Parent and young adolescent perspectives of family meals and meal preparation and the influence of the Kinect-Ed program

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PARENT AND YOUNG ADOLESCENT PERSPECTIVES OF FAMILY MEALS AND MEAL PREPARATION AND THE INFLUENCE OF THE KINECT-ED PROGRAM

By:

Jillian Ciccone

A Thesis
Submitted to the Faculty of Graduate Studies through the Department of Kinesiology in Partial Fulfillment of the Requirements for the Degree of Master of Human Kinetics at the University of Windsor

Windsor, Ontario, Canada

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PARENT AND YOUNG ADOLESCENT PERSPECTIVES OF FAMILY MEALS AND MEAL PREPARATION AND THE INFLUENCE OF THE KINECT-ED PROGRAM

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May 7, 2013
DECLARATION OF ORIGINALITY

I hereby certify that I am the sole author of this thesis and that no part of this thesis has been published or submitted for publication.

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ABSTRACT

Recently, public health messaging has included having more family meals and involving young adolescents (YAs) with meal preparation in order to improve healthful diets and family dinner frequency (FDF). Kinect-Ed, a nutrition education program included a motivational presentation created to encourage YAs (grades 6-8) to help with meal preparation and ultimately improve FDF. The purpose of this study was to evaluate the Kinect-Ed presentation, correlations between YA/parent dyad responses, and to determine parents’ perception of the Kinect-Ed. Participants consisted of YAs (n=113), and dyads (n=219) from the Niagara Region. Kinect-Ed successfully improved participants’ FDF, food preparation frequency, self-efficacy for cooking, and food preparation techniques; furthermore, scheduling was found to have the biggest effect on FDF. Therefore, encouraging YAs to get involved in the kitchen may reduce the time needed from parents to prepare meals, which may minimize scheduling issues, and allow more time for frequent family dinners.
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### LIST OF ABBREVIATIONS

**ATTs**  Family Meal Attitudes and Behaviours  
**BMI**  Body Mass Index  
**CCHS**  Canadian Community Health Survey  
**CDC**  Centers for Disease Control and Prevention  
**CHD**  Coronary Heart Disease  
**CSEP**  Canadian Society Exercise Physiology  
**CVD**  Cardiovascular Disease  
**EWCFG**  Eating Well with Canada’s Food Guide  
**FDF**  Family Dinner Frequency  
**HOME**  Healthy Home Offerings via the Mealtime Environment  
**ID**  Identifier  
**IOTF**  International Obesity Task Force  
**METS**  Metabolic Equivalent of a Task  
**NCDSB**  Niagara Catholic District School Board  
**PREP**  Food Preparation Frequency  
**SCT**  Social Cognitive Theory  
**SD**  Standard Deviation  
**SE**  Self-Efficacy for Cooking  
**TECH**  Food Preparation Techniques  
**TPB**  Theory of Planned Behaviour  
**WHO**  World Health Organization  
**YA/YAs**  Young Adolescent/Young Adolescents
RESEARCH ARTICLE

INTRODUCTION

Recently, public health messaging for young adolescents (YAs) has included having more family meals (Rao, 2008) and assisting with meal preparation in order to improve healthful diets (Burgess-Champoux, Larson, Newmark-Sztainer, Hannan, & Story, 2009). Approximately two-thirds of YAs (10 to 14 years old) reported six or more family dinners a week (Woodruff, Hanning, McGoldrick, & Brown, 2010; Woodruff, & Kirby, 2013; similar to Fulkerson, Pasch, et al., 2010) yet one-third reported less than two per week (Neumark-Sztainer, Hannan, Story, Croll, & Perry, 2003; Utter, Scragg, Schaaf, & Ni Mhurchu, 2008). Increased frequency of all family meals have been associated with many aspects of adolescent health including positive impacts on vocabulary and intellectual development (Eisenberg, Olsen, Neumark-Stainer, Story, & Bearinger, 2004; Fruh, Fulkerson, Kendrick, & Clanton, 2011), grade point average (Eisenberg et al., 2004), self-esteem, lower levels of depressive symptoms, suicidal ideation, suicide attempts (Eisenberg et al., 2004), and a lower likelihood of engaging in risky behaviours such as cigarette smoking and alcohol consumption (Eisenberg et al., 2004). Further, frequent family meals have been commonly associated with healthy food intake and nutrient consumption in children and adolescents (Burgess-Champoux et al., 2009; Gillman et al., 2000; Neumark-Sztainer et al., 2003; Woodruff & Hanning, 2009; Woodruff et al., 2010).

Food preparation during adolescence has been associated with positive eating behaviors into young adulthood (i.e., nutrient-rich; Laska, Larson, Neumark-Sztainer, & Story, 2011), however, only 69% of adolescents reported ever helping to prepare dinner
(Larson, Story, Eisenberg, & Neumark-Sztainer, 2006), and two thirds of those reported helping less than three times/week (Larson et al., 2006). Involvement in food preparation has been associated with improved overall diet quality, including significantly greater vegetable and fruit consumption (Larson et al., 2006; Brown & Hermann, 2005), having lower intakes of fat (Larson et al., 2006), higher nutrient intake (Larson et al., 2006; Meehan et al., 2008), and increased independence/responsibility for preparing meals (Simmons & Chapman, 2012), which has been shown to track into adulthood (Laska et al., 2011). Furthermore, a lack of confidence using basic cooking skills was the limiting factor for all individuals who did not cook frequently (Lang & Caraher, 2001).

Interestingly, parents’ and adolescents’ have typically shown differing perceptions of consumption and preparation of food. For example, parents reported higher family dinner frequency (FDF; Boutelle, Lytle, Murray, Birnham, & Story, 2001; Fulkerson, Neumark-Sztainer, & Story, 2006) and viewed them more positively than adolescents (Neumark-Sztainer, Larson, Fulkerson, Eisenberg, & Story, 2010; Fulkerson et al., 2006), whereas adolescents perceived higher frequency, than their parents, of helping with meal preparation (Boutelle et al., 2001). Parents reported socially desirable answers more than adolescents regarding family food rules and food availability (Van Assema, Glanz, Martens, & Brug, 2007), and younger adolescents’ perceptions had greater correlation to their parents’ than older adolescents’ perceptions (Steinberg et al., 2004). The variance in perceptions regarding the same food preparation and family meal events create issues for researchers (i.e., response trends, who to question in future research) that need to be further examined.
Moreover, interventions regarding meal preparation and cooking and family meals in adolescents are limited; however, among a small number of published studies, positive effects on food behaviour were reported (Clifford, Anderson, Auld, & Champ, 2009; Cullen, Watson, Zakeri, Baranowski, & Baranowski, 2007; Cullerton, Vidgen, & Gallegos, 2012). Specifically, cooking interventions among adolescents have reported improved cooking motivation, self-efficacy for cooking (SE), positively changed eating habits, and reduced barriers to cooking (Clifford et al., 2009). Further, family meal interventions have been found to increase FDF (Johnson, Birkett, Evens, & Pickering, 2006), leading to improved vegetable and fruit consumption (Fulkerson, Rudell, et al., 2010), a reduction in the consumption of high-fat foods and high-sugar foods and beverages served at family meals and their availability at home (Gillman et al., 2000), and improving food preparation techniques (TECH; Fulkerson, Rudell, et al., 2010). Of those who did not prepare dinner, a low SE was the limiting factor (Lang & Caraher, 2001). Parents’ barriers for not including their adolescent in food preparation included limited time and perceived mess, suggesting that allowing their adolescent to help in the preparation process will be more detrimental than helpful (Fulkerson et al., 2011).

An innovative intervention, called Kinect-Ed, was developed by Sandi Richard, a Food Network Chef, and Dr. Sarah Woodruff, a professor at the University of Windsor. Kinect-Ed aims to inspire students in grades 6 to 8 to help with meal preparation through a 90 minute informational and motivational presentation. The Kinect-Ed program was developed using the Social Cognitive Theory (SCT; Bandura, 1986) and the Theory of Planned Behaviour (TPB; Ajzen, 1991).
The SCT recognizes that personal, environmental, and behavioural factors affect one another and that learning occurs through observation of a model (Bandura, 1986). The TPB utilizes intentions, attitude toward the behaviour, subjective norm, and perceived behavioural control (Ajzen, 1991). The Kinect-Ed presentation utilizes the school environment to provide interactive demonstrations that explain how consuming excess fat, sugar, and salt can affect the body. The school environment will allow the presentation to target YAs’ subjective norms through the use of YAs’ close network of teachers, peers, and friends to develop a social norm. In addition, inspirational and motivational topics in the presentation are used to target YAs’ intentions to get involved with food preparation (doing the behaviour), and improve their attitudes toward food preparation and family meals. Researchers provide food preparation and family meal information and a cookbook to the YAs to ensure that they have the knowledge, personal, and environmental factors that could increase PREP (food preparation frequency; the behaviour). Furthermore, learning occurs through a model; therefore, Sandi Richard models her behaviours to the YAs with the hope that they will become the model for their parents and family. Both theories have been used in previous family meal/food preparation interventions (e.g., SCT; Larson et al., 2008; TPB; Eto, Koch, Contento, & Adachi, 2011). The objectives of the Kinect-Ed presentation include measuring and improving participant’s PREP and TECH, SE, FDF, family meal attitudes and behaviours (ATTs), and their motivation to cook. Therefore, the purpose of this study is to: (1) evaluate the Kinect-Ed presentation, (2) evaluate correlations between adolescent/parent dyad responses, and (3) determine parents’ perceptions of the Kinect-Ed presentation.
METHODS

Participants and Recruitment

As defined by Santrock (1989), adolescence is the period of transition from childhood to early adulthood (approximately 10 to 12 years of age, ending at 18 to 22 years of age). Therefore, for the purposes of this document, participants aged 10 to 14 years will be defined as young adolescents (YAs).

The participants for this study consisted of YA/parent dyads; YAs were recruited from sample of grades 6 to 8 from schools in the Niagara Catholic District School Board (NCDSB; n=5 schools). Schools were chosen based on principal interest in Kinect-Ed.

Materials

Overall Survey Design. Three surveys (parent pre-test, and YA pre- and post-test), as well as a parent interview script, were used to assess the intervention and perceptions of YA/parent dyads. The surveys were deemed valid and reliable through the use of an expert panel, face validity among YAs, and test-retest reliability and internal consistency completed in an earlier study (Kirby, 2012). Detailed results of the survey development have been described elsewhere (Woodruff & Kirby, in press). However, among the YA pre- and post-tests, test-retest correlations ranged from .50-1.00, and the majority of t-tests revealed non-significant differences while chi-square analyses revealed significant associations (Phi=.377-1.000; Woodruff & Kirby, in press).

Parental Survey. The survey was a multiple response style where the parents chose the most appropriate answers. The 4-question survey was developed, based on Kinect-Ed’s objectives, and designed to be distributed and collected with the parental consent form. The purpose of this survey was to collect information regarding FDF and
ATTs to be able to compare dyad perceptions. Two questions on the parent survey were identical to the YA surveys. The parents were asked a FDF question *How often does your family eat dinner together?* (Appendix A, Question 1) with response options of 0-2 days/week, 3-5 days/week, or 6-7 days/week. Secondly, they were asked *how strongly do you agree or disagree with the following statements about mealtimes in your family?* (Appendix A, Question 4), with 11 sub-questions relating to family meal scheduling (3 questions), environment (3 questions), enjoyment (1 question), communication (2 questions), and importance (2 questions). Response options included a four-point likert-type scale from *strongly disagree* to *strongly agree*. Each response was coded (or reverse coded) from 1 to 4, with higher scores indicating better outcomes, for a total score of 44. Subscales were calculated to determine specific differences among ATTs. Two remaining questions asked about how comfortable they were having their child in the kitchen. Refer to Appendix A for a copy of the survey.

**YA Pre-Test Survey.** The main goal of this survey was to establish baseline values for PREP, TECH, SE, FDF, and ATTs among YAs. This survey had three sections: demographics, food preparation, and family meals. The YAs were asked a PREP question *How often are you involved in preparing/making food?*. Answers were grouped into *at least once/day*, 1-6 times/week, and *once/month or less*. Four additional questions were asked pertaining to food preparation (i.e., with family, with friends, preparation preference, and parental encouragement). Scores for TECH were calculated by the question *When making meals, what type of food preparation do you get to do?* (Appendix B, Food preparation section, Question 15b), with one point for every *yes* in each of the 11 sub-statements, for a total score of 11. The question *Check the box that describes how you
feel about the following statements (Appendix B, Food preparation section, Question 11) analysed SE with the statements pertaining to different abilities with choices on a four-point likert-type scale from very hard to very easy. Higher scores indicated better outcomes, for a total SE score out of 32. FDF was measured using the question in the family meals section, Question 1 (Appendix B) with the same options as on the parental survey. Lastly, ATTs were analyzed the same as in the parental survey, with 3 additional sub-questions (Appendix B, Family meals section, Question 3). See Appendix B for a copy of the survey.

**YA Post-Test Survey.** The purpose of this survey was to measure changes in PREP, TECH, SE, FDF, and ATTs among YAs as a result of the Kinect-Ed presentation. All of the questions analyzed from this survey were identical to the questions on the YA pre-test survey. See Appendix C for a copy of the survey.

