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**OBESITE, TROUBLES DU COMPORTEMENT ALIMENTAIRE,**  
**ATTITUDES ET HABITUDES ALIMENTAIRES**

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## RESUME

### ADOLESCENTS AMERICAINS ET FRANÇAIS : OBESITE, TROUBLES DU COMPORTEMENT ALIMENTAIRE, ATTITUDES ET HABITUDES ALIMENTAIRES

Cette thèse en doctorat présente les résultats d'une étude comparative sur le thème de l'alimentation et des caractéristiques pondérales des adolescents français et américains. Nous avons étudié notamment les questions des fréquences respectives de l'obésité (OB), des attitudes et habitudes alimentaires dites « normales » ou dite de l'« alimentation journalière » (HAAJ) et des troubles du comportement alimentaire (TCA) comme l'anorexie mentale (AN) et la boulimie (BN) dans deux échantillons d'adolescents français (N=1031) et américains (N=1573). Les principaux objectifs étaient de comparer ces échantillons pour leurs poids, leurs HAAJ, leur insatisfaction corporelle (liée avec l'OB et les TCA), les symptômes de TCA observés, et les « diagnostics » de TCA posés, afin de déterminer s'il existe des différences significatives entre ces deux cultures. Après la création d'un outil d'évaluation des HAAJ, une série de questionnaires a été administrée dans plusieurs lycées et collèges en France et aux Etats Unis. L'enquête avait pour hypothèses: 1.) que les français montrent un taux d'obésité et surpoids moindres par rapport aux américains; 2.) que les français montrent davantage de HAAJ dites « saines » 3.) que des prévalences de TCA cliniques et sub-cliniques sont moindres pour le groupe des français. Les résultats sur le statut pondéral soutiennent la première hypothèse. Les résultats sur les HAAJ soutiennent globalement la deuxième hypothèse. En revanche la troisième hypothèse n'a pas été confirmée.

### FRENCH AND AMERICAN ADOLESCENTS : OBESITY, EATING DISORDERS, ATTITUDES AND PATTERNS OF EATING

This dissertation presents the results of a study comparing French (N=1073) and U.S. American (N=1573) adolescents for cultural differences in every day eating (EDE) habits and attitudes, eating disorders (ED) such as anorexia (AN) and bulimia (BN), and weight status, in particular, obesity (OB). Subjects were compared for weight status, EDE, body dissatisfaction (which is linked to EDs and OB), ED symptoms and « diagnoses » of AN and BN. After developing an instrument to assess EDE, a series of questionnaires were administered in several French and American high schools. The main hypotheses for the study were: 1.) that the French would

report a lower prevalence of OB and overweight compared to Americans ; 2.)that the French would report more “healthy” EDE behaviors and attitudes; and 3.)that prevalence of clinical and sub-clinical ED would be lower for the French group compared the American group. The results on weight status support the first hypothesis. The results of the EDE assessment support the second hypothesis. However, the third hypothesis was not confirmed in this study.

Mots clés: troubles du comportement alimentaire, obésité, adolescents, français, américains

Keywords: eating disorders, obesity, adolescents, France, United States

## **RESUME SUBSTANTIEL**

### **Introduction**

La France et les Etats Unis d’Amérique sont deux pays occidentaux qui montrent de fortes différences en termes de coutumes, d’attitudes et de pratiques alimentaires journalières d’une part et en terme de taux d’obésité d’autre part. En ce qui concerne les troubles du comportement alimentaire, les différences entre ces deux pays, si elles existent, n’ont pas été mise en évidence jusqu’à présent.

L’obésité est un problème de santé publique majeur, du fait de sa fréquence et de ses conséquences aussi bien somatiques (diabète, risque cardio-vasculaire) que psychologiques. L’obésité chez le sujet jeune prédit l’obésité chez l’adulte, avec une mortalité et une morbidité supérieures à celles de l’obésité qui débute à l’âge adulte (1–5). La prévalence de l’obésité aux Etats Unis pour les enfants est en augmentation constante et pour les personnes âgées de 2-19 ans elle est estimée à 11,9% (6,7). En France, chez les jeunes, la prévalence a augmenté pendant les dernières décennies (8–10) et une étude sur les jeunes de 12 ans dans l’est de la France a observé une prévalence de ce problème de 5,2% (11). Des différences pondérales entre ces deux pays ont été montrées par Cole (12) et le groupe de travail international pour l’obésité (13,14) : les américains ont un poids moyen supérieur aux français, tous âges confondus.

Les troubles des conduites alimentaires (TCA), anorexie mentale et boulimie, sont des pathologies psychiatriques fréquentes, invalidantes et souvent chroniques, qui touchent essentiellement les jeunes filles et les jeunes femmes. Aux Etats-Unis, l’anorexie mentale est, en fréquence, le troisième trouble chronique chez les adolescentes, après l’obésité et l’asthme, avec une prévalence entre 0.5 et 1% (15,16). Des études en Amérique du Nord et en France indiquent une prévalence de la boulimie chez les jeunes filles et les jeunes femmes égale ou supérieure à 1% (17–20). De plus, les enquêtes en population générale montrent la fréquence des troubles alimentaires sub-cliniques, associés, comme les troubles cliniques, à une comorbidité significative (17,21). Nous n’avons pas trouvé d’étude comparant la France et les Etats-Unis pour les TCA.

L'étiologie multifactorielle de l'obésité et des troubles des conduites alimentaires est largement reconnue. Elle implique des facteurs individuels et familiaux, tant génétiques que psychologiques, et des facteurs environnementaux, notamment culturels. Néanmoins, la nature exacte des déterminants culturels impliqués reste à identifier.

Les études précédentes, concernant des adultes, ont montré plusieurs différences entre français et américains en ce qui concerne les habitudes, attitudes et coutumes alimentaires cliniquement non-dysfonctionnelles, ce que nous pourrions appeler « habitudes et attitudes alimentaires journalières » (HAAJ) (22–25). Notamment, les français sont plus à l'aise aux repas et face aux aliments que les américains, ils prennent plus de temps et mangent principalement en famille ou en présence des amis ou collègues. Les américains montrent plus d'angoisse face aux décisions concernant l'alimentation, grignotent plus que les français et sont moins traditionnels dans la préparation et présentation des repas. Ils mangent souvent seuls ou devant une télévision ou même devant leur ordinateur au travail ce qui s'observe beaucoup moins en France (22–29).

En tenant compte du fait que les adultes et enfants français ont un taux d'obésité nettement moins élevé que les américains et que les différences existent entre ces deux pays en HAAJ, l'équipe de chercheurs, américains et français à laquelle je suis associée, s'est posée les questions suivantes : La fréquence des TCA est-elle différente entre ces deux pays ? Existe-t-il des différences de HAAJ entre les adolescents de ces deux pays comme montrées pour les adultes ? —la population adolescente étant la plus touchée par les TCA. Les différences observées entre ces deux pays en ce qui concerne l'obésité (OB) et le surpoids (SP) sont-elles si différentes ?—les écarts observés sont le fruit d'études utilisant des méthodes différentes ? Peu d'études ont directement comparé ces deux pays en utilisant le même instrument. Une comparaison directe apparaissait donc utile pour confirmer les taux de différences pondérales des adolescents (OB notamment), observer les différences de fréquence des TCA (s'ils existent) et confirmer (ou non) les différences d'HAAJ.

Les hypothèses principales de cette étude étaient donc qu'il existe, chez les adolescents, des différences entre les taux d'OB ainsi que de SP dans deux différentes cultures occidentales, les Etats Unis d'Amérique et la France ; que les habitudes et les attitudes concernant la nourriture et l'alimentation journalières (HAAJ) sont différentes entre ces deux pays ; et que celles-ci s'accompagnent de différences dans la prévalence des TCA cliniques et des TCA sub-cliniques. Plus précisément, nous nous attendions à ce que : les adolescents français montrent des taux d'obésité et de surpoids moindres comparés aux américains ; les français rapportent des taux de TCA cliniques et sub-cliniques inférieurs aux américains ; les français aient des scores de HAAJ indiquant des habitudes et attitudes plus saines que les américains. A notre connaissance, il n'existait pas alors, comme à ce jour, d'étude comparative entre la France et les Etats Unis d'Amérique comparant conjointement les HAAJ, l'OB et les TCA. Nous avons donc souhaité tester nos hypothèses dans une étude comparative entre adolescents français et américains.

# Méthodologie

## **Population**

Afin de recruter une population large et le plus représentative que possible d'adolescents non demandeurs de soins, l'enquête s'est déroulée dans des établissements scolaires, en France et aux Etats-Unis. Plusieurs établissements ont été sélectionnés dans chaque pays, afin d'obtenir des échantillons variés quant à l'appartenance géographique et sociodémographique des sujets: population urbaine et population rurale ou semi-rurale, écoles privées, établissements publics de secteurs à prédominance de classes moyennes, établissements publics de secteurs à population mixte sur le plan ethnique et socioéconomique. Entre les deux pays, nous avons procédé à un appariement école par école pour les caractéristiques des populations scolarisées.

L'étude regroupait des élèves de Collège (classe de 3<sup>ème</sup>) et de Lycée (classes de 2de à la Terminale) en France, et des élèves de « High School » (grades 9-12) aux Etats-Unis. L'échantillon total recruté par nos soins, pour chaque pays était de 1573 pour les Etats-Unis, 1073 pour la France. Dans chaque établissement, toutes les classes et tous les élèves de chaque classe ont été sollicités pour l'enquête, la plupart des établissements (des deux pays) ont préféré proposer l'enquête durant les cours de SVT, PS, Français ou Anglais. Six établissements français ont choisis de participer à l'étude alors que onze écoles américaines ont participé. L'enquête a été faite sous forme d'auto-questionnaire, qui était rempli par les élèves au cours d'une heure de classe normale dans leur lycée/high school.

## **Instruments**

Le questionnaire comportait plusieurs parties :

- Questions sur la taille et le poids actuels (calcul de l'indice de masse corporelle ou IMC, body mass index BMI), l'histoire pondérale, le poids souhaité, et le statut pubertaire du sujet, et questions sur la corpulence de chacun des parents biologiques (à l'aide d'une série de silhouettes standardisées).
- Le McKnight Risk Factor Survey IV(30–32) qui a été traduit en français par les investigateurs. Ce questionnaire de 106 items comporte des questions sur divers facteurs de risque pour les troubles pondéraux et les TCA, incluant: facteurs sociodémographiques et familiaux, régimes alimentaires et autres méthodes de contrôle du poids, comportements alimentaires, consommation de substances, image du corps et insatisfaction corporelle, estime de soi, régulation affective et émotionnelle, relations avec les pairs, influence des images culturelles et médiatiques, et stratégies de coping (faire face aux difficultés de la vie).

