parents and EAs about water consumption (Figure 5.2). These two beverages were considered healthy beverage consumption choices for all phases.

Unhealthy beverages. Unhealthy beverages evaluated by the multi-state study included soda pop and fruit drinks (Jensen et al., 2004). The questions about these beverages had six response options starting with "never or less than once per month" with a maximum frequency of "two more containers (can or glass) per day" (Figure 5.5). These frequencies were used in phases one and two. Similar to healthy beverage choices, the unhealthy beverage frequency responses were changed from monthly to "weekly to daily" consumption when pre-intervention data were collected for use in phase three (Figure 5.6).

Minor changes were made with water frequency choices in phase two by separating the response of "never" from "less than one bottle, glass or can" (Figure 5.3). This change was needed to explore if there were individuals who never drank plain water. For pre-intervention data collected for use in phase three, the healthy beverage frequencies were changed to weekly to daily frequency choices (Figure 5.4).

We would like to know about the beverages you drink and how often did you drink them in the past month (30 days). Please mark **ONLY ONE** answer for each question.

1. How often do you drink WATER [or MILK*]?

- O Never or less than one bottle, glass or can per month ***(30 Days)***
- O 1-3 bottles, glasses or cans ***per month (30 DAYS)***
- O 1 bottle, glass or can ***per week (7 DAYS)***
- O 2-6 bottles, glasses or cans **per week (7 DAYS)**
- O 1 bottle or glass ***per day***
- O 2 -3 bottles or glasses ***per day***
- O 4 or more bottles or glasses ***per day***

[*__Note.__ Milk container descriptions were carton or glass.]

Figure 5.2 **Phase one** monthly to daily frequency responses for healthy beverages.

We would like to know about the beverages you drink and how often did you drink them in the past month (30 days). Please mark **ONLY ONE** answer for each question.

1. How often do you drink WATER?

- O Never
- O Less than one bottle, glass or can ***per month (30 DAYS)***
- O 1-3 bottles, glasses or cans ***per month (7 DAYS)***
- O 1 bottle, glass or can **per week (7 DAYS)**
- O 2-6 bottles, glasses or cans ***per week***
- O 1 bottle, glass or can ***per day***
- O 2-3 bottles, glasses or cans ***per day***
- O 4 or more bottles, glasses or cans ***per day***

Figure 5.3 **Phase two** monthly to daily frequency responses for water.

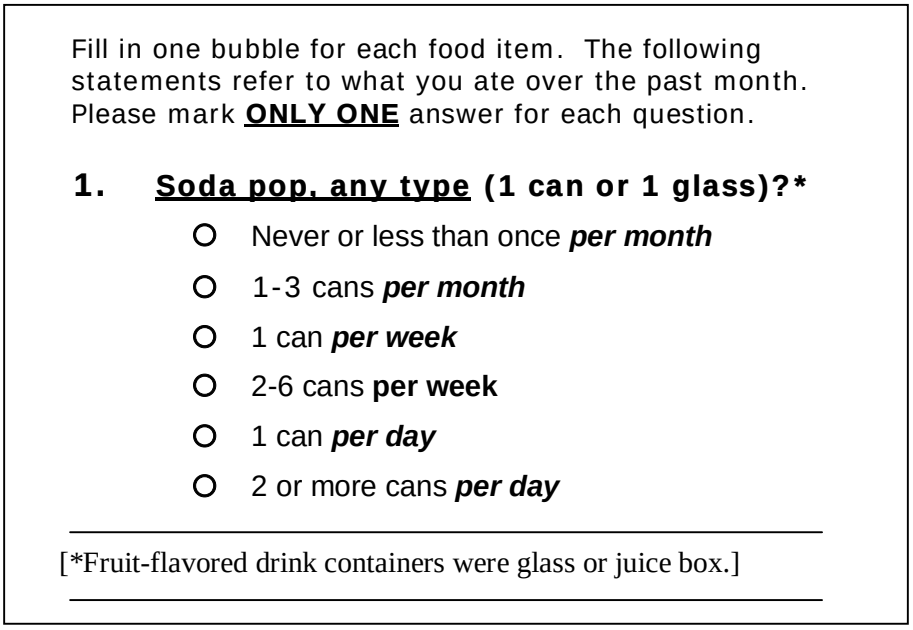
We would like to know about the beverages you drink and how often did you drink them in the past week (7 days). Please mark **ONLY ONE** answer for each question.

1. How often do you drink WATER [or MILK*]?

- O Never
- O Less than one bottle or glass per week
- O 1 bottle or glass per week
- O 2-6 bottles or glasses per week
- O 1 bottle or glass per day
- O 2 -3 bottles or glasses per day
- O 4 or more bottles or glasses per day

[*Milk container descriptions were carton or glass]

Figure 5.4 **Pre-intervention data collected for use in Phase three** and representative of weekly to daily frequency responses for healthy beverages (water or milk).



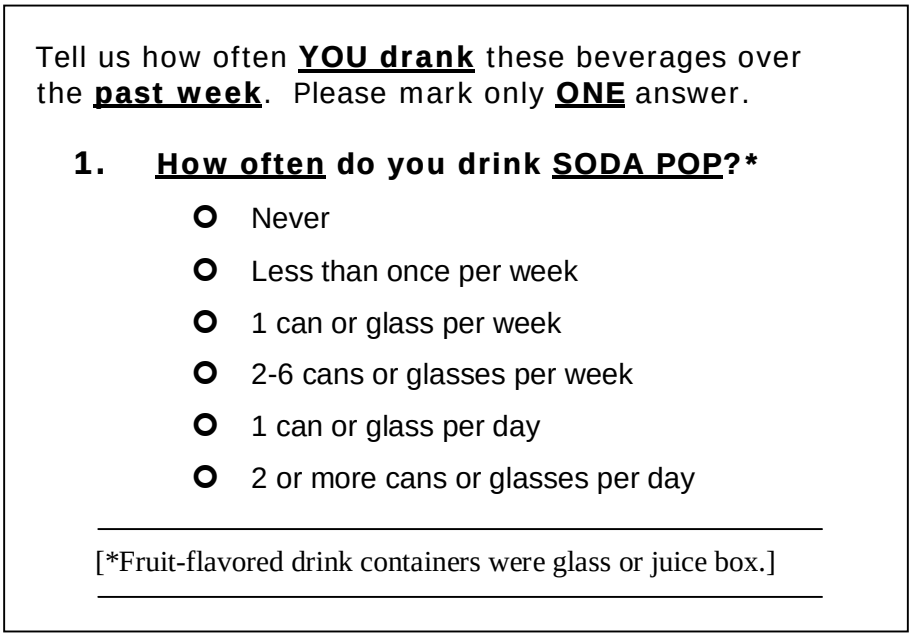
Fill in one bubble for each food item. The following statements refer to what you ate over the past month. Please mark **ONLY ONE** answer for each question.

1. Soda pop, any type (1 can or 1 glass)?*

- ○ Never or less than once ***per month***
- ○ 1-3 cans ***per month***
- ○ 1 can ***per week***
- ○ 2-6 cans **per week**
- ○ 1 can ***per day***
- ○ 2 or more cans ***per day***

[*Fruit-flavored drink containers were glass or juice box.]

Figure 5.5 **Phases one and two** monthly to daily frequency responses for unhealthy beverages (soda pop and fruit drink).



Tell us how often **YOU drank** these beverages over the **past week**. Please mark only **ONE** answer.

1. How often do you drink SODA POP?*

- ○ Never
- ○ Less than once per week
- ○ 1 can or glass per week
- ○ 2-6 cans or glasses per week
- ○ 1 can or glass per day
- ○ 2 or more cans or glasses per day

[*Fruit-flavored drink containers were glass or juice box.]

Figure 5.6. **Pre-intervention data collected for use in Phase three** and representative of weekly to daily frequency responses for unhealthy beverages (soda pop and fruit drink).

Statistical Analysis

All questionnaire entries were entered in duplicate to ensure accuracy. Statistical analyses were completed using the Statistical Analysis Software (version 9.1.3, 2007, SAS Institute Inc, Cary, NC). See Figure 5.1 for sample sources used in all three phases. Principal components analysis with varimax rotation was used to identify subscales based on items describing beliefs/expectations, parenting practices and self-efficacy. When a factor loading was > .40 and shared between two factors, the item was included with the factor where the loading was the highest. Component solutions were generated based on retaining items with eigenvalues greater than 1.0 (Nunnally, 1996, p. 362-428) and factor loadings > .40. A scree plot was used to identify whether all potential subscales were needed. Subscale scores were computed by summing the responses comprised within each of the subscales. Cronbach α coefficients were calculated to estimate the internal consistency of the subscales (Cronbach, 1951) and Spearman correlation coefficients measured item to total subscale correlation. Test-retest associations were also measured by Spearman correlation coefficients. Results were described according to obesity research guidelines (Baranowski, Klesges, Cullen and Himes, 2004).

Spearman correlation analysis was completed to examine parent and EA subscale associations with beverage intakes, perceived home availability, and frequency of family meals. Chi-square tests were used to test differences of proportions between samples on demographic measures of EA gender, age, and grade and parent measures of gender, age category, living arrangement, education and employment. Statistical significance was set at $\alpha < .05$.

Results

Parent demographic and economic indicators by phases are reported in Tables 5.1 and 5.2, respectively. Most parents in all steps were in the age range of 31-40 (39%) and 41-50 (52%) years. The majority of parents were women (81%) and most likely to be white (70%). Parent responses indicated that 80% of households had two or more adults in the home and 20% were eligible for free or reduced price school meals. Almost 2/3 reported they ate dinner together 5-7 days/week. Early adolescent demographic

characteristics are reported in Table 5.3. Mean age of early adolescents was 11.2 (±1.1 SD) years with slightly more males (52%) and mostly represented by non-Hispanic white (71%) and Hispanic (19%) race/ethnicities.

Before merging into one data set (all phases), a chi-squared analysis was completed to evaluate differences in descriptive data between samples (Tables 5.1, 5.2 and 5.3). Some parent and EA differences were observed between each of the three samples. For example, parents were more likely to be middle-aged (41-50 years) and better educated in phase one and two samples than parents in the pre-intervention sample used in phase three ($\chi^2_{4df} = 16.9$, $p < .01$ and $\chi^2_{6df} = 71.7$, $p < .001$, respectively). Early adolescents were less likely to be males in the phase two sample compared to the pre-intervention sample used in phase three ($\chi^2_{2df} = 12.8$, $p < .01$). The chi-squared test was deemed unreliable for small or zero cell counts within race and ethnicity for parents and EAs, and income measures reported by parents.

Beverage consumption frequencies by parents and EAs were determined as non-skewed (e.g., skewness between -2 and +2). However, volume measures (continuous data) for all beverages had SD greater than half of the mean, therefore the median (Md) and quartile range (indicated in brackets) are described. Parents reported a greater amount of water consumption compared to other beverages in a week [140 oz (108 oz quartile range)] which was equivalent to approximately 2 ½ glasses per day. Milk consumption of parents represented an 8-ounce glass per day [56 (132 oz quartile range)/week] and sweetened pop was 12 ounces per week [(78 oz quartile range)/week]. Of 142 parents reporting fruit drink consumption, 100 (75%) reported drinking one container or less per week and only 12 (8%) reported drinking these beverages daily resulting in a frequqency median of 1 and quartile range of 1. Median fruit drink amount was ~4 oz [3.7] per week. Therefore, the ability to examine associations between parent-reported fruit drink intake with parent self-efficacy and parenting practice subscales, home availability and family meals was limited.

Early adolescents also reported a greater amount of water consumption compared to other beverages in a week [140 oz (168 oz quartile range)] which was equivalent to approximately two glasses per day. Milk consumption represented an 8-ounce glass per day [112 oz (80 oz quartile range)/week] which was slightly more than parents (almost 1 ½ glasses of milk/day). EA median sweetened soda pop consumption was the same as parents but the quartile range was lower at 12 ounces per week [(42 oz quartile range)/week].

Table 5.1

Parent Demographics

Variable	Total		Phase 1		Phase 2		Step 3	
	n	P	n	P	n	P	N	P
Gender								
Female	116	81	66	82	24	83	26	76
Male	27	19	14	18	5	17	8	24
Age (years)								
18-30	7	5	1	1	0	0	6	17
31-40	57	39	22	28	15	52	20	56
41-50	75	52	52	65	14	48	9	25
51+	6	3	5	6	0	0	1	3
Living arrangement								
2 or more adults	130	90	73	71	26	93	31	86
1 adult	14	10	7	9	2	7	5	14
Race/ethnicity[a]								
African American	2	1	1	1	0	0	1	3
American Indian	10	7	1	1	0	0	9	26
Asian/Pacific Islander	8	6	2	2	0	0	6	17
White	102	70	73	90	29	100	0	0
Hispanic/ Latino	28	19	7	9	0	0	21	60

Note. Combined (total) sample (n = 146) represents participants from phase 1 (n = 81), phase 2 (n = 29), and pre-intervention data from Step 3 (n = 36). Sample sizes in the same row (by variable) or column (by phase and step) where n ≠ expected indicates data are missing.

P = percentage. [a]Participants could check more than one race or ethnicity.

Table 5.2
Parent Economic Indicators

Variable	Total		Phase 1		Phase 2		Step 3	
	n	P	n	P	n	P	n	P
Education level								
Not completed high school	23	16	3	4	0	0	20	56
High school diploma or GED	19	13	7	9	5	17	7	19
Some college/ technical school	48	33	26	33	14	48	8	22
4-year college degree	55	38	44	55	10	34	1	3
Employment								
Student/ homemaker	37	26	14	18	8	28	15	43
Not employed/ part-time	30	21	17	21	5	17	8	23
Full-time	77	53	49	61	16	55	12	34
Income measure								
WIC	17	12	4	5	0	0	13	37
SNAP	19	13	4	3	0	0	15	43
Free / reduced school lunch	29	20	8	10	1	3	20	57

Notes. Combined (total) sample size (n = 146), Phase 1 (n = 81), Phase 2 (n = 29), and pre-intervention data from Step 3 (n = 36). Sample sizes in the same row (by variable) or column (by phase or step) where n does not match expected indicates data are missing. P=percentage; GED=graduate equivalent degree; SNAP = Supplemental Food Assistance Program (formerly food stamps) WIC = Special Supplemental Nutrition Program for Women, Infant and Children.

Table 5.3

Early Adolescent Demographics

Variable	Total		Phase 1		Phase 2		Step 3	
	n	P	n	P	n	P	n	P
Gender								
Male	75	52	43	53	8	28	26	72
Female	69	48	38	47	21	72	10	28
Age (years)								
9-10	37	25	16	20	8	28	13	36
11	49	34	29	36	13	45	7	19
12	37	25	20	25	5	17	12	33
13	23	16	16	20	3	10	4	11
Race/ethnicity[a]								
African American	3	2	2	3	0	0	1	3
American Indian	18	13	5	6	2	7	11	34
Asian/Pacific Islander	8	6	3	4	0	0	5	16
White	101	71	68	84	28	97	5	15
Hispanic/Latino	27	19	9	11	0	0	18	56

Note. Combined (total) sample size (n = 146), Phase 1 (n = 81), Phase 2 (n = 29), and pre-intervention data from Step 3 (n = 36). Sample sizes in the same row (by variable) or column (by phase or step) where n does not match expected indicates data are missing. P = percentage.

[a]Participants could check more than one race/ethnicity.

Parent Subscales

Self-efficacy. All self-efficacy items on the parent questionnaire were tested in phase two (n = 29 questionnaires) and used to construct four subscales. Two subscales had moderate to strong test-retest reliability and described abilities limiting SSBs through "sweetened beverage discipline" (Table 5.4) and identifying healthy beverages labeled as "health conscious parenting" (Table 5.5). The variance explained from parent self-efficacy subscales was 46%.

Two other parent self-efficacy subscales described as "purchasing for planned occasions" and "healthy beverage availability expectations" had acceptable Cronbach-α correlation coefficients but weaker test-retest reliability (.50 and .47, respectively) in phase two. The "healthy beverage availability expectations" subscale was associated with EA orange juice consumption to confirm convergent validity. Since orange juice consumption was not measured in the pre-intervention sample in Step 3, and test-retest reliability was unacceptable, both subscales were not used in further analyses. See Table C.3 in Appendix C (p. 262) to view the unused parent self-efficacy items.

Parenting practices. Fifteen of 26 items made up six parenting practice subscales. Parenting practice subscales were characterized as (1) encouragement to consume healthy beverages (Table 5.6), (2) establishing sweetened beverage rules without a socio-environmental context (Table 5.7), (3) role modeling (Table 5.8), and (4) a permissive home environment allowing sweetened beverages (Table 5.9). These four subscales had internal

The remaining two subscales were (5) believing other family members support rules (Table C.2, p. 261) and (6) having daily and mealtime rules regarding milk intake (Table C.1, pp. 260) to view the unused parenting subscales. There were no associations between reported beverage consumption among parents or EAs and scores on these two subscales so they were not used in further analyses.

Table 5.4

Psychometric Properties of Parent Self-efficacy Subscale and Items: Sweetened beverage discipline

Subscale and Items	Factor loading[a]	Scale r_s[b]	M±SD[b]	Test retest Reliability r_s[a]
Sweetened beverage discipline[a,b]			4.1±0.9	.74***
Eigenvalue = 4.19				
Variance explained = 32.4%				
Cronbach α =.90				
1. Limit the sweetened beverages your child drinks even though you didn't have them when you were a child.	.86	.84	4.1±1.2	
2. Limit the amount of sweetened beverages you buy when you are stressed.	.85	.73	4.2±0.9	
3. Limit soda pop at meals when you eat away from home with family or friends.	.80	.73	4.0±1.1	
4. Limit the sweetened beverages your child drinks even though they were a treat for you when you were a child.	.78	.86	4.0±1.1	

Note. Self-efficacy statements were based on the preface: "*How sure are you that you can.*?" Response options were on a 5-point scale (5 = Very sure, 1 = Very unsure). Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability, r_s, is a Spearman correlation between the subscale score at baseline and 7-14 days later using the same questionnaire under similar conditions. EA = early adolescent, M = mean.

[a]Factor loading (standardized), test-retest reliability (r_s), eigenvalue, and variance explained are derived from phase 2 (n = 29). [b]Scale r_s, M±SD, and Cronbach α are derived from phase 2 (n = 29) and the pre-intervention sample in Step 3 (n = 36). ***p=.001.

Table 5.5

Psychometric Properties of Parent Self-efficacy Subscale and Items: Health conscious

Subscale and Items	Factor loading[a]	Scale r_s[b]	M±SD[b]	Test retest reliability r_s[a]
Health conscious parenting[a,b]			4.1±1.0	.68**
Eigenvalue = 1.03				
Variance explained = 13.4%[a]				
Cronbach α =.90				
1. Buy healthy beverages when they cost more than sweetened beverages.	.70	.84	4.1±1.1	
2. Tell the difference between 100% juice and fruit drink.	.72	.83	4.1±1.3	

Notes. Self-efficacy statements were based on the preface: "*How sure are you that you can.*?" Response options were made on 5-point scales (5 = Very sure, 1 = Very unsure). Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability, r_s, is a spearman correlation between the subscale score at baseline and 7-14 days later using the same questionnaire under similar conditions. M = mean.

[a]Factor loading (standardized), test-retest reliability (r_s), eigenvalue, and variance explained are derived from phase 2 (n=29). [b]Scale r_s, M±SD, and Cronbach α are derived from phase 2 (n=29) and the pre-intervention sample in Step 3 (n=36).

**p=.01.

Table 5.6

Psychometric Properties of Parenting Practice Subscale and Items: Encouragement

Subscale and Items	Factor loading[a]	Scale r_s[b,]	M±SD[b]	Test retest reliability$_s$[c]
Encouragement[a,b]			3.8±1.2	.80***
Eigenvalue = 6.4				
Variance explained = 16.8%				
Cronbach α = .96[a]				
1. I often encourage my child to drink healthy beverages.	.89	.92	3.9±1.3	
2. I often remind my child that he/she needs to drink healthy beverages.	.85	.90	3.9±1.3	
3. I often encourage my child to drink more water.	.72	.88	3.9±1.4	
4. I help my child choose a healthy beverage if he/she is packing a lunch for school.	.53	.81	3.7±1.4	

Notes. Parenting practice statements were based on the preface: "*What practices reflect what you do*?" Response options were made on 5-point scales (5 = Agree a lot, 1 = Disagree a lot). Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability, r_s, is a spearman correlation between the subscale score at baseline and 7-14 days later using the same questionnaire under similar conditions. M = mean.

[a]Factor loading (standardized), eigenvalue, and variance explained are derived from phase one (n=81). [b]Scale r_s, Cronbach α, and M±SD are derived from phase one (n = 8), phase two, n = 29 and the pre-intervention sample in Step 3(n = 36). [c]Test-retest reliability (r_s) is derived from phase 2 (n = 29).

***p=.001.

Table 5.7 Psychometric Properties of Parenting Practice Subscale and Items: Sweetened beverage rules and expectations

Subscale and Items	Factor loading[a]	Scale r_s[b]	M±SD[b]	Test retest reliability r_s[c]
Sweetened beverage rules\ expectations[a,b]			3.6±1.2	.78***
Eigenvalue = 5.4				
Variance explained= 15.8%				
Cronbach α=.94				
1. I expect my child to limit intake of sweetened beverages when I am not around.	.85	.81	3.8±1.4	
2. I expect my child to limit sweetened beverage intake after school.	.84	.83	3.7±1.4	
3. I have explained my reasons for making rules about sweetened beverages to my child.	.58	.69	3.7±1.3	
4. My child has to ask permission to drink sweetened beverages.	.55	.65	3.5±1.5	
5. I tell my child which sweetened beverage he/she is allowed to consume.	.53	.81	3.6±1.4	
6. I tell my child how much sweetened beverages he/she is allowed to consume.	.52	.81	3.6±1.4	

Note. Parenting practice statements were based on the preface: "*What practices reflect what you do*?" Response options were made on 5-point scales (5 = Agree a lot, 1 = Disagree a lot). Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability (r_s) is a Spearman correlation between the subscale score at baseline and 7-14 days later using the same questionnaire under similar conditions. M = mean.