**Parent Interview Script.** The purpose of the interview was to assess parental views on the changes in their YA’s TECHs and FDF as a result of the Kinect-Ed presentation. See Appendix D for a copy of the interview script.

**Study Procedures**

All procedures were approved by the University of Windsor Research Ethics Board and the Niagara Catholic Research Ethics Committee. Data were collected January to April, 2013.

**Parental Survey and Consent.** Following NCDSB approval, Sandi Richard presented a shortened version of the Kinect-Ed presentation to all elementary school principals and asked them to contact her if they were interested. From there, schools were chosen based on location and scheduling. Parent consent forms, letters of information,
and Kinect-Ed Parent surveys were sent to the principals who distributed them to grade 6 to 8 students in their school. Students were instructed to present them to their parent/guardians, and have the consent forms signed and returned if their parents would like them to participate in the study (along with the parent survey).

**YA Pre-test.** Once parental consent was obtained, the pre-test was administered to all YAs as a group in their classroom during school hours. In order to keep track of participants and compare their results between pre- and post-test surveys and their parent’s survey, participants created a tracking identifier (ID). The ID was a six digit number filled in at the top of the survey. The IDs were created based on date of birth, last two digits of phone number, and the last two letters of their last name (i.e., if their birthday was June 23rd, they will respond with 23, if their phone number was 253-9409, they will put 09, and if their last name was Smith, they put TH, thereby creating the code 23-09-TH). This ensured answers were rendered anonymous to the researchers and allowed the researchers to compare results across dyads and testing sessions. The pre-test survey took approximately 10-15 minutes, and was handed in a dropbox at the front of the classroom. As an incentive to participate, each participant received a ballot, which they filled out (first name and last initial), along with the survey. Following this data collection session, ballots were entered in a drawn to win the cookbook, *Eating Forward* by Sandi Richard (Cooking for the Rushed, 2010; one YA from each participating grade, in each school). The YAs were told if they did not want to participate and/or only complete the questions they wanted to they could still submit a partial/blank survey and/or a blank ballot.
**Intervention.** The Kinect-Ed presentation by Sandi Richard occurred after participants completed the pre-test. Sandi Richard, *Food Network Host* and International Best Seller, personally visited each participating school for a 90 minute presentation to all grade 6 to 8 students. The presentation incorporated educational information and interactive demonstrations focusing mainly on the effects of consuming fat, sugar, and salt (e.g., to demonstrate the effect of fat/cholesterol on the arteries, water and corn syrup were poured into separate clear tubes and YAs were able to observe how consuming food high in saturated fat can make blood move slowly through their arteries). Each participant received a copy of Sandi Richard’s newest cookbook called *Anyone Can Cook Dinner* (Cooking for the Rushed, 2012). The goal of the presentation was to encourage YAs to help prepare meals, which may lead to gaining TECH, SE, as well as increasing FDF and positive ATTs.

**YA Post-test.** One month after the Kinect-Ed presentation, researchers returned to each school to administer the post-test and another ballot. One month allowed enough time for participants to plan/prepare food. The post-test was compiled of identical questions from the pre-test with additional questions regarding Sandi Richard’s visit (additional questions were not included in this analysis). Post-test surveys were administered in the classrooms of grades 6 to 8 during school hours. Participants were asked to fill the ID section of the survey with the ID they created for the pre-test. The post-test, which took approximately 15-20 minutes, was handed in via a dropbox, and the ballot in an envelope, at the front of the classroom. Following this data collection session, one student’s ballot (from each participating grade, in each school) was drawn to win the cookbook, *Eating Forward* by Sandi Richard (Cooking for the Rushed, 2010).
**Parent/Guardian Phone Interview.** A parent follow-up interview was conducted approximately one month after the Kinect-Ed presentation (around the same time as the post-test). The convenience sample (i.e., n=23 (20%) parents), were contacted over the phone. The phone interviews lasted approximately 5 minutes and were meant to gain further information about their perceptions of the program (i.e., from their perspective, did anything change as a result of the presentation by Sandi Richard?).

**Data Analysis**

Data collected from the Kinect-Ed presentation surveys and interview were analyzed using SPSS version 21.0 for Windows (IBM Corp., 2012).

Demographic questions consisted of age, sex, and ethnicity. Any ages above 13 years (n=1) were included in the 13+ years group, and data from YAs who were not within 11 to 14 years were withdrawn because of the small sample size. Options for sex consisted of male or female. Participants’ ethnicity was coded as white or non-white due to the small number of ethnic groups.

**Intervention Evaluation.** Chi square analyses were used to determine basic demographics and associations between descriptor variables (sex, age, and ethnicity) and FDF. Paired-samples t-tests examined the changes in PREP, food preparation with family and with friends (pre-test) to T2 (post-test). Changes from T1 to T2 in FDF, PREP, with family, with friends, food preparation preferences, and parental encouragement to prepare food were categorized by decrease, no change, and increase and analyzed using a chi-square analysis. The categories were calculated by the difference of scores from T1 and T2 (i.e., T2 – T1= difference); negative values resulted from a decrease in scores from T1
to T2, positive values resulted from an *increase* in scores from T1 to T2, and scores of zero suggested *no change* in values from T1 to T2.

The effect of the Kinect-Ed program (T1 to T2) on the five major outcomes (i.e., FDF, PREP, SE, TECH, and ATTs) were explored using chi-square analyses (categorical data) and paired samples t-tests (continuous data).

A mixed model analyses was used to examine associations among FDF (dependent variable) and PREP, SE, TECH, and ATTs (independent variables); in addition, interactions between the independent variables were analysed. A mixed model analysis was used because it analyses associations of various independent variables on a dependent variable, as well as independent variables interactions from T1 to T2.

**YA/Parent Dyad Evaluation.** Comparisons within dyad’s ATTs and FDF were analysed using Pearson correlations and paired-samples t-tests. Furthermore, separate regressions were used to analyse the effect of ATTs subscales on FDF in YAs and parents separately.

**Kinect-Ed Parent Perceptions Evaluation.** Parent perceptions of the Kinect-Ed program were transcribed and coded. Frequencies were calculated for coded variables.

RESULTS

**Participants**

A total of 219 YA/parent dyads (n= 438; 50% response rate from five schools) participated. A subset of 113 YAs (47% response rate from schools, n=3) completed both pre- and post- test (T1 and T2 respectively) by the time of the analysis. School level socioeconomic status (calculated based on the school’s postal code [forward sortation areas] and the 2006 Canadian Census Track Profile) were $66422, $79953, $38993,
$43,319, and $68,862. In addition, approximately 20% (n=23) of the parents from the subset participated in the follow-up interview (similar to Kirby, 2012; Jago et al., 2011).

Of the 219 YAs from the dyads, 53% were male, 47% female, and participants ranged from 11 to 14 (28% 11 years, 36% 12 years, 30% 13 years, and 6% 14 years old). The majority of YAs were white (88%) compared to non-white (12%; Black, Chinese, Arabic, South Asian, Aboriginal, or otherwise not noted). Demographic data was not collected from the parents.

Validity of the Sample Size. The sample size of 219 YA/parent dyads, subset of 113 YAs, and 23 parents for follow-up provided ample data to achieve statistical power. Chi-square analyses and paired samples t-tests were used to compare data from T1 to T2 (n=113). Using standard settings to conduct a paired samples t-test (i.e., medium effect, with alpha =.05 and power =.80), the minimum number of cases needed to achieve sufficient power was 65 (at least 33 YA pre- and 33 YA post-tests). For YA/parent dyad comparisons, mixed model analyses were used; therefore, the minimum number of cases necessary were 128 (at least 64 parents and 64 YAs). Calculations were conducted using G*Power (Faul, 2009).

Kinect-Ed YA Analysis

Of the complete sample of YAs (n= 219), 51.6% (n=113) of the participants completed pre- and post-tests (T1 and T2 respectively) by the time of analysis. The following analyses were completed with only the participants who completed the FDF question (the dependent variable) and the surveys at both T1 and T2 (n=79).

At T1, participants reported having family dinners 6-7 days/week (69%), 3-5 days/week (25%), or 0-2 days/week (6%; see Table 1 for basic demographics by FDF at
T2). Although not significant, trends in food preparation involvement from T1 to T2 revealed more participants prepared food with family *often* at T2 (23% vs. 34%) whereas fewer prepared it *sometimes* (63% vs. 57%), or *never* (14% vs. 9%) at T2. Similarly, trends regarding preparing food with friends from T1 to T2 suggested more participants prepared food *often* at T2 (8% vs. 13%) or *never* (47% vs. 45%) and fewer prepared it *sometimes* (47% vs. 41%) at T2. Table 2 outlines the change in FDF and food preparation in various contexts from T1 and T2 by FDF at T2.

Interestingly, participants’ involvement in food preparation significantly shifted to more participants wanting to sustain their current involvement (37% vs. 55%), as opposed to increasing or decreasing the current amount (5% vs. 4%; and 58% vs. 41%, respectively; *p* ≤.01). Table 3 lists T1 and T2 scores for the 5 major outcomes. Table 4 outlines the associations among the main outcome variable, FDF, and the other four major outcomes (PREP, SE, TECH, and ATTs), including, the effects of interactions between the variables.

**YA/Parent Dyad Analysis**

Regarding YA/parent dyad evaluations, the following analyses were completed using T1 data from the YA (n=219) and one of their parents (n=219). Dyads’ correlations as well as differences (paired samples t-test) of FDF, ATTs, and subscales of enjoyment, communication, importance, environment, and scheduling are displayed in Table 5. A chi-square analysis found parents who were more comfortable with their YAs in the kitchen, had YAs who prepared/made food once a week or more (*p* <.001). Finally, the effects of various ATTs on FDF by both YA & parents are displayed in Table 6.
**Parent Perceptions of the Kinect-Ed Program**

Overall, FDF was high among parents at T2 (0-2 days/week, n=1; 3-5 days/week, n= 9; 6-7 days/weeks, n= 13). Parents suggested that differences occurred in dyad FDFs due to YAs living between different houses, YAs having extracurricular activities, issues with parental work schedules, or other issues. The majority of parents (76%) did not notice a change (including no change in YA PREP) in their YAs since participating in the Kinect-Ed presentation (yes, n= 5; no, n= 16; n/a, n=2).

**DISCUSSION**

The goal of the Kinect-Ed presentation was to motivate young adolescents to get involved in meal/food preparation, and ultimately improve FDF. This is the first study to examine the effectiveness of an intervention program on associations among FDF, PREP, SE, TECH, and ATTs. Generally, the Kinect-Ed presentation was found to be successful in terms of tested variables. In addition, scheduling was found to have the highest association with higher FDF in both YAs and parents. Finally, many parents did not report a noticeable difference in their YA’s food preparation and family meal involvement.

Overall, many YAs had family dinners as a part of a daily routine. FDF at T1 and T2 was much higher than previous findings in the USA (Eisenberg et al., 2004; Boutelle et al., 2001), and slightly higher than those others in similar regions in Canada (Woodruff, Hanning, McGoldrick, & Brown, 2010; Woodruff, & Kirby, in press). Previous research suggested FDF decreased as a function of age, regardless of ethnicity or gender (Fulkerson, Pasch, et al., 2010), whereas others found FDF was affected by gender (females reported higher) and age (inverse relationship with age; Eto et al., 2011). Eto and
colleagues (2011) suggested females reported a higher FDF based on social desirability because their attitudes, subjective norms, and perceived behavioural control variables were more strongly correlated to eating family meals than males. However, the current study found FDF did not vary among sex, age, or ethnicity, and statistically more participants remained or increased to 6-7 family dinners a week at T2.

Out of the five major outcomes, the Kinect-Ed presentation improved participants’ FDF, PREP, SE, and TECH. However, no change was found with ATTs. Interestingly, ATTs was the strongest variable associated with FDF in the mixed model analysis (similar to Woodruff & Kirby, in press). In addition, an inverse interaction was found between SE and ATTs on FDF (i.e., as the influence of SE on FDF increased, the effect of ATTs on FDF would decrease and vice-versa). Since SE significantly improved, the effect of ATTs on FDF could not have improved. Future research may use this new knowledge to adjust the focus from motivation in food preparation to improving SE, or participant’s ATTs (e.g., may need to provide techniques/suggestions to improve the environment or enjoyment of a family meal).

Compared to previous studies (Chu et al., 2012; Woodruff & Kirby, in press), PREP was higher among the current sample. Furthermore, it was the second strongest variable associated with FDF in the mixed model analysis. Previous research suggested that PREP increased YAs’ self-efficacy for making healthier food choices (Chu et al., 2012). In addition, higher PREP provided family interaction opportunities, where eating patterns and food preferences could be developed (Chu et al., 2012). In the Kinect-Ed presentation, hands-on food preparation demonstrations were not provided for all participants (i.e., one student demonstrated making a recipe during the presentation), but
an increase in SE was found among all participants. The relationship opposes previous findings, which suggested an advantage to hands-on cooking education to improve SE (Clifford et al., 2009). However, YAs may be over-reporting their PREP as Boutelle et al., (2001), revealed adolescents perceived they were more frequently involved in food preparation than adults perceived them to be, therefore, PREP may not have been as high as reported by current participants (or parents in Boutelle et al., 2001) were underreporting). Further, although the survey tries to point out what constitutes food preparation (e.g., making a bowl of cereal vs. cutting up vegetables for a stir fry), discrepancies between PREP may exist. In the future, research should investigate and determine better food preparation definitions to address this more clearly.