- Un questionnaire développé par les investigateurs, en français et en anglais, pour évaluer les pratiques alimentaires et les attitudes vis-à-vis de la nourriture : le questionnaire APA (Attitudes et Pratiques de l'Alimentation). Ce questionnaire de 28 items évalue : la régularité des repas, le choix des aliments (par ex., composition calorique, produits allégés, produits frais, conserves, ...), la fréquence, l'importance et les modalités des repas pris en famille, les pratiques culinaires familiales, les repas quotidiens et les repas de fête et l'alimentation en dehors des repas (snacks, grignotage).
- Un questionnaire bref de dépistage des troubles des conduites alimentaires, le SCOFF (Sick, Control, One stone, Fat, Food) (33), traduit en français et en cours de validation en France.

## **Procédure**

Les questionnaires étaient administrés dans des Lycées (et quelques collèges) dans plusieurs régions des Etats Unis et en région parisienne et dans l'est de la France. Les sujets et leurs parents (pour les mineurs) étaient informés des objectifs et des modalités de l'étude, et chacun signait un formulaire de consentement.

Les questionnaires étaient anonymes. Nous demandions aux élèves de ne pas écrire leurs noms, afin d'éviter toute identification (seul leur âge était indiqué). Le questionnaire de chaque élève était préalablement numéroté suivant la liste de la classe, un numéro étant attribué à chaque élève. La liste qui indiquait la correspondance entre les numéros et les noms était uniquement consultée si l'élève mentionnait des éléments qui révèlent un danger possible pour lui-même ou pour les autres, ou s'il ou elle avait un trouble du comportement alimentaire sévère. Les questionnaires et la liste étaient gardés séparément et dans des endroits sûrs (des conseils thérapeutiques était alors donnés de manière individuelle et confidentielle).

A l'issue de l'enquête, une présentation a été faite pour chaque classe dans le but de sensibiliser, informer, et mieux faire comprendre les effets potentiels des troubles des comportements alimentaires, des troubles de l'image du corps et des troubles de poids. Nous avons également distribué des brochures de sensibilisation et une liste d'organismes permettant aux élèves de trouver de l'aide si nécessaire, pour eux-mêmes ou pour autrui.

## **RETOMBÉES POTENTIELLES DE LA RECHERCHE**

Les objectifs de l'enquête furent d'identifier et de décrire les facteurs culturels et les pratiques alimentaires liées à la survenue de problèmes pondéraux et de troubles des conduites alimentaires chez

les adolescents. La mise en évidence de ces facteurs devrait permettre de mieux informer les jeunes et leurs éducateurs sur les facteurs de risque et la gravité de ces pathologies, et d'émettre des recommandations concernant des stratégies de prévention. De plus, une sensibilisation sur l'ampleur des problèmes de poids et des conduites alimentaires pathologiques en population générale est capitale. Les troubles du poids et les troubles de conduites alimentaires sont des pathologies dont l'évolution spontanée va vers la chronicité avec des complications somatiques et psychiatriques majeures. Outre la détresse psychologique qu'entraînent ces pathologies, leur coût socio-économique est extrêmement élevé. Une fois installées, elles nécessitent souvent une multitude d'interventions thérapeutiques coûteuses et prolongées. Il en est de même du traitement de leurs complications à court et à long terme.

La mise en évidence de facteurs de risque identifiables et potentiellement modifiables (les attitudes et les pratiques alimentaires) permettra d'empêcher le développement des troubles pondéraux et des troubles alimentaires chez les sujets jeunes, ainsi qu'une meilleure éducation collective autour de l'alimentation et de la nutrition. Nous espérons que l'information recueillie dans cette thèse permettra de promouvoir la diffusion d'information sur les habitudes et attitudes alimentaires journalières protecteurs et réparatrices.

Une discussion en français sur les résultats globale de l'étude et sur nos conclusions est présentée à la fin de cette thèse.

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# The Attitudes and Patterns of Eating (APE) Questionnaire: Development and factor analysis in a U.S. adolescent community sample

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**ABSTRACT. OBJECTIVE:** This paper describes the creation and demonstrates the internal consistency of the Attitudes and Patterns of Eating (APE) Questionnaire, English version, which assesses adolescent food beliefs and eating habits and can be used for comparative studies on various cultures and lifestyles. The questionnaire is intended for use in a study comparing French and U.S. adolescents, the details of which will be presented in a future article. **METHOD:** A research team composed of French and American researchers observed eating behaviors in community samples from each country and reviewed previous studies comparing Europe and North America regarding eating attitudes/practices. Common eating-related themes were identified and corresponding questionnaire items were constructed, then a group of U.S. high school students ( $N=1230$ ) was administered the questionnaire. **RESULTS:** A principal components analysis (PCA) identified 5 components: "Eating Diet/Light Foods," "Unhealthy/Increased Eating," "Homemade Meals," "Skipping Meals" and "Healthy Eating". **DISCUSSION:** The testing and factor analysis of the APE (English) Questionnaire demonstrated its internal consistency. Further validity and reliability studies will be needed to complete the global validation process for both the French and English versions. (*Eat. Weight Disord.* 17: e147-e156, 2012). ©2012, Editrice Kurtis

## INTRODUCTION

Misconceptions with regard to food and unhealthy eating habits are known to contribute to the development and maintenance of both eating disorders (ED) and obesity (1, 2). Adolescents are particularly at risk for these disorders: the EDs are most frequent in girls with a peak incidence during adolescence (3, 4); obesity and overweight are increasingly prevalent in adolescent boys and girls and put them at greater risk for being overweight or obese as adults (5, 6). Both eating and weight disorders have long lasting influence on physical and emotional health (7-11).

The fact that there may be shared risk factors for ED and obesity has been recently explored in the literature (1, 10, 12, 13). The prevention and treatment of both disorders include, among other things, the development and maintenance of healthy

eating behaviors and patterns (1, 13) such as: having regular meals as opposed to erratic eating or skipping meals (13), frequent family meals in a positive atmosphere (10, 14) and the preparation of balanced meals at home which is positively related to diet quality and healthful eating habits (15-17). Fruit and vegetable intake in adolescence is lower than recommended for the prevention of overweight and chronic diseases (18) and fast food intake reduction is essential to reduce and protect against obesity (19).

With regard to prevention of ED and obesity, Neumark-Sztainer et al. (13) and Koplan et al. (8) have recommended the fostering and implementing of an environment where it is easier to engage in healthy eating and physical activity. According to Rozin et al. (20-22), the culture around food in France has maintained such an environment. It is likely that healthier eating behav-

**Key words:**  
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iors occur more frequently in a culinary culture (20, 21, 23-25) such as France: previous research on adults suggests that the French are different from U.S. Americans in terms of every day attitudes and behaviors concerning food and eating (20-23), showing less anxiety and some healthier food practices (20-24, 26-30). It is unknown whether adolescents from these countries differ as well.

However, it is known that adolescent obesity rates differ significantly between France and the U.S. According to the International Obesity Task Force (31), the prevalence of childhood overweight/obesity is 35% in the U.S. (age 6-17) compared to 19% in France (age 11-17). Whereas in the U.S. the frequency is similar for boys and girls (35% vs 36% respectively), in France the percentage of overweight/obese boys is significantly higher (21.6%) compared to girls (16.5%). Differences in prevalence and incidence of eating disorders (if any) between the two countries are unknown.

Daily eating habits impact weight status (32-35) and unhealthy eating attitudes are one of many etiological factors for ED (36, 37). Understanding more fully the similarities and differences in adolescents' daily eating patterns and attitudes between two cultures such as France and the United States may further inform our knowledge about ED and obesity. Such knowledge could, in turn, inform health policy and clinical practice. At the time of launching such a study, no appropriate questionnaire for assessing adolescents' attitudes about food and every day eating patterns was found in the literature.

The objectives of the current paper are to describe: 1) the creation of a questionnaire assessing adolescents' beliefs about what constitutes healthy and unhealthy eating, and their actual eating habits; 2) the testing of the questionnaire in both French and English for the refinement of items; 3) the identification of the factor structure of the English version of the questionnaire in a community sample of U.S. adolescent boys and girls; and 4) the testing for internal consistency. The validation of the French version will be done in the following stage of our research.

## METHODS

### *Stage 1 - Field Observation*

Over a period of one year, observations of eating behaviors in France and the U.S. were recorded by a team of researchers, all of whom were from France or the U.S. Team members first gathered personal observations of their

experiences in both cultures: they kept journals describing meals or eating experiences they had observed in each culture. In an effort at representation, team members observed different samples (i.e. families, groups or individuals in eating situations) in various regions of the two countries. The meals/eating experiences occurred naturally in a variety of settings, for example, taking part in family meals or observing customers in restaurants. All of the researchers had traveled, lived and spent time in families or with hosts in various parts of the U.S. and in several regions of France. At the end of the year, the researchers compared and discussed their observations together; they noted similarities and differences in their journals and, based on their findings, decided upon a list of attitudes and behaviors regarding eating. For example, the behavior, purchase and consumption of fat-free/dietetic/"light" products was noted in both countries (although to a lesser degree in France) so it was included in the final list.

### *Stage 2 - Item Generation*

Stage two began with undertaking a literature review (38). Previous studies describing and comparing eating behaviors, attitudes and habits within and between Western countries (either adult or adolescent populations) were researched by the team. Common themes repeatedly found during the observation phase (stage 1) and literature review were identified and a final list of 7 themes was generated: 1) Eating "Light" Foods, 2) Family Patterns, 3) Individual Eating Habits and Attitudes, 4) Attitudes/Habits Concerning Body and Weight, 5) Healthy Eating, 6) Eating "Junk" Food, 7) Using Fresh Ingredients in the Making of Meals.

The team created individual question items derived from these themes. There was an average of 9 items per theme (6 minimum, 16 maximum with some questions pertaining to more than one theme). Each item covered a relevant aspect of the theme; for example, the question, "How often are meals in your family made (almost) solely from fresh ingredients?" represented an aspect of the *Using Fresh Ingredients* theme. Items were deemed relevant to the theme according to three criteria: 1) The entire team agreed on the item's relevance to the theme and to the future study (on eating behaviors and attitudes), and either 2) the item content (e.g. behavior of eating candy as a snack) was observed in the field, in one or both countries, by at least two team members independently during the observation stage of the project or, 3) the item content was previously reported in a published study.