[a]Factor loading (standardized), eigenvalue, and variance explained, are derived from phase one (n = 81). [b]Scale r_s, Cronbach α, and M±SD are derived from phase one, n = 81; phase two, n = 29 and the pre-intervention sample in Step 3, n = 36. [c]Test-retest reliability (r_s) is derived from phase two (n = 29). **p=.001.

Table 5.8

Psychometric Properties of Parenting Practice Subscale and Items: Parent role-modeling

Subscale and Items	Factor loading[a]	Scale r_s[b,]	M±SD[b]	Test retest reliability r_s[c]
Role-modeling[a,b]			3.6±1.2	.87***
Eigenvalue = 1.4				
Variance explained = 7.1%				
Cronbach α = .91				
1. I follow the same rules for drinking sweetened beverages that I expect my child to follow.	.86	.84	3.4±1.5	
2. I often drink healthy beverages to set an example for my child.	.61	.82	3.7±1.3	
3. I drink 100% fruit juices, milk or water to set an example for my child.	.51	.86	3.7±1.3	

Notes. Parenting practice statements were based on the preface: "*What practices reflect what you do*?" Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability (r_s) represents a Spearman correlation between the subscale score at baseline and 7-14 days later using the same questionnaire under similar conditions. M = mean.

[a]Factor loading (standardized), eigenvalue, and variance explained, are derived from phase one (n = 81). [b]Scale r_s, Cronbach α, and M±SD are derived from phase one, n = 81; phase two, n = 29 and the pre-intervention sample in Step 3, n = 36. [c]Test-retest reliability (r_s) is derived from phase two (n = 29). ***p=.001.

Table 5.9

Psychometric Properties of Parenting Practice Subscale and Items: Permissive parenting

Subscale and Items	Factor loading[a]	Scale r_s[b,]	M±SD[b]	Test retest reliability r_s[c]
Permissiveness[a,b]			2.6±1.3	.58***
Eigenvalue = 1.3				
Variance explained = 6.8%				
Cronbach α = .93				
1. I always have my child's favorite sugar-sweetened beverage available at home.	.86	.79	2.6±1.4	
2. I buy sweetened beverages because my child often asks for them.	.82	.80	2.6±1.4	

Notes. Parenting practice statements were based on the preface: "*What practices reflect what you do*?" Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability (r_s) represents a Spearman correlation between the subscale score at baseline and 7-14 days later using the same questionnaire under similar conditions. M = mean.

[a]Factor loading (standardized), eigenvalue, and variance explained are derived from phase one (n = 81). [b]Scale r_s, Cronbach α, and M±SD are derived from phase one, n = 81; phase two, n = 29 and the pre-intervention sample in Step 3, n = 36. [c]Test-retest reliability (r_s) is derived from phase two (n = 29). ***p = .001.

Early Adolescent Subscales

Self-efficacy. The EA self-efficacy component had 11 statements. All items were used to construct two subscales: personal discipline (Table 5.10) and situational choices (Table C.4, p. 258). Items in the personal discipline EA self-efficacy subscale included drinking milk with meals, and making alternative choices when with friends after school or with school lunch. The personal discipline EA self-efficacy subscale indicated good internal consistency with lower test-retest reliability and explained 14% of variance (Table 5.10). The Cronbach α correlation coefficient for the situational subscale was acceptable but test-retest reliability was below standards and ineffective in measuring associations between subscale scores with reported EA beverage consumption. Therefore, this subscale was not used in further analyses.

Beliefs and Expectations. Principal components analysis resulted in five EA subscales based on their perceptions about parent expectations and rules. The first three factors described whether parents had (1) sweetened beverage rules limiting intakes (Table 5.11), (2) meal-specific expectations (Table 5.12), and (3) milk amount expectations (Table 5.13). These subscales had high internal consistency and adequate test-retest reliability. The items represented in the three subscales explained 57% of variance of the belief and expectation constructs. The psychometric properties for early adolescent perceptions regarding parent-EA verbal interactions and home availability are reported in Table C. 5 and C.6 (pp. 259-260).

Table 5.10

Psychometric Properties of an Early Adolescent Self-efficacy Subscale and Items: Personal discipline

Subscale and Items	Factor loading[a]	Scale r_s[b]	M±SD[b]	Test retest reliability, r_s[c]
Personal discipline[a,b]			4.1±0.8	.63***
Eigenvalue = 1.6				
Variance explained = 14.1%				
Cronbach α = .83				
1. Drink healthy beverages after school.	.78	.76	4.0±1.1	
2. Drink healthy beverages when my friends are drinking sweetened beverages.	.69	.76	3.6±1.3	
3. Drink milk with meals instead of other beverages	.68	.79	4.0±.1.2	
4. Drink milk when served at school lunch.	.61	.47	4.6±0.8	

Notes. Self-efficacy statements were based on the preface: "*How sure are you that you can . . ?"* Response options were made on 5-point scales (5 = Very sure, 1 = Very unsure). Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability (r_s) is a Spearman correlation between the subscale score at baseline and 7-14 days later using the same questionnaire under similar conditions. EA = early adolescent; M = mean.

[a]Factor loading (standardized), eigenvalue, and variance explained' are derived from phase 1 (n = 81). [b]Scale r_s, Cronbach α, and M±SD are derived from phase one, n = 81; phase two, n = 29 and the pre-intervention sample in Step 3, n = 36. [c]Test-retest reliability (r_s) is derived from phase two (n = 29).

***p=.001.

Table 5.11

Psychometric Properties of an Early Adolescent Beliefs and Expectation Subscale and Items: Sweetened beverage rules

Subscales and items	Factor loading[a]	Scale r_s[b,]	M±SD[b]	Test retest reliability, r_s[c]
Sweetened beverage rules[a,b]			3.6±1.1	.53***
Eigenvalue = 5.4				
Variance explained = 25.0%				
Cronbach α=.91				
1. Limits the amount of sweetened beverages I can drink every day or week.	.84	.85	3.8±1.3	
2. Limits how often I can drink sweetened beverages	.83	.86	3.7±1.4	
3. Expects me to ask before I can drink sweetened beverages.	.83	.82	3.6±1.5	
4. Only lets me have sweetened beverages on special occasions.	.73	.74	3.3±1.4	

Notes. Beliefs and expectations statements were based on the preface "*What beverages do your parents (or caregiver) expect you to choose or drink?"* Response options were made on 5-point scales (5 = Agree a lot, 1 = Disagree a lot). Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability (r_s) is a Spearman correlation between the subscale score at baseline and 7-14 days later using the same questionnaire under similar conditions. EA = early adolescent; M = mean.

[a]Factor loading (standardized), eigenvalue, and variance explained are derived from phase 1 (n= 81). [b]Scale r_s, Cronbach α, and M±SD are derived from phase one, n = 81; phase two, n = 29 and the pre-intervention sample in Step 3, n = 36. [c]Test-retest reliability (r_s) is derived from phase two (n = 29). ***p=.001.

Table 5.12

Psychometric Properties of an Early Adolescent Beliefs and Expectation Subscale and Items: Meal specific expectations

Subscale and Items	Factor loading[a]	Scale r_s[b,]	M±SD[b]	Test retest reliability r_s[c]
Meal specific expectations[a,b]			3.8±1.1	.70***
Eigenvalue = 2.1,				
Variance explained = 22.6%				
Cronbach α = .89				
1. Expects me to drink milk with meals.	.85	.82	3.9±1.3	
2. Always serves milk with dinner.	.82	.81	3.6±1.5	
3 Expects me to drink milk when I buy school lunch.	.65	.69	4.2±1.2	
4. Helps me pack healthy beverages when I bring lunch to school.	.54	.73	3.6±1.4	

Notes. Beliefs and expectations statements were based on the preface "*What beverages do your parents (or caregiver) expect you to choose or drink?"* Response options were made on 5-point scales (5 = Agree a lot, 1 = Disagree a lot). Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability (r_s) is a Spearman correlation between the subscale score at baseline and 7-14 days later using the same questionnaire under similar conditions. EA = early adolescent. M = mean.

[a]Factor loading (standardized), eigenvalue, and variance explained' are derived from phase one (n = 81). [b]Scale r_s, Cronbach α, and M±SD are derived from phase one, n = 81; phase two, n = 29 and the pre-intervention sample in Step 3, n = 36. [c]Test-retest reliability (r_s) is derived from phase two (n = 29).

***p=.001.

Table 5.13

Psychometric Properties of an Early Adolescent Beliefs and Expectation Subscale and Items: Milk amount expectations

Subscale and Items	Factor loading[a]	Scale r_s[a,]	M±SD[b]	Test retest reliability r_s[c]
Milk amount expectations[a,b]			3.5±1.3	.73***
Eigenvalue = 1.1				
Variance explained = 9.7%				
Cronbach α=.94				
1. Expects me to drink a certain amount of milk each day before I can drink sweetened beverages.	.79	.92	3.5±1.5	
2. Expects me to drink a certain amount of milk each day.	.62	.88	3.6±1.3	

Notes. Beliefs/expectations statements were based on the preface *"What beverages do your parents (or caregiver) expect you to choose or drink?"* Response options were made on 5-point scales (5 = Agree a lot, 1 = Disagree a lot). Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability, r_s, is a spearman correlation between the subscale score at baseline and 7-14 days later using the same questionnaire under similar conditions. EA = early adolescent; M = mean.

[a]Factor loading (standardized), eigenvalue, and variance explained, are derived from phase one (n = 81). [b]Scale r_s, Cronbach α, and M±SD are derived from phase one, n = 81; phase two, n = 29 and the pre-intervention sample in Step 3, n = 36. [c]Test-retest reliability (r_s) is derived from phase two (n = 29).

***p=.001.

consistency reliability (Cronbach $\alpha > .90$) and moderate to high item to total subscale correlations and test-retest reliability. The variance explained from these four parenting practice subscales was 47%. Parental encouragement was only associated with orange juice intake of parents; however, this subscale was still used due to strong Cronbach α and test-retest correlations.

Subscale Associations with Home Availability

Parent

Scores on the sweetened beverage discipline self-efficacy subscale were positively associated with reported availability of flavored milk and diet soda pop ($p \leq .05$) (Table 5.14). Scores on parenting practice subscales (sweetened beverage rules, encouragement, and role-modeling) were negatively associated with parent perceptions of availability of regular soda pop ($p < .05$) (Tables 5.15 and 5.16). Parent sweetened beverage rules subscales were positively associated with perceptions of bottled water availability (Table 5.15). Parent perceptions of home availability of unhealthy beverages (e.g., soda pop and fruit drinks) were negatively associated with parent role-modeling subscale scores and positively associated with permissive practices subscale scores (Table 5.16).

Early Adolescent

Personal discipline self-efficacy subscale scores indicating confidence in the ability to drink milk outside the home were positively associated with EA perceptions of milk availability at home (Table 5.17). EA beliefs/expectations that parents had meal specific and milk amount expectations were also positively associated with EA perceptions of milk availability at home (Table 5.18). No other EA subscale scores were associated with perceived beverage availability at home.

Subscale Associations with Beverage Intakes

Parent

Parenting self-efficacy regarding having control over SSBs (sweetened beverage discipline subscale) and health conscious beliefs were positively associated with reported milk consumption by parents (Table 5.19). In addition, parent sweetened beverage discipline self-efficacy subscale scores were negatively associated with reported SSB intakes in parents and EAs ($p = .02$) (Table 5.20).

Contradictory associations between EA and parent healthy beverage intakes and parent role-modeling were observed (Table 5.21). For example, parent role-modeling was negatively associated with milk intake among EAs (Table 5.21) and negatively associated with soda pop intake among parents (Table 5.22). Finally, permissive parenting practices were negatively associated with EA water intake (Table 5.21) and positively associated with fruit drink intakes among EAs (Tables 5.22).

Table 5.14

Parent Self-efficacy Subscale Score Associations with Perceptions of Beverage Availability at Home

	Parent Subscales					
	Sweetened beverage discipline			Health conscious		
Beverages	n	r_s	p	N	r_s	P
Milk	65	.22	.08	65	.19	.12
Milk, flavored	65	.27	.03	65	.21	.08
Water, bottled	64	-.05	.71	64	.05	.70
Regular soda pop	65	-.23	.07	65	-.20	.12
Diet soda pop	65	-.24	.05	65	-.21	.09
Fruit drinks	65	-.05	.69	65	-.12	.32

Note. Sample represents participants from phase two (n = 29) and pre-intervention data from Step 3 (n = 36). Beverage availability responses were from parents and made on 4-point scales (4 = Always, 3 = Usually, 2 = Sometimes, 1 = Never). r_s = Spearman correlation.

Table 5.15

Parenting Practice Subscale Score Associations with Perceptions of Beverage Availability at Home

	Parent Subscales					
	Encouragement			Sweetened beverage rules		
Beverages	N	r_s	p	N	r_s	P
Milk	146	.06	.47	146	.01	.94
Milk, flavored	145	.05	.54	145	-.10	.22
Water, bottled	64	.16	.21	64	.32	.01
Regular soda pop	145	-.26	.002	145	-.20	.02
Diet soda pop	145	-.18	.03	145	-.11	.18
Fruit drinks	145	-.15	.06	145	-.27	.001

Note. Sample represents phase one, n = 81; phase two, n = 29 and the pre-intervention sample from Step 3, n = 36. Beverage availability responses were from parents and made on 4-point scales (4 = Always, 3 = Usually, 2 = Sometimes, 1 = Never). r_s = Spearman correlation.

Table 5.16

Parenting Practice Subscale Score Associations with Perceptions of Beverage Availability at Home

	Parent Subscales					
	Role-modeling			Permissiveness		
Beverages	n	r_s	P	n	r_s	P
Milk	146	-.05	.54	145	-.02	.82
Milk, flavored	145	-.09	.30	144	.05	.56
Water, bottled	64	.04	.74	64	.02	.82
Regular soda pop	145	-.22	.01	144	.32	.0001
Diet soda pop	145	-.12	.14	144	.01	.90
Fruit drinks	145	-.31	.0001	144	.27	.001

Note. Sample represents phase one, n = 81; phase two, n = 29 and the pre-intervention sample from Step 3, n = 36. Beverage availability responses were from parents and made on 4-point scales (4 = Always, 3 = Usually, 2 = Sometimes, 1 = Never). r_s = Spearman correlation.

Table 5.17

Early Adolescent Self-efficacy and Beliefs and Expectations Subscale Score Associations with Perceptions of Beverage Availability at Home

	EA Subscales					
	Self-efficacy			Beliefs and Expectations		
	Personal discipline			Meal specific expectations		
Beverages	n	r_s	P	N	r_s	P
Milk	63	.46	.001	63	.31	.01
Milk, flavored	63	.17	.19	63	.12	.37
Water, bottled	63	-.23	.07	63	-.11	.38
Regular soda pop	62	-.04	.73	62	-.09	.44
Diet soda pop	62	.05	.67	62	.19	.15
Fruit drinks	63	-.05	.72	63	.15	.24

Note. Sample represents phases one (n = 81) and two (n = 29). Beverage availability responses were from EAs and made on 4-point scales (4 = Always, 3 = Usually, 2 = Sometimes, 1 = Never). r_s = Spearman correlation; EA = early adolescent.

Table 5.18

Early Adolescent Beverage Beliefs and Expectations Subscale Score Associations with Perceptions of Beverage Availability at Home

	EA Subscales					
	Milk amount expectations			Sweetened beverage rules		
Beverages	n	r_s	P	n	r_s	p
Milk	63	.30	.02	63	.15	.23
Milk, flavored	63	.08	.51	63	.23	.07
Water, bottled	63	.08	.54	63	.12	.34
Regular soda pop	62	.18	.15	62	.20	.11
Diet soda pop	62	.17	.18	62	.06	.62
Fruit drinks	63	.10	.42	63	-.02	.89

Note. Sample represents phases one (n = 81) and two (n = 29). Beverage availability responses were from EAs and made on 4-point scales (4 = Always, 3 = Usually, 2 = Sometimes, 1 = Never). r_s = Spearman correlation; EA = early adolescent.

Table 5.19

Parent Self-efficacy Subscale Score Associations with Parent or EA Healthy Beverage Intakes

	Beverage Intakes Reported by Parent or EA					
	Milk			Water		
	n	r_s	P	n	r_s	p
Parent Subscales	Parent					
Sweetened beverage discipline	64	.24	.05	65	.09	.49
Health conscious	64	.30	.01	65	.11	.38
	EA					
Sweetened beverage discipline	60	.23	.07	61	.17	.18
Health conscious	60	.34	.01	61	.28	.03

Note. Sample represents phases one (n = 81) and two (n = 29). Milk (in a carton or glass) and water (in a glass or bottle) frequency responses were made on a 7-point monthly to daily scale [1 = Never or < once (container) /month, 2 = 1-3 (containers)/month, 3 = 1 (containers)/week, 4 = 2-6 (containers)/week, 5 = 1 (container)day, 6 = 2 or more (containers/day) and 7 = (4 or more containers)/day].

Note. Frequencies were recoded to a 6-point weekly to daily scale by coding the two monthly responses to 1 ≤ 1 (container)/week. The remaining responses were coded as 2 = 1 (container)/week, 3 = 2-6 (containers)/week, 4 = 1 (container)/day, 5 = 2-3 (containers)/day, and 6 = 4 or more (containers)/day]. EA = early adolescent;

r_s = Spearman correlation.

Table 5.20

Parent Self-efficacy Subscale Score Associations with Parent or Early Adolescent Unhealthy Beverage Intakes

	Beverage Intakes Reported by Parent or EA					
	Soda pop			Fruit drink		
	N	r_s	p	n	r_s	p
Parent Subscales	Parent					
Sweetened beverage discipline	65	-.28	.02	65	-.26	.03
Health conscious	65	-.22	.08	65	-.19	.13
	EA					
Sweetened beverage discipline	62	-.30	.02	61	-.11	.41
Health conscious	62	-.19	.14	61	-.31	.02

Note. Sample represents phases one (n = 81) and two (n = 29). Soda pop (can or glass) and fruit drink (glass or juice box) frequency responses were made on 6-point monthly to daily scales [1 = Never or ≤once (container)/month, 2 = 1-3 (containers]/month), 3 = 1 (container)/week, 4 = 2-6 (containers)/week, 5 = 1 (container)/day, and 6 = 2 or more (containers)/day)].

Note. Frequencies were recoded to a 5-point weekly to daily scale by coding the two monthly responses to 1 ≤ 1 (container)/week. The remaining responses were coded as 2 = 1 (container)/week, 3 = 2-6 (containers)/week, 4 = 1 (container)/day and 5 = 1 or more (containers)/day. EA = early adolescent, r_s = Spearman correlation.

Table 5.21

Parenting Practice Subscale Score Associations with Parent or EA Healthy Beverage Intakes

	Beverage Intake Reported by Parent or EA					
	Milk			Water		
	n	r_s	p	n	r_s	p
Parent Subscales	Parent					
Sweet beverage rules	145	-.18	.03	146	-.05	.51
Encourage	145	-.15	.06	146	.06	.47
Role-modeling	145	.02	.83	146	.01	.93
Permissiveness	144	.16	.06	145	.06	.47
	EA					
Sweet beverage rules	141	-.05	.58	142	.10	.22
Encourage	141	-.13	.11	142	.14	.09
Role-modeling	141	-.20	.02	142	-.06	.47
Permissiveness	140	-.06	.50	141	-.16	.05

Note. Sample represents phases one (n = 81) and two (n = 29). Milk (in a carton or glass) and water (in a glass or bottle) frequency responses were made on 7-point monthly to daily scales [1 = Never or < once (container) /month, 2 = 1-3 (containers)/month, 3 = 1 (containers)/week, 4 = 2-6 (containers)/week, 5 = 1 (container)/day, 6 = 2 or more (containers)/day) and 7 = 4 or more (containers)/day].

Note. Frequencies were recoded to 6-point scales. The first two monthly responses were collapsed to represent 1 = Never or < once (container)/week, and the remaining were recoded as 2 = 2-6 (containers)/week, 3 = 1 (containers)/week, 4 = 1 (container)/day, 5 = 2 -3 (containers)/day) and 6 = 4 or more (container)/day. EA = early adolescent; r_s = Spearman correlation.

Table 5.22

Parenting Practice Subscale Scores Associations with Parent or Early Adolescent Unhealthy Beverage Intakes

	Beverage Intake Reported by Parent or EA					
	Soda pop			Fruit drink		
	n	r_s	p	n	r_s	p
Parent Subscales	Parent					
Sweet beverage rules	146	-.04	.65	146	.19	.02
Encourage	146	-.04	.64	146	.12	.14
Role-modeling	146	-.21	.01	146	-.01	.98
Permissiveness	145	.03	.71	145	.09	.26
	EA					
Sweet beverage rules	143	.01	.95	141	-.05	.59
Encourage	143	-.01	.99	141	-.05	.50
Role-modeling	143	-.01	.95	141	-.15	.08
Permissiveness	142	.08	.35	140	.20	.02

Note. Sample represents phases one (n = 81) and two (n = 29). Soda pop (can or glass) and fruit drink (glass or juice box) frequency responses were made on 6-point monthly to daily scales [1 = Never or ≤once (container)/month, 2 = 1-3 (containers]/month), 3 = 1 (container)/week, 4 = 2-6 (containers)/week, 5 = 1 (container)/day, and 6 = 2 or more (containers)/day)].

Note. Frequencies were recoded to a 5-point weekly to daily scale by coding the two monthly responses to 1 ≤ 1 (container)/week. The remaining responses were coded as 2 = 1 (container)/week, 3 = 2-6 (containers)/week, 4 = 1 (container)/day and 5 = 1 or more (containers)/day. EA = early adolescent; r_s = Spearman correlation.

Early Adolescent

Personal EA discipline (self-efficacy) and EA beliefs and expectations regarding parental sweetened beverage rules and meal specific expectations were positively associated with EA milk intake (Table 5.23) and negatively associated with EA soda pop intake (Table 5.24). Personal discipline and meal specific rules subscale scores for early adolescents were also weakly associated with EA water intake (Table 5.23).