Among the ATTs, scheduling tends to be one of the strongest predictors of FDF in this study (similar to Eto et al., 2011; Neumark-Stainer, Story, Ackard, Moe, & Perry, 2000). Shift work, activities such as sports, extracurricular school activities, and socializing with friends were reported in focus groups (Neumark-Stainer et al., 2000) as being barriers to having regular family meals. Alleviating barriers (e.g., by planning specific days for family dinners or selecting appropriate dinnertimes that all members can attend) should be used to encourage a higher FDF (Eto et al., 2011).

The present study found that YAs and parents in the same household had significantly different perceptions of FDF and ATTs, regardless of gender, age, or ethnicity (from the paired samples t-test). In previous research, younger adolescents reported higher FDF compared to older adolescents, but overall, adults reported the highest frequency of family meals per week (Steinberg et al., 2004). Parents had higher scores on all variables except FDF and scheduling (higher scores indicated better
outcomes), which were previously found to have higher scores than adolescents (Steinberg et al., 2004). Some of the higher scores from the parents may have occurred as a function of social desirability (Boutelle et al., 2001). Strong correlations were found between YAs and their parents in FDF, ATTs, environment, and scheduling. During young adolescence, FDF may be associated with higher occurrence of dyad communication over time, even though communication decreases during adolescence (Fulkerson et al., 2011; Franko et al., 2008). That is important because as a YA’s age and scheduling become issues, YAs may not be at family dinners as frequently, however, fostering dyad communication at family dinners may be an important component to maintaining FDF into adolescence (Fulkerson et al., 2011). Efforts to increase FDF/family meal frequency may include increasing family breakfast or lunch frequency, scheduling pleasurable family dinners on at least 3-4 days/week, and/or avoiding conflict by shifting sensitive conversation topics for alternate times (Story & Neumark-Sztainer, 2005).

Parents’ perceptions of the Kinect-Ed presentation were collected via phone interviews. Parents generally reported no change in their YAs’ PREP since the Kinect-Ed program, regardless of feeling more comfortable with their YA in the kitchen. However, parents’ reports were based off of their YA’s external behaviours, whereas their YA’s internal thoughts may have changed (similar to Steinberg et al., 2004). Of the parents who did notice a change, they reported a large improvement in their YA’s PREP. One parent described his son’s change as “you can tell, he feels more proud about himself… I’ve never seen him make a whole pork dinner [before], but that’s my son, he’s building skills now that will last a lifetime”. When asked about dyad FDF differences, parents suggested
scheduling issues and their YAs having multiple homes might have created the difference in perceptions. A longitudinal study by Fulkerson and colleagues (2011) found adolescents in single parent homes had lower FDF and perceived lower dyad communication than those in two-parent homes through adolescence. Perceived lower dyad communication in single parent homes may have occurred from the greater chance of at least one parent being at dinner if there were two parents at home (Fulkerson et al., 2011). In addition, previous research found that adolescents reported large differences within homes and between households (e.g., changes in parent employment, family relationships, or older siblings leaving the home; Neumark-Stainer et al., 2000). Although the current pre- and post-tests ask YAs about who they live with the majority of the time, perhaps gathering more information on dual households would be beneficial in the future. Overall, promotion of family meals among families with single parents should include enjoying other family meals (not just dinner) or making meal timing more convenient for the whole family (Fulkerson et al., 2011).

**Limitations**

This study is not without limitations. The study sample was of convenience, the sample size and ethnic diversity were small compared to other studies, and this study’s response rate was a bit lower than others (Boutelle et al., 2001; Chu et al., 2012) yet comparable to others in Canada (e.g., 51% in Veugelers & Fitzgerald, 2005; 39% in Hanning et al., 2007). Due to the large number of possible explanations (parents never received the forms, parents did not care or were too lazy to read and/or sign the information and forms, student forgot the signed form in his/her book bag, or parents/students truly did not want to participate) it is not possible to determine whether
the results are generalizable to the larger population. Also, socioeconomic status of YAs and their parents were not assessed, which has been found to be negatively associated with FDF in previous research (Neumark-Sztainer et al., 2003). In addition, since the sample was of convenience (with a minimal range of socioeconomic status, ethnicity, etc.) this study may not be generalizable to the larger population; therefore, practical significance was not analysed. Future research on this topic should incorporate a large, more diverse participant sample and incorporate practical significance into the results.

The inability to directly observe variables (e.g., types of communication, scheduling issues, etc.) in the family home could be an issue. Indirect observation (i.e., through self-report) may increase the chance for participants to respond based on social desirability bias (Fisher, 1993). Qualitative analyses were only completed on parents (in the phone interview); therefore, the results could not be compared to YA post-test responses without qualitative assessment of the YA post-test responses. Furthermore, all data for this study was drawn from self-reporting; in attempts to minimize social bias, direct evaluation can be used to collect data. However, direct evaluation in a family home setting is not practical and may have its own limitations (i.e., behaviour changes when being directly observed) and, therefore, surveys may be an acceptable way to collect data. In addition, the surveys grouped frequencies into categories to analyse FDF and PREP, therefore, smaller changes in from T1 to T2 may have been undetectable.

The results from this study are also limited to family dinner frequency and not all meals. It is not expected, however, that the influence of eating other meals with family would be any different than those observed in the present study. Only a minimal amount of the variance in FDF could be explained for by the independent variables in the dyad.
regression analyses (Table 6); however, unexplained variance can be expected in human behaviour research (Ajzen, 1991). Furthermore, it is important to note that when interpreting the results of food preparation, the survey questions do not indicate whether YAs were preparing meals from scratch, making ready-made foods, or just helping set the table etc. Research has found that convenience foods are negatively associated with diet quality (Alexy, Libuda, Mersmann, & Kersting, 2011), and therefore, promoting scratch cooking skills should be included in future research.

**Conclusions & Implications**

The Kinect-Ed presentation was a successful intervention to improve YAs’ FDF, PREP, SE, and TECH. Although it had the strongest association with FDF, ATTs did not change. Therefore, Kinect-Ed, and health promotion endeavours may need to shift the focus to improving YA’s ATTs in order to improve FDF. In addition, it is important to provide encouragement and opportunities to allow families to continue eating together. Scheduling is the main issue; therefore, by encouraging YAs to get involved in the kitchen, it may reduce the time needed from parents to prepare the meal, which may minimize the issues with scheduling, and allow more time for frequent family dinners.
REFERENCES


<table>
<thead>
<tr>
<th></th>
<th>0-2 days/week [n(%)]</th>
<th>3-5 days/week [n(%)]</th>
<th>6-7 days/week [n(%)]</th>
<th>p</th>
</tr>
</thead>
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<td></td>
<td></td>
<td></td>
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<td>Male (n=48)</td>
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<td>11 (23)</td>
<td>34 (71)</td>
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</tr>
<tr>
<td>Female (n=31)</td>
<td>2 (7)</td>
<td>9 (29)</td>
<td>20 (65)</td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>11 years (n=22)</td>
<td>1 (5)</td>
<td>6 (27)</td>
<td>15 (68)</td>
<td>.49</td>
</tr>
<tr>
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<td>4 (12)</td>
<td>8 (24)</td>
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<tr>
<td>13+ years (n=23)</td>
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<td>6 (27)</td>
<td>17 (73)</td>
<td></td>
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</tr>
<tr>
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<td>15 (21)</td>
<td>50 (73)</td>
<td>.11</td>
</tr>
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<td>1 (10)</td>
<td>5 (50)</td>
<td>4 (40)</td>
<td></td>
</tr>
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*Note: p is considered significant at <.05.*
### Table 2: Changes from T1 to T2 by Family Dinner Frequency at T2 (n=79)

<table>
<thead>
<tr>
<th></th>
<th>0-2 days/week</th>
<th>3-5 days/week</th>
<th>6-7 days/week</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[n(%)]</td>
<td>[n(%)]</td>
<td>[n(%)]</td>
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<tr>
<td><strong>Change in Family Dinner Frequency</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Decrease (n=8)</td>
<td>2 (25)</td>
<td>6 (75)</td>
<td>-</td>
<td>&lt;.01</td>
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<tr>
<td>No Change (n=55)</td>
<td>3 (6)</td>
<td>9 (16)</td>
<td>43 (78)</td>
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</tr>
<tr>
<td>Increase (n=9)</td>
<td>-</td>
<td>2 (22)</td>
<td>7 (78)</td>
<td></td>
</tr>
<tr>
<td><strong>Change in Food Preparation Frequency</strong></td>
<td></td>
<td></td>
<td></td>
<td>.99</td>
</tr>
<tr>
<td>Decrease (n=14)</td>
<td>1 (7)</td>
<td>3 (21)</td>
<td>10 (72)</td>
<td></td>
</tr>
<tr>
<td>No Change (n=43)</td>
<td>3 (7)</td>
<td>11 (26)</td>
<td>29 (67)</td>
<td></td>
</tr>
<tr>
<td>Increase (n=22)</td>
<td>1 (5)</td>
<td>6 (27)</td>
<td>15 (68)</td>
<td></td>
</tr>
<tr>
<td><strong>Change in Food Preparation Frequency with Family</strong></td>
<td></td>
<td></td>
<td></td>
<td>.33</td>
</tr>
<tr>
<td>Decrease (n=11)</td>
<td>1 (9)</td>
<td>2 (18)</td>
<td>8 (73)</td>
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<tr>
<td>No Change (n=45)</td>
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<td>14 (31)</td>
<td>27 (60)</td>
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<td>4 (17)</td>
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<td></td>
</tr>
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<td><strong>Change in Food Preparation Frequency with Friends</strong></td>
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<td></td>
<td>.54</td>
</tr>
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<td>2 (18)</td>
<td>9 (82)</td>
<td></td>
</tr>
<tr>
<td>No Change (n=55)</td>
<td>5 (9)</td>
<td>15 (27)</td>
<td>35 (64)</td>
<td></td>
</tr>
<tr>
<td>Increase (n=13)</td>
<td>0 (0)</td>
<td>3 (23)</td>
<td>10 (77)</td>
<td></td>
</tr>
<tr>
<td><strong>Change in How Often Participant Prefers to Prepare/Make Food</strong></td>
<td></td>
<td></td>
<td></td>
<td>.74</td>
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<tr>
<td>Decrease (n=8)</td>
<td>1 (12)</td>
<td>2 (25)</td>
<td>5 (63)</td>
<td></td>
</tr>
<tr>
<td>No Change (n=52)</td>
<td>3 (6)</td>
<td>14 (27)</td>
<td>35 (67)</td>
<td></td>
</tr>
<tr>
<td>Increase (n=16)</td>
<td>1 (6)</td>
<td>2 (13)</td>
<td>13 (81)</td>
<td></td>
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<tr>
<td><strong>Change in Encouragement from Parents to Prepare/Make Food</strong></td>
<td></td>
<td></td>
<td></td>
<td>.12</td>
</tr>
<tr>
<td>Decrease (n=9)</td>
<td>0 (0)</td>
<td>5 (56)</td>
<td>4 (44)</td>
<td></td>
</tr>
<tr>
<td>No Change (n=58)</td>
<td>5 (9)</td>
<td>11 (19)</td>
<td>42 (72)</td>
<td></td>
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<tr>
<td>Increase (n=7)</td>
<td>0 (0)</td>
<td>1 (14)</td>
<td>6 (86)</td>
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*Note: p is considered significant at <.05.*
Table 3: Effects of the Kinect-Ed Presentation on the Five Major Outcomes (n=113)