The initial questionnaire included 42 items. One item offered response possibilities to be checked off (see *Appendix 2*, number 2) and forty-one items were constructed in a 5-point Likert scale format. The Likert-scale was chosen for its facility of construction, adaptability and relatively good reliability (39-41) as well as consistency with the other validated instrument chosen for the France/U.S. project - The McKnight Risk Factor Survey (42).

#### *Stage 3 - Item Refinement*

The initial questionnaire was tested on a group of 343 high school students in the U.S. (northern California) during one hour of class time. The questionnaire was also translated into French by the research team and back-translated by an independent researcher. The French translation was tested on a group of 130 Lycée students. Items which proved problematic (i.e. the students did not understand an item's meaning or they asked questions about it) to 10 or more students from either sample, or which were different in the back-translation were removed or revised. Items which were thought to better relate to a construct other than eating habits/attitudes (e.g. physical exercise, mood) were also removed.

This stage of the project, because it involved human subjects, was previously approved by the Research Ethic Board of Stanford University, California.

#### *Stage 4 - Data Collection*

The revised questionnaire, both English and French versions, included 36 items. Stage 4 concerned only the English version of the questionnaire. It was administered to a sample of 1230 high school students (grades 9-12) from 11 schools in the U.S. In order to access a diversity of students, many schools were approached across the U.S., representing different populations. Although individual schools were ultimately included in the study because of their willingness to participate (rather than random allocation), in the end, the number of schools and variety of neighborhoods accessed did provide a diversified population. The sample was derived from urban, suburban, and rural communities; from various private and public schools in predominantly Caucasian middle class areas; and public schools in areas encompassing mixed ethnic and socio-demographic groups. Parent and student active consent forms were required for participation in the study. Neither credit nor incentive was offered in return for participation. The questionnaire was completed during class time, with noncompleters being given an alternate

school-related assignment. Students who chose not to participate were given the alternate assignment by their teachers.

#### *Statistical Analyses*

Data derived from the revised English-version questionnaire were entered and statistical analyses conducted using the Statistical Package for the Social Sciences (SPSS, Version 15). Double entry of the same data by 2 independent research assistants was performed on about 20% of the questionnaires to check accuracy. Data were checked for accuracy by confirming they were within the correct scoring range for each item (and by other standard data cleaning procedures). Only participants who completed all 36 items on the questionnaire (approximately 78%) were included in the analyses (N=956).

An exploratory factor analysis using principal components analysis (PCA) with varimax rotation was performed to identify the component structure of the questionnaire. A cut-off level of 0.40 was chosen for including a particular item (43). Both eigenvalues (greater than 1) and scree plots were examined to show the component solutions (43). Internal consistency was examined for items within each component using the Cronbach's alpha statistic.

## RESULTS

There were 458 males and 498 females with a mean age of 15.73 years (range 13.25 to 20.08 years). The overall response rate was 88%. Non-response was due to absence, lack of desire to participate or lack of parental consent.

Results of a PCA including the 36 items revealed 8 components with eigenvalues above 1. The examination of the scree plot indicated a five-component solution. The five-component solution was accepted by the research team because each component made clinical sense and the Kaiser-Guttman rule (eigenvalue above 1) over-estimates the number of components (44). Another PCA was run with varimax rotation forcing the number of components to five.

Seven items were removed because of insufficient loading (cut-off 0.40) to any of the resulting factors (see *Appendix 2*). One item was removed because its format precluded inclusion in the factor analysis (see *Appendix 2*, number 2).

A final five-component PCA was performed on the remaining 28 items. The KMO (Kaiser-Meyer-Olkin measure of sampling adequacy) value was 0.803, and the five components

explained 48.54% of the total variance. The reliability analysis for the total scale (28 items) indicated a Cronbach alpha of 0.63. Table 1 presents results of this final PCA.

The first component was labelled "*Eating Diet/Light Foods*" and consisted of five items (10c, 11, 12, 19b, 19c; See Table 1). It explained 11.91% of the variance with an eigenvalue of 4.615. The internal consistency of the component was strong with a value of 0.811.

The second component was called "*Unhealthy/Increased Eating*". It consisted of nine items (numbers 1, 2, 3a, 3b, 7, 8, 10b, 16, 17) and explained 11.45% of the variance with an eigenvalue of 3.177. The internal consistency of this component was also high, with a Cronbach alpha of 0.750.

The third component was labelled "*Homemade Meals*". It consisted of six items (numbers 4, 5, 6, 18, 19e, 19f; items number 6 and 18 are reversed) and explained 8.92% of the variance, with an eigenvalue of 2.470. The internal consistency of this component was strong with a Cronbach alpha of 0.699.

The fourth component was named "*Skipping Meals*". It consisted of four items (13, 14, 15, 20; item number 20 is reversed) and explained 8.18% of variance, with an eigenvalue of 1.843, and a Cronbach alpha coefficient of 0.585.

The fifth component was called "*Healthy Eating*". It consisted of four items (numbers 3c, 9, 10a, 19a) and explained 8.06% of variance with an eigenvalue of 1.485. The Cronbach alpha was 0.683.

## DISCUSSION

The main objectives of this paper were: to describe the construction of the APE questionnaire (see *Appendix 1*), a new instrument to be used in a study comparing French and American adolescents' eating behaviours and attitudes towards food; and to present the testing for internal consistency of the English version. Validity and reliability testing for the French version as well as reliability testing of the English version will be presented in future works.

A principal components analysis identified 5 factors, four of which agreed, for the most part, with original themes formulated by the research team. After the PCA, the original theme, "Eating Light Foods" was renamed "Eating Diet/Light Foods" to better describe the items which loaded therein (see Table 1). The themes "Eating Junk Food" and "Fresh Ingredients" were renamed respectively, "Unhealthy/Increased Eating" and "Homemade Meals" in order to better reflect the questions

which loaded therein. The title of the theme "Healthy Eating" remained unchanged.

The original theme "Family Patterns" was not identified in the factor analysis. Items originally thought to be related as family behaviors instead loaded among the factors "Homemade Meals", "Healthy Eating" and "Skipping Meals." Four original "Family Patterns" items (See *Appendix 2*, number 1) were removed due to low loading onto any factor. One was removed due to problems in interpretation and scoring as well as its inability to be included in the factor analysis because of its format (See *Appendix 2*, number 2).

Items thought to be related under the theme entitled "Individual Eating Habits and Attitudes" did not load together; nor did items thought to be related under the theme "Attitudes/Habits Concerning Body and Weight". These two original themes were therefore eliminated. However, several items initially intended for these themes did load sufficiently among the "Healthy eating", "Unhealthy Eating" and "Skipping Meals" components and were therefore kept as part of these themes (for example, the item "How often during the day, do you find yourself thinking about eating?" loaded under the "Unhealthy Eating" factor). One item from the original "Individual Eating Habits and Attitudes" theme was removed after the PCA and two items were removed from the original "Attitudes/Habits concerning Body and Weight" theme due to low loading onto any factor (See *Appendix 2*, numbers 3 and 4).

A new component emerged in the PCA and was labeled "Skipping Meals" (See Table 1). Items in this component were originally thought to be under the themes "Individual Eating Habits and Attitudes" and "Family Patterns."

A "Family Patterns" item about eating in (non-fast food) restaurants (See *Appendix 2*, number 1) did not load sufficiently onto any factor. During the first two phases of the current study, high restaurant patronage was noted in both countries and previous research indicated that eating out increased intake of fat, sodium and sugar and reduced intake in fiber, vitamins and minerals (16, 45-47). Given indications of recent increases in this practice, at least in the U.S. (45-47), it was considered useful to keep this question as a stand-alone item in the upcoming France/U.S. study.

Three other removed family-themed items were: "How often do members of your household (or family) skip family meals due to work?"; "How often does your family have big or special meals for special occasions?"; and "How important is it that you eat meals with



**TABLE 1**  
Factor Structure and Items of the Attitudes and Patterns of Eating (APE) Survey 28-item questionnaire (N=956).

Subscales and Items	M	SD	1	2	3	4	5	
<b>SUBSCALE 1: Eating Diet/Light Foods</b>	2.320	1.056	0.731					
10c) How often when you choose a dessert, do you choose to eat the following: light or fat-free desserts?								
11) How often do you eat other "light" or "low-fat" products – for example, "light" chips or "low-fat" cookies	2.280	1.050	0.753					
12) How often do you eat "light" meals (i.e. Weight Watchers meals) for breakfast, lunch, or dinner	1.520	0.842	0.512					
19b) How important is it to you that food you eat be low in fat content?	2.450	1.107	0.780					
19c) How important is it to you that food you eat be low in caloric content?	2.420	1.090	0.764					
<b>SUBSCALE 2: Unhealthy/Increased Eating</b>								
1) How often do you eat when you are not hungry?	2.490	1.030		0.591				
2) How often during the day, do you find yourself thinking about eating?	2.400	1.025		0.602				
3a) How often do you eat the following snacks: chips/crackers	3.150	0.954		0.589				
3b) How often do you eat the following snacks: candy	3.000	1.027		0.566				
7) How often do you eat fast foods – for example, McDonald's	2.680	1.012		0.432				
8) How often do you drink carbonated beverages such as pop or sparkling juice drinks?	3.090	1.124		0.439				
10b) How often when you choose a dessert, do you choose to eat the following: Creamy, sugary desserts (not fat-free or "light")	3.120	1.052		0.637				
16) How often do you eat little bits of food throughout the day snacking whenever you feel like it (instead of sitting down for 3 separate meals)?	2.760	1.120		0.574				
17) How often do you have a fourth small meal, or snack (i.e. after-school snack) in addition to breakfast, lunch, and supper?	3.130	1.199		0.655				
<b>SUBSCALE 3: Homemade Meals</b>								
4) How often are meals in your family made (almost) solely from fresh ingredients?	3.410	1.062			0.715			
5) How often does/do the cook(s) in your family use fresh herbs and/or spices?	3.050	1.190			0.689			
6) How often does/do the cook(s) in your family use frozen, packaged, canned ingredients when making a meal?*	2.990	0.904			-0.605			
18) How often are family sit-down meals replaced by "food on the run" or quicker meals (i.e. TV dinners)?*	2.210	1.026			-0.419			
19e) How important is it to you that food you eat be made with fresh ingredients (not frozen, packaged pre-made, not canned, powdered or boxed as a mix)?	2.780	1.122			0.573			
19f) How important is it to you that food you eat be homemade or made from scratch – that is, not from a pre-prepared mix?	2.570	1.163			0.568			
<b>SUBSCALE 4: Skipping Meals</b>								
13) How often do you skip breakfast?	2.680	1.443				0.625		
14) How often do you skip lunch?	2.020	1.071				0.683		
15) How often do you skip supper?	1.650	0.924				0.664		
20) How often do you eat regular meals with your immediate family at home, sitting at the table together?*	3.023	1.228				-0.507		
<b>SUBSCALE 5: Healthy Eating</b>								
3c) How often do you eat the following snacks: fruit?	3.580	1.008					0.726	
9) How often do you drink "real" fresh juices (not artificially flavored)?	3.310	0.978					0.561	
10a) How often when you choose a dessert, do you choose to eat the following: Fresh fruit?	2.900	1.071					0.718	
19a) How important is it to you that food you eat be healthy and nutritious?	3.340	1.030					0.508	
Eigenvalue			4.615	3.177	2.470	1.843	1.485	
Variance (%)			11.915	11.447	8.924	8.187	8.064	
Cronbach alpha			0.811	0.749	0.699	0.585	0.683	
Overall variance= 48.54%; Range for items= 1 to 5; *Items 6, 18 and 20 have a negative loading: their scores need to be reversed in order to compute a subscale score.								