Table 5.23

Early Adolescent Self-efficacy and Beliefs and Expectations Subscale Score Correlations with Healthy Beverage Intakes

	Beverage Intake Reported by EAs					
	Milk			Water		
	N	r_s	p	n	r_s	p
EA Self-efficacy						
Personal discipline	141	.45	.001	142	.18	.03
EA Beliefs/expectations						
Sweetened beverage rules	141	.17	.04	142	.07	.38
Meal specific expectations	141	.50	.001	142	.23	.01
Milk amount expectations	141	.26	.01	142	.07	.35

Notes. Sample represents phases one (n = 81) and two (n = 29). Milk (in a carton or glass) and water (in a glass or bottle) frequency responses were made on 7-point monthly to daily scales [1 = Never or < once (container) /month, 2 = 1-3 (containers)/month, 3 = 1 (containers)/week, 4 = 2-6 (containers)/week, 5 = 1 (container)/day, 6 = 2 or more (containers)/day) and 7 = 4 or more (containers)/day].

Frequencies were recoded to 6-point scales. The two monthly responses were collapsed to 1 = Never or < once (container)/week, and the remaining were recoded as 2 = 2-6 (containers)/week, 3 = 1 (containers)/week, 4 = 1 (container)/day, 5 = 2 -3 (containers)/day) and 6 = 4 or more (container)/day. EA = early adolescent; r_s = Spearman correlation

Table 5.24

Early Adolescent Self-efficacy and Beliefs and Expectations Subscale Score Associations with Unhealthy Beverage Intakes

	Beverage Intake Reported by EA					
	Soda pop			Fruit drink		
	n	r_s	p	n	r_s	p
EA Self-efficacy Behaviors						
Personal discipline	143	-.25	.01	141	-.13	.13
EA Beliefs and Expectations						
Sweetened beverage rules	143	-.17	.05	141	.02	.78
Meal specific expectations	143	-.20	.01	141	-.09	.29
Milk amount expectations	143	-.12	.16	141	-.04	.61

Note. Sample represents phases 1 (n = 81) and 2 (n = 29). Soda pop (can or glass) and fruit drink (glass or juice box) frequency responses were made on 6-point monthly to daily scales [1 = Never or ≤once (container)/month, 2 = 1-3 (containers]/month), 3 = 1 (container)/week, 4 = 2-6 (containers)/week, 5 = 1 (container)/day, and 6 = 2 or more (containers)/day)].

Note. Frequencies were recoded to a 5-point weekly to daily scale by coding the two monthly responses to 1 ≤ 1 (container)/week. The remaining responses were coded as 2 = 1 (container)/week, 3 = 2-6 (containers)/week, 4 = 1 (container)/day and 5 = 1 or more (containers)/day. EA = early adolescent; r_s = Spearman correlation.

Beverage Associations with Eating Meals Together (Family meals)

Associations between reported frequency of family meals and beverage intakes provide conflicting results. When parents reported eating family dinners together more frequently they also reported higher milk intake (Table 5.25). When EAs reported eating more dinners together more often, they reported higher soda pop intake (Table 5.26).

Table 5.25

Family Meal Frequency Associations with Parent or Early Adolescent Healthy Beverage Intakes

	Healthy Beverages					
	Milk			Water		
	n	r_s	p	n	r_s	p
	Parent-reported					
Breakfast	110	.07	.43	111	.23	.01
Lunch	109	-.12	.20	111	.23	.01
Dinner	110	.19	.05	111	-.05	.56
	EA-reported					
Breakfast	31	-.25	.17	32	-.12	.52
Lunch	31	.12	.51	32	-.05	.79
Dinner	30	.30	.10	31	-.14	.45

Notes. Sample represents phases one (n = 81) and two (n = 29). Milk (in a carton or glass) and water (in a glass or bottle) frequency responses were made on 7-point monthly to daily scales [1 = Never or < once (container) /month, 2 = 1-3 (containers)/month, 3 = 1 (containers)/week, 4 = 2-6 (containers)/week, 5 = 1 (container)/day, 6 = 2 or more (containers)/day) and 7 = 4 or more (containers)/day).

Revised coding was as follows: the first two responses were collapsed to represent 1 = Never or < once (container)/week, and the remaining were recoded as 2 = 2-6 (containers)/week, 3 = 1 (containers)/week, 4 = 1 (container)/day, 5 = 2 -3 (containers)/day) and 6 = 4 or more (container)/day. EA = early adolescent; r_s = Spearman correlation

Table 5.26

Family Meal Frequency Associations with Unhealthy Beverage Intakes of Parents and Early Adolescents

	Unhealthy Beverages					
	Soda pop			Fruit drink		
	N	r_s	p	n	r_s	p
				Parent-reported		
Breakfast	115	.06	.54	115	.15	.12
Lunch	114	.06	.55	114	.21	.03
Dinner	115	.03	.73	115	.11	.26
				EA-reported		
Breakfast	33	.15	.42	32	-.20	.28
Lunch	33	.31	.08	32	-.05	.78
Dinner	32	.40	.02	31	-.13	.48

Soda pop (can or glass) and fruit drink (glass or juice box) frequency responses were made on 6-point monthly to daily scales [1 = Never or ≤once (container)/month, 2 = 1-3 (containers]/month), 3 = 1 (container)/week, 4 = 2-6 (containers)/week, 5 = 1 (container)/day, and 6 = 2 or more (containers)/day)].

Note. Frequencies were recoded to a 5-point weekly to daily scale by coding the two monthly responses to 1 ≤ 1 (container)/week. The remaining responses were coded as 2 = 1 (container)/week, 3 = 2-6 (containers)/week, 4 = 1 (container)/day and 5 = 1 or more (containers)/day. EA = early adolescent; r_s = Spearman correlation.

Discussion

Study measurement tools were developed to determine associations between parenting self-efficacy and practices and EA self-efficacy and beliefs/expectations with perceptions of home availability, frequency of family meals and reported parent and EA beverage consumption. The tools were designed using social cognitive theory which identifies constructs that may be operational when parents and children interact at home, especially at mealtimes (McAlister, Perry, & Parcel, 2008). Associations between self-efficacy beliefs among parents or EAs with greater milk consumption may indicate personal health-related beliefs of milk as a healthy lifestyle choice. Current results suggest that EA milk consumption is associated with perceived meal-specific parent expectations. These findings strongly support a parent role of setting choices at meals which regulate beverage type and amount. The existence of these associations indicates that application of social cognitive theory constructs may increase the ability to develop effective nutrition education programs to improve beverage intakes (Contento, 2007, chap. 4).

Parental practices may have a modest impact on EA behaviors because EAs are becoming more independent. However, two randomized controlled intervention studies that only targeted parents resulted in early adolescent weight loss (Golan & Crow, 2004; Golley, Magarey, Baur, Steinbeck, & Daniels, 2007). The validated parent-EA tools in the current study provide researchers with the ability to monitor changes in four important parental roles. These include changing the environment (i.e., controlling SSB availability), improving personal self-efficacy to build knowledge and skills, communicating SSB and healthy beverage rules and expectations, and monitoring mealtime behaviors. Parents have dual roles to make healthy choices for themselves while also monitoring EA beverage choices. This may explain the necessity for intensive parenting interventions and justify longer term parent exposure to education directed at monitoring beverage goals and rules in family eating and snacking environments.

Several approaches to measure intakes of were used in Step 2. Two beverages (water and flavored milk) were defined as healthy beverages for parent-EA pairs in the home environment. Mean water consumption was within two ounces of a national study using a similar tool with a 7-point response scale (never to $\geq$ 3 times/day) in adolescents and adults (Deschamps et al., 2009). Yearly water intake reliability was also confirmed by Deschamps et al. and indicated water intake responses in the current study could be

evaluated against parent and EA subscales. Unfortunately, a question about bottled water availability was missing in phase one which resulted in a smaller sample size; and in the total sample, there were no questionnaire items which addressed parent or EA self-efficacy, beliefs/expectations or practices regarding water intake. An association between parent perceptions of flavored milk availability and parenting self-efficacy regarding sweetened beverage discipline is an important finding because it suggests that parents may have flavored milk at home to limit intake of other sugar-sweetened beverages such as fruit drinks. Branscum, Sharma, Kay, & Succop (2010) found that 95% of low-income youth reported drinking SS-fruit drinks indicating that these beverages are commonly consumed by 8-10 year-old children. Children and EAs drink more milk when flavored compared to plain (Johnson, Frary, & Wang, 2002; Murphy, Douglass, Johnson, & Spence, 2008). Setting guidelines that allow availability of water and flavored milk as beverage options may strengthen parental abilities to encourage choices and establish healthier preferences during early adolescence.

EA perceptions of their frequency of eating meals together were not associated with their milk or water intakes whereas parent-reported meals together were weakly associated with their milk and water consumption. A disconcerting outcome was that EA reports of eating meals together was moderately associated with soda pop consumption which may be related to the frequency of eating meals away from home where SSBs are allowed (Verzeletti, Maes, Santinello, & Vereecken, 2009). Eating out, having food delivered, and serving soda pop may be ways that parents treat or reward EAs and encourage them to spend time with parents. Parenting practices which monitor intakes may be less frequent as family life is stressed with outside commitments. Therefore, the beverage intake associations observed in the current study may reflect actual intakes caused by program attendance but may not necessarily be typical weekly or daily intakes.

A spring break and a federal holiday occurred between the first and second administration of the questionnaires for most of the individuals which may have affected the reliability of reported sweetened beverage intakes based on the FFQ used. Additional challenges to the reliability of reported SSB intakes include the fact that they are consumed at mealtimes, offered in after-school programs and viewed as a reward at special family celebrations. The context and location where family meals are eaten and how often beverages are viewed as rewards or consumed because they are convenient may account

for differences in associations between parent and EA beverage intakes. Clarifying these situations may offer a better understanding of "contingency" rules when established rules or expectations are ignored to improve mealtime socialization (Campbell et al., 2010).

Economic challenges affect milk availability and family consumption (Glanville, & McIntyre, 2009). Therefore a limitation of the current study is the convenience sampling method which resulted in a majority of participants representing middle class non-Hispanic white parents. Hupkens, Knibbe, Otterloo, and Drop (1998) reported that proportionately more low income mothers did not restrict soda pop and allowed children to eat between meals. These results suggest that additional study is needed with low-income parents to further validate parenting subscales with respect to practices that limit intake of SSBs among EAs.

The validated questionnaires represent a beginning effort to measure changes in self-efficacy, beliefs/expectations and parenting practices regarding beverage intakes among parents and EAs. While several subscales within the instruments could be improved with further study to strengthen relationships with reported intakes, positive features of the instruments were recognized. The favorable psychometric properties of the various subscales, use of social cognitive theory to guide their development, and expected associations with perceptions of availability and reported beverage intakes indicate that these tools can be used to effectively evaluate benefits of parent-child paired interventions to improve beverage intakes.

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CHAPTER 6

Step 3 – Parent and Early Adolescent Intervention

Effectiveness of a five-week, after school parent-child pilot intervention to improve beverage intakes.

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Background

Sugar sweetened beverage (SSB) consumption has increased among adults and children over the past decade and has shown associations with health risks such as adiposity, diabetes mellitus and cardiovascular risks. National dietary guidelines establish limits on daily added sugar intake while social cognitive theory provides a framework to describe mediating roles of parent behaviors that encourage healthy beverage consumption and establish boundaries for beverages that pose health risks.

Objective

The objective of this study was to develop and implement a nutrition intervention to change beverage intakes in parent-child pairs to meet added sugar dietary recommendations. Following the intervention, parents and EAs will have personal self-efficacy to make healthier beverage choices with meals as a family and independently.

Methods

A convenience sample of 29 parent-early adolescent (EA) pairs participated in a 5-week intervention with sessions one, three and five having EA and parent attendance, and sessions two and four with EA attendance only. The primary intervention outcome was to reduce SS soft drink and fruit drink consumption and promote adequate milk and water consumption. Joint parent and EA sessions focused on beverage label-reading, eating family meals together, encouraging parent-child discussions about beverage expectations and rules, and improving knowledge and beverage availability and preparation. Secondary outcomes were parent and EA self-efficacy to make healthy beverage choices at home and away from home.

Results

Milk availability at home was high at baseline and did not change over the 5 week period. EA beverage intakes were not changed but parents reported a significant decrease in SS soda pop intake that was equivalent to about one can per week ($\underline{M}$ = 10.6 oz/week). No changes were observed in EA reports of their confidence in the ability to drink milk at meals and occasions with friends or in beliefs about parent rules and expectations for setting limits on SSBs and encouraging healthy beverage intakes.

Parents reported an increase in self-efficacy for behaviors that limited intakes of less healthy beverages in situations where SSBs would be given as treats or used as a reward ($p = .03$). Parents also significantly increased their personal subscale factor scores for knowing the differences between beverage types (juice or drink) and buying them even if they cost more ($p = .02$).

Conclusions

Parents had less intervention exposure but reported improved self-efficacy to identify and buy healthier beverages and reduced their soda pop consumption, whereas EAs did not decrease SSB consumption. These results suggest positive role-modeling and improved confidence on the part of parents. Overall, this pilot program provides ideas and challenges to begin changing the momentum to drink less SSBs and more milk and water.

Introduction

A wide variety of novel beverages exist in the marketplace today and early adolescents are enticed to try them through advertisements. For example, drinks represented 15-27% of the advertisements targeting multi-ethnic youth (Powell, Szczypka, & Chaloupka, 2007) and 54% of the advertised drinks were sugar-sweetened on Spanish language television (Thompson, Flores, Ebel, & Christakis, 2007). Some beverages can be viewed as healthy because of their thirst quenching properties and added nutrients associated with better health. Beverage ingredients may include sweeteners (non-caloric or caloric), energy compounds (e.g., caffeine), carbonated water, acids (e.g., phosphoric or citric) and added nutrients (singular or multiple vitamins, minerals, or probiotics). Water is the consistent ingredient in all choices but making decisions about which beverages provide health benefits can be difficult.

Traditional beverages recommended for consumption by early adolescents (EAs) to provide specific nutrients are 100% fruit juice, low-fat milk and water (American Academy of Pediatrics [AAP], 2001; Fulgoni, 2007; Greer, Krebs, & Committee on Nutrition, 2006; Sawka, Cheuvront, & Carter, 2005). Results from a longitudinal study with adolescents indicate that nutrient-fortified juices, soft drinks and energy beverages provided significantly more calcium, iron, vitamin A and vitamin C over time than other beverages (Sichert-Hellert & Kerstin, 2001). Fluid milk consumption has decreased in the past decade and currently represents only 25% of calcium intake per individual (United States. Department of Agriculture, Economic Research Service [ERS], 2010). Recommended beverages are now juxtaposed against novel beverages that advertise health, taste, and thirst quenching benefits.

Sugar-sweetened beverages (SSBs) are sources of energy and hydration, but these health benefits for children and adolescents may be overshadowed by excessive calories. For example, sweetened soft drinks represented 7-8% of total energy intake in early adolescents (9-13 years) residing in the U.S. (NHANES 2005-2006) (Lloyd-Jones et al., 2009) and 5% residing in Mexico (Perichart-Perera et al., 2010). For the latter, SSBs had a positive association with higher blood glucose and diastolic blood pressure. Poor beverage consumption habits have been associated with poor bone modeling in EAs (Libuda et al., 2008). Childhood consumption of sweetened beverages is associated with future risks of a higher percentage of body fat during early adolescence

(Fiorito, Marini, Francis, Smicklas-Wright, & Birch, 2009) and adiposity into adulthood (Baker, Olson, & Sorensen, 2007; Hu & Malik, 2010). A recent systematic review confirms associations between overweight among adolescents and increased risks of cardiovascular disease and diabetes mellitus in adulthood as well as early death (Barquera et al., 2008, deKoning, Malik, Rimm, Willet, & Hu, 2011; Reilly & Kelly, 2011). Overall, current beverage consumption habits are not consistent with recommendations to limit added sugars found in sweetened beverages (United States. Department of Health and Human Services. Department of Agriculture. Center for Nutrition Policy and Promotion, 2010).

Individualized dietary guidance to reduce added sugars from sweetened beverages has demonstrated promising health benefits in adults (Chen et al., 2009). In families, parents can contribute to interventions designed to change child behaviors. For example, teaching low-fat nutrition behaviors to children in a school environment was more effective in improving child dietary knowledge when parents were included compared with only a school intervention (Luepker et al., 1999). In Hispanic students, greater family participation has also been associated with higher self-efficacy to choose healthy foods (Nader et al., 1996). A family-based intervention that addressed availability and promoted more family mealtimes, increased knowledge about beverage substitutions for SSBs and reduced daily SSBs by 100 calories during a six-month period (Rodearmel et al., 2007).

Theoretical Framework

Social Cognitive Theory (SCT) provides a framework for intervention strategies involving parent-EA teaching opportunities that promote healthy lifestyle choices (McAlister, Perry, & Parcel, 2008). Parent practices that provide consistent availability and accessibility of fruit juices for early adolescents have been associated with greater intakes (Cullen et al., 2003; Hearn et al., 1998). Parent role-modeling of beverage consumption is dependent on availability (Birch & Davison, 2001) and applies to both healthy and less healthy beverages. For example, mothers reported milk consumption at home was positively correlated with their children drinking milk (Johnson, Panely, & Wang, 2001) and parent consumption of SSBs in the home was associated with higher SSB consumption among children and EAs (Grimm, Harnack & Story, 2004). Absent or inconsistent family meals (breakfast or evening) have been

associated with higher EA soft drink intakes (Kusano-Tsunoh, et al., 2001; Larson, Story, Wall, & Neumark-Sztainer, 2006; Neumark-Sztainer, Hannan, Story, Croll, & Perry, 2003; Siega-Riz, Cavadini, & Popkin, 2001). Making healthful beverages available, sharing family mealtimes and parent role-modeling are important practices that promote healthful beverage consumption among EAs. Research which solely emphasizes how to reduce SSB consumption at home or away from home, at meals or snacking incidents, and in routine or special occasions among parent-EA pairs is missing in published literature.

Parents are pivotal in changing the home environment and adolescents associate parents with offering and encouraging healthy foods (Shepherd et al., 2006). However, as children move from elementary school age to middle school, they become more independent with their learning and parents respond with less involvement (Green, Walker, Hoover-Dempsey & Sandler, 2007). This increased independence is a time when EAs are forming peer friendships while parent limits with expectations, rules and disciplinary consequences are ongoing (Denham, Wyatt, Bassett, Echeverria, & Knox, 2009; Maccoby & Martin, 1984). Beverage purchases and consumption by EAs when they are with peers is an area where parenting expectations may not be met. Therefore, the transition phase between dependence in childhood and independence in late adolescence is an important time for parents to actively communicate beverage consumption guidelines with an emphasis on moderating intakes of SSBs.

The purpose of this study was to develop and implement a nutrition intervention to change beverage intakes in EAs and parents from low-income communities to be more in line with dietary recommendations (United States. Department of Health and Human Services. Department of Agriculture. Center for Nutrition Policy and Promotion, 2005). The intervention was based on addressing individual and environmental factors that mediate healthful beverage intakes.

Methods

Research design and recruitment

A pre-post, parent-EA pairs design was used to measure changes in beliefs and perceptions of beverage rules and expectations at home and away from home, availability of selected beverages in the home and reported consumption of sugar-sweetened (SS) pop, fruit flavored sweetened drinks (lemonade, Kool-aid©, Hawaiian

punch and tea), milk (white or chocolate) and water. Families were eligible for inclusion if they had an early adolescent (9-13 years) and a parent or caregiver willing to participate. Participants were primarily recruited through low-income community recreation centers in the Minneapolis/St. Paul metropolitan area that had recently implemented an after-school physical activity program. Some parent and EA referrals were from local community clinics serving metropolitan area Hispanic populations. A few parent-early adolescent pairs were recruited through Extension and other community education programs being offered in the nine county metropolitan areas.

The study protocol was approved by the University of Minnesota Institutional Review Board. Researchers obtained informed consent from parents for their participation and assent of their child at the beginning of the first session. Parents and children completed a questionnaire at the beginning of the first session and immediately after the final session. Compensation was offered in the form of a $40 gift card after completing the survey at week one and a $25 gift card at the final session. Additional incentives were providing healthy beverages every week, a family meal for week 3 and a family celebration with healthy beverages prepared by their children.

Questionnaire development (Parent and EA Beverages 4 Health (B4H))

An initial review of published literature and existing evaluation instruments was completed prior to the development of the questionnaire. This included literature regarding interventions to increase fruit and vegetable intakes using the Social Cognitive Theory (SCT) framework (Vereecken, vanDamme, & Maes, 2005). Parent-child questionnaires regarding parenting practices and behaviors relevant to younger children were reviewed (Birch & Fisher, 2000; Birch, Fisher et al., 2001). An existing instrument designed to measure family socio-environmental factors that influence fruit and vegetable intakes was also reviewed (Neumark-Sztainer, Wall, Perry, & Story, 2003). Development and testing of psychosocial measures included in the questionnaires were described in chapter 5.

Measures

Demographic. Questions about demographic and physical characteristics for EAs assessed grade, age, household composition, gender, height, weight, ethnicity/race, and stomach aches after drinking milk (yes or no). Questions about demographic and physical characteristics of the parent or primary caregiver assessed age, gender, height,

weight, number of adults in household, education, employment, participation in federal assistance programs offered to low-income families, ethnicity and race, and stomach aches after drinking milk (yes or no).