<table>
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<tr>
<th>Outcome Variables</th>
<th>Pre-Test</th>
<th>Post-Test</th>
<th>p</th>
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<tbody>
<tr>
<td>Family Dinner Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-2 days/week [n (%)]</td>
<td>8 (8)</td>
<td>5 (6)</td>
<td>&lt;.01&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>3-5 days/week [n (%)]</td>
<td>24 (25)</td>
<td>20 (25)</td>
<td></td>
</tr>
<tr>
<td>6-7 days/week [n (%)]</td>
<td>64 (67)</td>
<td>54 (69)</td>
<td></td>
</tr>
<tr>
<td>Food Preparation Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At least once/day [n (%)]</td>
<td>24 (21)</td>
<td>28 (30)</td>
<td>&lt;.01&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>1-6 times/week [n (%)]</td>
<td>48 (43)</td>
<td>46 (47)</td>
<td></td>
</tr>
<tr>
<td>Once/month or less [n (%)]</td>
<td>41 (36)</td>
<td>23 (23)</td>
<td></td>
</tr>
<tr>
<td>Self-Efficacy for Cooking Score, range 8-32&lt;sup&gt;a&lt;/sup&gt;, [Mean (SD)]</td>
<td>26.3 (4.6)</td>
<td>27.0 (4.5)</td>
<td>.02&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Food Preparation Techniques, range 0-11&lt;sup&gt;a&lt;/sup&gt;, [Mean (SD)]</td>
<td>7.7 (2.5)</td>
<td>8.2 (2.0)</td>
<td>.01&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Family Meal Attitudes and Behaviours Scale, range 14-56&lt;sup&gt;a&lt;/sup&gt;, [Mean (SD)]</td>
<td>44.8 (7.1)</td>
<td>44.5 (8.6)</td>
<td>.57&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Subscale: Enjoyment (2 items), range 2-8&lt;sup&gt;a&lt;/sup&gt;, [Mean (SD)]</td>
<td>7.0 (1.4)</td>
<td>7.0 (1.5)</td>
<td>.74&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Subscale: Communication (2 items), range 2-8&lt;sup&gt;a&lt;/sup&gt;, [Mean (SD)]</td>
<td>6.8 (1.5)</td>
<td>6.9 (1.4)</td>
<td>.57&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Subscale: Importance (3 items), range 3-12&lt;sup&gt;a&lt;/sup&gt;, [Mean (SD)]</td>
<td>9.9 (2.0)</td>
<td>9.9 (2.3)</td>
<td>.76&lt;sup&gt;c&lt;/sup&gt;</td>
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<tr>
<td>Subscale: Environment (3 items), range 3-12&lt;sup&gt;a&lt;/sup&gt;, [Mean (SD)]</td>
<td>8.7 (2.7)</td>
<td>8.7 (2.9)</td>
<td>1.00&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Subscale: Scheduling (4 items), range 4-16&lt;sup&gt;a&lt;/sup&gt;, [Mean (SD)]</td>
<td>12.5 (3.0)</td>
<td>12.2 (3.3)</td>
<td>.34&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
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</table>

Note: p is considered significant at <.05.
<sup>a</sup> Higher scores indicate better outcomes.
<sup>b</sup> Chi-square analyses were used to assess significance.
<sup>c</sup> Paired samples t-tests were used to assess significance.
Table 4: Associations among Family Dinner Frequency and Self-Efficacy for Cooking, Food Preparation Frequency, Food Preparation Techniques, and Family Meal Attitudes and Behaviours.

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<tr>
<th>Independent Variable</th>
<th>Standardized Coefficient</th>
<th>p</th>
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<tr>
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<td>.05</td>
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<tr>
<td>Self-Efficacy for Cooking</td>
<td>.134</td>
<td>.24</td>
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<tr>
<td>Food Preparation Techniques</td>
<td>.188</td>
<td>.09</td>
</tr>
<tr>
<td>Family Meal Attitudes and Behaviours</td>
<td>.510</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Food Preparation Frequency X Self-Efficacy for Cooking</td>
<td>-.089</td>
<td>.40</td>
</tr>
<tr>
<td>Food Preparation Frequency X Food Preparation Techniques</td>
<td>-.022</td>
<td>.80</td>
</tr>
<tr>
<td>Food Preparation Frequency X Family Meal Attitudes and</td>
<td>.007</td>
<td>.94</td>
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<td>Behaviours</td>
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<tr>
<td>Self-Efficacy for Cooking X Food Preparation Techniques</td>
<td>.007</td>
<td>.93</td>
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<td>.05</td>
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<tr>
<td>Behaviours</td>
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<td></td>
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<tr>
<td>Food Preparation Techniques X Family Meal Attitudes and</td>
<td>-.213</td>
<td>.06</td>
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<tr>
<td>Behaviours</td>
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Note: Dependent variable: Family Dinner Frequency; p is considered significant at <.05.
<table>
<thead>
<tr>
<th>Main Outcomes</th>
<th>YA</th>
<th>Parent</th>
<th>r</th>
<th>p&lt;sup&gt;a&lt;/sup&gt;</th>
<th>t</th>
<th>p&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Family Dinner Frequency</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-2 days/week [n(%)]</td>
<td>13 (7)</td>
<td>20 (9)</td>
<td>.49</td>
<td>&lt;0.01</td>
<td>3.3</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>3-5 days/week [n(%)]</td>
<td>46 (25)</td>
<td>75 (35)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>6-7 days/week [n(%)]</td>
<td>135 (68)</td>
<td>122 (56)</td>
<td></td>
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<tr>
<td><strong>Family Meal Attitudes and Behaviours Scale, range 14-56 (mean [SD])</strong></td>
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<td>Subscale: Enjoyment (2 items), range 2-8 (mean [SD])</td>
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<td>3.8 (0.5)</td>
<td>.20</td>
<td>&lt;0.01</td>
<td>-6.0</td>
<td>&lt;0.01</td>
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<tr>
<td>Subscale: Communication (2 items), range 2-8 (mean [SD])</td>
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<td>7.4 (0.9)</td>
<td>.29</td>
<td>&lt;0.01</td>
<td>-5.9</td>
<td>&lt;0.01</td>
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<tr>
<td>Subscale: Importance (3 items), range 3-12 (mean [SD])</td>
<td>6.6 (1.3)</td>
<td>7.2 (0.9)</td>
<td>.33</td>
<td>&lt;0.01</td>
<td>-7.3</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Subscale: Environment (3 items), range 3-12 (mean [SD])</td>
<td>8.7 (2.6)</td>
<td>9.5 (2.4)</td>
<td>.62</td>
<td>&lt;0.01</td>
<td>-5.8</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Subscale: Scheduling (4 items), range 4-16 (mean [SD])</td>
<td>9.0 (2.3)</td>
<td>8.6 (2.6)</td>
<td>.54</td>
<td>&lt;0.01</td>
<td>2.6</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

*Note: Higher scores indicate better outcomes; p is considered significant at <.05.

*<sup>a</sup>Pearson correlations were used to assess significance.

*<sup>b</sup>Paired samples t-tests were used to assess significance.*
Table 6: The Effect of Family Meal Attitudes and Behaviours on Family Dinner Frequency

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>YA Standardized Coefficient (n=219)</th>
<th>Parent Standardized Coefficient (n=219)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enjoyment</td>
<td>.04</td>
<td>-.01</td>
</tr>
<tr>
<td>Communication</td>
<td>.17*</td>
<td>.16*</td>
</tr>
<tr>
<td>Importance</td>
<td>.24*</td>
<td>.04</td>
</tr>
<tr>
<td>Environment</td>
<td>.08</td>
<td>.07</td>
</tr>
<tr>
<td>Scheduling</td>
<td>.33*</td>
<td>.55*</td>
</tr>
<tr>
<td>R²</td>
<td>.32</td>
<td>.63</td>
</tr>
</tbody>
</table>

Notes: Separate (YA and parent) regression analyses were used to assess significance. The dependent variable is family dinner frequency. R² is the amount of variance accounted for by the independent variables. *p is significant at <.05.
REVIEW OF LITERATURE

CHILD/ADOLESCENT OBESITY

Over 25 years, the collective prevalence of overweight and obese children and adolescents in Canada has more than doubled; of those, obesity tripled (Canadian Community Health Survey (CCHS), 2004). In 2004, 8% of adolescents were obese and 18% were overweight, for a total of approximately one quarter of all adolescent Canadians being overweight or obese (CCHS, 2004), slightly behind obesity rates in the United States (Ogden, Carroll, Kit, & Flegal, 2012). Percentages differed by gender as rates of obese females were slightly lower than males (Shields, 2006). Regardless of gender, however, overweight and obesity has been found to be associated with decreasing levels of emotional/psychological and physical well-being (Doll, Petersen, & Stewart-Brown, 2000). Since adolescent obesity is known to progress into adulthood (Goldhaber-Fiebert, Rubinfeld, Bhattacharya, Robinson, & Wise, 2012; Daniels et al., 2012), it is important to reduce its prevalence through the use of interventions.

*Body Mass Index (BMI).* BMI is commonly used to define weight status, (i.e., cut points for underweight, normal weight, overweight, and obese I, II, III) by comparing an adult’s weight and height; wt(kg)/ht(m$^2$) (Health Canada, 2003). The weight status cut points are often related to degree of body fatness and disease risks (Stevens, Cai, Juhaeri, Thun, & Wood, 2000). Due to growth differences between children aged 2-19 years, a BMI-for-age value is commonly used. This method of BMI defines overweight and obesity as being above the 85th percentile and 97th percentile, respectively (Dietitians of Canada and Canadian Paediatric Society, 2010). Differences in BMI classifications to compare BMI cut-points may affect rates of overweight and obesity. Using three main
classification systems by the Centers for Disease Control and Prevention (CDC), the International Obesity Task Force (IOTF), and the World Health Organization (WHO), Shields and Tremblay (2010) compared overweight and obesity rates using different cut-points. At all ages, the WHO cut-points yielded higher percentages of overweight/obese children/adolescents and IOTF yielded the lowest; overall, an 8.5% difference in rate of population overweight/obesity was found between WHO and IOTF cut-points (Shields & Tremblay, 2010). The large differences between results stemmed from the variances between participants used to compile each data set. For example, CDC’s data was derived from five nationally representative surveys in the United States between 1963 and 1994; IOTF used data collected from 1963-1993 from large, nationally representative cross-sectional studies in Brazil, Great Britain, Hong Kong, Netherlands, Singapore, and the United States; WHO’s data was collected between 1997-2003 from children who lived in conditions that allowed for optimal growth in Brazil, Ghana, India, Norway, Oman, and the United States. Canada currently uses WHO’s growth charts to assess child obesity in Canada (Dietitians of Canada and Canadian Paediatric Society, 2010).

**Emotional/Psychological Effects of Obesity**

Weight issues can emotionally impact young adolescents and last a lifetime (Dietz, 1998). A study by Strauss (2000), found that regardless of race, obese adolescents had significantly lower levels of self-esteem than non-obese peers. In addition, longitudinal studies in children have found, body weight/fat and self-esteem were inversely related (Klesges et al., 1992; Wang, Wild, Kipp, Kuhle, & Veugelers, 2009). In young adolescents, the obesity-related decrease in self-esteem was accompanied with increased levels of loneliness, sadness, stress, and anxiety, as well as, higher incidences of
engaging in high-risk behaviours such as smoking and alcohol usage, and suicidal thoughts and attempts (Paradise & Kernis, 2002; McGee, Williams, & Nada-Raja, 2001; Strauss, 2000). When comparing obese adolescents’ quality of life to their non-obese peers, obese adolescents experienced a quality of life score 5.5 times lower, a score similar to an adolescent with cancer (Schwimmer, Burwinkle, & Varni, 2003). Regarding gender differences, the overall emotional and psychological impact of overweight or obesity was greater among females than males (Strauss, 2000).

Peers have been found to be the most influential group for psychological and emotional development in adolescents (Pearce, Boergers, & Prinstein, 2002); therefore, low self-esteem in overweight and obese adolescents may stem from teasing and social stigmas (Musher-Eizenman, Holub, Barnhart Miller, Goldstein, & Edwards-Leeper, 2004; Robinson, 2006). A study by Musher-Eizenman et al. (2004) found that children assigned more negative characteristics to overweight figures than thinner ones. In addition, fatness played a role in friend selection; overweight peers were not viewed as desirable playmates compared to normal weight counterparts, even if a choice of only one playmate did not have to be made (Musher-Eizenman et al., 2004).

Academic achievement has also been shown to decrease in obese young adolescents with low self-esteem (Canning & Mayer, 1967). A six-year study by Gable, Krull, and Chang (2012) found that participants who were persistently obese or had later onset of obesity had poorer school performance than the control (never being obese). In addition, a longitudinal study by Gortmaker, Must, Perrin, Sobol, and Dietz (1993) found that after adjusting for baseline effects (family income, education, and ethnicity),
participants who were overweight completed less schooling, had lower household incomes, and higher rates of poverty than non-overweight participants.

**Physical Effects of Obesity**

Obese adolescents may be subjected to initial stages of chronic diseases; however, the full effects of these diseases may not emerge until later in life (Goldhaber- Fiebert et al., 2012). The issues associated with adolescent obesity include, but are not limited to, increased risk of asthma, injuries, gallstones, hepatitis, sleep apnea, cardiovascular disease, issues with growth, type II diabetes, hypertension, some cancers, and mortality (Burns, Murrock, & Graor, 2012; Must, Jacques, Dallal, Bajema, & Dietz, 1992; Must & Strauss, 1999; Park, Falconer, Viner, & Kinra, 2012; Noal, Menezes, Macedo, & Dumith, 2011); many of which do not emerge until adulthood (Must et al., 1992). The increased risk of developing cardiovascular disease, injuries, and cancer, as well as risk of mortality are highlighted below.

**Cardiovascular Disease (CVD).** CVD encompasses diseases of the circulatory system including coronary heart disease (CHD), stroke, and peripheral vascular disease; in Canada, it is the leading cause of adult death (Public Health Agency of Canada, 2010). In 2007, 13 million Canadians reported having CVD (Public Health Agency Canada (2010), and in 2008, CVD accounted for 29% of all deaths in Canada (Statistics Canada, 2011). A systematic review conducted by Park et al. (2012) found that high BMI status at age 2-25 years was associated with increased risk of CHD and stroke later in life. CVD risk factor levels did not differ between overweight/obese adults who were obese or normal weight as a child, however, early onset obesity was related to the degree of
obesity as an adult (Freedman, Khan, Dietz, Srinivasan, & Berenson, 2001) and the rate and degree of CVD (Kannel, D’Agostio, & Cobb, 1996).