your family?" (See Appendix 2, number 1). Country differences were subjectively observed by the researchers during Stage 1 of the current study: French families appeared to be having more regular family meals together as well as more frequent, special, copious/lengthy meals than U.S. families. Possible objective differences will be interesting to investigate in the France/U.S. study, using these individual questions, since previous research has shown family meals to be a protective factor against adolescent eating problems (10, 14, 48).

The fifth removed "family" theme question, "What does your family typically do after big family meals?" was found to be difficult to score and interpret (See Appendix 2, number 2). The team had observed between-country differences; namely, that the French population appeared to be more physically active after holiday meals (in order to "digest well") than U.S. families. This might be an interesting question to explore individually in a future study.

There were interpretation problems with the question, "How important is it to you that food be good tasting/ flavorful?" (from the original "Individual Eating Habits and Attitudes" theme; See Appendix 2, number 3) which was removed due to low loading. The team observed an interesting phenomenon with regard to this item as a result of the PCA. The team had expected the "good taste" item to load onto the original "Healthy Eating" factor, under their assumption that fresh, high quality ingredients and homemade foods would be associated with the idea of "good taste". In their various eating experiences around France, team members had taken part in lively conversations about taste, where the main criteria in labeling a food item "good tasting" was its freshness and the high natural quality of its ingredients. It is likely that the experience of flavor is culturally moderated or affected by one's experience with certain types of food; and since the research team members were all either native French or Americans living in France at the time of the questionnaire construction, they were probably culturally biased in their definition of "good taste". In contrast, taste may also be defined as "good" if it has high quantities of fat, salt and sugar. Case in point: during the 1970s the McDonald's corporation was introducing new fast food products into the U.S. market. Their main criteria for whether or not a new food item would be successful and therefore, whether or not they would release it nationwide was: "good" taste. The research and development teams invented food items without much consideration as to freshness of ingredients, nutritional content, additive or

chemical content; salt, sugar, calorie or fat content (49, 50). The resulting food items invented by McDonald's were not, in fact, based on the idea that good taste is the result of using fresh, ripe, natural ingredients. Their success testifies to a different definition of "good taste" than the one assumed by the present research team. The "taste" question, in fact, loaded unexpectedly onto the "Unhealthy/Increased Eating" factor and loaded poorly at that, so it was eliminated due to both problems. It will be interesting, however, to observe how this question loads in the French sample. Furthermore, a future study exploring cultural differences in taste attribution might be constructive.

The removed questions: "How likely do you think it is that you can attain your ideal body type?" and "How often do you make a conscious effort to exercise - for example: go running, biking, or play a sport only in order to influence your shape or weight?" (See Appendix 2, number 4) were from the original "Attitudes/Habits concerning Body and Weight" theme. Ultimately these items were not coherent with the rest of the APE, although, in the beginning, the research team found them worthwhile subjects to consider inter-culturally. For the former item: it seemed to the research team that U.S. adolescents expressed more often that it was possible to sculpt any body into an ideal one than did French adolescents, and they wanted to test this hypothesis. This item will be treated individually in the final project since it is consistent with the goals of the larger France/U.S. study. The latter item, regarding exercise, was redundant with the other instrument to be used in the future France/U.S. study.

Future researchers wishing to use the APE-English version may choose to add individual items which were removed (See Appendix 2) and score them individually in order to consider between-group differences. The present research team found these questions interesting and relevant to investigating individual and familial eating behavior and attitudes and will be using certain ones for the France/U.S. study.

The purpose of the APE is to measure certain eating attitudes and practices. The components uncovered by the PCA reduce the English version down to its most relevant and coherent parts.

#### *Utilization of the APE*

For comparative studies employing the APE Questionnaire (See Appendix 1) it is recommended to use the 5 subscales (See Table 1) in addition to individual items, if desired (See Appendix 2). There is no total score. Compar-



isons using the APE can be made for descriptive or comparative studies. Note that for certain items the scores are reversed.

**CONCLUSION**

A four-stage process was undertaken to create a new questionnaire (for use in a project studying French and U.S. adolescents' eating attitudes and behaviors) which included testing it in adolescent populations in the U.S. and France, then subjecting the U.S. data to a PCA to test internal consistency. Validation tests for the French version are forthcoming. The PCA revealed a five factor solution, upon which the entire team agreed for the final version of the questionnaire. The questionnaire was named "The Attitudes and Patterns of Eating (APE) Questionnaire" (See Appendix 1) and consists of

28 items. Individually removed items may be used as desired in future research (see Appendix 2).

Future perspectives for improving psychometric strength and confirming usefulness of the APE include testing it for reliability in both the French and U.S. populations, subjecting the French sample to tests for internal consistency and ensuring that the factor structure of the French version is consistent with that of the English version.

The factor analysis and testing of the English version APE questionnaire demonstrated its internal consistency. After doing the same for the French version and testing both versions for reliability, we will use the instrument for comparative purposes in the France/U.S. study. The APE Questionnaire may also be appropriate for other comparative studies on adolescent eating practices.

**APPENDIX 1**  
The Attitudes and Patterns of Eating (APE) Questionnaire:

YOUR EATING HABITS, and EATING HABITS IN YOUR FAMILY...					
How often...	Never	Seldom	Sometimes	Often	Almost always
1. do you eat when you are not hungry? .....	1	2	3	4	5
2. do you find yourself thinking about eating? .....	1	2	3	4	5
3. do you eat the following snacks:					
a. Chips/crackers? .....	1	2	3	4	5
b. Candy? .....	1	2	3	4	5
c. Fruit? .....	1	2	3	4	5
4. are meals in your family made (almost) solely from fresh ingredients? .....	1	2	3	4	5
5. does/do the cook(s) in your family use fresh herbs and/or spices? ...	1	2	3	4	5
6. does/do the cook(s) in your family use frozen, packaged, canned ingredients when making a meal? .....	1	2	3	4	5
7. do you eat in fast foods (e.g. McDonald's)? .....	1	2	3	4	5
8. do you drink carbonated beverages such as pop or sparkling juice drinks? .....	1	2	3	4	5
9. do you drink "real" fresh juices (not artificially flavored)? .....	1	2	3	4	5
10. when you choose a dessert, do you choose to eat the following:					
a. Fresh fruit? .....	1	2	3	4	5
b. Creamy, sugary desserts (NOT fat-free or "light")? .....	1	2	3	4	5
c. "Light" or "fat-free" desserts? .....	1	2	3	4	5
11. do you eat other "light" or "low-fat" products – for example, "light" chips or "low-fat" cookies? .....	1	2	3	4	5
12. do you eat "light" meals (e.g., Weight Watchers meals) for breakfast, lunch or dinner? .....	1	2	3	4	5
13. do you skip breakfast? .....	1	2	3	4	5

*Continued*

How often...	Never	Seldom	Sometimes	Often	Almost always
14. do you skip lunch? .....	1	2	3	4	5
15. do you skip supper? .....	1	2	3	4	5
16. do you eat little bits of food throughout the day, snacking whenever you feel like it instead of sitting down for 3 separate meals? .....	1	2	3	4	5
17. do you have a fourth small meal, or snack, (i.e. after-school snack) in addition to breakfast, lunch, and supper? .....	1	2	3	4	5
18. are family sit-down meals replaced by "food on the run" or quicker Meals (i.e. TV dinner)? .....	1	2	3	4	5
19. How important is it to you that the food you eat be:	Not important	Somewhat important	Moderately important	Very important	Extremely important
a. healthy and nutritious? .....	1	2	3	4	5
b. low in fat content? .....	1	2	3	4	5
c. low in caloric content? .....	1	2	3	4	5
d. made with fresh ingredients (not frozen, packaged pre-made, not canned, powdered or boxed as a mix)? ...	1	2	3	4	5
e. homemade or made from scratch or nearly from scratch that is, not from a pre-prepared mix? .....	1	2	3	4	5
20. Do you eat regular meals with your immediate family at home, sitting at the table together?					
1. never to a few times a year		4. once a day			
2. once or several times a month		5. two or more times a day			
3. once or several times a week					

APPENDIX 2

- Four original "Family patterns" items removed due to low loading onto any factor:
  - Do you eat in restaurants with your family (not fast food restaurants)?
  - How often do members of your household (or family) skip family meals due to work?
  - "Does your family (immediate or extended) have big or special meals for special occasions?"
  - How important is it that you eat meals with your family?
- One "Family Patterns" item removed due to difficulty in interpretation/scoring and its format which precluded inclusion in the factor analysis:
  - What does your family typically do after big family meals? Please place a check next to the most appropriate answer(s).
  - Watch TV together \_\_\_\_\_
  - Go see a movie together \_\_\_\_\_
  - Sit and read \_\_\_\_\_
  - Participate in an activity together, such as take a walk in a park or in a mall--an activity which requires movement and aids in digestion \_\_\_\_\_
  - Everyone does whatever they want to do (not necessarily together) \_\_\_\_\_
  - Watch sports together on TV \_\_\_\_\_
  - Play a sport together like football or basketball \_\_\_\_\_
  - Sit and talk together \_\_\_\_\_
  - Take a nap \_\_\_\_\_
  - Other--please describe \_\_\_\_\_
- One original "Individual Eating Habits and Attitudes" item removed due to insufficient or inadequate loading to any of the resulting factors:
  - How important to you is it that the food you eat be: Good tasting/flavorful?