Primary outcome. Weekly beverage intake frequency was assessed for four beverages: SS pop, fruit flavored sweetened drinks (lemonade, Kool-aid®, Hawaiian Punch® and tea), milk (white or chocolate) and water. The self-administered Harvard food frequency questionnaire (FFQ) (Rockett, Berkey, Field, & Colditz, 2001) was modified in several ways prior to inclusion in the parent and EA questionnaires to assess pre-post change in beverage consumption. Instructions were simplified by substituting monosyllabic words to improve clarity. The consumption reference period was changed from monthly to "per week" or "per day" to increase the likelihood of accurate beverage consumption recall by EAs (United States. National Institute of Health [NIH], Electronic access, 2007). Features of beverage containers (i.e., can or glass) and purchased sizes were added and examples provided by using brand names. A water intake frequency question was created using a time frame and glass or bottle serving containers similar to the Harvard food frequency questionnaire (Rockett et al., 2001). Food frequency questionnaires (FFQ) for beverages questions have been used successfully with Mexican EAs (Jimenez-Cruz, Bacardi-Gascon, & Jones, 2002). Furthermore, in adults, a study by Parr, Veierod, Laake, Lund and Hjartaker (2006) indicated the beverage reliability coefficient for a combined measure of orange juice, juice and soda pop intakes was .70 and .66 for Spearman and Pearson coefficients. For the current study, a beverage question asking about 100% fruit juice was eliminated based on misunderstanding of the differences between 100% fruit juice and fruit drinks in questionnaire development and pilot testing. A misclassification between 100% fruit juice and fruit drinks was also confirmed within the same age group in an international study (Martens, vanAssema, & Brug, 2005).

Personal self-efficacy. Early adolescents completed four self-efficacy questions that represented one subscale. Questions asked about their ability to choose healthy beverages in difficult situations such as "How sure are you that you can . . ." with response options based on a 5-point rating scale as follows: 5 = very sure, 4 = somewhat sure,
3 = neither sure or unsure, 2 = somewhat unsure, 1 = very unsure. Parents completed

six questions about self-efficacy that made up two subscales (sweetened beverage discipline and health conscious parenting) using the same response options. Responses were summed across the subscales to generate self-efficacy subscale scores.

Behavioral. Early adolescents completed 10 items measuring their beliefs and perceptions of parent expectations and limits at home and away from home. Parents completed 15 items related to beverage purchases for EAs, role-modeling healthy beverage consumption and talking about home environment rules and expectations that discourage or encourage beverage consumption. A 5-point rating scale was used for behavioral items for EAs and parents from 5 = disagree a lot to 1 = agree a lot. EA items were combined to form three subscales including sweetened beverage expectations and rules, meal-specific expectations and support, and milk expectations. Parent items were combined to form four subscales including permissive parenting style, encouragement, sweetened beverage rules, and parental role modeling. Subscale scores were based on the summed responses to items within the subscales.

Socio-environmental. Questions regarding home availability of 11 beverages were included for parents and EAs. The questions had been tested previously for reliability and validity in adolescents (Neumark-Sztainer, Wall, Perry, & Story, 2003). Based on this same survey, soft drink availability in the home had strong intraclass reliability (.77) and validity (.76) in parents of young children (Bryant et al., 2008). In the current study, parents and EAs answered "How often would you say these beverages are in your home?" for milk, flavored milk, regular soda pop, diet soda pop, 100% fruit juice, fruit drink, diet fruit drink, energy drink, and sports drink. The response choices ranged from 4 = "always" to 1 = "never."

Eating meals together. Questions asked about the frequency of family meals together (breakfast, lunch and dinner) were worded according to Neumark-Sztainer, Wall, Perry, and Story (2003). Parent questions were the same as EAs. Response options were "never," "1 or 2 days,"
3 to 4 days," "5-6 days" and "every day."

EA beverage choices. Five forced-choice questions were developed to ask about beverage choices as an after-school snack, for breakfast, eating dinner at home, eating at a fast-food restaurant, and if you were buying a beverage with your own money. For example, a question asked, "What beverage would you choose most of the

time with an after-school snack?" Two choices were offered (e.g., water or fruit drink) and EAs asked choose only one). This style was based on a previous study that assessed choices regarding fruits and vegetables (Birnbaum et al., 2002).

Intervention methods

Development and testing of parent-child intervention activities. Initial parent-child activities were developed and pilot-tested with children (5-12 years) within a summer education program held in a community education center in a predominantly Hispanic, low-income urban area. Take home activities and recipes were provided in two languages; Spanish and English, and had a Fleish-Kincaid Readability grade level of 6.6. Parent activities were developed using parent focus group results (Roth-Yousey, Chu, & Reicks, in press). Extension Community Nutrition Educators helped with English to Spanish translation when necessary.

Program development. The beverage nutrition intervention was criterion-referenced by reviewing established intervention program guides (California Department of Health Services. Public Health Institute, 2000; General Mills, 1994 [Spanish and English]; United States. Department of Agriculture. Food and Nutrition Services, 2003; United States. Department of Agriculture. Department of Health and Human Services. Centers for Disease Control. Department of Education, 2005; United States. Department of Health and Human Services. National Institutes of Health, 2005). Learning activities for parents and EAs were further developed using focus group results from multi-ethnic, low-income parents (Roth-Yousey, Chu, & Reicks, in press; dissertation chapter 4). Parent-child beverage conversation starters for week 3 were developed based on an education program addressing diabetes mellitus (Healthy Interactions, Inc., 2006).

Hydration recommendations from national dietary recommendations (Food and Nutrition Board, 2004) and the International Life Sciences Institute (Grandjean & Campbell, 2004) were used to develop beverage recommendations. Recommendations for adequate daily water intake ranged from 2.4-2.9 L/day (10-12.25 cups) for EA boys and 2.1-2.5 L/day (8-10.5 cups) for EA girls, respectively. A daily hydration recommendation was to drink eight and seven cups of beverages for male and female (9-13 years) adolescents, respectively. The overall theme for sessions was to drink at

least four glasses of water and drink water more often than SS beverages "when you feel thirsty."

The intervention program consisted of five sessions with sessions one, three and five with EA and parent attendance, and sessions two and four with only EA attendance. EA and parent goals are presented in Tables 1 and 2, respectively. The primary intervention outcome was to reduce SS soft drink and fruit drink consumption and to promote adequate milk and water consumption. Joint parent and EA sessions focused on beverage label-reading, eating family meals together, encouraging parent-child discussions about beverage expectations and rules, and improving knowledge and beverage availability and preparation (Tables 6.3, 6.5 and 6.7) for learning objectives and activities). Intervention activies with EAs were designed to help with preparing healthy beverages and making healthy beverage choices when with peers (Table 6.4 and 6.6),

Take-home resources and activities explored home, school and neighborhood availability and accessibility of beverages. Four home environment mediators were addressed in the curriculum including 1) promoting family meals together, 2) EAs asking for water and milk (including flavored), 3) parent role modeling healthy beverage intakes at home and away from home, and 4) parent communication with EA about expectations and rules. EAs prepared a beverage they liked that was suitable for breakfast to promote autonomy.

Program implementation. An educator (nutrition graduate student) conducted five intervention lessons with three groups of EAs and parents over a 5 week period between September, 2008 and March, 2009. Two bilingual nutrition educators assisted in translating sessions and educational handouts. Each session lasted 45-75 minutes and included a 15 minute "snack and healthy beverage" break. In one group, there was a break between sessions three and four because of a Halloween holiday. No intervention sessions were started or ongoing between December 20, 2008 and January 10, 2009.

Data analysis

Sample size estimates and analyses were completed with SAS software (version 9.2, 2010; SAS, Inc., Cary, NC). Statistical significance of $p \leq .05$ was accepted. Means and standard deviations were calculated for beverage intakes (oz/day). A paired

t-test was used to compare beverage intake (oz/day) for four beverages assessed at the first and final lessons. A non-parametric Wilcoxon matched-pairs signed ranks test was used to assess pre-post changes in parent and EA subscale scores for self-efficacy, beliefs and expectations, practices and perceived changes in home availability. This nonparametric approach compared the median of the changes or differences in matched pairs to zero. A McNemar's test was used to analyze the binomial, forced choice categorical variables where EA were asked to select between two beverage choices in various settings where no adult was present.

If 30 participants would enter this two-measure crossover study (post-intervention changes from pre-intervention beverage consumption), mean beverage consumption changes within individuals would decrease by 12 ounces. There would be an 80% probability that the study would detect a treatment difference at a two-sided, significance level ($p \leq .05$) if the true difference between measures was 9 oz. This was also dependent on the assumption that the within-patient standard deviation of the response variable was a 12 oz serving. Therefore, the goal was to recruit approximately 30 or more parent-child pairs.

Results

Forty parents or primary caregivers attended the first session. Eleven parents did not complete parent consent forms, completed less than 20% of questions on the pre- or post-evaluation questionnaire, or did not complete both evaluation questionnaires. Data from these parent/EA pairs where pre and post-intervention evaluation data were not available or complete were excluded from analysis. Data from the remaining 29 participant pairs were used in analysis for this report. Demographic characteristics of parents and EAs are reported in Tables 6.8, 6.9 and 6.10, respectively. Parent participants
($n = 29$) had mean body mass indices of 24.7 and 30.7, respectively, and represented low to moderate income families with $\geq 75\%$ of Hispanic ethnicity.

EA participants were predominantly male whereas parents were predominantly female. There were two families which enrolled more than one EA and only one parent-EA pair was selected. Baseline healthy and unhealthy beverage consumption of EAs and parents are found in Table 6.11.

Process evaluation

Overall, all sessions were well attended by parents and extended family (e.g., grandmother, and aunt). In some cases, both parents attended, including divorced parents. Participation by enrolled parents (n = 29), ranged from 27 to 29. Two parents did not attend the family mealtime due to work scheduling conflicts.

EAs enrolled in the study and peers (non enrolled children) participated in the intervention sessions. One EA was unable to attend session one and a questionnaire, educational materials and a self-addressed, stamped mailer were sent with a parent. Directions on how to complete the questionnaire without parental help were given. Four and seven EAs were absent on weeks two and four (sessions without parents), respectively. Post-hoc analysis indicated two EA males reported age as 14 years and were kept in the analysis because participation criteria were met and community youth leaders reported that bilingual capabilities indicated age-appropriateness.

Younger siblings seemed to accompany EAs in week two because of child care conflicts. In addition, the community centers often had friends of participants attending. Youth program leaders had to monitor attendance for their programs. They would allow nonparticipants to stay and would report at the end of the session how many participants missed a session. The youth leader would take the handouts and give to the missing early adolescents before the next session. Youth leaders reported three early adolescents missing one session at one site.

Internal validity measures of EA learning with application in the home environment were measured through take-home refrigerator magnets. The “Tracking your Water Intake” magnet documented water consumption changes at home. The expectations were to have a parent ‘catch’ their child drinking water (positive behavior) in order to place a “check” on the magnet. An in-class subjective assessment was conducted to evaluate interactive discussions regarding how EAs and parents helped each other drink more water. Almost all water intake magnets were returned the following week. Less than half of the take-home magnets from week two were returned the following week and marks showed less effort to make changes in breakfast beverage consumption. Finally, the refrigerator magnet from week four had even fewer magnets returned for the final session.

Two sessions (week two and week four) were designed for EAs only. A screening tool ("Beverage Check-up") was used in the second session to measure various frequencies of healthy and unhealthy beverage intakes using check marks. Water consistently had unlimited daily consumption. The majority of EAs reported either once per week or twice a day frequency for milk consumption whereas EA-reported SS fruit drinks and soda pop was balanced across once per week to once per day. Fruit juice had balanced responses across all frequencies (weekly to four or more times per day). The hands-on activity of preparing three beverages had overwhelming positive ratings (95%) for taste and ease of preparation. At week four, it was difficult to initiate group participation in planning a media campaign based on peer role-modeling and development of media posters. This session tended to go over the time allotted.

Parent and EA learning was monitored by means of attendance at the family meal with discussions using a beverage conversation map (week three) and mealtime planning placemat (week five). Successful results in both sessions were difficult to achieve because of differences in parenting practices as well as EA differences in motivation to talk in groups with other parents. EAs were asked to "teach-back" to their family members on the final intervention by preparing the three beverages completed at week two. After tasting the beverages, most parents complimented their children and 92% responded they liked the beverage flavors. Family conversations about what food and beverages to serve at a meal were practiced when using the placemat. EAs asked for fruit and yogurt smoothies and argued with siblings about who was setting the table versus washing the dishes. A few older EAs came with their families and acted disinterested. It is noteworthy that the definition of family always included extended family members such as aunts and uncles. Overall, when beverages were served, interactive family conversations about specific beverages were common. The post-survey was completed after the conversation placemat activity to plan a meal.

Main Outcome

There were no significant changes in EA beverage intakes from the first to the final lesson. Parents reported a significant decrease that was equivalent to about one can per week ($\underline{M}$ = 10.6 oz/week) in SS soda pop consumption (Table 6.12). Following the five-week intervention, healthy beverage intakes increased slightly and unhealthy

beverages decreased somewhat, however, these differences were not statistically significant (Table 6.12).

Secondary Outcomes

EA self-efficacy and beliefs/expectations. No intervention-dependent differences were observed in EA reports of their confidence in the ability to drink milk at school, after school, at meals, and when friends are drinking SSBs (Table 6.13). There were no significant intervention-dependent changes in beliefs about rules including setting limits and asking behaviors in EAs (Table 6.13).

Parent self-efficacy and practices. Parents reported an increase in self-efficacy behaviors that limited intakes of less healthy beverages in situations where SSBs would be given as treats or used as a reward (Table 6.14; $p = .03$). Parents also significantly increased their personal subscale factor scores for knowing the differences between beverage types (juice or drink) and buying them even if they cost more ($p = .02$). There were no significant differences in any of the parenting practices that included permissiveness, setting SSB rules and expectations, encouragement, and role-modeling.

Home availability. There were no significant changes in reported beverage availability by either EAs or parents (Tables 6.15, 6.16. and 6.17 for EAs and 6.18, 6.19 and 6.20 for parents). All but one parent ($n = 28$; 97%) reported that they always had milk available at baseline and therefore any significant positive changes were unlikely. Similarly, most EAs indicated they always ($n = 17$; 64%) or almost always ($n = 6$; 22%) had milk available at home. Parents did not report less SSB (pop or fruit drink) availability (Table 6.20) or a reduction in the availability of sports drink (Mean, M = .27 oz/week,
$p = .07$ Data not shown). There were also no significant reported changes in experiencing more stomach aches that would have been related to drinking milk in parents or EAs.

Eating meals together. The reported frequency of eating breakfast, lunch or dinner by parents did not change from before to after the five-week intervention. From an EA perspective, fewer lunch meals were reportedly eaten together after the intervention compared to before the intervention (Median, Mdn,: -46.5, $p = .006$).

EA forced choice. There were no significant changes in EA responses about which beverages they would choose in different situations. However, EAs were

somewhat more likely to indicate they would buy SS-fruit, sports or energy drink with their own money but this difference was not statistically significant ($p = .08$).

Discussion

This family-focused intervention targeted parent-EA pairs to improve the healthfulness of beverages consumed within the home environment and encourage independent EA beverage choices away from home. Unfortunately, parents and EAs did not significantly change mean intakes of water, milk, and fruit drink. Parents and EAs drank less soda pop but differences were only significant for parent consumption.

SCT provided a framework for explaining a plausible relationship between increased parent awareness, knowledge and belief in their ability to change their environment and consume less SSBs. Subsequently, as parents would gain knowledge about the amount of sugar in specific beverages and health benefits, they would be motivated to change their beverage consumption behavior and motivate EA behaviors, especially reduction in SS soda pop intakes. An extensive systematic review on randomized controlled trials with parent-child interventions, reported that better child nutrition outcomes such as decreased fat and sugar consumption, were associated with direct parent participation and attendance at sessions (direct exposure) (Hingle, O'Connor, Dave, & Baranowski, 2010). Therefore, it is possible that the effect of direct parent involvement in this parent-EA study and the indirect exposure through weekly take-home magnets for the refrigerator contributed to better parenting practices. The significant finding of decreased parent SSB consumption after five-weeks in this pilot study is promising but needs further research with greater numbers of parent-EA pairs to confirm results.

Several underlying reasons may explain the overall lack of significant findings in this study. First, the sample size was less than what was calculated to be able to detect significant differences in beverage intakes. Recruitment fliers were printed in Spanish, included a telephone number, and distributed by the bilingual intervention staff. No one called this telephone line which may indicate some hesitancy of undocumented immigrants to participate. Another potential barrier of parent attendance was related to conflicts with work schedules which forced a few parents to come late or ask a grandparent to listen to the topic until the parent arrived. Therefore, the

consistency and strength of exposure to intervention topics varied between primary parents.

The pre/post-test convenience sample study design limits generalizations due to a small sample size and the inability to compare against a control sample. However, the objective of this pilot study was to first show efficacy of methods and materials in a small sample prior to testing in a more rigorous manner in a larger, randomized, controlled study. Two previous interventions focused primarily on improving parent knowledge and increased home availability (Albala et al., 2008; Rodearmel et al., 2007) with equal exposure of the intervention to both parents and children. Studies solely focused on changing beverage consumption habits with alternating parent-EA exposures have not been commonly reported in the literature.

Another limitation of this study was the possibility that EAs or parents may have under-reported beverage intakes after learning how to identify unhealthy SSBs and the recommendation to reduce SSB amounts. In a previous study, EA African-American girls who scored high on a social desirability subscale reported lower preferences for several sweetened beverages (composite score of diet or sugar-sweetened) ($p < .05$). Yet, girls reporting high social desirability were not more likely to underestimate sweetened beverage consumption compared to girls who did not report high social desirability (Klesges et al., 2004). An indirect underreporting bias is possible since parents helped with the completion of two, 24-hour recalls. Parents may not have known about or monitored EA SSB intakes on weekends when intakes are known to be larger (Bjelland et al., 2010). A national study using seven-day food records and well-defined underreporting criteria did not find differences in the percentage of total energy intake from soft drinks in adolescents identified as "under reporters or reliable reporters" (Gibson & Neate, 2007). In addition, the Gibson and Neate study did not find significant differences in percent of energy intakes from soft drinks by body mass indices. Participants in the aforementioned studies have used differing beverage assessment tools which leaves interpretation of the under-reporting outcome unresolved.

Parents and EAs may have under-reported water consumption because of the difficulty in translating various glassware sizes and various places that water is consumed. In particular, EAs did not have parent assistance when completing surveys

and were asked to remember monthly to daily water intakes which were based on several locations and glass ware (i.e., water fountain at school, purchased bottles from convenience stores, and at a friend's house). The beverage portion of the survey asked only one question and did not give extensive probes to identify all contexts where water is consumed. This approach is similar to an earlier (1999-2004) 24-hour recall procedure where water intake frequency was asked at the end of the National Health and Nutrition Examination Survey (NHANES) interview (Kant, Graubard, & Atchison, 2009). Recently, NHANES (2005-2006) procedures include questions about water intake within the entire process (Kant et al., 2009). More effort is needed to identify the best approach to help EAs remember frequency, serving size container and volume of water consumed. No studies were found reporting the accuracy of water intake using a food frequency measurement tool without parent assistance.

The intervention length of five weeks may not have been enough exposure to support EA changes within home and unsupervised settings. A meta-analysis suggests that interventions can be shorter with parent participation (Kitzmann et al., 2010). A recent short-term intervention providing only eight sessions with active parent involvement demonstrated a significant increase in calcium intake (from food and beverage sources) at nine months for boys but not girls (Melbourne et al., 2009). A two-year intervention to reduce cholesterol levels in children which began with weekly sessions and then changed to monthly resulted in a promising outcome by changing EA milk preferences from whole to low-fat milk (Friedman et al., 2007). Unfortunately, EAs also increased soda pop intakes while progressing through growth and maturation phases (Friedman et al., 2007). Sweetened beverage intakes in the current study did not change in EAs which may be a successful outcome for a short intervention period given that frequency of milk and water availability started at high levels. More effort is needed to understand the transitional phase of autonomous behaviors and beverage choices in mid-adolescence with lessening parenting control.

The "Beverages 4 Health" five week program was developed using social cognitive theory as a framework for changing the home environment using parents as mediators of change. Intervention components encouraged parent-EA interactions that supported the health behavior changes of identifying unhealthy beverages through label reading and reducing sugar-sweetened beverage availability at home, meals and eating

occasions away from home. Parent-EA pairs also worked together to encourage each other to drink more water and make healthy beverage choices at shared mealtimes. Process evaluations using a refrigerator magnet indicated increased awareness of water and SSB intakes. Parents had less intervention exposure but reported increased self-efficacy to identify and buy healthier beverages and decreased SS soda pop intake. Overall, this pilot program provides ideas and challenges to begin changing the momentum for consuming excessive calorie-containing beverages and increasing healthier beverage consumption.

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Table 6.1

Early Adolescent Nutrition Intervention Outcome Goals

Primary Outcome Goal	EAs will reduce SSB consumption after participating in a five-week after-school program (expecting parents will attend three parent-EA sessions).
Secondary Goals	
	Through Social Cognitive Theory (SCT), EAs will:
Personal	Increase knowledge about health risks associated with unhealthy beverage consumption such as excessive added sugar intake, dental health risks, large portion sizes, and hydration risks,
Behavioral & Home environment	Improve frequency of asking parents to purchase or serve healthier beverages for the home environment
Multiple settings	EAs will increase adolescent self-efficacy to choose healthy beverages in challenging situations such as during school lunch and after school purchases, shared family mealtimes, and at fast-food restaurants

Note. EAs = early adolescents. SCT = Social cognitive theory. SSBs = Sugar-sweetened beverages.

Table 6.2

Parent Nutrition Intervention Outcome Goals

Primary Outcome Goal	Parents will reduce SSBs consumption after a child (9-13 y) participates in a five-week after-school program (expecting parents will attend three parent-EA sessions).
Secondary Goals	Parents will improve their personal and behavioral practices to promote healthy beverage consumption and reduce SSB consumption. Through SCT, parents will
Personal	Increase self-efficacy of role modeling healthy beverages consumption behaviors,
Behavioral	Use parenting practices (such as improving healthier beverage availability for meals and snacks, setting expectations and applying rules) to guide beverage choices and amounts,
Home environment	Establish positive family mealtime interactions which promote healthy beverage consumption habits when eating away from home, and
Multiple Settings	Establish interactive communication with early adolescents which address beverage choices through asking and buying made at home or away from home and in supervised or unsupervised settings.

Note. SSBs = Sugar-sweetened beverages. SCT = Social cognitive theory

Table 6.3
Parent-Early Adolescent Intervention Objectives and Outcomes for Week 1.