**Injury.** Significant relationships have been found between BMI and severity of injury (i.e., normal weight adolescents experience less severe injuries compared to overweight peers; Burns et al., 2012). In regards to type of injuries that require hospitalization, overweight adolescents are more likely to experience lower extremity injuries due to greater forces on the lower extremities (Pomerantz, Timm, & Gittelman, 2010). In addition, sprains occurred more often when compared to normal weight counterparts (Pomerantz, Timm, & Gittelman, 2010). This may be due to significantly greater overall bone density in obese adolescents than normal weight peers, suggesting that forces that would cause bone breaks in lighter adolescents act on ligaments resulting in sprains (Leonard, Shults, Wilson, Tershakovec, & Zemel, 2004). Even though fractures were found to be less common among obese adolescents, those who were obese and had a history of fractures had a higher incidence of repeated fractures than their non-obese counterparts (Dimitri, Wales, & Bishop, 2010; Manias, McCabe, & Bishop, 2006).

**Cancer.** Deaths from all cancers have been found to significantly increase in those who have the highest BMIs (Wolk et al., 2001; Calle, Rodriguez, Walker-Thurmond, & Thun, 2003). Specifically, 14-20% of deaths from all cancers are linked to overweight or obesity. Avoiding weight gain in adolescence can provide a preventative effect for cancers of the colon, breast, prostate, endometrium, kidney, esophagus, pancreatic, uterus, gallbladder, ovaries, and liver (Calle et al., 2003). Differences exist between males and females. Worldwide, breast cancer is the most frequently diagnosed cancer in females and is the leading cause of female cancer death (Jemal et al., 2011). A high-fat diet in
childhood and adolescence is linked to an increase risk of postmenopausal breast cancer. In addition, the only established primary breast cancer prevention method is preventing obesity (Kelsey, 1993). In males, prostate cancer is the second most diagnosed cancer (Jemal et al., 2011) and obese men are at an increased risk of the development and recurrence of prostate cancer due to detection difficulties (Freedland & Platz, 2007). A cohort study by Schuurman, Goldbohm, Dorant, and Van Den Brandt (2000) suggested that body composition in young adulthood may predict future prostate cancer risk.

**Mortality.** A systematic review conducted by Park et al. (2012) found that a high BMI status at age 2-19 years increased the risk of mortality by 40-60% when compared to non-obese counterparts. In addition, type II diabetes, hypertension, and coronary heart disease were found consistently associated with being overweight at a young age (Park et al., 2012). The Harvard Growth Study, conducted from 1922 to 1935, echoed these results (Must et al., 1992). Over 3000 school-aged children’s heights and weights were measured to determine body mass index (BMI) annually for eight consecutive years. Approximately 55 years later, researchers conducted a follow-up study. Of the 508 contacted for follow-up, 32% were deceased. Mortality from all causes, including coronary heart disease, stroke, and colorectal cancer, were more prevalent in men who were overweight in adolescence than those who were lean. In addition, women who were overweight during adolescence reported greater amounts of arthritis and greater difficulty in personal care and daily living activities later in life than their adolescent lean counterparts (Must et al., 1992).
**Energy Balance**

As explained previously, high BMIs are related to many emotional, psychological, and physical ailments. Preventing weight gain or reducing high BMIs can provide a preventative effect for many weight-related issues. BMIs can change depending on the energy consumed and expended. For example, imagine a weight scale that has two plates; one side represents energy consumed (i.e., food), the other represents energy expelled (i.e., metabolic rate, physical activity, thermic effect of food). If the energy consumed exceeds the amount expelled, a positive weight imbalance will occur overtime, which may lead to weight gain. According to the most recent documented prevalence of overweight and obese children/adolescents, approximately 30% have energy intakes in excess of what was required (Health Canada, 2012) and only seven percent meet Canada’s current recommendations for physical activity (Active Healthy Kids Canada, 2012). Reducing excess energy can be achieved by reducing energy intake or increasing output (physical activity).

**Sedentary and Physical Activity**

Sedentary behaviours, as defined by the Sedentary Behaviour Research Network (2012), consist of ‘any waking behavior characterized by an energy expenditure less than or equal to one and a half METs (metabolic equivalency tasks) while in a sitting or reclining posture’; whereas not meeting specified physical activity guidelines is deemed ‘inactive’. To conceptualize METs, one MET is the energy expenditure at rest; therefore, light activity such as dusting or reading are one to three METs (depending on intensity), whereas jogging, swimming laps, and heavy construction are considered seven or more METs (depending on intensity). Given the theoretical differences in physical activity vs.
sedentary behaviours, the Canadian Society for Exercise Physiology (CSEP) has developed recommendations at both ends of the energy expenditure spectrum. The current physical activity guidelines for Canadian adolescents to achieve health benefits include an accumulation of at least 60 minutes of moderate to vigorous intensity physical activity daily, with vigorous intensity activities at least three days per week and muscle and bone strengthening activities at least three days per week (CSEP, 2012). Sedentary behaviour guidelines for young Canadians are to minimize daily sedentary time by limiting recreational screen time to no more than two hours per day, and limit sedentary transport, extended sitting, and time spent indoors throughout the day (CSEP, 2012).

Koezuka et al. (2006) used CCHS data to examine inactivity among adolescents. They defined inactivity as less than 60 minutes of brisk walking per day (less strict than the current Canadian physical activity guidelines) and determined that two-thirds of females and half of all males were inactive. The Canadian Health Measures Survey objectively measured Canadian adolescents’ physical activity and determined only seven percent of adolescents reached the recommended guidelines (Colly et al., 2011). In addition, the same survey found that adolescents spend 8.6 hours (62% of waking hours) sedentary. Being sedentary for extended periods of time is an issue because it can increase the risk for premature mortality regardless of weight; therefore, unfit lean individuals have a higher risk of premature mortality than fat but fit peers (Lee, Blair, & Jackson, 1999).

**Media effects.** Time spent engaging in media such as watching television, playing video games, or using the computer continues to increase each year and is currently approximately two times higher than the recommended daily limit of 2 hours/day (Babey,
Television viewing was strongly linked being sedentary in both genders (Babey, Hastert, & Wolstein, 2012); however, males spent more time sedentary than females (Leatherdale & Wong, 2008). CCHS found that 35% of Canadian adolescents who spent 30 or more hours with screen time per week were overweight or obese participants, compared to only 23% of less than 10 hours per week (Shields, 2006). The issue with increased media use is that it 1) may displace physical activity and reduce energy expenditure, 2) increase dietary energy intake from eating during viewing or from the effects of food advertising, and/or 3) decrease resting metabolic rate while viewing (Koezuka et al., 2006); all of which can lead to an increased BMI and the complications associated with it.

**NUTRITION**

**Current Intakes**

Food energy is measured in calories (kcals), units of heat. An average Canadian male adolescent reportedly consumes 2600 - 2800 kcals, and a female adolescent 1850 – 2000 kcals (Garriguet, 2007; Vance, Woodruff, McCargar, Husted, & Hanning, 2009; Storey et al., 2009). There are no specific Canadian caloric intake standards because an individual’s caloric needs could vary depending on age, sex, weight, height, and activity level, among other factors (Institute of Medicine of the National Academies, 2005). Since adolescence is a time of physical changes and growth, adolescents also require slightly more energy (e.g., 25 kcals) to facilitate growth (Alberga, Sigal, Goldfiels, Prud’homme, Kenny, 2012; Institute of Medicine of the National Academies, 2005); therefore, caloric intake is highest among adolescents and declines with age (Garriguet, 2007).
The most recent food guide, Eating Well with Canada’s Food Guide (EWCFG) (Health Canada, 2007) recommends food group servings based on age and gender. Using the most recent national nutrition survey data (CCHS, 2004), *Vegetables and Fruit* were found to be greatly under-consumed with 62% of females and 68% of males not meeting the minimum requirement (Garriguet, 2007). *Milk and Alternatives* were also under-consumed, 83% of females and 61% of males did not meet the minimum requirements. Most adolescents (usually males faring better) consumed the minimum requirements for *Grain Products* and *Meat and Alternatives*. Based on other smaller, regional, studies investigating food intakes in children and adolescents, similar results have been observed (Rossiter, Evers, & Pender, 2012; Hanning et al., 2007). A further study by Rossiter et al. (2012), found that only 0.4% and 2% of Canadian adolescent males and females, respectively, met the minimum recommendations in all four food groups.

During adolescence, diet quality declines with age (Rossiter et al. 2012; Storey et al. 2009). Rossiter et al., (2012) found the percent of adolescents who met the minimum requirements in each of the four food groups declined over three years. More specifically, as requirements increased (result of adolescents aging), consumption decreased. A significant decrease in *Vegetables and Fruit* was observed among males, and in *Grain Products* and *Milk and Alternatives* in females.

Coupled with potentially problematic serving intakes, over the years, caloric intake has remained the same, but BMIs have increased (Tremblay & Willms, 2000). This suggests that healthy food choices are replaced by *Other Foods*; food and drinks that are not part of the other four food groups (Storey et al., 2009). Examples of *Other foods* include, but are not limited to, soft drinks, cookies, cakes, and chips (i.e., usually foods
high in fat, sugar, and salt). Based on smaller studies, adolescents often consumed three servings of these foods daily, which accounted for approximately a quarter of daily calories in adolescents (Evers, Taylor, Manske, & Midgett, 2001; Hanning et al., 2007). This is a pressing issue because adolescents are not meeting EWCFG requirements (Health Canada, 2007) and are consuming large portions of their energy from a food group that is supposed to be limited.

**Meals and Snacks**

CCHS data reported that, on average, breakfast made up 18% of calories, lunch, 24%, dinner, 31%, and snacks counted for 27% of calories (Garriguet, 2007). These results were similar to a smaller, regional study of healthy adolescent males (Stockman, Schenkel, Brown, & Duncan, 2005). Three meals a day has been associated with lower likelihood of overweight or obesity if a meal was not skipped (Antonogeorgos et al., 2011). Meal skipping is particularly evident in adolescents. Breakfast tends to be the meal most often skipped, followed by lunch, then dinner, regardless of body weight status. Skipping breakfast and/or lunch resulted in a poorer overall diet quality (Woodruff, Hanning, Lambraki, Storey, & McCargar, 2008) and higher association with obesity (Storey et al., 2009; Woodruff & Hanning, 2009b; Stockman et al., 2005) than if the meal(s) was(were) consumed. Overall, meal skipping can be detrimental (particularly breakfast) as it has been associated with negative effects on memory, concentration, reasoning, creativity, problem solving, and vocabulary which can lead to poorer achievement test scores, academic grades, and school attendance (Rampersaud, 2009).

Skipped meals may also result in increased snacking. Over 20 years, the frequency of snacks increased significantly, were more energy-dense than meals (Jahns,
Siega-Riz, & Popkin, 2001; Piernas & Popkin, 2010), and were consumed the most by adolescents when compared to other age groups (Garriguet, 2007). Overall, snacks have been found to contribute from a quarter to a third of daily calories (Garriguet, 2004; Piernas & Popkin, 2010; Roblin, 2007), and are consumed regardless of fullness depending on environmental cues (Fisher & Birch, 2002). Regarding snack selection, taste outranked nutrition as the most important characteristic in a snack (Cross, Babicz, & Cushman, 1994) with the majority of snack calories categorized as sweetened beverages and desserts, with an increasing prevalence of salty snacks (Phillips et al., 2004; Piernas & Popkin, 2010). Interestingly, in a recent study of grade seven students, those who consumed snacks in the evening were found to spend more time sedentary than non-snackers, furthermore, evening sedentary time was the greatest predictor of overall poor diet quality (Ciccone, Woodruff, Fryer, Campbell, & Cole, in press).

**FAMILY MEALS**

Approximately a quarter of adolescents reported seven or more family meals a week (out of all possible meals), whereas a third reported having them less than three times a week (Eisenberg, Olson, Neumark-Sztainer, Story, & Bearinger, 2004; Boutelle, Lytle, Murray, Birnbaum, and Story, 2001). On average, a family dinner lasted 21-30 minutes, and adolescents who had more frequent family meals reported spending more time at each event (QEV Analytics, Ltd. Knowledge Networks, 2011).

**Benefits of Family Meals**

Increased frequency of family meals had positive associations with many aspects of adolescent health. These benefits included positive impacts on vocabulary and intellectual development (Fruh, Fulkerson, Kendrick, & Clanton, 2011; Eisenberg et al.,
2004); and students who excelled in school and achievement tests reported having the most frequent family meals (Cullen & Baranowski, 2000; Eisenberg et al., 2004). Regular family meals resulted in a reduced likelihood of low self-esteem, depressive symptoms, suicidal ideation, and suicide attempts; in addition, adolescents were less likely to engage in risky behaviours such as cigarette smoking and alcohol consumption (Eisenberg et al., 2004). Alternatively, those who had family meals less frequently also reported spending less time with their parents in a week; both of which resulted in four times as likely to use tobacco, and twice as likely to use alcohol and/or drugs (QEV Analytics, Ltd. Knowledge Networks, 2011).