Continued

4. Original items thought to be related under the original designated theme "Attitudes/ Habits Concerning Body and Weight" removed due to insufficient or inadequate loading to any of the resulting factors:

How likely do you think it is that you can attain your ideal body type?

How often do you make a conscious effort to exercise—for example, go running, biking, or play a sport only in order to influence your shape or weight?

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# **Attitudes and Patterns of Every-day Eating: A Cross-cultural study between Adolescents from France and the United States**

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## INTRODUCTION

Eating and drinking are a natural part of the progression of people's days and are linked to daily schedules, roles and responsibilities at home and at work (1). Every-day eating (EDE) consists of behaviors undertaken regularly and customarily by a given individual or group for self-nourishment or the nourishment of their young (2). The notion of EDE is not new: in the 4th century BC, Aristotle first suggested that EDE behaviors might have an effect on health, and nutritional guidelines for training athletes were used in ancient Greece (3). Much later, in the early 20<sup>th</sup> century, Casimir Funk coined the term "vitamines" which contributed to the dissemination of ideas about nutrition (4). With increasing public interest in nutrition in recent decades (5), the information garnered and presented has changed, and even contradicted itself at times—leading to sometimes confusing media and educational messages, and information overload (6,7). Some successful effort has been made, nonetheless, by European governments to promote healthy eating practices among their populations, in order to improve health and decrease nutrition-related health problems (8–10).

Nutritionists have been scientifically studying human consumptive behavior and the nutritional qualities of given foods and nutrients since the 18th century: starting with the pioneering work of Lavoisier, the rigorous study of nutrition developed (11). EDE practices have been studied by research teams in the past few decades, especially since the global alarm was sounded over the obesity epidemic (12–14)— more recently termed "pandemic" (15).

Due to the rapid increase in the prevalence of obesity, researchers have suggested that psychological and behavioral factors, as opposed to biological factors, are primarily responsible for the trend (16,17). Traditional food patterns are changing (1,18,19), such that certain EDE customs, attitudes and practices, which are protective against the development of dysfunctional eating behaviors (20–22) and weight disorders (21–25), may be lost. In contrast, it is well understood that certain unhealthy EDE behaviors, patterns and attitudes (or beliefs) are related to eating disorders (EDs) such as anorexia nervosa (AN) and bulimia nervosa (BN) (22,26–31), and weight problems (2,22,29,32,33). For example, recent work by Neumark-Sztainer et al. (20,22,34) and Haines et al. (35) showed that EDE patterns such as having dinner with the family in a positive setting were protective against EDs and weight problems such as obesity (OB). Other research has shown that the role of environment (36) and eating behaviors are crucial and that changing EDE habits is essential in dealing with obesity (2,33,37–39), while environment and beliefs around eating and certain EDE behaviors must be addressed in the treatment of ED (38,40,36). Specifically, unhealthy EDE patterns such as skipping meals, high consumption of



carbonated drinks, eating out, grazing, snacking, restricting food intake through dieting or fasting (which are often followed by purging or overeating) increase the risk for developing OB and are related to onset and maintenance of EDs (35,41–46).

### **Every Day Eating Between cultures**

There have been increasing efforts in recent years to study the power of cultural influence on ED and how cultural factors intersect with individual ones to produce ED (47) and obesity (48,49). Describing cultural differences in eating and identifying which specific cultural practices and attitudes protect and benefit human physical and psychological health can aid in the development and improvement of ED and OB prevention programs, medical and psychological intervention programs and educating the public (50–52). The negative health effects of these disorders are well understood and described in the literature (12,40,45). Defining practices which protect against and reduce rates of OB and ED may aid in addressing and redirecting public education regarding food practices for the ultimate goal of harnessing and slowing the obesity epidemic (52) and EDs.

Repairing and restructuring maladaptive cultural behaviors which promote and maintain these disorders is a tall order and may not be possible, given the fact that individual choice appears to be the ultimate deciding factor in whether or not maladaptive (or adaptive) behaviors are undertaken and maintained in the first place and given the present “obesogenic” nature of certain environments, with their availability of high density, nutritionally poor yet affordable foods in the marketplace (53,54). However, a recent amelioration of the nutritional status of the population in France (55) seems to be the result of government sponsored and supported efforts at educating the public and providing access to healthier foods (56). Furthermore, a group of studies by Wansink (57) in the United States challenges the notion of choice in human food consumption: this group and their research maintains that humans are subject to manipulation by the environment such that their responses to the presence and portions of food may be automatic and due to unconscious processes rather than voluntary. If the results are shown to be robust in this group’s continued work, the argument in favor of government intervention for reducing obesogenic or “ED-genic” (i.e. risk factors for ED) elements in the environment will be further supported.

To say that every-day eating practices and attitudes differ between cultures (58,59) and impact adults’ and children’s body size and what they eat (49) is an understatement. It is not necessary to be a scientific researcher to observe cultural eating differences; one need merely be an observant tourist

(60). The study of EDE behaviors and attitudes have become more common in recent literature as global interest in nutrition, eating styles and obesity rates have increased (61,62), although there have been few cross-cultural studies using the same instrument (63).

Cultural beliefs and attitudes contribute significantly to the development of ED (64) and since ED behavior is more prevalent in industrialized and Western societies, culture is considered to be one of the major factors in the etiology of ED (63). With regard to OB, adolescent weight problems have become a widespread problem in the developed world, so it is timely to understand commonalities and differences underlying EDE practices across countries and delineate which cultural patterns and beliefs are protective against weight problems (21,50).

France and the United States are two western countries which have been studied in recent years in terms of eating habits and attitudes, perhaps because of significant differences in obesity between these two countries (49,65)—the higher weight averages found among U.S.A. populations— and to common notions of France as a culinary (49,59), traditional, “slow” food culture (66,67) contrasted with widespread agreement that the U.S.A. is a “toxic,” fast food, cheap food, industrial food culture (51,59,66).

Most previous studies comparing France and the U.S.A. were performed on adult populations and they conclude that differences do exist and these differences in health behaviors translate into different rates of obesity for the two countries (66). Differences in prevalence of ED between these two countries are unknown, so the question emerges: are differences in EDE in these two cultures also associated with different rates of ED? A future article by the present research team will explore this question.

The present research group chose to study adolescents from France and the U.S.A. for several reasons: 1) to explore whether differences in EDE exist among adolescents from these countries, as they do among adults; 2) improvement in eating behaviors and patterns (i.e. nutrition and healthy lifestyle) in coming decades is essential for the reduction of obesity rates and protection against eating disorders (29) and knowledge of country differences may aid in delineating the EDE behaviors which are protective and/or reparative; 3) adolescents are at risk for ED and OB (68) yet while they are growing they need sufficient nutrients (as opposed to excess of intake) in order to grow up healthier, to ensure better learning capacity, performance and concentration in school (69) and in order to be better off socially and psychologically (45,70,71)—in short, nutrition and balanced eating habits are part of the cycle of wellness (23,45); 4) finally, adolescence is an important time to form lifelong EDE habits (45,72),



therefore, information which educates the public about healthy EDE behaviors for adolescents may support families in promoting them.

The present study aims to compare France and U.S.A. adolescents for self-reported EDE behaviors and attitudes by country and by gender. Researchers from France, the U.S.A. and Canada hypothesize that adolescents from France will show overall healthier EDE attitudes and practices than their U.S.A. counterparts, as previous research with adult subjects has shown (66,73–76). The specific eating practices and attitudes chosen for study in this project are grouped into the following categories or subscales: “healthy eating,” “unhealthy/increased eating,” “skipping meals,” “homemade meals,” and “eating diet/light foods”; which are assessed through the APE questionnaire, an instrument developed and tested by the present research team (77). Individual items on the APE are also explored.

## **Background**

Before administering the questionnaire to the populations in question, as a first step in understanding known differences (or similarities) between France and the United States in terms of EDE, the research team researched within-country and between country studies for a literature review focusing on eating habits, patterns and attitudes (or beliefs). The following section presents previous literature on the subject of EDE and on EDE comparisons between France and the United States.

### **Eating with the family vs. meal skipping**

Regularity of meal times, frequency of family meals and meal rituals are associated with better nutritional quality, healthful eating patterns, lower ED, lower high-risk behaviors (including bingeing, purging and excessive weight loss) in adolescents and young adults and lower health problems such as obesity and energy imbalance (34,35,38,78–83). Simply eating dinner with others is significantly associated with fruit and vegetable intake in young adults while eating on the run is related to higher soft drink intake, higher fast food and total fat intake and lower intake of healthful foods (79). Meal skipping is associated with weight gain and poor nutrient intake, is related to unhealthy lifestyle behaviors and is considered to be an unhealthy weight control behavior (22,44,84) that may contribute to binge eating—which is associated with both ED and OB (38).

The home-cooked family meal has “become a thing of the past” in the U.S.A. (5) where previous research showed that fewer than half of children eat with their families every night (85). In France,

however, regular meals and the traditional family meal remain more common (19,60) although there are signs of “de-structuration” of such eating-related traditions and rituals in France (19). Differences between France and the U.S.A. (strictly speaking, in terms of scientific research) with regard to meal skipping or eating on the run are unknown, yet much is written about the fact that the French eat regularly, in a balanced way and rarely “on the run,” while author Shapin laments that Americans “have become an eat-on-the-run, absent-mindedly feeding, cup-holder culture” (59,86).

### **Eating out and Fast Food vs. home-cooked meals and use of fresh of ingredients in cooking**

The ingredients in food and its quantity are not under the control of the consumer who eats outside of the home (12). Eating out is associated with lower intake of healthful foods and higher intake of food overall (87) as well as higher intake of unhealthful foods such as saturated fats, sodium, soft drinks and fast food (72,79). Fast food is associated with poor dietary intake and with weight gain, which likely increase risk for OB (84,88–92). U.S. American adolescents over consume fast food, regardless of their body weight (93). However, when they report attitudes towards healthy eating they may decrease fast-food consumption (91). Fruit, vegetable and milk intake is lower among frequent adolescent fast food restaurant users (89) and frequent fast food intake ( $\geq 3$  times a week) was reported by 20-33% of U.S.A. adolescents transitioning into young adulthood (91). A recent study demonstrated that the salt content of fast food is excessive and is higher in the U.S.A. than in France (94). Since the 1980s Americans have been increasingly eating out, which is associated with adverse nutritional and weight related consequences for children and adults (72,95–100). Fast food sales have increased substantially in the U.S.A. (101) and in France have been following (60).