	Beverage Basics Board
	After participation, parents and EAs will be able to:
SCT Factors	
Personal (Knowledge)	State two negative health outcomes from excessive added sugar intake and to appraise reasons for healthy beverage choices (such as better teeth, maintaining weight, hydration and bone health).
Behavioral	Identify 100% fruit juice using beverage labels, use serving sizes on beverage labels and translate the amount of sugar is in one serving and the entire purchased container.
Socio-environmental	Assess occasions in the home where parents can role model intake of healthy beverages.
Measurement Tool	Beverage basics board Over 30 beverage cans, bottles, and cartons are stuck to a white foam board (40" X 60") with Velcro strips. Parent-EA pairs each choose a liked beverage from the board, translate amount of sugar into a sugar cube quantity and push inside the empty container.
Outcome Measures	1. Knowledge of carbohydrate definitions found on a label 2. Translate sugar amounts into a sugar cubes number, 3. Understand sugar cube number based on a serving size or a purchased size, 4. Parent-child pairs will identify the difference between 100% fruit and fruit drinks; and 5. Monitor water intake by jointly completing a take-home refrigerator magnet

Note. SCT = Social cognitive theory

Table 6.4

Early Adolescent Intervention Objectives and Outcomes for Week 2

Goal setting, Behaviors and Barriers (EAs only)	
After participation, EAs will be able to:	
SCT factors	
Personal (Knowledge)	State healthy beverages that can be substituted for less healthy beverage in specific eating occasions,
Behavioral	Formulate two healthy snacks that include milk or 100% fruit juice and two breakfast menus that include 100% fruit juice; EAs will also plan changes in beverage intake to meet goals, and
Socio-environmental	Identify barriers that can be changed at home to increase healthy beverage choices.
Measurement tool	Beverage check-up worksheet A beverage assessment worksheet that presents seven beverages and asks to reflect how many times consumed within one week or daily using check-marks.
Outcome Measures	1. Extend knowledge on various beverages classifications 2. Compare intake frequency to current age-based suggested recommendations, 3. Prepare and taste potential beverages that can be independently be made and consumed at home, and 4. Review water intake from refrigerator magnets.

Note. EAs = Early adolescents SCT = Social cognitive theory

Table 6.5
Parent-Early Adolescent Intervention Objectives and Outcomes for Week 3

Get the Family Change Talkin' (Parents and Early adolescents)	
	After participation, parents and EAs will be able to:
SCT factors	
Personal	
Parent	Justify reasons for SSB rules and expectations at home.
Behavioral	
EA	Explain how to change SSB intakes and attempt to talk with parents about eating more family meals together; the importance of conversing with parents about their opinions on EA beverage intake (valuing choices).
Parent	Identify when it is difficult to role-model and enforce rules or expectations.
Socio-environmental	
EA	List one way he/she can make it easier to drink cold water to quench thirst and practice asking parents (or primary caregiver) to change the home environment availability of SSB; another challenge includes composing a question that inquires about a family beverage rule or expectation.
Parent	Establish one strategy to eat family meals together with weekly consistency and discuss rules and expectations for beverage intake in various settings.
Measurement Tool	Mealtime magnet and worksheet Plan and set a goal for eating more breakfasts together and identify ways EAs ask a parent for help with unsupervised beverage intakes.
Outcome Measures	1. Compare beverage knowledge, to recommendations and taste 100% fruit juice. 2. Interactive conversations between families about successes and challenges at home.

Note. EAs = Early adolescents; SCT = Social cognitive theory; SSBs = sugar-sweetened beverages

Table 6.6

Early Adolescent Intervention Objectives and Outcomes for Week 4

Personal and Peer Influences (EA Only)	
	After participation, EAs will be able to:
SCT Factors	
Personal (Knowledge)	Explain the value of why soft drinks shouldn't be traded for beverages with nutrients needed for healthy (water and calcium) through role-playing; and if time allows, explore volume differences between glass shapes.
Behavioral	Examine and encourage beverages that support hydration and less sugar when with friends or participating in sports.
Socio-environmental	Discuss and create beverage advertising slogans to differentiate between healthy and unhealthy beverage choices
Measurement Tools	Media Posters Poster themes and oral statements when role-playing Media Slogan Magnet Write media message on a magnet to share at home with family.
Outcome Measures	1. Peer interactions to build knowledge, create media poster theme and gain confidence to share with family 2. Increase self-efficacy for teaching and asking skills.

Note. EAs = Early adolescents; SCT = Social cognitive theory; SSBs = sugar-sweetened beverages

Table 6.7

Parent-Early Adolescent Intervention Objectives and Outcomes for Week 5

Celebrate the change (Families and EAs)	
	After participation, parents and EAs will be able to:
SCT Factors	
Personal (Family)	Create menus that include a healthy beverage for a family mealtime.
EA	Encourage family members the benefits of fresh fruit or 100% fruit juice to flavor beverages (i.e., lemons in water) instead of sweetened fruit ades/drinks
Parent	Encourage beverage choices that are tasted at final session and willing to consider recommended beverage choices suggested by EA
Socio-environmental	
EA	Create a menu with family and help assign tasks where everyone helps in eating together; Discuss beverage choices in the selected setting and possible changes in availability; Enjoy participating in a family meal celebration and role-model drinking beverages promoted in the intervention series.
Parent	Establish one strategy to support eating a family meal together where everyone helps; Discuss rules and expectations for beverage choices in the selected setting and possible changes in what beverages are purchased; Enjoy participating in a family meal celebration and role-model drinking beverages promoted in the intervention series.
Measurement Tool	Meal Placemat Open parent-EA discussions planning a menu
Outcome Measures	1. Post-survey.

Note. EAs = Early adolescents. SCT = Social cognitive theory

Table 6.8

Parent Demographics

Variable	n[a] (%)
Gender	
Female	21(78)
Male	6(22)
Age (y)	
18-30	4(14)
31-40	17(59)
41-50+	8(27)
Living arrangement	
2 or more adults	25(62)
1 adult	7(24)
Body mass index (kg/m^2)	
18.5- <25	4(14)
25- <30	14(50)
≥ 30	10(36)
Race/ethnicity[b]	
American Indian	9(32)
Hispanic/Latino	21(75)

[a] n = 29; Sample sizes where n does not = 29 indicates data are missing.

[b]Participants could check more than one race or ethnicity.

Table 6.9
Parent Economic Indicators[a]

Variable	n[a] (%)
Education	
Not completed high school	14(48)
High school diploma or GED	6(21)
Some college/technical school	8(28)
4-year college degree	1(3)
Employment	
Student/homemaker/househusband	8(29)
Not employed or employed part-time	7(25)
Employed full-time	13(46)
Income measure	
WIC	10(36)
Food stamps	8(29)
Free or reduced price school lunch	15(54)

Note. GED = graduate equivalent degree; WIC = Women, Infant and Children Program. Participants could check more than one race/ethnicity. Height and weight were self-reported.

[a]n = 29; Sample sizes where n does not = 29 indicates data are missing.

Table 6.10

Early Adolescent Demographics

Variable	n[a] (%)
Gender	
Male	23(79)
Female	6(21)
Age (y)	
9-10	10(34)
11-12	13(45)
13-14	6(7)
Body mass index (kg/m^2)	
18.5- <25	18(63)
25- <30	6(22)
≥ 30	4 (15)
Height (in)	
<60	9(35)
60- <65	12(46)
≥ 65	5 (19)
Weight (lb)	
< 100	5(19)
100- <125	8(31)
≥125	13(50)
Race/ethnicity	
American Indian	10(37)
Asian/Pacific Islander	1 (4)
White	5(18)
Hispanic/Latino	22(84)

Note. EA=early adolescent; Participants could check more than one race/ethnicity.

[a]n = 29, Sample sizes where n does not = 29 indicates data are missing.

Table 6.11

Mean Beverage Intakes of Parent-Early Adolescent Pairs at Baseline

	Water (oz/week)				Milk (oz/week)			
	M	SD	n[a]	Range	M	SD	n[a]	Range
EA	58.3	42.6	26	4-112	21.5	30.9	26	1 - 140
Parent	81.1	38.2	28	8-112	51.7	70.2	28	0 - 224
	Soda pop (oz/week)				**Fruit drink (oz/week)**			
	M	SD	n[a]	Range	M	SD	n[a]	Range
EA	15.6	26.9	26	0 – 84	10.6	13.5	26	0 - 51
Parent	38.9	50.8	29	0 – 168	9.3	14.5	29	0 - 51

Note. EA = early adolescent; M = mean. [a]n = 29; Sample sizes where n does not = 29 indicates data are missing.

Table 6.12

Mean Beverage Intake Changes from Baseline in Parent-Early Adolescent Pairs

	Water (oz/week)				**Milk (oz/week)**				**Soda pop (oz/week)**				**Fruit drink (oz/week)**			
	M	SE	n	P	M	SE	N	p	M	SE	n	p	M	SE	n	p
EA	3.8	8.3	23	.40	17.4	11.2	24	.13	-4.4	5.8	24	.46	-1.2	2.5	24	.63
Parent	3.2	10.3	25	.76	-4.3	16.9	25	.80	-10.6	3.9	26	.01**	-2.5	2.4	25	.32

Note. EA=early adolescent, M = mean and SE = standard error.

[a]n = 29; Sample sizes where n does not = 29 indicates data are missing.

**p = .01

Table 6.13

Mean Self-efficacy and Beliefs and Expectation Subscale Score Changes in Early Adolescents

	Scores						
Subscale	Before[a]		After[b]		Change[c,d]		
	M	SD	M	SD	M	SD	p
	Self-efficacy						
Personal	3.71	0.85	3.52	1.21	-.23	1.31	.39
	Beliefs & expectations						
Sweetened beverage expectations & rules	3.57	1.02	3.79	.98	.21	1.12	.35
Meal-specific expectations & support	2.94	1.17	3.19	1.01	.26	1.10	.30
Milk expectations	3.19	1.46	3.58	1.21	.38	1.32	.26

Note. EA=early adolescent. M = mean. SD = standard deviation. Self-efficacy statements were responses to "I am sure that I can . . .". "Responses were coded as 5= very sure, 4= somewhat sure, 3 = neither sure or unsure, 2 = Somewhat unsure, 1 = Very unsure. Responses to statements about perceived rules and expectations were coded as 5= Agree a lot, 4= Agree a little, 3= Neither agree or disagree, 2 = Disagree a little, and 1 = Disagree a lot.

[a]n = 29. [b]n = 27. [c]n = 25.

[d]p > .05; ns for all subscales.

Table 6.14

Mean Self-efficacy and Parenting Practice Subscale Score Changes in Parents

	Scores						
Subscale	Before[a]		After[b]		Change[b]		
	M	SD	M	SD	M	SD	p
	Self-efficacy						
Sweetened beverage discipline	4.16	.91	4.5	.48	.44	.88	.03*
Health conscious parenting	4.22	1.13	4.67	.58	.50	1.06	.02*
	Parenting Practices						
Subscale	Before[a,b]		After[c,d]		Change[d]		
	M	SD	M	SD	M	SD	p
Permissiveness	2.36	1.20	2.46	1.20	.24	.91	.29
Sweetened beverage rules and expectations	4.37	.64	4.51	.51	.12	.65	.65
Encouragement	4.81	.30	4.80	.31	.01	.35	.80
Role-modeling	4.25	.96	4.43	.90	.18	.73	.26

Notes. Self-efficacy statements were responses to "I am sure that I can . . .". "Responses were coded as 5 = very sure, 4 = somewhat sure, 3 = neither sure or unsure, 2 = Somewhat unsure, 1 = Very unsure. Beliefs and expectations statements were responses to varying practices that included encouragement, stating expectations and rules and role-modeling. Parent statements were coded as 5 = Agree a lot, 4 = Agree a little, 3 = Neither agree or disagree, 2 = Disagree a little, and 1 = Disagree a lot. M = Mean, SD = Standard deviation.

[a]n = 26. [b]Subscales for "Encouragement" and "Role-modeling" had 'Before 'sample sizes of n = 25. [c]n = 24. [d]Subscales for "Encouragement" and "Role-modeling" had 'After' sample sizes of n = 25. *$p < 0.05$.

Table 6.15

Response Changes in Mean Home Availability of Dairy Beverages by Early Adolescents

	Milk (Before, n = 27; After, n = 24)					
Frequency	Before		After		Change [a,b]	
		%	n	%	n	%
Always	17	63	18	75	1	6
Usually	6	22	1	4	-5	-83
Sometimes	3	11	3	13	0	0
Never	1	4	2	8	1	100

	Flavored Milk (Before, n = 27; After, n = 25)[a]					
	Before		After		Change[a,c]	
	n	%	n	%	n	%
Always	7	26	8	32	1	14
Usually	6	22	4	16	-2	-33
Sometimes	8	30	8	32	2	0
Never	6	22	5	20	-2	-17

Notes. Percentages of response changes are calculated by post-intervention frequency. Change = $(n_{after} - n_{before}/n_{before}) \times 100$. For example, the frequency for "Always" drinking milk before the intervention was n = 17 and after the intervention was n = 18. Therefore, $18_{after} - 17_{before}/17_{before}) \times 100 = 6\%$ increase in reported milk availability as "always." EA=early adolescent;

[b]n = 24. [c]n = 25. [a]p > .05; ns.

Table 6.16

Response Changes in Mean Home Availability of Healthy Beverages by Early Adolescents

Frequency	100% Fruit Juice (Before, n = 26; After, n = 25)					
	Before		After		Change[a, b]	
	n	%	n	%	n	%
Always	13	50	9	36	-4	-31
Usually	5	19	8	32	3	60
Sometimes	7	27	7	28	0	0
Never	1	4	1	4	0	0
	Bottled Water (Before, n = 27; After, n = 25)					
	Before		After		Change[a, b]	
	n	%	n	%	n	%
Always	20	74	13	52	-7	-35
Usually	0	--	6	24	6	24
Sometimes	7	26	5	20	-2	-29
Never	0	--	1	4	1	0

Note. EA = Early adolescents. Percentages of response changes are calculated by post-intervention frequency. Change = $(n_{after} - n_{before}/n_{before}) \times 100$. For example, availability of "always" for 100% fruit juice (n) was $13_{after} - 9_{before}/13_{before}) \times 100 = -31\%$ or a decrease in "always" having 100% fruit juice available.

[b] n=25.

[a] $p > .05$; ns.

Table 6.17

Response Changes in Mean Home Availability of Unhealthy Beverages by Early Adolescents

Frequency	SS-Soda Pop (Before, n = 26; After, n = 25)					
	Before		After		Change[a,b]	
	n	%	n	%	n	%
Always	4	15	1	4	-3	-75
Usually	8	31	5	20	-3	-38
Sometimes	11	42	18	72	7	64
Never	3	12	1	4	-2	-67
	SS-Fruit Drinks (Before, n = 27; After, n = 25)					
	Before		After		Change[a,b]	
	n	%	n	%	n	%
Always	4	15	2	8	-2	-50
Usually	3	11	6	24	3	20
Sometimes	17	63	14	56	-3	-18
Never	3	11	3	12	0	0

Note. Percentages of response changes are calculated by post-intervention frequency. Change = $(n_{after} - n_{before}/n_{before}) \times 100$. For example, the frequency for "always" drinking 100% fruit juice = $(13_{after} - 9_{before}/13_{before}) \times 100 = 31\%$ of an increase in availability. EA=Early adolescents. SS = sugar-sweetened. [b]n = 25. [a]p > .05; ns.

Table 6.18

Response Changes in Mean Home Availability of Dairy Beverages by Parents

	Milk (Before, n = 29; After, n = 26)					
Frequency	Before		After		Change[a,b]	
	n	%	n	%	n	%
Always	28	97	25	96	-3	-11
Usually	0	0	1	4	1	25
Sometimes	1	3	0	--	-1	-100
Never	0	0	0	--	0	0

	Flavored Milk (Before, n = 29; After, n = 26)					
	Before		After		Change[a,b]	
	n	%	n	%	n	%
Always	3	10	2	8	-1	-33
Usually	4	14	4	15	0	0
Sometimes	15	52	12	46	-3	-20
Never	7	24	8	31	1	14

Note. Percentages of response changes are calculated by post-intervention frequency. Change = $(n_{after} - n_{before}/n_{before}) \times 100$. . For example, the frequency for "Always" drinking milk = $(25_{after} - 28_{before}/28_{before}) \times 100$ = -11% decrease in reported milk availability as "always."

[b]n=26.

[a]$p > .05$; ns.

Table 6.19

Response Changes in Mean Home Availability of Healthy Beverages by Parents

Frequency	100% Fruit Juice (Before, n = 27; After, n = 26)					
	Before		After		Change[a, b]	
	n	%	n	%	n	%
Always	12	44	11	42	-1	-8
Usually	8	30	10	39	2	25
Sometimes	5	19	5	19	0	0
Never	2	7	0	--	-2	-100
	Bottled Water (Before, n = 27; After, n = 26)					
	Before		After		Change[a, b]	
	n	%	n	%	n	%
Always	19	66	15	58	-4	-21
Usually	4	14	4	15	0	0
Sometimes	4	14	5	19	1	25
Never	2	-7	2	8	0	0

Note. Percentages of response changes are calculated by post-intervention frequency. Change = $(n_{after} - n_{before}/n_{before}) \times 100$. For example, the frequency for "Always" drinking 100 fruit juice = $(12_{after} - 11_{before}/11_{before}) \times 100$ = -8% decrease in reported "always" availability of 100% fruit juice.

[b]n = 26.

[a]p > .05; ns.

Table 6.20

Response Changes in Mean Home Availability of Unhealthy Beverages by Parents

Frequency	SS-Soda Pop (Before, n = 29; After, n = 26)					
	Before		After		Change[a,b]	
	n	%	n	%	n	%
Always	0	0	0	0	0	0
Usually	3	10	4	15	1	33
Sometimes	15	52	15	58	0	0
Never	11	38	7	27	-4	36
	SS-Fruit Drinks (Before, n = 29; After, n = 26)					
	Before		After		Change[a,b]	
	n	%	n	%	n	%
Always	2	7	2	8	0	0
Usually	4	14	3	12	-1	25
Sometimes	17	59	13	50	-4	24
Never	6	21	8	31	2	33

Note. Percentages of response changes are calculated by post-intervention frequency frequency. Change = $(n_{after} - n_{before}/n_{before}) \times 100$. For example, the frequency for "Usually" drinking SS soda pop = $(4_{after} - 3_{before}/11_{before}) \times 100$ = -10% increase in reported "usual" availability. SS=sugar sweetened.

[b]n=26.

[a]p > .05; ns.

Table 6.21
Response Changes in Early Adolescent Beverage Choices at Meals and Snacks[a]

	Pre-Intervention				Post-Intervention			
What beverage would you choose most of the time . . .?	100% fruit juice		SS-Soda pop		100% fruit juice		SS-Soda pop	
	n	%	n	%	n	%	n	%
1. for breakfast?	26	93	1	7	25	100	0	0
	Water		Fruit, energy or sports drink		Water		Fruit, energy or sports drink	
2. with an after-school snack?	16	59	11	47	10	40	15	60
	Milk		Fruit, energy or sports drink		Milk		Fruit, energy or sports drink	
3. if you were eating dinner at home?	12	44	15	56	11	44	14	56
	Milk		SS-Soda pop		Milk		SS-Soda pop	
4. if you were eating at a fast-food restaurant?	19	70	8	30	19	76	6	24
	Milk		Fruit, energy or sports drink		Milk		Fruit, energy or sports drink	
5. if you had to buy the drink with your own money?	21	78	6	22	16	64	9	36

Notes. EA=Early adolescents. SSBs = sugar-sweetened beverages. SS = sugar-sweetened. [a]n=29; sample sizes not equaling n=29 are due to missing responses; [b]p = >0.05 for all questions.

CHAPTER 7

SUMMARY AND FUTURE RESEARCH

In the U.S., the prevalence of overweight and/or obesity among early adolescents (EAs) and adults is currently at its highest level. Recent national dietary guidelines have established significant limits on added sugar to address dietary factors that may contribute to overweight and obesity. Parents with children at home can support intakes of healthy beverages at meals and limit availability of sugar-sweetened beverages (SSBs). Overall, a healthy home environment supports replacing SSB choices with beverages that provide nutrients such as low fat milk, 100% fruit juice and water to build lifelong healthy beverage habits.

The present research targeted SSB consumption because the risks of developing poor habits are high in EAs with continuing risks of increased consumption during late adolescence and young adulthood. Through this transition, EAs develop more independence in decision-making while parent responsibilities are to educate children about the importance of nutritional components provided in beverages. Healthy beverage habits established at home could help EAs resist unhealthy choices when EAs are with peers.

Parents were included in this study because they are key stakeholders in promoting availability at home and making healthier beverages accessible. Key parenting practices include role-modeling and monitoring beverage consumption at home and away from home. Parenting practices of monitoring can provide opportunities to reiterate rules and expectations and observe portion sizes. Moreover, promoting positive parent-EA interactions at home allows for verbal conversations about beverage choices as well as behavioral modeling of healthy beverage consumption.

This dissertation study involved three steps which included the development and testing of parent and EA instruments, conducting parent focus groups to identify important intervention components, and designing a parent-EA beverage intervention. These three steps involved successive projects that complemented each other and ultimately provided information to address SSB consumption habits of parents and EAs. The target audience included ethnically diverse, low-income early adolescents (9-13 years) and their parents. The overall purpose was to develop a parent-child intervention which would lower SSB intakes and increase or substitute non-caloric beverages such as water or healthy beverages (milk and 100% fruit juices).

Summary of Findings

Focus Groups

In Step 1, focus group questions were developed after reviewing qualitative research regarding beverage intakes of pre-adolescents or EAs. No qualitative studies exploring specific parental rules and expectations for intakes of water, low-fat milk and 100% fruit juices were found. Therefore, original focus group questions were developed to assess parents' perceptions about beverages EAs liked and parent expectations in several contexts such as at home, at school, friend's homes and after school.