Frequent family meals had positive associations with the consumption of vegetables and fruit (Burgess-Champoux, Larson, Newmark-Sztainer, Hannan, & Story, 2009). Furthermore, adolescents who consumed five or more fruits and vegetables daily were substantially less likely to be overweight or obese (Shields, 2006), and were more likely to have a better overall diet quality (Woodruff, Hanning, McGoldrick, & Brown, 2010; Burgess-Champoux et al., 2009). Regarding sex, inverse associations have been found between family meal frequency and overweight status in females, but not males (Fulkerson, Neumark-Sztainer, Hannan, & Story, 2008; Hammons & Fiese, 2011).

Frequent family meals also had positive associations among both genders with breakfast eating and beneficial nutrients such as fibre, folate, calcium, iron, and vitamins B₆, B₁₂, and E (Gillman et al., 2000). In addition, family meals were associated with lower trans fats, soda, fried foods, and a lower glycemic load, all of which are beneficial in chronic disease prevention (Gillman et al., 2000). Burgess-Champoux et al. (2009) found that family meal frequency in adolescence contributed to longitudinal healthy eating habits;
adolescents who initially had greater family meal frequency experienced increased consumption of vegetables and fruit, calcium, magnesium, potassium, iron, and zinc five years later.

Frequent family meals benefit parents as well. No consistent trends were found among parent family meals and BMIs; however, family meal frequency had a positive association with vegetable and fruit consumption (Berge et al., 2012). In addition, mothers who reported five or more family meals a week, and fathers who reported three or more, were less likely to engage in binge eating than those who had less frequent family meals (Berge et al., 2012).

Family meals are often a time to check-in with family members (Neumark-Sztainer, Story, Ackard, Moe, & Perry, 2000; Eisenberg et al., 2004), as well as to provide a communication bridge between parents and adolescents (Fulkerson, Pasch, Stigler, Farakhsh, Perry, and Komro, 2010; Neumark-Sztainer, Story, Ackard, Moe, & Perry, 2000; Eisenberg et al., 2004). A meta-analysis found that overall, five or more family meals per week resulted in a protective factor setting a stage for parents to recognize and prevent nutritional health issues such as overweight, unhealthy eating, and disordered eating (Hammons & Fiese, 2011). Family meals were also used to provide information to adolescents. For instance, Neumark-Sztainer et al., (2000), found that adolescents viewed food at family meals to be more nutritious (than meals not eaten with the family) and that they were more often engaged in conversations about healthy eating practices (Gillman et al., 2000; Neumark-Sztainer et al., 2000). Family meals also provided a platform to share days’ events, pass on family traditions, and allowed time for problem solving (Martinasek et al., 2010). Time spent with family members at dinner five
or more times a week resulted in approximately two times greater opportunity to have quality relationships with their mother, father, and/or siblings and vice versa for those who had infrequent family meals (QEV Analytics, Ltd. Knowledge Networks, 2011).

Overall, aside from family meals being beneficial, 79% of adolescents enjoyed having meals with their family and many reported willing to cancel a weekend activity to have a meal with the family (Zollo, 1999).

**Potential Family Meal Issues**

Family meals have been found to be beneficial, especially in younger adolescents; however, dissatisfaction with family relations, conflicting schedules, privacy to teen life, and dislike of food served at the family meal are known barriers (Neumark-Sztainer et al., 2000). Conflict during family meals was found to be a strong limiting factor to family meal frequency in older adolescents (Neumark-Sztainer et al., 2000); furthermore, it had negative effects on meal quality as it reduced the amount of time spent eating dinner and reduced the chance of family meal reoccurrence (Boutelle, Birnbaum, Murray, & Story, 2003). In addition to family conflict, the quality of food served at a family meal predicted low family meal frequency if adolescents believed family meals provided less-nutritious foods, and/or if the family used unhealthy food preparation methods, such as frying or using high-fat products (Neumark-Sztainer et al., 2000).

Aside from family conflict, scheduling, and dislike of food, the benefits of family meals also deteriorated when distractions were introduced. Adolescents who had infrequent family meals reported greater distractions at dinner tables (i.e., phones, laptops, video games, or television). The mix of infrequent family meals and interrupted family meals resulted in two to three times more likely to use marijuana, tobacco, and
alcohol (QEV Analytics, Ltd. Knowledge Networks, 2011). One third of adolescents reported having a television on during dinner time four or more times a week (Boutelle et al., 2001). Television viewing during dinner was linked to lower fruit and vegetable consumption (Boutelle et al., 2003; FitzPatrick, Edmunds, & Dennison, 2007), higher fat consumption (Boutelle et al., 2003), and poorer overall diet quality (Feldman, Eisenberg, Neumark-Sztainer, & Story, 2007). In addition, watching a television during a family meal takes away from communication, creates a distraction that overrides satiety cues (Temple, Giacomelli, Kent, Roemmich, & Epstein, 2007; Fulkerson, Story et al., 2008), and increases media-related food choices through advertisements (Coon et al., 2001; Fulkerson, Story et al., 2008).

**Parental Roles**

Parents filled a large role in family meal planning and food preparation for adolescents (Videon and Manning, 2003). Parenting style was associated with the frequency of family meals, even after accounting for age, socio-economic status, and race/ethnicity (Berge, Wall, Neumark-Sztainer, Larson, and Story, 2010). Out of the four parenting styles (authoritative, authoritarian, permissive, and neglectful), authoritative style was associated with the highest family meal frequency (Berge et al., 2010). Berge et al. (2010) suggested that a home environment with set parental expectations, structure, and warmth may promote family meal frequency more than a home environment with less parental expectation, structure and warmth. Longitudinal data suggested a maternal authoritative parenting style for male adolescents and paternal authoritative parenting for female adolescents predicted more frequent family meals (Berge et al., 2010).
The top benefits of family meals reported by parents included enjoying the conversation, feeling of togetherness, being together, eating together, relaxing, and laughing (Fulkerson, Story et al., 2008). However, the main barrier, as reported by parents, was limited amount of time due to work and other events (Neumark-Sztainer et al., 2000).

**Family Meals at Home Vs. Away from Home**

Woodruff and Hanning (2009) found that the majority of adolescents’ family meals occurred at home (83%); only 6% occurred at a restaurant/fast food location, and the remaining 11% of adolescents ate alone or did not eat. A high frequency of family meals at home was inversely associated to BMI, overweight, and obesity (Chan & Sobal, 2011), whereas frequency of family meals away from home were directly associated to BMI and obesity (Chan & Sobal, 2011). The strongest version of this affiliation was among fathers as opposed to other members of the family (Chan & Sobal, 2011). The likelihood of lower diet quality increased when adolescents consumed dinner in a restaurant/fast food place with their family when compared with consuming it at home with or prepared by family (Woodruff & Hanning, 2009). This effect may have occurred because more healthful food, portions, and preparation techniques were more easily controlled in the home (Chan & Sobal, 2011).

**FAMILY MEAL PERCEPTIONS OF PARENTS AND ADOLESCENTS**

Perceptions of parents and adolescents regarding food consumption and food behaviours commonly had correlations, even when questions were about the same events. Only a few studies have looked at correlations regarding family meals.
A study by Boutelle et al. (2001) examined the level of agreement between parents and adolescents regarding the perceptions of family mealtime and adolescent food behaviour. They found that adults reported higher frequency of family meals, and more arguments and television watching during meals; adolescents perceived higher frequency, than their parents, of helping with meal preparation, making dinner for themselves, and making dinner for at least one other family member. The only significant agreement between parents and children was the frequency of arguments about eating. Similar to the study by Boutelle, et al., (2001), Fulkerson, Neumark-Sztainer, & Story, (2006) found that parents reported more frequent family meals. They also found that parents reported valuing family meals more than adolescents; specifically, they had stronger feelings about making family meals a priority, having a positive atmosphere, and appropriate structure of a family meal.

Overall, parents and adolescents view family meals positively, however, it seems that parents view it more positively than adolescents (Neumark-Sztainer, Larson, Fulkerson, Eisenberg, & Story, 2010; Fulkerson et al., 2006). Comparing parent and adolescent responses on various topics has been explored in the past; though, correlations have varied depending on the context being studied. For example, parent-adolescent correlation is higher for adolescent overt behaviours (i.e., behaviours done or shown openly) than covert behaviours (i.e., behaviours not openly shown or displayed) regarding eating behaviours in overweight children (Steinberg et al., 2004), but mixed results for overt/covert behaviours in other contexts have been found (e.g., correlations regarding adolescent meal preparation for their family, overt, and for themselves, can be covert, were low; Boutelle et al., 2001; Fulkerson et al., 2006). Aside from overt/covert
behaviours, other factors such as gender and age have historically affected correlations between parent and adolescent perceptions.

**Gender.** Genders of both the parents and adolescents can change the levels of concurrence in answers about the same event. In a longitudinal study of changes in the time parents spent in activities with their adolescent, mothers spent more time with adolescents than fathers (Dubas & Gerris, 2002), suggesting that mother-adolescent responses may be closer than father-adolescent responses (Dubas & Gerris, 2002). In addition, more time is spent with the same-sex child; since the majority of parent-adolescent surveys have been completed by female parents, a higher congruence with female adolescents is expected (Dubas & Gerris, 2002). Also, females tend to provide more socially desirable answers in more contexts than males; for example, contexts such as reporting diet (Hebert et al., 2007); management perceptions, (Schoderbek & Deshpande, 1996), religiousness (Chung and Monroe, 2003), and rates of physical activity (Adams et al., 2005). In addition, parents often report socially desirable answers than adolescents regarding family food rules and availability (Van Assema, Glanz, Martens, & Brug, 2007).

**Age.** Historically, younger adolescents’ perceptions had greater correlation to their parents’ than older adolescents’ perceptions. For example, younger adolescents reported more frequent family meals compared to older adolescents, but overall, adults reported the highest frequency of family meals per week (Steinberg et al., 2004). An explanation of the age effect may be that younger adolescents have been found to have poorer incite on their own behaviour and call on their parents for assistance, thus creating a response similar to their parents (Steinberg et al., 2004). Alternatively, older adolescents may have
missed scheduled family meals, thus creating a difference in adult and adolescent perceptions of family meals (Fulkerson et al., 2006).

**FOOD PREPARATION**

One strategy to possibly improve frequency and behaviours of family meals includes encouraging adolescents to be more involved in food preparation. Adolescents often use the terms *cooking* and *food preparation* interchangeably (Simmons & Chapman, 2012), and these terms may be interpreted differently depending on culture and ethnic background (Engler-Stringer, 2010). No definition has been set in research; however, it has not posed any problems (Engler-Stringer, 2010). Using the term *help prepare food* as a measure of food preparation, 69% of adolescents reported helping to prepare dinner (Larson, Story, Eisenberg, & Neumark-Sztainer, 2006), but two thirds of those reported helping less than three times/week (Larson, Story et al., 2006). Of those who did not prepare dinner, significantly more males than females reported not doing so because of inadequate cooking skills (Larson, Perry, Story, & Neumark-Sztainer, 2006). Furthermore, a lack of confidence using basic cooking skills was the limiting factor for all individuals who did not cook frequently (Lang & Caraher, 2001).

Food preparation at least 1 – 2 times a week during adolescence was associated with positive food preparation behaviors (including enjoyment), in adulthood (Laska, Larson, Newmark-Sztainer, & Story, 2011). Components of cooking were most commonly taught to adolescents by mothers (Caraher, Dixon, Lang, Carr-Hill, 1999), and adolescent females helped with meal preparation more than males (Larson, Perry et al., 2006; Larson, Story et al., 2006; Smith et al., 2010). Aside from gender, younger rather than older adolescents, helped more in meal preparation (Larson, Perry et al., 2006;
Meehan, Yeh, & Soark, 2008); and overall, males and African Americans reported the lowest prevalence of food preparation, compared to females and other ethnicities/races (Larson, Perry et al., 2006).

Involvement in food preparation was associated with improved overall diet quality, including significantly greater vegetable and fruit consumption, having lower intakes of fat, and overall higher nutrient intake (Larson, Story et al., 2006; Smith et al., 2010; Meehan et al., 2008; Chu et al., 2012). Also, adolescents who had the highest diet quality cooked meals more often and used more complex cooking techniques compared to those with lower diet quality (Larson, Perry et al., 2006). Using individual food preparation scores (based off frequency of food preparation behaviours; i.e. prepared a green salad, prepared a dinner for two or more people), Larson, Perry et al., (2006), related the scores to overall food preparation scores. Higher food preparation scores were found among females, adolescents of Asian, Hispanic, or Caucasian ethnicity/races, and those who had fast food the least, compared to males, adolescents of other ethnicities/races, and high consumption of fast food (Larson, Perry, et al., 2006).