Meals cooked at home are higher in essential nutrients and fiber (102–104) and lower in non-nutritive or unhealthful ingredients such as excess fat and sodium (104). The use of fresh or raw ingredients (as opposed to frozen, canned, bottled or boxed ingredients; or “industrially made” prepared foods) is associated with higher nutritional quality of meals, as long as the fresh ingredients—such as fruits and vegetables—aren’t kept too long (105). A stronger interest in health, organic products and freshness is related to “not being obese” (106). Overweight and obesity are associated with one-time-a-week (at least) take-out dinner purchases (83) as opposed to meals made at home. A decrease in frequency of home cooked meals (using raw ingredients) has been observed in France, although France is still considered to have one of the most stable food culture and resilient meal patterns among developed nations (42,59). For the French compared to Americans, freshness of food and taste are more

important than shelf life (6,59) and the French are more interested in quality of food than in quantity (75).

### **Fruit and vegetable intake**

Few adolescents and young adults consume fruits and vegetables in recommended amounts (107). Eating fruits and vegetables since childhood leads to higher intakes of those foods in adulthood (72,108,109) and increasing fruit and vegetable consumption (while reducing portion sizes of other foods and sweet drink consumption) have been found to offer health benefits related to (and “above and beyond”) the prevention of overweight for children (71). Many children choose foods that are high in fat or added sugars at the expense of nutrient-dense foods, vegetables, whole-grains and other foods (96), which may exacerbate the trend toward increasing OB and other health problems; indeed, the consumption of high-calorie, low quality snacks are linked to excessive weight gain (92). More French adults eat fruits and vegetables than their American counterparts (66,110).

### **Soft drink consumption**

Sugar rich drinks are related to weight problems (12) and OB in children (45,92) ; whereas reduction in consumption of carbonated drinks is associated with reduction in overweight and OB in children (71,111). In the U.S.A. drinking soda is likely to replace eating fruit or drinking fruit juice or milk and many teens replace milk consumption with soda, twice as much or more, according to certain researchers (112,113). Replacement of milk results in lower intakes of calcium: the average U.S.A. teenage girl gets 40 percent less calcium than she needs (112,113) and U.S.A. pre-school children drink less milk than recommended (114). By contrast, in France, children and adults alike are commonly encouraged in families to eat dairy products daily and to be sure their water intake is sufficient (115) although there is no recent research, to our knowledge, showing whether soda intake is replacing water and dairy intake in France.

Soft drink (sodas, flavored water, sweetened juice drinks) consumption by American children and adults has increased substantially in recent decades (95,116). Americans drink up to six times more soda than fruit juice (113); 7 cans a day are consumed (84 oz. altogether) by some. Where soda servings have increased from 6 ½ ounce bottles in the 1950s to 20-ounce bottles in 1998; a “child size” soft drink in fast food restaurants is 12-ounces and a “small” is 16 ounces. The “double gulp” at 7-11 stores is 64 ounces. A 12-ounce can of non-diet cola has about 10 sugar cubes in it (10 teaspoons) (112,113).

According to authors Lang and Heasman, “Colas and burgers are now synonymous with America” (117). Significantly fewer French adults drink sweetened beverages than their American counterparts (66) and the principal liquid consumed by French people of all ages is water (118).

### **Diet or “light” foods, Fat-free, low-calorie attitudes and behaviors**

The French eat fewer fat-reduced, “light” or “diet” foods than their U.S.A. counterparts (6,59,74,115,119) yet the French remain thinner than U.S. Americans (6,76,120–123). In the U.S.A., consumption of foods labeled “fat-free” or “healthy” can lead to overeating (124). According to researchers Rozin et al. (125,126), a third of Americans seek a totally fat-free (“and therefore actually fatal”) diet and they view fat as a toxin (125). Excessive attention for food calories is a risk factor for ED (127). The French regularly disdain foods which contain high amounts of “chemicals” and therefore shun “diet,” “low-carb,” “low-cal,” “fat-free,” (i.e. foods in which natural fats are replaced with synthetic ingredients) or “light” foods to a higher degree than Americans do (77,115). Food is viewed as more sensory and social by the French compared to U.S. Americans, as opposed to being seen as a source of nutrients, toxins or calories (73). As part of common discourse and behavior in France, “eating light” is a widely discussed value, but it is addressed through buying fresh ingredients at the marketplace, cooking at home using oils instead of butter and choosing fresh lean meats or fish; fresh vegetables as opposed to pre-prepared ones and choosing fruit or homemade, in-season fruit-based desserts more often than choosing rich desserts, except on special occasions. It is less common for the French to decrease their calorie or fat load through the intake of “industrially manufactured foods” which have been chemically altered to be “light” or “low-cal” (115).

### **Snacking/Grazing**

Snacks are often high in fat and sugar and constitute a considerable portion of American children’s and adolescents’ total energy intake (45). Energy dense foods are associated with overweight and OB (128), although a surprising finding showed that children’s (from 34 countries) higher sweets intake was associated with lower odds for overweight (129), so perhaps “sweets” intake and high-density snacking lead to different outcomes. In the U.S.A., snacking or eating outside of mealtimes has increased since the 1980s (95,130) and adolescent frequency of snacking has been shown to be associated with elevated fast food intake in the U.S.A. (91). In contrast, the French snack less than

Americans (6,74); snacking (what nutritionists may call “grazing”) or eating outside of a traditional meal, is rather rare in France (6). Although the French routinely offer a snack or “goûter” to children at 4:00pm every day, this is considered a healthy part of daily eating practices. It is a routine moment of pleasure and is given the same respect as a small meal, normally consisting of fruit, quite often pieces of baguette and squares of chocolate, along with yogurt. It is meant to give children energy and keep them from being hungry before the evening meal, which is late by U.S.A. standards, usually between 7:00 and 8:00pm. The “goûter” can perhaps be likened to the English tea and is not considered snacking because of its purpose, its meal status and its consistency. Moreover, French children are actively discouraged from grazing or snacking between meals, the goûter considered as meal more than a snack (115,131).

### **Attitudes towards food: France vs. the United States**

According to a series of studies by Rozin et al. there are sharp, highly significant differences between France and the U.S.A. in attitudes of adults towards eating (125). They demonstrated that the French are less anxious and less guilty about food and eating than Americans (73), and that the French have a more positive attitude towards food, worry less about health consequences, and pay more attention to their food in a sensory fashion rather than in terms of nutrition (73,125). Rozin and colleagues discuss the French tradition of moderation (versus the American value on abundance), which emphasizes the joys of the moment rather than making life comfortable and easy; and they believe that it supports a healthier lifestyle (6). Furthermore, according to these researchers, the French experience less stress and more pleasure in relation to eating (73); they focus more on the experience of eating while Americans attend more to the consequences of eating; “the French seem to consider eating a more important part of life” and encourage slow, moderate, social eating(6). In sum, French attitudes towards the importance of pleasure, quality of food and social aspects of eating may be part of a protective lifestyle (against OB) of the French environment (25).

Based on the adult literature, our hypothesis was that we would find higher frequencies of healthy EDE behaviors, attitudes and patterns in French compared to American adolescents. That is, we expected the French sample of adolescents to have higher scores on the APE subscales assessing “healthy eating,” and “homemade meals;” and lower scores on the subscales for “eating diet/light food,” “unhealthy/increased eating,” and “skipping meals” compared to the U.S.A. sample. We also expected to find a higher rate of “healthy” responses to individual APE items for the French sample. For

example, on the items referring to use of fresh ingredients in cooking and home-cooked family meals (77), we expected higher scores for the French group; and on questions referring to fast-food patronage and grazing, we expected higher scores for the U.S.A. sample. Our notions about what constitutes healthy eating (and what does not) are derived from previous research (115) and are explained above.

## METHOD

### Study Population and Procedure

The study was conducted among high school (Lycée) students in the U.S.A. and France. A number of schools were selected from each country. In order to collect data from a diversified sample, with regards to geographic and socio-demographic profiles of the participants, in both countries, the study samples came from urban and rural/semi-rural populations, private schools, public schools in predominantly white middle class areas, and public schools in areas encompassing mixed ethnic and socio-demographic groups. In the United States, 11 schools from the following states were visited: California (northern and southern), Massachusetts (Boston, Boston suburbs), Wisconsin (suburb), and Illinois (countryside). In France, six schools were visited: in Paris and its suburbs, and in the East of France (countryside).

Since the U.S. High Schools include the last 4 years of secondary education (9-12<sup>th</sup> grades), while the Lycées in France include only the last 3 years (equivalent to 10-12<sup>th</sup> grades), we were missing the younger subjects in France. We compensated only partially by recruiting a small number of students in the last year of Collège (3<sup>ème</sup>, which corresponds to 9<sup>th</sup> grade in the U.S.A.) in the few schools that included a Collège as well as a Lycée.

The study was approved by the Research Ethic Board of Stanford University, California, for the U.S.A., and by the Institut National pour la Santé et la Recherche Médicale (INSERM), in Paris, for France. In addition, within each country, consent was solicited from the participating school boards and/or individual schools, and student participation was voluntary. There was no incentive given to students or schools in return for participation. Prior to data collection, both students and their parents were given detailed information regarding the incoming study and asked for their written consent.

After administering the questionnaires, researchers returned to the classrooms, usually the next day, to give a presentation informing the students about eating disorders, weight problems, body image problems, and balanced eating habits and attitudes. Brochures were distributed and students were permitted to ask questions and talk to the researcher-clinicians. While incentives were not offered for participation in the study, we believe that teachers and students alike were highly motivated to participate because they were interested in hearing the presentation. Students who did not participate were not excluded from the presentation.

The study had a high participation rate: only about 15% of youth who were presented the study declined participation. We believe the high rate may be due to the fact that, besides offering a presentation, researchers had personally visited teachers, principals or school health personnel before the study in order to request their participation and explain the purposes of the study. This personal contact may have further motivated school personnel. Furthermore, the day before administering questionnaires, classrooms were given a 10-minute pre-briefing, in which a description of the study was given and consent forms were passed out. This, too, may have increased the motivation of students to participate.

The total sample size was 2,186 participants: 1,113 in the U.S.A. and 1,073 in France.

## ***Instruments***

### **General socio-demographic data**

The study questionnaire started by asking information pertaining to participants' age, grade, gender, parental education background, parental marital status, ethnic background of the family, and language spoken in the home.