A major theme from the focus group results was that parents were concerned about health and were motivated to ensure that beverages EAs liked were available. Another qualitative study has demonstrated that parents and EAs developed specific beverage and food preferences that were based on taste, texture and appearance rather than application of knowledge about nutrition (Fitzgerald, Heary, Nixon, & Kelly, 2010). This was also demonstrated in the dissertation study focus groups. Although most parents viewed milk and water as choices which support EA health, some parents negatively role-modeled SSB consumption.

Parents described specific mealtime expectations at home but more general expectations for EA choices in less controlled environments. Mealtimes were the best opportunity to encourage milk consumption. However, some beverage differences were noted between English-speaking and Spanish-speaking parents at mealtimes. For example, Spanish-speaking parents encouraged or expected fruit juice consumption at breakfast or lunch meals. Mothers of a 5-17 year-old child of Mexican descent indicated in interviews that the easiest approach to make their family's diet healthier was adding an extra glass of fruit juice because it was convenient, well-liked by family members, and there were a variety of juice flavors (California Department of Health and Human Services. Public Health Institute, 2000). Therefore, Spanish-speaking parents viewed juices as offering more variety at mealtimes and helped balance family member preferences.

Beverages consumed at meals may also be embedded in a cluster of lifestyle choices promoting weight gain. For example, parent role-modeling of daily soda pop consumption as snacks has been associated with higher BMI percentile scores in their child and their child having sedentary lifestyles such as watching more television and videos (Hendy, Williams,

Camise, Eckman, & Hedemann, 2009). Therefore, a potential parent intervention component could include discussion of positive role-modeling of healthy beverage intakes.

In the current study, parents identified beverages their child liked and defined a monitoring role as allowing leniency or discipline. A similar theme was noted by Jackson, Mannix, Faga, & McDonald (2005) as "treading a fine line between being over-controlling and too relaxed." Parents in the current study were knowledgeable about the favorite beverages of their child and some were concerned that overly restrictive rules would motivate EAs to make less healthy choices outside the home and when unsupervised. In essence, parents believed they could monitor beverage intakes at home but could not effectively monitor what EAs drank outside the home.

Two qualitative studies (Hart, Bishop, & Truby, 2003; Hattersley, Shrewsbury, King, Howlett, & Baur, 2009) reported adolescent and parent perceptions of drinking SSBs. However, neither study included questions related to water consumption. The current study added to information about parent beverage expectations and rules by identifying how water consumption is encouraged in the home. New information was also noted about how parents made water accessible, which was described as making it portable and cold.

A qualitative approach using individual interviews with mothers of children (5-15 years), identified that a change in the home environment must be mutually shared between parents in order for changes to remain effective (Jackson, Mannix, Faga, & McDonald, 2005). This theme was not identified in the current focus group study because very few fathers participated. An additional qualitative study described interactive family conversations as including "harmony and disharmony" (Kaplan, Kiernan, & James, 2006). These results suggest that mealtime conversations with parents about nutrition in early adolescence and continuing into late adolescence can be challenging. Successful parent-child interventions will need to design conversational topics surrounding parent-EA differences and consider including family members. Results from the focus group interviews in Step 1 of the present study shaped intervention strategies used in Step 3.

Evaluation Tool Development and Validation

The second study involved the development of evaluation tools to measure changes in parent and EA personal and behavioral expectations to select water, low-fat milk and 100% juice at home and in unsupervised locations. Using the social cognitive theory (SCT) as a framework, physical-and socio-environmental issues were considered. Parent self-

efficacy statements needed to include parenting practices that encourage and promote healthy beverages at home and in environments outside of the home where SSBs are treats or may be consumed in quantities that exceed parental rules and expectations. Similarly, EA efficacy to choose healthy or unhealthy beverages may differ in various contexts such as eating a meal at home and eating with peers after school.

A widely used parent-child feeding tool measures parent practices of restriction, concern, pressure to eat, and monitoring (Birch et al., 2001). However, this tool combines permissive and restrictive statements as one factor defined as "parent restriction." In the current study, permissive parent practices allowing EAs to consume SSBs at home and away from home have distinct meanings separate from restrictive parenting practices that directly or indirectly limit SSBs through ongoing parental communications. Another study by Hupkens, Knibbe, van Otterloo, and Drop (1998) measured mother's perceptions of home rules for milk, yogurt drinks, soda pop, and fruit juice but did not measure parenting self-efficacy to manage beverages within the home environment and outside the home. In the current study, separate tools were developed to measure personal self-efficacy in parents and EAs.

Parent factors. Two factors were developed to assess parent self-efficacy. The first factor described parent confidence in the ability to buy healthy beverages and differentiate between fruit juices and drinks and was labeled "health conscious." This factor was associated with EA reports of drinking milk and water as well as EAs reporting lower frequency of fruit drink intake. The "health conscious" factor was the most successful in demonstrating associations with parent and EA perceptions and behaviors compared to other factors.

The second parent factor "sweetened beverage discipline" described parent beliefs that they could limit SSBs as rewards, treats and at extended family celebrations. This factor was inversely associated with parental soda pop and fruit drink consumption. Both factors were positively associated with parents drinking milk ($p < .05$).

Four parent factors for belief and attitudes were developed. Two described role modeling and parent involvement through encouragement. Parental role-modeling of healthy beverage consumption was associated with parents drinking less soda pop and an unexpected association with milk consumption in EAs. In the latter, parents may have substituted a different beverage for soda pop such as flavored diet beverages, for which

intake was not assessed. The parenting practice of encouraging healthy beverages was not associated with consumption of any beverages by parents or EAs.

No associations were observed between EA or parent beverage intakes and parent encouragement in the current study. Another study defined a similar parenting factor as positive persuasion which was associated with children consuming more fruits and vegetables (Hendy, Williams, Camise, Eckman & Hedemann, 2009). Positive persuasion was described as parents making comments to their child that they liked fruits and vegetables, talked about the positive health benefits, encouraged healthy fruits and vegetables, and made references that other peers liked healthy fruits and vegetables (Hendy et al., 2009). In the current study, lack of associations between parent involvement and EA beverage intakes could be related to differences in child age ranges. For example, early adolescents were included in the current study whereas the study by Hendy et al. (2009) included much younger children (first through fourth graders) where parents have more control of foods and beverages consumed. These results suggest that in the transition from childhood to adolescence, parent involvement is changing and interventions can target specific parental behaviors to build EA autonomy while also teaching moderate SSB consumption.

Permissive parenting practices were weakly associated with EAs drinking fruit drinks and negatively associated with EAs drinking water ($p \leq .05$). A study by Vereecken, Legiest, de Bourdeaudhuij, and Maes (2009) found only permissive parenting was associated with EA SSB intakes. Therefore, parent and EA messages developed for interventions to reduce SSBs will need to assess current permissive parenting practices and parent-EA problem solving to reduce SSB availability. These types of discussion will always include liked flavors of SSBs compared to un-flavored cold water. Nevertheless, the focus group studies define an important characteristic: water is more preferable if it is cold.

Parenting practices of verbal praise, encouragement, and negotiation were not associated with soda pop and fruit drink intakes. However, an unexpected association was noted between parents reporting several expectations related to limiting SSBs for EAs with their fruit drink consumption ($p < .05$). A study by Glanville and McIntyre (2009) reported that mothers drank coffee or carbonated beverages at the end of the month if money was scarce. This may explain the inconsistencies between parent behaviors and parent expectations observed in the current study. The current study used participation in

subsidized food programs as indirect measures of socioeconomic status which may not be as accurate as income. Therefore, parents may believe they cannot afford healthier beverages such as milk and use fruit ades to provide liked choices amidst food insecurity.

EA factors. One EA self-efficacy factor was developed. An EA personal behavior subscale described healthy beverage choices at family meals, when with friends, at school lunch and after school. EA self-efficacy was positively associated with their healthy beverage consumption and negatively associated with unhealthy beverage consumption ($p < .05$). In EAs, only milk intake was associated with personal self-efficacy to drink milk or healthy beverages in various settings.

Three EA factors identifying beliefs and perceived parent practices were developed. These were defined as sweetened beverage rules, meal specific rules, and milk amount expectations. All three EA factors were positively associated with EA milk intake ($p < .05$).

Home availability of SS-soda pop and fruit drinks was inversely associated with parenting behaviors that limit the amount of SSBs offered to EAs. Intakes of both beverages were positively associated with permissive parenting rules and expectations. Parents play a critical role in beverage choices through home availability and accessibility. EAs may have established habits of drinking SS-soda pop and fruit drinks and changing these preferences during a time where they are making more independent choices will be challenging. Therefore, future interventions should continue to provide EA intervention activities to help EAs decrease intake of liked, calorically-sweetened beverages and increase intake of less liked beverages.

In summary, several useful parent and EA factor scales were developed using SCT. Convergent validity was established by associations between parent or EA self-efficacy and healthy (milk and water) and unhealthy (fruit drink and soda pop) intakes. Internal consistency and test-retest reliability were also established for these parent and EA factor subscales. The validated parent-EA tools in the current study provide researchers with the ability to monitor changes in four important parental roles. These include changing the environment (i.e., controlling SSB availability), improving personal self-efficacy to build knowledge and skills, communicating SSB and healthy beverage rules and expectations, and monitoring mealtime behaviors. Parents have dual roles to make healthy choices for themselves while also monitoring EA beverage choices. This may explain the necessity

for intensive parenting interventions and justify longer term parent exposure to education directed at monitoring beverage goals and rules in family eating and snacking occasions.

Intervention

The objective of this study was to develop and implement a nutrition intervention that would decrease SSB intakes in parent-child pairs and increase consumption of healthy beverages. Expected changes for parents and EAs were to decrease consumption of SSBs to align with the 2010 dietary guidelines for added sugar dietary recommendations (United States. Department of Agriculture. Department of Health and Human Services. Center for Nutrition Policy and Promotion, 2010). In addition, parent-child pairs would consume adequate milk and 100% fruit juices. Healthier beverages included 100% fruit juice, water and milk at meals and with snacks.

A new five-week intervention was developed using SCT as a framework and targeted SSB consumption changes in EAs and parents. Parents were viewed as mediators of change in the home and at family mealtimes. A comprehensive systematic review only identified five home-based studies and two school-based interventions with parental outreach through take-home activities (Flynn et al., 2006). A family-based intervention study demonstrated a modest decrease in daily SSBs by delivering healthy beverage choices into homes for each family member every week (Ebbeling et al., 2006). Missing from these studies was an intervention that integrated parent-EA interactive conversations discussing SSB availability in the home environment, and parental beverage expectations for meals eaten at home and away from home. Beverages sweetened with non-caloric sweeteners were not addressed in the five-week intervention. The rationale for exclusion was that with limited time and money, offering three healthy beverages typically found in many settings (water, 100% fruit juice and low-fat milk) would clearly delineate the national healthy beverage guidelines.

Beverage availability based on family member preferences may contribute to increased consumption of liked beverages. However, parents were unable to reduce availability of SSBs after a short five-week intervention. Almost all parents reported moderate to high availability at baseline and this was unchanged five weeks later. Early adolescents did not report decreases in SSB availability at home. Intensive interventions with greater scrutiny of availability may be needed to maintain awareness of SSB

availability at home or when eating meals outside the home. Studies of fruit and vegetable availability in the home are in agreement with the prominence of SSB availability (Jago, Baranowski, & Baranowski, 2007). Therefore, lifestyle interventions targeting home availability of high fat snacks and SSBs could synergistically improve caloric intakes in individuals.

Current adolescent consumption habits of SSBs and availability in multiple environments (i.e., home, schools, restaurants, athletic events, and neighborhood) may lessen attention to parental rules and expectations. A recent study indicated that habits developed for SSB intakes is a highly ranked mediating factor for child and adolescent SSB consumption (Tak et al., 2011). In another study, Ebbeling et al. (2006) delivered non-caloric or low-caloric beverages ordered by each family member to homes and decreased SSB intakes by 82%. Therefore, parent-child interactions and family efforts to choose water and low fat milk at meals can support healthier beverage habits. Allowing unhealthy beverage availability in homes increases parent concerns and behaviors to control unhealthy beverage consumption and encourage healthy beverages.

The parent-child paired educational session in the intervention program may have increased parent personal self-efficacy which resulted in decreased parental SS soda intakes. For example, both parent self-efficacy factors significantly increased after the intervention and parents reported a statistically significant decrease in SS soda pop by almost one 12-ounce can/week. SCT suggests that increasing self-efficacy with specific tasks (such as identifying and purchasing healthy beverages) would change parent SSB intakes. However, the influence of decreased soda pop consumption by parents did not influence significant changes in perceived home availability. In addition, EAs did not perceive changes in soda pop availability which, theoretically, could result in subsequent changes in EA consumption of SSBs. In a large cross-sectional study, associations were observed between parental and peer support for eating healthy food and home availability of fruits and vegetables but home availability was not directly associated with fruit and vegetable intakes (Neumark-Sztainer, Wall, Perry, & Story, 2003). In this same study, EA taste preferences and home availability directly influenced adolescent fruit and vegetable intakes (Neumark-Sztainer et al., 2003). Future changes in the intervention tested in the current study may be needed to place greater attention on liked and disliked beverages and changes in home availability of SSBs. However, changing preferences for flavored and sweetened beverages to preferences for

water is unlikely based on current beverage consumption habits. Lengthening the number of intervention sessions could provide more opportunities for parent-EA interactions in problem-solving how to reduce SSB availability at home.

There were no significant changes in EA beverage intakes from the first to the final lesson after exposure to five, consecutive weekly lessons. The intervention did not improve EA confidence in the ability to drink milk at school, after school, at meals, and with friends. There were no significant intervention-dependent changes in beliefs about parental rules including setting limits and EA asking behaviors.

A clinic-based treatment intervention for obese EAs instructed families to reduce intakes of high energy foods (i.e., foods or beverages containing >5 grams fat/serving and sweet foods >25% calories/serving) (Epstein, Paluch, Beecher, & Roemmich, 2007). After intensive weekly, biweekly, and monthly meetings over two years, EAs showed greater standardized BMI reductions for a longer period compared to EAs instructed to eat more healthy foods (Epstein et al., 2007). The current study may have been unsuccessful in changing habits due to a very short intervention length, limited exposure and ignoring the contributions of calories from fat.

Successful family interventions may need to adopt components of intensive clinic-based interventions with longer program lengths and significant parent participation. The current study initiated parent-EA interactions to reduce SSB intakes. Including additional guidelines for parent-EA pairs on how to reduce fat alongside reductions in added sugars is an opportunity to build parent self-efficacy and extend several parenting practices across energy contributions from macronutrients.

Implications for Practice

Participants in the focus group studies described various contexts where parent-EA pairs are faced with choosing SSBs or healthy beverages. Results from this study indicated that although tap water is always available in the home environment, parents must make water more accessible. All family members can participate in keeping the refrigerated water pitcher full. Tools were designed to measure water consumption (including tap water) to help all family members encourage one another to drink more water.

Parents clearly identified child-liked beverages as well as their own beverage preferences. The family conversation map used in the intervention was developed to help

initiate family mealtime conversations. Water, milk, and juices were preferred less often compared to soda pop and fruit drinks. Therefore, nutrition educators working with low-income families may find that discussing beverage choices appropriate for families through the pictorial map is a possible strategy. Specifically, families could address the variety of preferred flavors and determine when SSBs would be served. Parent-EA conversations will need to discuss how much is served.

Focus groups provided information used in the development of parent-child activities that could be modified for use in future longitudinal parent-child intervention studies and clinic-based settings. For example, the water magnet placed on the refrigerator is a simple reminder to drink more water. Lastly, a longer and more intensive intervention may be necessary to change well-established SSB consumption habits among parents and EAs.

Implications for Future Research

Healthy or unhealthy beverage consumption is not the sole cause of overweight and obesity among adults and children; however beverages are important contributors of energy and water. Availability and accessibility are important characteristics which can influence beverage choices at home. There are no water recommendations in national guidelines which weakens the importance of plain water consumption in place of flavored or sweetened beverage intakes. Longitudinal studies measuring water consumption changes from late childhood to early adolescence are needed to develop a general guideline recommendation for this population group. In addition, because flavored beverages can lead to strong taste preferences, intervention studies that focus on encouraging water and milk intakes in childhood are needed.

The current focus group study did not address differences in beverage consumption habits between weekday and weekend days. Because of work schedules and EA activities, weekend consumption may be more important to measure than weekday SSB intakes. Early adolescents may drink greater quantities of SSB if unsupervised because parents work on weekends. In addition, school lunch meals which offer milk are not available on weekends. Therefore, more qualitative studies are needed to evaluate parenting practices and beverage consumption differences between weekdays and weekend days.

More qualitative and quantitative research is needed to clarify how specific mealtime actions and parenting practices are related to SSB consumption with meals, as

snacks, as rewards and as hydration after physical activity. SSBs are also culturally acceptable when eating away from home and at family celebrations. Parents need to balance their SSB intakes with their child expectations because availability at home is one context that parents have control throughout the transition between childhood and adolescence. Families need to take advantage of exploring beverage choices within all family members. Research is needed to further explore how to effectively encourage positive parent role modeling and to discourage SSB availability in the home.

Non-caloric artificial sweetened beverages were not addressed in this study because water can successfully maintain hydration without a financial cost. Flavor preferences were important characteristics for parents and their children. Therefore, further qualitative studies with EAs and parents are necessary to understand how EAs and parents view intakes of non-calorically sweetened beverages as a substitute for water and SSB consumption. Future interventions targeting parents may also need to clarify how nutrient-enhanced, flavored waters are consumed by parents and EAs.

Educational activities were used to promote water intake at home and away from home but were ineffective against established SSB preferences. More educational tools are needed to evaluate home routines and self-efficacy for water consumption. For example, instruments that measure parent or EA self-efficacy to select water in varying locations and practices that improve availability and accessibility within extended family settings are needed. Similar to the SSB home availability checklist used in the current study, a home environment availability checklist for water could be developed and tested for its ability to increase awareness of opportunities where water could be offered or consumed instead of SSBs.

Strengths and Limitations

This dissertation study focused on both parents and EAs in all steps to strengthen exposure within the home environment. Interactive parent-EA pair intervention sessions were conducted and discussions focused on encouraging more water intake, preparing healthy beverages, and planning a family meal together. These conversations were helpful in understanding challenges parents face when setting boundaries for SSB intakes by EAs and having beverage mealtime rules. A successful intervention outcome was to reduce frequency or quantity of SSBs consumed by parents. Sharing family mealtime interactions, monitoring home availability and guiding EA choices when they are unsupervised were vital

components suggested by focus groups and the intervention. This study included water consumption measures in parent-child pairs which are rarely considered as an intervention outcome.

Beverage intake data and anthropometric measures were self-reported by parents and EAs which allowed for possible underreporting due to social desirability bias. Collins, Watson, and Burrows (2010) discuss specific concerns about the accuracy of early adolescent dietary intake reports. Two common biases are applicable to this dissertation study because they affect recall of beverages. First, EAs may have less structured eating occasions and cannot remember the variety of beverages and containers sizes for each. They may also report only the most recent 24-hour intakes to finish the survey more quickly (recency bias) (Collins et al., 2010). Parents may also have under-reported intakes because of social desirability and social approval biases. Instruments used to measure home availability and shared family meals were based on similar questions used in a national longitudinal study with children and adolescents of similar age ranges (Neumark-Sztainer et al., 2003). In the past decade, however, the availability of different beverage flavors, purchased sizes and sweeteners has increased to a level that is greater than before 2003. The reciprocal nature of the SCT constructs indicates that increased SSB variety would create constant temptation to consume and lead to greater intake.

Study participants were obtained from convenience samples representing an urban and rural population and sample sizes for quantitative analysis were small. In addition, participants in each step were not balanced by race and ethnicity. For example, the factor analysis step involved participants predominantly representing non-Hispanic white parent-child pairs whereas the intervention study included predominantly Native American and Hispanic/Latino parent-child pairs. The intervention sample did not reach expected size needed to determine statistically significant changes. Therefore, this type of study needs to be replicated with a larger sample to improve the ability to detect significant intervention effects. Generalization to a broader, multi-ethnic population of parents and EAs is not appropriate. Therefore, larger research studies are needed to determine if parenting practices and their associations with beverage intakes are similar in multi-ethnic populations.

Another weakness based on the nature of the study population was that very few fathers participated in each step. Therefore, the parent results mainly reflect mother's perceptions. Studies which measure gender differences between parents would extend

research and the roles that fathers play at home and at meals regarding SSB consumption among EAs.

A limitation to the current study was the use of a FFQ to measure overall beverage intake and availability. Assessment of home availability for beverages by specific meal or snacking occasion may have been more useful. In addition, the ability to quantify beverage frequency and amount per drinking occasion could improve the understanding of distinct beverage consumption patterns. Future interventions could tailor an intervention based on the type of SSB beverage and frequency with which it is consumed in excess of expectations. Understanding beverage consumption patterns could contribute to the development of a beverage assessment tool that recognizes the number and types of beverages consumed and an association with SES measures.

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APPENDIX A

EVALUATION TOOLS

Step 2

Phase one

Psychometric Analysis

Beverages and Me' for Parent Expectations and Beliefs about Beverages (pp. 218-222)

Beverages and Me' for Youth (Early Adolescent; EA) Self-efficacy and Perceived Parent Expectations and Rules (pp. 223-226)

Beverage Survey [Parent or Youth (EA) Beverage Assessment Instrument (p. 227)]

PARENT EXPECTATIONS & BELIEFS ABOUT BEVERAGES
(Phase one)

We would like to know your expectations and beliefs about beverages your child drinks. Remember, there is NO right or wrong answer, just what is the best answer for you.