Perceived barriers by adolescents regarding food preparation included inadequacy of appliance use and food selection in stores (Larson, Perry et al., 2006). Parents’ barriers for not including their adolescent in food preparation included limited time, perceived mess, concern over the limited variety of food their adolescent would prepare, and the need to multitask during meal preparation, suggesting that allowing their adolescent to help in the preparation process will be more detrimental than helpful (Fulkerson et al., 2011).
Self-efficacy, the perception that an individual can successfully perform a behaviour (Bandura, 1977), is positively related to gaining appropriate practical skills (Hill, Casswell, Maskill, Jones, & Wyllie, 1998); therefore, Larson, Perry et al., (2006) suggested that having the skills to prepare healthful foods would promote improvements in diet quality. Adolescents felt that being able to cook gave them more responsibility over their own meals, which could contribute towards gaining independence (Simmons & Chapman, 2012). In addition, regardless of current cooking level, adolescents considered food preparation/cooking to be important skills necessary to obtain for the future (Simmons & Chapman, 2012).

**MEAL PREPARATION AND FAMILY MEAL INTERVENTIONS**

Information about food preparation frequency and/or techniques among children and how these can possibly translate to health outcomes is minimal; researchers often report the benefits of an intervention rather than an in depth look at the targeted behaviours. Interventions regarding meal preparation and cooking in adolescents are limited; however, the ones that have happened had positive effects on food behaviour (Cullerton, Vidgen, & Gallegos, 2012). Past interventions focused on vegetable and fruit consumption or overall diet quality; very few examined improving meal preparation skills and self-efficacy around improving those skills. For example, *Good Grubbin’* (Clifford, Anderson, Auld, & Champ, 2009), was an intervention aimed to improve self-efficacy, knowledge, attitudes, and behaviours regarding fruit and vegetable intake. The intervention used short cooking videos and a website component to model how to prepare, shop for, and plan balanced meals. Overall, the intervention significantly changed cooking motivators and barriers, and self-efficacy towards cooking. In addition,
over half of the participants reported making positive changes in their eating habits after watching the intervention video, thus suggesting modeling food preparation through short videos/presentations can be used as a cost-effective way to reach a large audience.

Another intervention, *Squire’s Quest* (Cullen, Watson, Zakeri, Baranowski, & Baranowski, 2007) was a ten session intervention program for fourth grade students. The intervention’s purpose was to use goal setting in efforts of increasing juice, vegetable, and fruit consumption and self-efficacy of consumption. The intervention used activities that promoted asking behaviour, food preparation, produce shopping, fast food selection, problem solving, goal setting, self-regulation, and self-reward skills. The intervention resulted in an increase of total fruit, juice, and vegetable intake, with the goal setting feature useful in females compared to males. Overall, Cullen et al., (2007) concluded that a substantial dietary change can occur from an intervention, and can be amplified by goal setting.

Similar to food preparation interventions, only a few family meal interventions have been conducted. Examples include, the *Promoting Family Meals* intervention module (Johnson, Birkett, Evens, & Pickering, 2006) which aimed to increase family meal frequency through module based discussions, teacher-lead group session, walk through displays, and one-on-one counselling session and the *Healthy Home Offerings via the Mealtime Environment (HOME)* intervention (Fulkerson et al., 2010) which aimed to increase vegetables and fruit consumption, decrease high-fat foods and high-sugar foods and beverages served at family meals and available at home, and improve food preparation skills.
The *Promoting Family Meals* module used group sessions, handouts, children’s colouring sheets, bookmarks, banners and posters to build awareness and importance of family meals to families who do not have them, and to provide new ideas to keep families who have family meals engaged. To evaluate the intervention, an 11-item survey was used to examine family meal frequency, television use during meals, enjoyability, and planning behaviours. Means of identification were not used during data collection; therefore, survey responses were not able to be matched individually, creating a limitation. However, after six months of the intervention, the number of families that ate a meal together increased by 2%, whereas the control group decreased by 4%, concluding that family meal interventions are successful tools in increasing family meal frequency (Johnson et al., 2006).

The *HOME* (Fulkerson et al., 2010) pilot study consisted of five 90 minute sessions that incorporated interactive, hands-on components including family meal preparation, nutrition education, and take-home materials for parent/child dyads. Post-intervention, participants experienced improvement in food preparation skill development, vegetable and fruit consumption (higher), sweetened beverage consumption (lower), and the amount of vegetables and salad (higher) offered at home when compared to the control group. The results suggested that the *HOME* intervention was successful; however, this study was not without limitations. The sample used by Fulkerson et al., (2010) was predominately Caucasian, and therefore, limited generalizability; a greater culturally diverse sample would provide a greater generalizability to the greater population.

THE KINECT-ED PROGRAM
Researchers/clinicians are striving to come up with creative ways to improve meal preparation and family meal self-efficacy, behaviours, attitudes, and skills. Kinect-Ed was developed by Sandi Richard, a Food Network Host and International Best Seller, and Dr. Sarah Woodruff, a researcher from the University of Windsor. Sandi personally visited each participating school for a 90 minute presentation to all grade 6 to 8 students. The presentation incorporated educational information and interactive demonstrations focusing mainly on the effects of consuming fat, sugar, and salt (e.g., to demonstrate the effect of fat/cholesterol on the arteries, water and corn syrup were poured into separate clear tubes and YAs were able to observe how consuming unhealthy items can make blood move slowly through their arteries). Each participant received a copy of Sandi Richard’s newest cookbook called Anyone Can Cook Dinner (Cooking for the Rushed, 2012). The goal of the presentation was to encourage YAs to help prepare meals, which may lead to gaining food preparation techniques, self-efficacy for cooking, as well as increasing family dinner frequency and positive family meal attitudes and behaviours.

The Kinect-Ed program was developed using the Social Cognitive Theory (SCT) and the Theory of Planned Behaviour (TPB). The SCT has two major themes; 1) the acknowledgement that personal, environmental, and behavioural factors affect one another and 2) learning occurs through observation of a model (Bandura, 1986); whereas the TPB explains outcome behaviours by incorporating the constructs of subjective norms, perceived behavioural control, attitudes toward behaviours, and intention (Ajzen, 1991).

Regarding the first theme of the SCT (i.e., the acknowledgement that personal, environmental, and behavioural factors affect one another), the SCT recognizes the way
in which behaviour, in this case becoming more involved in food/dinner preparation, depends not only on the motivation of the individual to want to cook (or learn how to cook), but also on the social norms of cooking/eating within the family context.

Regarding the second SCT theme (learning occurs through observation of a model), observing others allows an individual’s knowledge and skill base to expand by seeing behaviours of others and understanding the results of the behaviours; i.e., society learns from seeing others get reinforced, punished, and/or successfully/unsuccesfully perform a task. For example, an adolescent saw their parent/friend prepare food, which resulted successfully in a nutritious meal for the family; therefore, the adolescent learned they could also prepare nutritious food for the family.

Intentions of individuals can be altered through more than just the people around them; self-efficacy, media influences, and disincentives can also have an effect (Sheeshka, Woolcott, & Mackinnon, 1993). Self-efficacy (Bandura, 1977), can predict which food preparation practices individuals feel capable doing, amount of effort they will use to learn new techniques, and persistence around obstacles. Media (e.g., internet, television, newspapers) is used as a symbolic model (as opposed to a direct model of observing other individuals) in the early stages of learning and evaluating (Bandura, 1986). Media influences can be used for mass-media promotion of food preparation techniques and/or presenting the benefits consuming a meal with the family. Disincentives are similar to the effects of cost outweighing the benefits; for example, if the time it takes to prepare a meal displaces the time available to enjoy the meal with family, it is considered a disincentive.
The TPB can be useful to understand how attitudes and beliefs influence specific health behaviours (Ajzen, 1991). Kinect-Ed incorporates the construct of a person’s own attitudes toward family meals and food preparation, constructs related to the beliefs of how others perceive one’s behaviour with food preparation and family meals, and beliefs about having control of food preparation or family meals (Ajzen, 1991; Eto et al., 2011). For example, an individual will be more likely to engage in food preparation or family meals if their own attitudes towards them are positive, if others perceive them as being positive, and if an individual feels like they have control over them. In addition, all three constructs will have an effect on intention and ultimately the behaviour of engaging in family meals or food preparation. Kinect-Ed also uses motivational techniques to inspire perceived behavioural control over food preparation and family meals to encourage subsequent behaviour.

The Kinect-Ed presentation utilizes the school environment to provide interactive demonstrations that explain how consuming excess fat, sugar, and salt can affect the body. The school environment will allow the presentation to target YAs’ subjective norms by targeting the YAs’ close network of teachers, peers, and friends to develop a social norm. In addition, inspirational and motivational topics in the presentation are used to target YAs’ intentions to get involved with food preparation (doing the behaviour), and improve their attitudes toward food preparation and family meals. In addition, researchers provide food preparation and family meal information and a cookbook to the YAs to ensure that they have the knowledge, personal, and environmental factors that could increase PREP (food preparation frequency; the behaviour). Furthermore, learning occurs through a model, therefore, Sandi Richard models her behaviours to the YAs with the belief that
they will become the model for their parents and family. Both theories have been used in previous family meal/food preparation interventions (e.g., SCT; Larson et al., 2008; TPB; Eto, Koch, Contento, & Adachi, 2011).
REFERENCES


APPENDICES

APPENDIX A

Kinect-Ed Parent Survey

In order to compare your and your child's answers we ask that you fill in the ID section by creating a 6 digit ID.

<table>
<thead>
<tr>
<th>What day of the month was your child born?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex: If the birthday is March 6 0 6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What are the last 2 digits of your phone number?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex: If your phone number is 987-6543 4 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What are the last 2 letters of your child’s last name?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex: If the last name is Smith T H</td>
</tr>
</tbody>
</table>

We would like to contact you by telephone to ask about your experience with the Kinect-Ed program. If you agree please leave us your phone number below. Thank you!

Phone #: __________________________________________

1) How often does your family eat dinner together?

- [ ] 0-2 days per week
- [ ] 3-5 days per week
- [ ] 6-7 days per week

2) How comfortable or uncomfortable are you with having your child(ren) in the kitchen involved in dinner preparation?

- [ ] 1 Not Comfortable
- [ ] 2
- [ ] 3
- [ ] 4 Very Comfortable

3) Why do or don’t you involve your child(ren) in dinner preparation? (check all that apply)

- [ ] They are really interested in cooking
- [ ] I think it is a good opportunity to teach them important life skills
- [ ] I am busy and involving them in dinner preparation really gets in the way
- [ ] They are not interested in cooking
- [ ] I don’t want to clean up the extra mess
- [ ] I am busy and involving them in dinner preparation really helps me out
- [ ] They are too busy to be involved
- [ ] I am too busy to teach them how to cook
- [ ] Having them in the kitchen (e.g., around the stove and using knives) worries me
- [ ] Other: ________________________________________
4) How strongly do you agree or disagree with the following statements about mealtimes in your family?

<table>
<thead>
<tr>
<th>In my family...</th>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) It is important that the family eat at least one meal a day together</td>
<td>[ ] 1</td>
<td>[ ] 2</td>
<td>[ ] 3</td>
<td>[ ] 4</td>
</tr>
<tr>
<td>b) Mealtime is a time for talking with other family members</td>
<td>[ ] 1</td>
<td>[ ] 2</td>
<td>[ ] 3</td>
<td>[ ] 4</td>
</tr>
<tr>
<td>c) I want to sit down with my family, eat together and talk, but find it frustrating that I can’t seem to pull that off</td>
<td>[ ] 1</td>
<td>[ ] 2</td>
<td>[ ] 3</td>
<td>[ ] 4</td>
</tr>
<tr>
<td>d) we often watch TV while eating dinner</td>
<td>[ ] 1</td>
<td>[ ] 2</td>
<td>[ ] 3</td>
<td>[ ] 4</td>
</tr>
<tr>
<td>e) It is often difficult to find a time when family members can sit down to a meal together</td>
<td>[ ] 1</td>
<td>[ ] 2</td>
<td>[ ] 3</td>
<td>[ ] 4</td>
</tr>
<tr>
<td>f) Dinner time is about more than just eating food; we all talk with each other</td>
<td>[ ] 1</td>
<td>[ ] 2</td>
<td>[ ] 3</td>
<td>[ ] 4</td>
</tr>
<tr>
<td>g) Different schedules make it hard for us to eat meals together</td>
<td>[ ] 1</td>
<td>[ ] 2</td>
<td>[ ] 3</td>
<td>[ ] 4</td>
</tr>
<tr>
<td>h) Eating brings people together in an enjoyable way</td>
<td>[ ] 1</td>
<td>[ ] 2</td>
<td>[ ] 3</td>
<td>[ ] 4</td>
</tr>
<tr>
<td>i) We don’t have to eat meals at the kitchen/dining room table</td>
<td>[ ] 1</td>
<td>[ ] 2</td>
<td>[ ] 3</td>
<td>[ ] 4</td>
</tr>
<tr>
<td>j) It’s ok to have the television on during meals</td>
<td>[ ] 1</td>
<td>[ ] 2</td>
<td>[ ] 3</td>
<td>[ ] 4</td>
</tr>
<tr>
<td>k) Families that eat together often eat healthier meals</td>
<td>[ ] 1</td>
<td>[ ] 2</td>
<td>[ ] 3</td>
<td>[ ] 4</td>
</tr>
</tbody>
</table>
Food Preparation

1) Do you cook?
   - Yes, often
   - Sometimes
   - No, never

2) Do you prepare/make food with your family?
   - Yes, often
   - Sometimes
   - No, never

3) Do you prepare/make food with your friends?
   - Yes, often
   - Sometimes
   - No, never

4) How often are you involved in preparing/making food?
   - More than once/day
   - Daily
   - 2 to 6 times a week
   - Once a week
   - Once a month
   - Rarely or never

5) In the past week, how many times did you help to shop for groceries?
   - Never
   - One time
   - More than one time

6) In the past week, how many times did you help prepare/make food for dinner?
   - None
   - 1-2 times
   - 3-4 times
   - 5-6 times
   - 7 times

7) Who does the most planning or preparing of meals in your house?
   - Mother/ Stepmother
   - Father/ Stepfather
   - I do
   - Grandmother/ Grandfather
   - Sibling
   - Nanny or babysitter
   - Other:
     - I don’t know
8. How often would you like to be involved in preparing/making food?
   - More than I am now
   - Less than I am now
   - As much as I am now

10. How much do your parents/stepparents/guardians encourage you to help out in the kitchen?
    - Strongly encourage
    - Somewhat encourage
    - Somewhat discourage

9. Check the box that best describes how you feel about the following statements:

<table>
<thead>
<tr>
<th>How do you feel...</th>
<th>Really don't like</th>
<th>Don't like</th>
<th>Kind of like</th>
<th>Really like</th>
<th>I don't do</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) about cooking?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) about the taste of foods that you have helped prepare/make?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) about making food with your friends?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) about making food with your family?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) about making snacks?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. Check the box that best describes how you feel about the following statements:

<table>
<thead>
<tr>
<th>I can...</th>
<th>Very Hard</th>
<th>Hard</th>
<th>Easy</th>
<th>Very Easy</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) make a meal with fruit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) make a meal with vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) help make a family meal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) cut up food</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) make a salad</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) measure ingredients</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g) follow recipe directions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h) use a recipe with help</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
12) What do you get to do when preparing/making food? (Fill in your answer on the right)
Your Answer:

☐ I don’t make/prepare food.