### **The APE (Attitudes and Patterns of Eating) Questionnaire**

The APE is a questionnaire which was developed by the research team (77). It is a 28-item self-report questionnaire, measuring adolescents' EDE attitudes and patterns. Each item of the APE is scored on a five-point Likert scale, where the participant rates his/her agreement with the statement "how important is it to you that..." or "how often do you..." (range: 1 = not important; 5=very important; or, 1=never; 3= sometimes; 5= always).

The APE consists of five subscales which were the product of a factor analysis (77): "healthy

eating,” “unhealthy/increased eating,” “skipping meals,” “homemade meals,” and “eating diet/light foods.” The questionnaire was translated and back translated into both English and French. The APE questionnaire showed sufficient face validity and internal consistency, as reported in a previous article (77). It takes about 10 minutes to complete. Two extra individual questions were added to the APE for this study: “Do you eat in restaurants with your family (not fast food restaurants)?” and “Does your family (immediate or extended) have big or special meals for special occasions?”

## **Statistical Analyses**

### ***APE Subscale differences between groups***

Using the Statistical Package for the Social Sciences (SPSS) version 20.0, a multivariate analysis of covariance (MANCOVA) was conducted to examine the effects of gender and country on the five APE subscales. The covariates used for this analysis were parental education and participant age, which were found to differ across countries. Parental education level was thought to be a good measure for socio-economic status; and an age difference between French and U.S. American subjects was noted, namely that the French group was an average one year older than the U.S.A. group. Other analysis specific assumptions (e.g., homogeneity of regression slopes) were also explored. Significant MANCOVA findings supported the exploration of individual analysis of covariance (ANCOVAs).

### ***Data cleaning and assumptions checking***

Participants with missing data on any of the 5 APE subscales were excluded from statistical analyses. For all groups combined, all variables had less than 5% missing data, thus it was assumed that the data was missing completely at random. Normality, linearity and homoscedasticity were explored using a number of visual aids and statistical resources. Linearity and homoscedasticity were met; however, normality was not met (132). There were no concerns with multicollinearity. Normality was not met because of the skewness of some of the outcome variables. In order to correct for the skewness of the outcome variables and to address lack of normality, square root and log transformations were performed. MANCOVAs were conducted with and without the transformed data, however, results yielded identical patterns; thus, MANCOVA without transformations was retained. After computing standardized scores (Z-scores) of the outcome variables and using a Z-score criterion of  $\pm 3.29$  ( $p < .001$ , two-tailed test), it was determined that there were 4 univariate outliers. Using a Mahalanobis distance



cutoff of  $\chi^2(9) = 27.877$  for  $p < .001$ , there was 1 multivariate outlier (Mahalanobis distance of 32.36). The univariate outliers were brought within range while still holding their rank of extremeness and were considered to be the source of the non-normality of the outcome variables. Upon checking the homogeneity of covariance assumption, it was determined that the MANCOVA had a Type I error inflation because the smallest group was responsible for the larger variances and covariances (132). A Bonferroni correction ( $\alpha = .05/5 = .01$ ) was applied to the results of the MANCOVA in order to ensure that the multivariate test was not overly liberal. The assumption of homogeneity of regression slopes was satisfied. A Bonferroni correction was applied to the interpretation of the ANCOVA results due to the violation of Levene's formal test of homogeneity of variances for almost all of the APE subscales.

### **Individual APE items: T-tests**

Independent samples *t*-tests were performed in order to determine mean APE individual item differences in the characteristics of the four groups (French male, French female; U.S.A. male, U.S.A. female).

## **Results**

The sample size was 1113 students from the U.S.A. and 1073 students from France. Due to a few missing data (students did not always answer every item on the questionnaire) sample size may vary slightly from one subscale to another.

### **Description of the samples (Table 1)**

Table 1. Sample characteristics according to country and gender ( total N= 2186)

<i>Characteristic</i>	<i>FRANCE (N= 1073)</i>		<i>U.S. (N= 1113)</i>	
	Males (n=436)	Females (n=637)	Males (n=399)	Females (n=714)
Age in years: mean (SD) range	16.52 (1.59) 10.17 – 23.00	16.63 (1.48) 13.00 – 22.00	15.90 (1.06) 14.08 – 20.08	15.85 (1.11) 13.25 – 20.00
Grade: n (%)				
9 <sup>th</sup> grade	145 (33.0)	52 (8.2)	180 (45.1)	314 (44.0)
10 <sup>th</sup> grade	161 (36.7)	351 (55.1)	132 (33.1)	204 (28.6)
11 <sup>th</sup> grade	92 (21.0)	123 (19.3)	69 (17.3)	155 (21.7)
12 <sup>th</sup> grade	41 (9.3)	111 (17.4)	18 (4.5)	41 (5.7)
N (%) participants speaking language of country of residence in their family	340 (85.6)	503 (81.0)	231 (65.4)	531 (75.3)
Country of origin of family N (%)				
France	320 (77.9)	353 (57.5)	0 (0)	0 (0)
Other European countries	15 (3.6)	51 (8.3)	46 (11.9)	138 (19.7)
North America	1 (0.2)	1 (0.2)	150 (38.9)	252 (36.0)
Other country	75 (18.2)	209 (34.0)	190 (49.2)	310 (44.3)
Parental education: N (%)				
Neither parent has post-secondary education	263 (59.9)	395 (62.0)	218 (54.6)	287 (40.2)
One/both parents have post- secondary education	176 (40.1)	242 (38.0)	181 (45.4)	427 (59.8)

### Scores on APE Subscales

Mean scores (and standard deviations) on the five APE subscales are shown per country (Table 2) and per gender (Table 3).

A Bonferroni correction ( $\alpha = .05/5 = .01$ ) was applied to the results of the MANCOVA as a means of addressing the violation of the homogeneity of covariance assumption. Using Pillai's criterion, there

was a non significant effect of the covariate age ( $F(5, 978) = 2.95, p = .012, \eta^2 = .015$ ). The effect of age accounted for 1.5% of variance in the linear combination of APE subscale scores. The MANCOVA had an observed power of .86 to detect the effect of the covariate. Using Pillai's criterion, there was a significant effect of the covariate parental education ( $F(5, 978) = 4.33, p = .001, \eta^2 = .022$ ). Parental education accounted for 2.2% of the variance in the linear combination of APE subscale scores. The MANCOVA had an observed power of .97 to detect the effect of parental education. Using Pillai's criterion, there was a significant effect of country ( $F(5, 978) = 26.48, p < .001, \eta^2 = .119$ ). Country accounted for 11.9% of the variance in the linear combination of APE subscale scores. The MANCOVA had an observed power of 1.00 to detect the effect of country. Using Pillai's criterion, there was a significant effect of gender ( $F(5, 978) = 15.04, p < .001, \eta^2 = .071$ ). Gender accounted for 7.1% of the variance in the linear combination of APE subscale scores. The MANCOVA had an observed power of 1.00 to detect the effect of gender. Using Pillai's criterion, there was a non significant country by gender interaction ( $F(5, 978) = 1.41, p = .219, \eta^2 = .007$ ). The country by gender interaction accounted for 0.7% of the variance in the linear combination of APE subscale scores. The MANCOVA had an observed power of .50 to detect the country by gender effect.

Due to the lack of significance of the effect of the age covariate and of the country by gender interaction, these effects were not explored further. A Bonferroni correction of  $\alpha = .01$  was applied to the interpretation of the individual ANCOVAs for the significant effects above aforementioned. There was a significant effect of the parental education covariate only on the APE4 subscale ( $F(1, 982) = 17.69, p < .001, \eta^2 = .018$ ). There was a significant effect of country on the APE1, APE3 and APE4 subscales (See Table 2). There was also a significant effect of gender on the APE1, APE3 and APE4 subscales (See Table 3).

**Table 2. Country Effects*****Unadjusted Means (standard deviations) on Each of the Five APE Subscales by Country***

Subscale	U.S.A. Mean (sd)	France Mean (sd)	F(1, 982)	p
<b>APE1: Eating Diet/Light Food</b>	<b>2.48 (0.82)</b>	<b>2.02 (0.67)</b>	<b>75.93</b>	<b>&lt;.001</b>
APE2: Unhealthy/Increased Eating	2.75 (0.60)	2.78 (0.63)	1.42	.233
<b>APE3 : HomemadeMeals</b>	<b>3.29 (0.68)</b>	<b>3.48 (0.63)</b>	<b>12.15</b>	<b>&lt;.001</b>
<b>APE4 : SkippingMeals</b>	<b>2.21 (0.82)</b>	<b>1.81 (0.80)</b>	<b>71.01</b>	<b>&lt;.001</b>
APE5:HealthyEating	3.88 (0.42)	3.86 (0.37)	0.05	.825

France x USA group effects MANCOVA controlled for age, education of parents (SES)

Table values are mean values unadjusted for covariates with standard deviations in parentheses

**Table 3. Gender Effects*****Unadjusted Means (standard deviations) on Each of the Five APE Subscales by Gender***

Subscale	Males Mean (sd)	Females Mean (sd)	F(1, 982)	p
<b>APE1: Eating Diet/Light Food</b>	<b>2.00(.67)</b>	<b>2.38(.81)</b>	<b>52.93</b>	<b>&lt;.001</b>
APE2: Unhealthy/Increased Eating	2.74(.60)	2.79(.63)	2.05	.153
<b>APE3 : HomemadeMeals</b>	<b>3.42(.64)</b>	<b>3.37(.68)</b>	<b>.59</b>	<b>&lt;.001</b>
<b>APE4 : SkippingMeals</b>	<b>1.83(.76)</b>	<b>2.11(.85)</b>	<b>24.87</b>	<b>&lt;.001</b>
APE5:HealthyEating	3.83(.41)	3.90(.39)	6.33	.012

Gender Effects MANCOVA controlled for age, education of parents (SES)

Table values are mean values unadjusted for covariates with standard deviations in parentheses

### **Scores on APE Individual Items**

The results of the T-tests demonstrated numerous significant differences: For males, there were significant differences between countries on 19 of the individual APE items (see Table 4). For females, 17 individual items were significantly different between French and American subjects (see Table 5).