Examples of Beverages

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet. Names include:
Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

	Agree a lot	Agree a little	Neither agree or disagree	Disagree a little	Disagree a lot
1. I encourage my child to drink milk with meals.	❑	❑	❑	❑	❑
2. Over the course of the day, my child has to drink a certain amount of milk before he/she can drink sweetened beverages.	❑	❑	❑	❑	❑
3. I buy flavored milk to encourage my child to drink milk.	❑	❑	❑	❑	❑
4. I have a rule about how much milk my child has to drink each day.	❑	❑	❑	❑	❑
5. I drink 100% fruit juices, milk or water to set an example for my child.	❑	❑	❑	❑	❑

PARENT EXPECTATIONS & BELIEFS ABOUT BEVERAGES-(Continued)

Examples of Beverages

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet. Names include:
Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

	Agree a lot	Agree a little	Neither agree or disagree	Disagree a little	Disagree a lot
6. I expect my child to limit intake of sweetened beverages when I am not around.	❑	❑	❑	❑	❑
7. I expect my child to limit sweetened beverage intake after school.	❑	❑	❑	❑	❑
8. I expect my child to drink milk with lunch purchased at school..	❑	❑	❑	❑	❑
9. I help my child choose a healthy beverage if he/she is packing a lunch for school.	❑	❑	❑	❑	❑
10. I tell my child **how much** sweetened beverages he/she is allowed to consume.	❑	❑	❑	❑	❑

PARENT EXPECTATIONS & BELIEFS ABOUT BEVERAGES

(Continued)

Examples of Beverages

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet.
Names include:
Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

	Agree a lot	Agree a little	Neither agree or disagree	Disagree a little	Disagree a lot
11. I tell my child which sweetened beverages he/she is allowed to consume.	❑	❑	❑	❑	❑
12. I always have my child's favorite sugar-sweetened beverage available at home..	❑	❑	❑	❑	❑
13. I follow the same rules for drinking sweetened beverages that I expect my child to follow.	❑	❑	❑	❑	❑
14. I buy sweetened beverages as a treat for my child.	❑	❑	❑	❑	❑
15. I buy sweetened beverages only for special occasions.	❑	❑	❑	❑	❑

PARENT EXPECTATIONS & BELIEFS ABOUT BEVERAGES (Continued)

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet. Names include:
Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

	Agree a lot	Agree a little	Neither agree or disagree	Disagree a little	Disagree a lot
16. I buy sweetened beverages because my child often asks for them	❑	❑	❑	❑	❑
17. I ask relatives or other family members to support my rules about sweetened beverages.	❑	❑	❑	❑	❑
18. I don't let my child have sweetened beverages if my child doesn't obey family rules..	❑	❑	❑	❑	❑
19. I often drink healthy beverages to set an example for my child.	❑	❑	❑	❑	❑
20. My child has to ask permission to drink sweetened beverages..	❑	❑	❑	❑	❑
20. I allow soda pop at meals when we eat away from home.	❑	❑	❑	❑	❑
21. I expect my child to drink diet soda pop instead of regular sweetened soda pop.	❑	❑	❑	❑	❑

PARENT EXPECTATIONS & BELIEFS ABOUT BEVERAGES (Continued)

Examples of Beverages

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet. Names include:
Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refresco
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

	Agree a lot	Agree a little	Neither agree or disagree	Disagree a little	Disagree a lot
24. I often encourage my child to drink more water.	❑	❑	❑	❑	❑
25. I often remind my child that he/she needs to drink healthy beverages.	❑	❑	❑	❑	❑
26. I often encourage my child to drink healthy beverages.	❑	❑	❑	❑	❑
27. I have explained my reasons for making rules about sweetened beverages to my child..	❑	❑	❑	❑	❑

BEVERAGES AND ME (YOUTH)

(Phase one)

We would like to know about your thoughts when choosing something to drink. Remember, there is no right or wrong answer, just what is the best answer for you.

We define the various types of beverages as follows:
Milk is skim, fat-free, 2% and whole milk; any type of flavored milk such as chocolate, strawberry or chocolate malt. It can be made from dairy cows, rice or soybeans.

Sweetened beverages include those sweetened with sugars such as “soda pop”, “refrescos” or “tonic” (like Coke, Sierra Mist or Orange Pop), “fruit drinks” (like Sunny Delight, Kool-Aid or Capri Sun), “sports drinks” (like Gatorade or Powerade) and sweetened teas and lemonade.

For this survey, sweetened beverages do **NOT** include those sweetened with artificial sweeteners that have NO CALORIES like "Diet soda pop”.

Check only ONE box for each.

How sure are you that you can…	Very sure	Somewhat sure	Neither sure nor unsure	Somewhat unsure	Unsure
1. Drink milk when served at school lunch.	❑	❑	❑	❑	❑
2. Pack healthy beverages in your lunch to bring to school.	❑	❑	❑	❑	❑
38. Drink healthy beverages when my friends are drinking sweetened beverages.	❑	❑	❑	❑	❑
4. Drink milk with meals instead of other beverages.	❑	❑	❑	❑	❑
5. Drink healthy beverages at a restaurant.	❑	❑	❑	❑	❑
6. Drink healthy beverages after school.	❑	❑	❑	❑	❑

BEVERAGES AND ME (Youth)

(Continued)

We would like to know about your thoughts when choosing something to drink. Remember, there is no right or wrong answer, just what is the best answer for you. We define the various types of beverages as follows:

Milk is skim, fat-free, 2% and whole milk; any type of flavored milk such as chocolate, strawberry or chocolate malt. It can be made from dairy cows, rice or soybeans.

Sweetened beverages include those sweetened with sugars such as “soda pop”, “refrescos” or “tonic” (like Coke, Sierra Mist or Orange Pop), “fruit drinks” (like Sunny Delight, Kool-Aid or Capri Sun), “sports drinks” (like Gatorade or Powerade) and sweetened teas and lemonade.

For this survey, sweetened beverages do **NOT** include those sweetened with artificial sweeteners that have NO CALORIES like "Diet soda pop”.

Check only ONE box for each.

How sure are you that you can…	Very sure	Somewhat sure	Neither sure nor unsure	Somewhat unsure	Unsure
7. Limit the amount of sweetened beverages I drink.	❑	❑	❑	❑	❑
8. Drink water more often than sweetened beverages.	❑	❑	❑	❑	❑
9. Drink healthy beverages at my friend’s houses.	❑	❑	❑	❑	❑
10. Drink healthy beverages at parties or special events.	❑	❑	❑	❑	❑
11. Drink healthy beverages while traveling in a car, truck, van or bus.	❑	❑	❑	❑	❑

EXPECTATIONS & BELIEFS ABOUT BEVERAGES (YOUTH)
(Continued)

Now it is time to think about the parent or other adult who makes the most meals for you. What are their expectations for the beverages you drink? Remember, there is no right or wrong answer, just what is the best answer for you.

We define the various types of beverages as follows:
Milk is skim, fat-free, 2% and whole milk; any type of flavored milk such as chocolate, strawberry or chocolate malt. It can be made from dairy cows, rice or soybeans.

Sweetened beverages include those sweetened with sugars such as "soda pop", "refrescos" or "tonic" (like Coke, Sierra Mist or Orange Pop), "fruit drinks" (like Sunny Delight, Kool-Aid or Capri Sun), "sports drinks" (like Gatorade or Powerade) and sweetened teas and lemonade.

For this survey, sweetened beverages do **NOT** include those sweetened with artificial sweeteners that have NO CALORIES like "Diet soda pop".

Check only ONE box for each.

My parent or other adult in my home…	Agree a lot	Agree a little	Neither agree or disagree	Disagree a little	Disagree a lot
12. Expects me to drink milk with meals.	❑	❑	❑	❑	❑
13. Expects me to drink milk when I buy school lunch.	❑	❑	❑	❑	❑
14. Helps me pack healthy beverages when I bring my lunch to school.	❑	❑	❑	❑	❑
15. Offers me the choice of several beverages with meals.	❑	❑	❑	❑	❑
16. Always serves milk with dinner.	❑	❑	❑	❑	❑
17. Lets me order sweetened beverages at restaurants.	❑	❑	❑	❑	❑
18. Expects me to drink a certain amount of milk each day before I can drink sweetened beverages.	❑	❑	❑	❑	❑

EXPECTATIONS & BELIEFS ABOUT BEVERAGES (YOUTH) (Continued)

We define the various types of beverages as follows:
Milk is skim, fat-free, 2% and whole milk; any type of flavored milk such as chocolate, strawberry or chocolate malt. It can be made from dairy cows, rice or soybeans.

Sweetened beverages include those sweetened with sugars such as "soda pop", "refrescos" or "tonic" (like Coke, Sierra Mist or Orange Pop), "fruit drinks" (like Sunny Delight, Kool-Aid or Capri Sun), "sports drinks" (like Gatorade or Powerade) and sweetened teas and lemonade.

For this survey, sweetened beverages do **NOT** include those sweetened with artificial sweeteners that have NO CALORIES like "Diet soda pop."

My parent or other adult in my home…	Agree a lot	Agree a little	Neither agree or disagree	Disagree a little	Disagree a lot
18. Talks with me about the amount of sweetened beverages I should drink.	❑	❑	❑	❑	❑
19. Talks with me about how much 100% fruit juice or milk I should drink.	❑	❑	❑	❑	❑
20. Limits the amount of sweetened beverages I can drink every day or week.	❑	❑	❑	❑	❑
21. Limits how often I can drink sweetened beverages.	❑	❑	❑	❑	❑
22. Expects me to drink a certain amount of milk each day.	❑	❑	❑	❑	❑
23. Buys flavored milk to get me to drink milk.	❑	❑	❑	❑	❑
24. Encourages me to drink healthy beverages.	❑	❑	❑	❑	❑
25. Doesn't buy sweetened beverages to limit the amount I drink.	❑	❑	❑	❑	❑

BEVERAGES (Parent and Youth)
(Phase one)

Please tell us about the beverages you drank over the past month. Fill in one circle for each food item. The following statements refer to what you ate over the past month.

---

1. Soda pop, any type (1 can or 1 glass)

- O Never or less than once per month
- O 1-3 cans per month
- O 1 can per week
- O 2-6 cans per week
- O 1 can per day
- O 2 or more cans per day

2. Fruit-flavored drinks such as Hawaiian Punch®, lemonade, Kool-Aid , or other non-carbonated fruit drink (1 glass or 1 juice box)

- O Never or less than once per month
- O 1-3 glasses per month
- O 1 glass per week
- O 2-6 glasses per week
- O 1 glass per day
- O 2 or more glasses per day

3. Orange juice (1/2 cup)

- O Never or less than once per month
- O 1-3 servings per month
- O 1 serving per week
- O 2-6 servings per week
- O 1 serving per day
- O 2 or more servings per day

4. [See text (p. 84) for water frequency]

5. Café Latte, Café Mocha, Cappuccino, or Café Au Lait (1 tall or 1 large)

- O Never or less than once per month
- O 1-3 drinks per month
- O 1 drink per week
- O 2-6 drinks per week
- O 1 drink per day
- O 2 or more drinks per day

6. Coffee or tea (1 cup)

- O Never or less than once per month
- O 1-3 cups per month
- O 1 cup per week
- O 2-6 cups per week
- O 1 cup per day
- O 2 or more cups per day

7. Cocoa (hot chocolate) made with milk (1 cup)

- O Never or less than once per month
- O 1-3 cups per month
- O 1 cup per week
- O 2-6 cups per week
- O 1 cup per day
- O 2 or more cups per day

8. Milk to drink, white or chocolate (1 cup or 1 carton)

- O Never or less than once per month
- O 1-3 cups per month
- O 1 cup per week
- O 2-6 cups per week
- O 1 cup per day
- O 2-3 cups per day
- O 4 or more cups per day

EVALUATION TOOLS

Step 2

Phase two

(Parent Self-efficacy Items and Test-Retest Reliability)

Parent self-efficacy (new) (pp. 230-231)

Beverage survey (Parent and Youth) (p. 232)

Home availability (Parent and Youth)(new) (p. 233)

PARENT SELF-EFFICACY
(Phase two)

Examples of Beverages

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet. Names include:
Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

How sure are you, that you can . . .	Agree a lot	Agree a little	Neither agree or disagree	Disagree a little	Disagree a lot
1.Tell the difference between 100% juice and fruit drink.	❑	❑	❑	❑	❑
2. Buy healthy beverages when they cost more than sweetened beverages.	❑	❑	❑	❑	❑
3. Pack healthy beverages in your child's lunch to bring to school.	❑	❑	❑	❑	❑
4. Buy healthy beverages for parties or family events.	❑	❑	❑	❑	❑
5. Buy healthy beverages for your child while traveling in a car, truck, van or bus.	❑	❑	❑	❑	❑
6. Limit soda pop at meals when you eat away from home with family or friends	❑	❑	❑	❑	❑

PARENT SELF-EFFICACY – Continued

Examples of Beverages

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet. Names include:
Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos, or tonic
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

How sure are you, that you can . . .	Agree a lot	Agree a little	Neither agree or disagree	Disagree a little	Disagre e a lot
8. Limit the sweetened beverages your child drinks even though you didn't have them when you were a child.	❑	❑	❑	❑	❑
9. Limit the amount of sweetened beverages you buy when you are stressed.	❑	❑	❑	❑	❑
10. Limit the amount of sweetened beverages you buy when you are stressed.	❑	❑	❑	❑	❑

Beverage Survey (Parent and Youth)*

9. Soda pop, any type (1 can or 1 glass)

- O Never or less than once per month
- O 1-3 cans per month
- O 1 can per week
- O 2-6 cans per week
- O 1 can per day
- O 2 or more cans per day

10. Fruit-flavored drinks such as Hawaiian Punch®, lemonade, Kool-Aid , or other non-carbonated fruit drink (1 glass or 1 juice box)

- O Never or less than once per month
- O 1-3 glasses per month
- O 1 glass per week
- O 2-6 glasses per week
- O 1 glass per day
- O 2 or more glasses per day

11. Orange juice (1/2 cup)

- O Never or less than once per month
- O 1-3 servings per month
- O 1 serving per week
- O 2-6 servings per week
- O 1 serving per day
- O 2 or more servings per day

12. Cappuccino, Cofe Mocha, Cappuccino, or Café Au Lait (1 tall or 1 large)

- O Never or less than once per month
- O 1-3 drinks per month
- O 1 drink per week
- O 2-6 drinks per week
- O 1 drink per day
- O 2 or more drinks per day

13. Coffee or tea (1 cup)

Never or less than once per month

- O 1-3 cups per month
- O 1 cup per week
- O 2-6 cups per week
- O 1 cup per day
- O 2 or more cups per day

14. Cocoa (hot chocolate) make with milk (1 cup)

- O Never or less than once per month
- O 1-3 cups per month
- O 1 cup per week
- O 2-6 cups per week
- O 1 cup per day
- O 2 or more cups per day

15. Milk to drink, white or chocolate (1 cup or 1 carton)

- O Never or less than once per month
- O 1-3 cups per month
- O 1 cup per week
- O 2-6 cups per week
- O 1 cup per day
- O 2-3 cups per day
- O 4 or more cups per day

[See text (p. 85) for water frequency]

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* Beverage Survey for parent and youth used in phase one is reprinted in phase two. There are not differences between phase one and two beverage

Beverage Availability (Parent or Youth)

For the following questions, check the box that best answers each question. How often would you say these beverages are available in your home?

Beverage type	Always	Usually	Sometimes	Never
Whole, 1%, 2% or soy milk	❑	❑	❑	❑
Flavored milk (includes chocolate, strawberry or other flavors)	❑	❑	❑	❑
Hot chocolate, prepared	❑	❑	❑	❑
Regular soda pop	❑	❑	❑	❑
Diet soda pop	❑	❑	❑	❑
100% fruit juice	❑	❑	❑	❑
Fruit drinks (includes any fruit drink flavor, sports drinks and lemonade or sweetened tea)	❑	❑	❑	❑
Blended yogurt and juice drink or yogurt drink	❑	❑	❑	❑
Bottled water	❑	❑	❑	❑

APPENDIX B

EVALUATION TOOLS

Step 2 (Phase three only)

Step 3

Final Parent and EA (Youth) Questionnaire

Phase three in Step 2

Internal Consistency and Convergent Validity

Parent Version (pp. 237- 244)

Youth (Early Adolescent) Version – (pp.245 – 257)

Beverage Survey
(Parent/Primary Caregiver)

This survey is part of a study being done at the University of Minnesota. Your input will help us learn how beverages help you meet energy, calcium and hydration needs.

This survey is to be filled out by an adult who is primarily responsible for preparing meals for a child who is between the ages of 10-13 years. If you have more than one 10-13 year old child living with you, please choose one child in this age range and fill out the questions with only this child in mind. This survey is asking what *beverages YOU drink and your beliefs and feelings* when choosing something to drink

1. Age of child in this study: O 9 years O 10 years O 11 years O 12 years O 13 years O 14 years

2. Is this child a boy or girl? O Boy O Girl

3. What is the height of this child? _____ feet and/or _____ inches

4. What is the weight of this child? _____ (pounds)

5. What is your relationship to the child in this study?
- O Parent (includes step parent/foster)
- O Grandparent
- O Aunt or uncle
- O Sibling
- O Other, please specify _____

6. On average, how many days of the week does this child live in your home?
- O 1-3 days
- O 4 or more days

7. How many children are under the age of 18 in your home?
- O 1
- O 2
- O 3
- O 4
- O 5
- O 6 or more children

About You (For Parent/Primary Caregiver)

Tell us about yourself. Mark the bubble that best answers each question.

8. How old are you?
- O 18-30 years
- O 31-40 years
- O 41-50 years
- O 51 years or older

9. Are you a man or a woman?
- O Man
- O Woman

10. What is your height? _____ (inches)

- O Do not know.

11. What is your weight? _____ (pounds)

- O Do not know.

12. How many adults, counting yourself, over the age of 18 live in your home?
- O 1
- O 2
- O 3 or more

13. What is your highest level of formal education?
- O Have not completed high school
- O Received high school diploma or GED
- O Some college or technical school
- O 4-year college, university degree or advanced degree

14. Which of the following best describes your employment status?
- O Student
- O Homemaker/househusband
- O Not employed
- O Employed part-time
- O Employed full-time
- O Retired

15. Are you or your family members participating in the following programs? (Mark all that apply)
- O WIC
- O Food stamps
- O Free/reduced priced school lunch
- O None

16. Are you . . (Mark only one)

- O Hispanic or Latino
- O Not Hispanic or Latino

17. Which racial groups(s) do you consider yourself to be? (Mark all that apply)

- O American Indian or Alaska Native
- O Asian or Asian American
- O Black or African American
- O White or Caucasian
- O Other, please specify

_____

18. I get a stomach ache after drinking milk.

- O Strongly disagree
- O Disagree
- O Neither agree or disagree
- O Agree
- O Strongly agree
- O Don't know

Eating Meals Together

Tell us about the meals you ate together <u>with family members that live in your house</u>.

Mark only <u>one</u> answer.

19. During the past week (7 days), how many times did all or most of your family <u>*eat breakfast*</u> together?

- O Never
- O 1 or 2 days
- O 3 to 4 days
- O 5-6 days
- O Every day

20. During the past week (7 days), how many times did all or most of your family <u>*eat lunch*</u> together?

- O Never
- O 1 or 2 days
- O 3 to 4 days
- O 5-6 days
- O Every day

21. During the past week (7 days), how many times did all or most of your family <u>*eat dinner*</u> together?

- O Never
- O 1 or 2 days
- O 3 to 4 days
- O 5-6 days
- O Every day

22. Water (1 glass or bottle)

- O Never
- O Less than once per week
- O 1 glass or bottle per week
- O 2-6 glasses or bottles per week
- O 1 glass or bottle per day
- O 2 or more glasses or bottles per day
- O 4 or more cartons or glasses per day

Drinking Beverages

Tell us how often <u>YOU drank</u> these beverages over the <u>past week</u>.

Mark only <u>one</u> answer.

23. Sugar-sweetened soda pop, any type (Coke®, Mountain Dew®, refresco and other flavors) (1 can or glass)?

- O Never
- O Less than once per week
- O 1 can or glass per week
- O 2-6 cans or glasses per week
- O 1 can or glass per day
- O 2 or more cans or glasses per day

24 Fruit-flavored and other sugar-sweetened drinks (lemonade, Kool-aid®, Hawaiian Punch® and tea)? (1 glass or juice box)?

- O Never
- O Less than once per week
- O 1 glass or juice box per week
- O 2-6 glasses or juice boxes per week
- O 1 glass or juice box per day
- O 2 or more glasses or juice boxes per day

25 Milk (white or chocolate) (1 carton or glass)?

- O Never
- O Less than once per week
- O 1 carton or glass per week
- O 2-6 cartons or glasses per week
- O 1 carton or glass per day
- O 2 or more cartons or glasses per day
- O 4 or more cartons or glasses per day

BEVERAGES AND ME (For Parents)

We would like to know about your thoughts when buying and choosing something to drink. Remember, there is no right or wrong answer, just what is the best answer for you.

Examples of Beverages

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet. Here are other names:
Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos, or tonic
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

How sure are you that you can…	Very sure	Somewhat sure	Neither sure nor unsure	Somewhat unsure	Unsure
1. Limit the soda pop at meals when you eat away from home with family or friends.	❑	❑	❑	❑	❑
2. Limit the sweetened beverages your child drinks even though you did not have them when you were a child.	❑	❑	❑	❑	❑
3. Limit the amount of sweetened beverages you buy when you are stressed.	❑	❑	❑	❑	❑
4. Limit the sweetened beverages your child drinks even though they were a treat for you when you were a child.	❑	❑	❑	❑	❑

BEVERAGES AND ME (For Parents)
Continued-

We would like to know about your thoughts when buying and choosing something to drink. Remember, there is no right or wrong answer, just what is the best answer for you.

Examples of Beverages

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet. Here are other names:
Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos, or tonic
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

How sure are you that you can…	Very sure	Somewhat sure	Neither sure nor unsure	Somewhat unsure	Unsure
5. Tell the difference between 100% juice and fruit drink.	❑	❑	❑	❑	❑
6. Buy healthy beverages when they cost more than sweetened beverages.	❑	❑	❑	❑	❑

BEVERAGES AND ME (For Parents)

We would like to know about your thoughts when buying and choosing something to drink. Remember, there is no right or wrong answer, just what is the best answer for you.