13) What would you like to do when preparing/making food? (Fill in your answer on the right)
Your Answer:

14) Give an example of something you prepared/cooked in the last 7 days: (Fill in your answer on the right)
Your Answer:

☐ I didn’t make any food in the past 7 days.

15 a) Thinking about the last 7 days, indicate when you were involved in preparing/making food? (check all that apply)

<table>
<thead>
<tr>
<th></th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lunch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dinner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

☐ I wasn’t involved in preparing/making any food during the last 7 days.
b) When making meals, what type of food preparation do you get to do? (check all that apply)

<table>
<thead>
<tr>
<th></th>
<th>Do</th>
<th>Don’t do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutting up foods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peeling fruits/vegetables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measuring the ingredients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixing the ingredients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using the can opener</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use oven/stove</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Put together the food/meal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting table</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microwave</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grilling/ BBQ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Putting together a pre-made meal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Family Meals

1) Typically, how many days per week do you eat dinner/supper with at least one parent/guardian?

- [ ] 0-2 days/week
- [ ] 3-5 days/week
- [ ] 6-7 days/week

2) How strongly do you agree or disagree with the following statements about mealtimes in your family?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) I enjoy eating meals with my family.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) In my family, we are expected to be home for dinner.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) I am often too busy to eat dinner with my family.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3) How strongly do you agree or disagree with the following statements about mealtimes in your family?

<table>
<thead>
<tr>
<th>In my family...</th>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) it is important that my family eat at least one meal a day together</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) mealtime is a time for talking with other family members</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) my family wants to sit down together, eat and talk, but find it frustrating that we can’t seem to pull that off</td>
<td></td>
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<td>f) dinner time is about more than just eating food; we all talk with each other</td>
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<tr>
<td>g) different schedules make it hard for us to eat meals together</td>
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<td>h) eating brings people together in an enjoyable way</td>
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</tr>
<tr>
<td>k) families that eat together often eat healthier meals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX C

Kinect-Ed
Post-Test Survey

What day of the month were you born?
Ex: If your birthday is March 6
0 6

What are the last 2 digits of your phone number?
Ex: If your phone number is 987-5543
4 3

What are the last 2 letters of your last name?
Ex: If your last name is Smith
T H

What is your age?
9 10 11 12 13 14

Are you...
Male
Female

What grade are you in?
4 5 6 7 8 9

Would you consider yourself...
☐ White (for example, Canadian, English, French, Italian, Polish, etc.)
☐ Black (for example, African-Canadian, African-American, African, Nigerian, etc.)
☐ Chinese
☐ Arabic (for example, Lebanese, Jordan, Palestinian, Egyptian, Iraqi, Syrian, etc.)
☐ South Asian (for example, Indian, Pakistani, Sir Lankan, Nepali)
☐ Aboriginal (for example, First Nations, Metis, Inuit)
☐ Other:
☐ I don’t know

Thinking about your home, what adults live with you the majority of the time? (check all that apply)
☐ Mother/ Stepmother
☐ Father/ Stepfather
☐ Grandmother/ Grandfather
☐ Parents Boyfriend/ Girlfriend
☐ Guardian
☐ Adult Brothers/ Sisters
☐ Other:

Is there an adult at home at the following times?

<table>
<thead>
<tr>
<th></th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Usually</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you arrive home from school in the afternoon (2-5 pm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the early evening (about 5-7pm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Food Preparation

1) Do you cook?
   - Yes, often
   - Sometimes
   - No, never

2) Do you prepare/make food with your family?
   - Yes, often
   - Sometimes
   - No, never

3) Do you prepare/make food with your friends?
   - Yes, often
   - Sometimes
   - No, never

4) How often are you involved in preparing/making food?
   - More than once/day
   - Daily
   - 2 to 6 times a week
   - Once a week
   - Once a month
   - Rarely or never

5) In the past week, how many times did you help to shop for groceries?
   - Never
   - One time
   - More than one time

6) In the past week, how many times did you help prepare/make food for dinner?
   - None
   - 1-2 times
   - 3-4 times
   - 5-6 times
   - 7 times

7) Who does the most planning or preparing of meals in your house?
   - Mother/Stepmother
   - Father/Stepfather
   - I do
   - Grandmother/Grandfather
   - Sibling
   - Nanny or babysitter
   - Other:
     - I don’t know
8) How often would you like to be involved in preparing/making food?
- More than I am now
- Less than I am now
- As much as I am now

10) How much do your parents/stepparents/guardians encourage you to help out in the kitchen?
- Strongly encourage
- Somewhat encourage
- Somewhat discourage

9) Check the box that best describes how you feel about the following statements:

<table>
<thead>
<tr>
<th>How do you feel...</th>
<th>Really don’t like</th>
<th>Don’t like</th>
<th>Kind of like</th>
<th>Really like</th>
<th>I don’t do</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) about cooking?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) about the taste of foods that you have helped prepare/make?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) about making food with your friends?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) about making food with your family?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) about making snacks?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11) Check the box that best describes how you feel about the following statements:

<table>
<thead>
<tr>
<th>I can...</th>
<th>Very Hard</th>
<th>Hard</th>
<th>Easy</th>
<th>Very Easy</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) make a meal with fruit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) make a meal with vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) help make a family meal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) cut up food</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) make a salad</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) measure ingredients</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g) follow recipe directions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h) use a recipe with help</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
12) What do you get to do when preparing/making food?  
(Fill in your answer on the right)  
Your Answer:  

☐ I don’t make/prepare food.

13) What would you like to do when preparing/making food?  
(Fill in your answer on the right)  
Your Answer:  

14) Give an example of something you prepared/cooked in the last 7 days:  
(Fill in your answer on the right)  
Your Answer:  

☐ I didn’t make any food in the past 7 days.

15 a) Thinking about the last 7 days, indicate when you were involved in preparing/making food? (check all that apply)  
I was involved in preparing/making food during:  

<table>
<thead>
<tr>
<th></th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lunch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dinner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

☐ I wasn’t involved in preparing/making any food during the last 7 days.
b) When making meals, what type of food preparation do you get to do? (check all that apply)

- I am not involved in making food

<table>
<thead>
<tr>
<th></th>
<th>Do</th>
<th>Don’t do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutting up foods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peeling fruits/vegetables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measuring the ingredients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixing the ingredients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using the can opener</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use oven/stove</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Put together the food/meal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting table</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microwave</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grilling/ BBQ</td>
<td></td>
<td></td>
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<tr>
<td>Putting together a pre-made meal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SANDI’S VISIT**

How much did you enjoy Sandi’s visit?

- 1  2  3  4
  - Didn’t Enjoy  - Really Enjoyed

What did you like best about Sandi’s visit?
How much did Sandi motivate or not motivate you to start preparing/making meals?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Didn't motivate</td>
<td></td>
<td></td>
<td>Couldn't wait!</td>
</tr>
</tbody>
</table>

Since Sandi’s visit to your school, did you have a talk with your parents about getting in the kitchen and helping to make meals?

- Yes
- No

What did you talk about? ___

Have you changed any health behaviours as a result of Sandi’s visit? (For example: eating healthier, not eating certain foods)

- Yes
- No

What have you changed? ___

Did you share or show anyone else the book that Sandi gave you?

- Yes
- No

If yes, who? (check all that apply)

- Parents/guardians
- Siblings
- Grandparents
- Aunts/uncles/cousins
- Friends
- Other:

What did they think about it? ___
If you **DID** cook one of Sandi’s recipes CONTINUE answering the following questions (if not skip this section and go to the next box like this)

---

**Choosing one meal/recipe that you made in the past month:**

**What did you like about the recipe?**

**What did you get to do?**
- Cut up foods
- Used the can opener
- Peeled vegetables
- Used oven/stove
- Measured the ingredients
- Put together the food/meal
- Mixed the ingredients
- Set the table
- Other:

**Would you like to try more of Sandi’s recipes or other recipes soon?**

- Yes
- No

**Why?**
Use the same one meal/recipe from the previous box:

Who ate the meal? (check all that apply)

- □ Parents/guardians
- □ Siblings
- □ Aunts/uncles/cousins
- □ Friends
- □ Grandparents
- □ Only me
- □ Other: ____________

How easy or hard do you think the recipe was to prepare?

- □ 1
- □ 2
- □ 3
- □ 4

Very Hard  Very Easy

If you DIDN'T cook one of Sandi's recipes from the book COMPLETE this section:

Why didn't you cook one of Sandi's recipes? (check all that apply)

- □ I was too busy
- □ I didn't like the foods in the booklet
- □ We don't usually have those ingredients in my house
- □ I don't like cooking
- □ I didn't think I could do it well enough
- □ I have food allergies
- □ I was too lazy
- □ Other: ____________

Do you plan on trying one of Sandi's recipes or other recipes in the soon?

- □ Yes
- □ No

Why or why not? _______
Family Meals

1) Typically, how many days per week do you eat dinner/supper with at least one parent/guardian?
- [ ] 0-2 days/ week
- [ ] 3-5 days/week
- [ ] 6-7 days/ week

2) How strongly do you agree or disagree with the following statements about mealtimes in your family?

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) I enjoy eating meals with my family.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>b) In my family, we are expected to be home for dinner.</td>
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<tr>
<td>c) I am often too busy to eat dinner with my family.</td>
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<td></td>
</tr>
<tr>
<td>In my family...</td>
<td>Strongly Disagree</td>
<td>Somewhat Disagree</td>
<td>Somewhat Agree</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------</td>
<td>-------------------</td>
<td>-------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>a) it is important that my family eat at least one meal a day together</td>
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<tr>
<td>b) mealtime is a time for talking with other family members</td>
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<td>c) my family wants to sit down together, eat and talk, but find it frustrating that we can’t seem to pull that off</td>
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APPENDIX D

INTERVIEW SCRIPT: PHONE FOLLOW-UP FOR PARENT SURVEY

Hello, I am Jillian from the University of Windsor. I am calling as part of the Kinect-Ed Program that your child was part of. When you filled out a survey you provided us with your phone number to contact you for follow up. I was wondering if I could have about 5 minutes of your time and ask you a few questions based on the Kinect-Ed program?

1. a) In an average week, how many days does your family have meals together?
   If different than child’s answer:
   b) Hypothetically, if the number of family meals in a week you reported was different than your child’s, why would they be different? (i.e. idea of family meal may be different- everyone together, at a table).

2. Since being a part of the Kinect-Ed program:
   a) Have you noticed a change in your child’s interest in cooking?
   b) Has your child become more involved in family meals/wanted to help out in the kitchen more?
   c) How comfortable are you with your child in the kitchen? Why? (if needed, can prompt with safety issues, cleanliness, time, child’s interest).

3. Did your child share the cookbook Anyone can cook dinner with you?
   If so,
   a) What did your child say/do when they presented it?
   b) Has your family found it to be a helpful tool?
   c) Has your child wanted to cook/look at/buy any other cookbooks or look up recipes from other sources (i.e. online, magazines)?

Thank you for your input and time.
VITA AUCTORIS

NAME: Jillian Ciccone

PLACE OF BIRTH: Windsor, ON

YEAR OF BIRTH: 1989

EDUCATION: St. Thomas of Villanova, LaSalle, ON, 2007

University of Windsor, BHK, Windsor, ON, 2011

University of Windsor, MHK., Windsor, ON, 2013