Examples of Beverages

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
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Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

How sure are you that you can…	Very sure	Somewhat sure	Neither sure nor unsure	Somewhat unsure	Unsure
1. Limit soda pop at meals when you eat away from home with family or friends.	❑	❑	❑	❑	❑
2. Limit the sweetened beverages your child drinks even though you did not have them when you were a child.	❑	❑	❑	❑	❑
3. Limit the amount of sweetened beverages you buy when you are stressed.	❑	❑	❑	❑	❑
4. Limit the sweetened beverages your child drinks even though they were a treat for you when you were a child.	❑	❑	❑	❑	❑

BEVERAGES AND ME (For Parents)
Continued-

We would like to know about your thoughts when buying and choosing something to drink. Remember, there is no right or wrong answer, just what is the best answer for you.

Examples of Beverages

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet.
Here are other names:
Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos, or tonic
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**.
Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

How sure are you that you can…	Very sure	Somewhat sure	Neither sure nor unsure	Somewhat unsure	Unsure
5. Tell the difference between 100% juice and fruit drink.	❑	❑	❑	❑	❑
6. Buy healthy beverages when they cost more than sweetened beverages.	❑	❑	❑	❑	❑

PARENT EXPECTATIONS & BELIEFS ABOUT BEVERAGES

We would like to know your expectations and beliefs about beverages your child drinks. Remember, there is NO right or wrong answer, just what is the best answer for you.

Examples of Beverages

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet. Names include:

Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos, or tonic
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

	Agree a lot	Agree a little	Neither agree or disagree	Disagree a little	Disagre e a lot
1. I drink 100% fruit juices, milk or water to set an example for my child.	❑	❑	❑	❑	❑
2. I expect my child to limit intake of sweetened beverages when I am not around.	❑	❑	❑	❑	❑
3. I expect my child to limit sweetened beverage intake after school.	❑	❑	❑	❑	❑
4. I help my child choose a healthy beverage if he/she is packing a lunch for school.	❑	❑	❑	❑	❑
5. I tell my child how much sweetened beverages he/she is allowed to consume.	❑	❑	❑	❑	❑

PARENT EXPECTATIONS & BELIEFS ABOUT BEVERAGES

(Continued)

We would like to know your expectations and beliefs about beverages your child drinks. Remember, there is NO right or wrong answer, just what is the best answer for you.

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet. Names include:
Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos, or tonic
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

My parent or other adult in my home…	Agree a lot	Agree a little	Neither agree or disagree	Disagree a little	Disagree a lot
6. I tell my child which sweetened beverages he/she is allowed to consume.	❑	❑	❑	❑	❑
7. I always have my child's favorite sugar-sweetened beverage available at home.	❑	❑	❑	❑	❑
8. I follow the same rules for drinking sweetened beverages that I expect my child to follow.	❑	❑	❑	❑	❑
9. I buy sweetened beverages because my child often asks for them.	❑	❑	❑	❑	❑
10. I often drink healthy beverages to set an example for my child.	❑	❑	❑	❑	❑

PARENT EXPECTATIONS & BELIEFS ABOUT BEVERAGES

(Continued)

We would like to know your expectations and beliefs about beverages your child drinks. Remember, there is NO right or wrong answer, just what is the best answer for you.

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet. Names include:
Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos, or tonic
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

My parent or other adult in my home…	Agree a lot	Agree a little	Neither agree or disagree	Disagree a little	Disagree a lot
11. My child has to ask permission to drink sweetened beverages.	❑	❑	❑	❑	❑
12. I often encourage my child to drink more water.	❑	❑	❑	❑	❑
13. I often remind my child that he/she needs to drink healthy beverages.	❑	❑	❑	❑	❑
14. I often encourage my child to drink healthy beverages.	❑	❑	❑	❑	❑
15. I have explained my reasons for making rules about sweetened beverages to my child.	❑	❑	❑	❑	❑

PARENT EXPECTATIONS & BELIEFS ABOUT BEVERAGES

(Continued)

We would like to know your expectations and beliefs about beverages your child drinks. Remember, there is NO right or wrong answer, just what is the best answer for you.

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet. Names include:
Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos, or tonic
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

	Agree a lot	Agree a little	Neither agree or disagree	Disagree a little	Disagree a lot
16. I drink 100% fruit juices, milk or water to set an example for my child.	❑	❑	❑	❑	❑
17. I expect my child to limit intake of sweetened beverages when I am not around.	❑	❑	❑	❑	❑
18. I expect my child to limit sweetened beverage intake after school.	❑	❑	❑	❑	❑
19. I help my child choose a healthy beverage if he/she is packing a lunch for school.	❑	❑	❑	❑	❑
20. I tell my child how much sweetened beverages he/she is allowed to consume.	❑	❑	❑	❑	❑

Beverages Found in Your Home (For Parents)

Check the box that best describes beverages found in your home.

24. How often would you say these beverages are in your home?				
Beverage type	**Always**	**Usually**	**Sometimes**	**Never**
Milk, whole, skim, 1%, 2% or soy	❑	❑	❑	❑
Flavored milk (such as chocolate, strawberry or any flavor)	❑	❑	❑	❑
Regular, sugar-sweetened soda pop	❑	❑	❑	❑
Diet soda pop	❑	❑	❑	❑
100% fruit juice	❑	❑	❑	❑
Regular, sugar-sweetened fruit and other drinks (such as lemonade, tea, Hawaiian Punch®, and Kool-aid®)	❑	❑	❑	❑
Diet fruit and other drinks (such as lemonade, tea, Hawaiian Punch®, and Kool-aid®)	❑	❑	❑	❑
Energy drinks (such as Monster®, Red Bull®, and Vault®)	❑	❑	❑	❑
Sports drinks (such as Gatorade® and Powerade®)	❑	❑	❑	❑
Water in bottles or cans	❑	❑	❑	❑

BEVERAGES AND ME (YOUTH)

This survey is part of a University of Minnesota study. Your input will help us learn how beverages help you meet energy, calcium and water needs.

You must be 10-13 years to complete the survey. This survey asks *what beverages YOU drink* and your beliefs and feelings when choosing something to drink. Many thanks for your help!

1. What grade are you in?

- O 4th grade
- O 5th grade
- O 6th grade
- O 7th grade
- O 8th grade
- O 9th grade

2. How old are you?

- O 9 years or under
- O 10 years
- O 11 years
- O 12 years
- O 13 years
- O 14 years

3. Who lives in your home? (Mark all that apply)

- O Mother
- O Father
- O Sister(s)
- O Brother(s)
- O Grandmother(s)
- O Grandfather(s)
- O Aunt(s)
- O Uncle(s)
- O Cousin(s)

4. Gender?

- O Boy
- O Girl

5. How tall are you?

_____**feet**_____**inches**

- O Don't know.

6. What do you weigh?

_____ **pounds**

- O Don't know.

7. Which of the following do you consider yourself to be? (Mark only one)

- O Hispanic or Latino
- O Not Hispanic or Latino

8. Which of the following group(s) do you consider yourself to be? (Mark all that apply)

- O American Indian or Alaska Native (for example Sioux, Arapaho, Apache, Pima, Cherokee, Navajo, Hopi, and others)
- O Asian or Asian American (for example, Chinese, Japanese, Laotian, Vietnamese, Thai, Filipino, Hmong, and others)
- O Black or African American
- O Native Hawaiian or other Pacific Islander (for example, Samoan, Tongan, Micronesian, and others)
- O White or Caucasian (for example, Italian, German, English, Scandinavian, Greek, Russian, and others)
- O Other (please specify below)

9. I get a stomach ache after drinking milk.

- O Strongly disagree
- O Disagree
- O Neither agree or disagree
- O Agree
- O Strongly agree
- O Don't know

BEVERAGES AND ME (For Youth)

We would like to know about your thoughts when buying and choosing something to drink. Remember, there is no right or wrong answer, just what is the best answer for you.

Examples of Beverages

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet.
Here are other names:
Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos, or tonic
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

How sure are you that you can…	Very sure	Somewhat sure	Neither sure nor unsure	Somewhat unsure	Unsure
1. Drink milk when served at school lunch.	❑	❑	❑	❑	❑
2. Drink healthy beverages when my friends are drinking sweetened beverages.	❑	❑	❑	❑	❑
3. Drink milk with meals instead of other beverages.	❑	❑	❑	❑	❑
4. Drink healthy beverages after school.	❑	❑	❑	❑	❑

YOUTH EXPECTATIONS & BELIEFS ABOUT BEVERAGES

Think about the parent or other adult who makes the most meals for you. What are their expectations for the beverages you drink? There is no right or wrong answer, just what is the best answer for you.

Examples of Beverages

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet. Names include: Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos, or tonic
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**.
Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

My parent or other adult in my home…	Agree a lot	Agree a little	Neither agree or disagree	Disagree a little	Disagree a lot
1. Expects me to drink milk with meals.	❑	❑	❑	❑	❑
2. Expects me to drink milk when I buy school lunch.	❑	❑	❑	❑	❑
3. Helps me pack healthy beverages when I bring my lunch to school.	❑	❑	❑	❑	❑
4. Always serves milk with dinner.	❑	❑	❑	❑	❑
5. Expects me to drink a certain amount of milk each day before I can drink sweetened beverages.	❑	❑	❑	❑	❑

YOUTH EXPECTATIONS & BELIEFS ABOUT BEVERAGES
(Continued)

Milk Skim, fat-free, 2% and whole
Can be flavored such as chocolate or strawberry
Can be made from dairy cows, rice or soybeans

Sugar-sweetened beverages have sugar added to make them sweet. Names include:
Soda pop (e.g., Coke®, Mountain Dew® or Orange Pop), refrescos, or tonic
Fruit drinks (e.g., Sunny Delight®, Kool-Aid® or Capri Sun®)
Sports drinks (e.g., Gatorade® or PowerAde®)
Sweetened teas and lemonade

Do **NOT** think about beverages that have artificial sweeteners or **NO CALORIES (diet)**. Do **NOT** tell us about drinks that have names like diet soda pop or diet fruit drink.

Check only ONE box for each.

My parent or other adult in my home…	Agree a lot	Agree a little	Neither agree or disagree	Disagree a little	Disagree a lot
6. Only lets me have sweetened beverages on special occasions.	❑	❑	❑	❑	❑
7. Expects me to ask before I can drink sweetened beverages.	❑	❑	❑	❑	❑
8. Limits the amount of sweetened beverages I can drink every day or week.	❑	❑	❑	❑	❑
9. Limits how often I can drink sweetened beverages.	❑	❑	❑	❑	❑
10. Expects me to drink a certain amount of milk each day.	❑	❑	❑	❑	❑

Eating Meals Together

Tell us about the meals you ate together <u>with family members that live in your house</u>.

Mark only <u>one</u> answer.

11. During the past week (7 days), how many times did all or most of your family <u>*eat breakfast*</u> together?

- O Never
- O 1 or 2 days
- O 3 to 4 days
- O 5-6 days
- O Every day

12. During the past week (7 days), how many times did all or most of your family <u>*eat lunch*</u> together?

- O Never
- O 1 or 2 days
- O 3 to 4 days
- O 5-6 days
- O Every day

13. During the past week (7 days), how many times did all or most of your family <u>*eat dinner*</u> together?

- O Never
- O 1 or 2 days
- O 3 to 4 days
- O 5-6 days
- O Every day

Drinking Beverages

Tell us how often <u>YOU drank</u> these beverages over the <u>past week</u>.

Mark only <u>one</u> answer.

14. Sugar-sweetened soda pop, any type (Coke®, Mountain Dew®, refresco and other flavors) (1 can or glass)?

- O Never
- O Less than once per week
- O 1 can or glass per week
- O 2-6 cans or glasses per week
- O 1 can or glass per day
- O 2 or more cans or glasses per day

15 Fruit-flavored and other sugar-sweetened drinks (lemonade, Kool-aid®, Hawaiian Punch® and tea)? (1 glass or juice box)?

- O Never
- O Less than once per week
- O 1 glass or juice box per week
- O 2-6 glasses or juice boxes per week
- O 1 glass or juice box per day
- O 2 or more glasses or juice boxes per day

16 Milk (white or chocolate) (1 carton or glass)?

- O Never
- O Less than once per week
- O 1 carton or glass per week
- O 2-6 cartons or glasses per week
- O 1 carton or glass per day
- O 2 or more cartons or glasses per day
- O 4 or more cartons or glasses per day

20. Water (1 glass or bottle)

- O Never
- O Less than once per week
- O 1 glass or bottle per week
- O 2-6 glasses or bottles per week
- O 1 glass or bottle per day
- O 2 or more glasses or bottles per day

Beverages Found in Your Home
Check the box that best describes beverages found in your home.

21. How often would you say these beverages are in your home?

Beverage type	Always	Usually	Sometimes	Never
Milk, whole, skim, 1%, 2% or soy	❑	❑	❑	❑
Flavored milk (such as chocolate, strawberry or any flavor)	❑	❑	❑	❑
Regular, sugar-sweetened soda pop	❑	❑	❑	❑
Diet soda pop	❑	❑	❑	❑
100% fruit juice	❑	❑	❑	❑
Regular, sugar-sweetened fruit and other drinks (such as lemonade, tea, Hawaiian Punch®, and Kool-aid®)	❑	❑	❑	❑
Diet fruit and other drinks (such as lemonade, tea, Hawaiian Punch®, and Kool-aid®)	❑	❑	❑	❑
Energy drinks (such as Monster, Red Bull and Vault)	❑	❑	❑	❑
Sports drinks (such as Gatorade® and Powerade®)	❑	❑	❑	❑
Water in bottles or cans	❑	❑	❑	❑

BEVERAGE CHOICES (For Youth)

Directions:
Choose the beverage you would pick to drink most of the time.

Mark only ONE BUBBLE from each pair.

What beverage would you choose most of the time . . .?

22. with an after-school snack?

- O Water
- O Fruit drink, energy drink or sports drink

23. for breakfast?

- O 100% Fruit juice
- O Soda pop

24. if you were eating dinner at home?

- O Milk (chocolate or white)
- O Fruit drink, energy drink or sports drink

25. if you were eating at a fast-food restaurant?

- O Soda pop
- O Milk (chocolate or white)

26. if you had to buy the drink with your own money?

- O Fruit drink, energy drink or sports drink
- O Milk (chocolate or white)

"Thank you for your time in completing this survey.

APPENDIX C

EVALUATION TOOL

Step 2

Psychometric Properties of Unused Subscales

Unused Parent Subscales

Phase one: Parenting Practices – Tables C.1 and C.2

Phase two: Self-efficacy – Table C.3

Table C.1

Phase one: Psychometric Properties of Unused Parenting Practice Subscale and Items (1)

Subscale and items	Factor loading[a]	Scale r_s[a]	M±SD[a]	Test retest reliability, r_s[b]
Family support of rules[a]			2.0±1.0	.71**
Eigenvalue = 2.7				
Variance explained= 12.4%				
Cronbach α=.72				
1. I buy sweetened beverages only for special occasions.	.65	.68	2.2±1.2	
2. I ask relatives or other family members to support my rules about sweetened beverages.	.84	.87	2.0±1.2	
3. I don't let my child have sweetened beverages if my child doesn't obey family rules.	.78	.81	1.7±1.4	

Note. Parent self-efficacy statements were based on the preface: "*How sure are you that you can.*?" Response options were on a 5-point scale (5 = Very sure, 1= Very unsure). Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability, r_s, is a spearman correlation between the subscale score 7 - 14 days later using the same questionnaire under similar conditions.

[a]Factor loading (standardized), Scale r_s, M±SD, eigenvalue, variance explained and Cronbach α were derived from step 1 (n = 81). [b]Test-retest reliability (r_s) was derived from step 2 (n = 29).
**p=.01.

Table C.2

Phase one: Psychometric Properties of Unused Parenting Practice Subscale and Items (2)

Subscale and items	Factor loading[a]	Scale r_s[b]	M±SD[b]	Test retest reliability, r_s[a]
Daily and mealtime milk rules[a,b]			2.7±0.8	.84**
Eigenvalue = 1.8				
Variance explained= 7.8%				
Cronbach α=.72				
1. I encourage my child to drink milk with meals.	.85	.54	3.6±0.8	
2. Over the course of the day, my child has to drink a certain amount of milk before he/she can drink sweetened beverages.	.46	.89	2.1±1.4	
3. I expect my child to drink milk with lunch purchased at school.	.81	.38	3.6±1.0	
4. I have a rule about how much milk my child has to drink each day.	.44	.89	1.6±1.3	

Note. Parenting practice statements were based on the preface: "*What do you expect or believe about the beverages your child drinks?*" Response options were on a 5-point scale (5 = Agree a lot, 1 = Disagree a lot). Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability, r_s, is a spearman correlation between the subscale score 7 - 14 days later using the same questionnaire under similar conditions.

[a]Factor loading (standardized), Scale r_s, M±SD, eigenvalue, variance explained and Cronbach α were derived from step 1 (n=81). Test-retest reliability (r_s) was derived from step 2 (n=29).

**p=.01.

Table C.3

Phase two: Psychometric Properties of Unused Parent Self-efficacy Subscales and Items[a]

Subscales and Items	Factor loading	Scale r_s	M±SD	Test retest reliability, r_s
Availability and accessibility to healthy beverages			2.9±1.0	.47**
Eigenvalue = 1.58				
Variance explained= 17.7%				
Cronbach α=.74				
1. Pack healthy beverages in your child's lunch to bring to school.	.94	.85	3.3±1.0	
2. Serve healthy beverages with foods (like pizza or popcorn) that would taste better with sweetened beverages.	.54	.94	2.6±1.2	
Purchasing healthy beverages for planned occasions			2.9±0.9	.50**
Eigenvalue = 1.20				
Variance explained= 16.8%				
Cronbach α=.75				
1. Buy healthy beverages for your child while traveling in a car, truck, van or bus.	.73	.90	3.3±1.0	
2. Buy healthy beverages for parties or special events.	.95	.91	2.9±1.0	

Note. Parent self-efficacy statements were based on the preface: "*How sure are you that you can.*?" Response options were on a 5-point scale (5 = Very sure, 1 = Very unsure). Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability, r_s, is a spearman correlation between the subscale score at 7 - 14 days later using the same questionnaire under similar conditions.

[a]Factor loading (standardized), Scale r_s, M±SD, test-retest reliability (r_s), eigenvalue, variance explained and Cronbach α are derived from steps 2 (n = 29).

**p=.01

Unused Early Adolescent (EA) Subscales

Phase One

EA Self-efficacy – Table C.4

EA Beliefs or expectations – Tables C.5 and C.6

Table C.4.

Psychometric Properties of Unused Early Adolescent Self-efficacy Subscale and Items

Subscale and Items	Factor loading[a]	Scale r_s[b]	M±SD[b]	Test retest reliability, r_s[a]
Situational choices self-efficacy[a,b]			2.7±0.8	.55**
Eigenvalue = 4.04				
Variance explained= 36.7%				
Cronbach α=.81				
1. Drink healthy beverages while traveling in a car, truck, van or bus.	.71	.70	2.7±1.2	
2. Limit the amount of sweetened beverages I drink.	.68	.62	2.8±1.2	
3. Drink water more often than sweetened beverages.	.67	.54	3.2±1.1	
4. Drink healthy beverages at my friend's houses.	.66	.71	2.8±1.1	
5. Drink healthy beverages at parties or special events.	.76	.77	1.9±1.2	
6. Drink healthy beverages at a restaurant.	.68	.67	2.4±1.4	
7. Pack healthy beverages in my lunch I bring to school.	.50	.57	2.8±1.3	

Note. Early adolescent self-efficacy statements were based on the preface: "*How sure are you that you can.*?" Response options were on a 5-point scale (5 = Very sure, 1 = Very unsure). Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability, r_s, is a spearman correlation between the subscale score 7 - 14 days later using the same questionnaire under similar conditions.

[a]Factor loading (standardized), scale r, mean (M), eigenvalue, variance explained and Cronbach α are derived from step 1 (n=81). Test-retest reliability (r_s) was derived in step 2 (n=29). EA = early adolescent. **p=.01.

Table C.5.

Psychometric Properties of Unused Early Adolescent Beliefs and Expectations Subscale and Items (1)

Subscale and Items	Factor loading[a]	Scale r_s[b]	M±SD[b]	Test retest reliability, r_s[a]
Parent communication [a,b]			2.6±1.0	.52**
Eigenvalue = 1.8				
Variance explained= 13.2%				
Cronbach α=.76				
1. Talks with me about the amount of sweetened beverages I should drink.	.71	.70	2.5±1.2	
2. Talks with me about how much 100% fruit juice or milk I should drink.	.74	.90	2.2±1.3	
3. Encourages me to drink healthy beverages.	.56	.68	3.1±1.0	

Note. Early adolescent self-efficacy were based on the preface: "*How sure are you that you can.*?" Response options were on a 5-point scale (5 = Very sure, 1 = Very unsure). Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability, r_s, is a spearman correlation between the subscale score 7 - 14 days later using the same questionnaire under similar conditions.

[a]Factor loading (standardized), scale r, mean (M), eigenvalue, variance explained and Cronbach α are derived from step 1 (n=81). Test-retest reliability (r_s) was derived in step 2 (n=29). EA = early adolescent.

**p=.01

Table C.6

Psychometric Properties of Unused Early Adolescent Beliefs and Expectations Subscale and Items (2)

Subscale and items	Factor loading[a]	Scale r_s[b]	M±SD[b]	Test retest reliability, r_s[a]
Beverage availability[a,b]			1.9±1.0	.49**
Eigenvalue = 1.2				
Variance explained= 9.5%				
Cronbach α =.55				
1. Offers me the choice of several beverages with meals.	.71	.77	2.3±1.4	
2. Buys flavored milk to get me to drink milk.	.69	.76	1.2±1.4	
3. Doesn't buy sweetened beverages to limit the amount I drink.	.68	.66	2.2±1.3	

Note. Early adolescent statements were based on the preface: "*My parent or primary caregiver - - .*" Response options were on a 5-point scale (5 = Very sure, 1 = Very unsure). Scale r_s refers to the item to subscale Spearman rank correlation coefficient. Test-retest reliability, r_s, is a spearman correlation between the subscale score 7 - 14 days later using the same questionnaire under similar conditions.

[a]Factor loading (standardized), test-retest reliability (r_s), eigenvalue, and variance explained are derived from step 2 (n=29). [b]Scale r_s, M±SD, and Cronbach α are derived from steps 2 (n=29) and 3 (n=36). EA = early adolescent.

**p=.01