**Table 4. Unadjusted Means (standard deviations) on APE Individual Items for U.S. and French Males**

	US Males Mean (sd)	FR Males Mean (sd)	t-test Sig. (2-tailed) p<
<b>choose "Light" or "fat-free" desserts</b>	<b>2.15 (1.00)</b>	<b>1.47 (0.76)</b>	<b>.0001</b>
<b>"light" chips, "low-fat" cookies</b>	<b>2.06 (0.96)</b>	<b>1.36 (0.66)</b>	<b>.0001</b>
<b>"light" or dietetic meals</b>	<b>1.38 (0.69)</b>	<b>1.18 (0.56)</b>	<b>.0001</b>
importance low fat content?	2.21 (0.98)	2.19 (0.97)	.757
Importance of low caloric content	2.19 (1.02)	2.02 (0.93)	.018
how often eat when not hungry	2.23 (0.99)	2.21 (1.05)	.732
how often think about eating	2.16 (0.97)	2.18 (1.12)	.832
<b>how often chips/crackers as snack</b>	<b>3.06 (0.95)</b>	<b>2.80 (1.00)</b>	<b>.0001</b>
how often candy as snack	2.85 (0.95)	2.89 (1.06)	.525
how often fast foods	2.67 (0.93)	2.70 (0.96)	.746
drink carbonated beverages	3.16 (1.08)	3.23 (1.05)	.381
<b>choose creamy, sugary desserts</b>	<b>3.06 (1.04)</b>	<b>3.24 (1.00)</b>	<b>.011</b>
snacking throughout day	2.48 (1.12)	2.37 (1.16)	.234
<b>fourth small meal, or snack</b>	<b>2.80 (1.24)</b>	<b>3.39 (1.25)</b>	<b>.0001</b>
<b>meals made from fresh ingredients</b>	<b>3.33 (1.04)</b>	<b>3.52 (0.93)</b>	<b>.010</b>
<b>fresh herbs and/or spices in cooking</b>	<b>3.07 (1.13)</b>	<b>3.32 (1.09)</b>	<b>.002</b>
frozen, packaged ingredients	2.87 (0.89)	2.80 (0.90)	.233
"food on the run" or TV dinners	2.07 (0.95)	2.06 (1.02)	.859
Importance of fresh ingredients	2.68 (1.13)	2.86 (1.15)	.026
<b>Importance homemade</b>	<b>2.55 (1.16)</b>	<b>3.01 (1.18)</b>	<b>.0001</b>
<b>how often skip breakfast</b>	<b>2.34 (1.36)</b>	<b>1.91 (1.31)</b>	<b>.0001</b>
<b>how often skip lunch</b>	<b>1.74 (0.98)</b>	<b>1.42 (0.85)</b>	<b>.0001</b>
<b>how often skip supper</b>	<b>1.46 (0.81)</b>	<b>1.35 (0.72)</b>	<b>.047</b>
<b>regular meals with family at home</b>	<b>2.99 (1.22)</b>	<b>3.58 (1.18)</b>	<b>.0001</b>
how often eat fruit as snack	3.41 (0.97)	3.28 (1.07)	.071
<b>drink "real" fresh juices</b>	<b>3.30 (1.04)</b>	<b>3.53 (1.01)</b>	<b>.001</b>
<b>choose fresh fruit as dessert</b>	<b>2.75 (1.03)</b>	<b>3.02 (1.04)</b>	<b>.0001</b>
<b>Importance healthy nutritious food</b>	<b>3.12 (1.04)</b>	<b>2.95 (1.08)</b>	<b>.023</b>

**Table 5. Unadjusted Means (standard deviations) on APE Individual Items for U.S. and French Females**

	US Females Mean (sd)	FR Females Mean (sd)	t-test Sig. (2-tailed) p<
<b>choose "Light" or "fat-free" desserts</b>	<b>2.46 (1.08)</b>	<b>1.76 (1.05)</b>	<b>.0001</b>
<b>"light" chips, "low-fat" cookies</b>	<b>2.45 (1.08)</b>	<b>1.69 (0.92)</b>	<b>.0001</b>
<b>"light" or dietetic meals</b>	<b>1.63 (0.93)</b>	<b>1.27 (0.68)</b>	<b>.0001</b>
<b>importance low fat content?</b>	<b>2.56 (1.12)</b>	<b>2.92 (1.04)</b>	<b>.0001</b>
Importance of low caloric content	2.50 (1.10)	2.57 (1.08)	.255
how often eat when not hungry	2.63 (1.01)	2.51 (1.09)	.054
<b>how often think about eating</b>	<b>2.49 (1.03)</b>	<b>2.33 (1.09)</b>	<b>.005</b>
<b>how often chips/crackers as snack</b>	<b>3.22 (0.93)</b>	<b>2.74 (1.06)</b>	<b>.0001</b>
how often candy as snack	3.06 (1.06)	2.99 (1.06)	.182
how often fast foods	2.67 (1.04)	2.77 (0.86)	.057
<b>drink carbonated beverages</b>	<b>3.00 (1.14)</b>	<b>2.82 (1.07)</b>	<b>.003</b>
<b>choose creamy, sugary desserts</b>	<b>3.14 (1.06)</b>	<b>2.95 (1.00)</b>	<b>.001</b>
snacking throughout day	2.88 (1.12)	2.73 (1.14)	.070
fourth small meal, or snack	3.36 (1.16)	3.37 (1.30)	.892
meals made from fresh ingredients	3.40 (1.06)	3.42 (0.93)	.740
<b>fresh herbs and/or spices in cooking</b>	<b>2.97 (1.21)</b>	<b>3.36 (1.13)</b>	<b>.0001</b>
frozen, packaged ingredients	3.05 (0.91)	2.96 (0.97)	.087
"food on the run" or TV dinners	2.26 (1.05)	2.18 (1.13)	.174
<b>Importance of fresh ingredients</b>	<b>2.74 (1.15)</b>	<b>2.93 (1.07)</b>	<b>.002</b>
<b>Importance homemade</b>	<b>2.48 (1.17)</b>	<b>3.06 (1.11)</b>	<b>.0001</b>
<b>how often skip breakfast</b>	<b>2.77 (1.46)</b>	<b>2.26 (1.50)</b>	<b>.0001</b>
<b>how often skip lunch</b>	<b>2.10 (1.11)</b>	<b>1.71 (1.00)</b>	<b>.0001</b>
how often skip supper	1.72 (0.96)	1.75 (1.03)	.593
<b>regular meals with family at home</b>	<b>3.04 (1.20)</b>	<b>3.60 (1.20)</b>	<b>.0001</b>
<b>how often eat fruit as snack</b>	<b>3.66 (1.00)</b>	<b>3.40 (1.04)</b>	<b>.0001</b>
drink "real" fresh juices	3.28 (0.96)	3.31 (1.11)	.569
<b>choose fresh fruit as dessert</b>	<b>2.96 (1.08)</b>	<b>3.23 (1.00)</b>	<b>.0001</b>
Importance healthy nutritious food	3.37 (1.03)	3.29 (0.98)	.113

## Scores on additional questions

**Table 6. Unadjusted Means (standard deviations) on APE Additional Items for U.S. and French Males**

	US males Mean (sd)	FR males Mean (sd)	t-test sig (2-tailed) p<
Does your family have big meals for special occasions	3.08 (1.31)	3.23 (1.23)	.113
<b>Do you eat in restaurants with your family</b>	<b>2.98 (1.27)</b>	<b>2.22 (1.05)</b>	<b>.0001</b>

**Table 7. Unadjusted Means (standard deviations) on APE Additional Items for U.S. and French Females**

	US females Mean (sd)	FR females Mean (sd)	t-test sig (2-tailed)
Does your family have big meals for special occasions	3.23 (1.26)	3.21 (1.16)	.810
<b>Do you eat in restaurants with your family</b>	<b>3.22 (1.19)</b>	<b>2.02 (1.03)</b>	<b>.0001</b>

## Discussion

### APE subscales

We found significant differences on three APE subscales for both gender and country. The results support the hypothesis that the French would show healthier eating habits and attitudes than the



American group, namely for eating regularly, having more homemade meals, and avoiding industrially marketed “light” foods. Gender differences showed healthier behaviors and attitudes overall for the male group, and this was true for both US and French males. On the “healthy eating” subscale, subjects from both countries saw themselves as making an effort towards healthy eating overall, or at least believing that it is important to eat in a healthy fashion. For the “unhealthy eating” subscale, both country groups appeared to be attempting to avoid unhealthy eating practices equally.

### **Individual items**

In order to understand more fully the differences between groups, we examined the APE results item by item, comparing subjects of the same sex by country. The high number of significant results observed on individual APE items provide interesting discussion points.

First of all, females appeared to value the idea that low calories and low fat content are rather important, as opposed to boys who didn’t seem much interested in either concept. French girls emphasized more strongly the importance of low fat content compared to the other groups, and French boys showed the least concern of all groups about low calorie content of food.

The question about choosing “creamy, sugary desserts” yielded mixed results, whereby French boys’ scores were higher than those of U.S. boys, while U.S. girls’ scores were higher than those of French girls. This result is consistent with the “importance of low fat-content” attitude, which was strongest for French females: French females reported eating fewer rich desserts, consistent with their belief in the importance of eating a diet low in fat; while their male compatriots didn’t seem to care about eating a diet low in fat or calories and thus they enjoyed rich desserts more often.

The question about frequency of carbonated beverage intake also yielded mixed results: boys and U.S. girls reported drinking soft drinks “sometimes” or “often,” and more often than French girls who reported drinking them only “seldom” or “sometimes.”

The three questions about fruit intake yielded mixed results as well. Eating fresh fruit for dessert was reported to a significantly higher degree by the French group, while eating fresh fruit as a snack was reported to a higher degree by the U.S. sample.

The questions on the use of fresh ingredients, homemade foods and meals made from scratch yielded clearly and consistently higher scores in the French group, as reflected on the APE subscale

results. These results might seem contradictory to those on the question “how important is it to you that food you eat be healthy and nutritious?” which scored significantly higher in the U.S. sample. If we add to this discussion the fact that the U.S. group consistently scored higher on the questions about “fat-free,” “low calorie,” “light” and “dietetic” foods and meals, it appears that a cultural or country difference in beliefs or attitudes about what constitutes “healthiness” and “nutrition” is at work. Americans may believe that healthiness comes from eating the “light,” “diet,” “low calorie” types of food that can be found more often in the U.S.A. than in France. The “American paradox” (59) may be at play here: according to Pollan (133), Americans “are notably unhealthy people obsessed with the idea of eating healthily,” and although Americans consume more industrially made fat-free, low-cal foods than the French (115), the rate of obesity in America is significantly higher.

The U.S. group reported higher restaurant (not fast-food) patronage than the French. This result was expected, since, as noted in the introduction, Americans eat out more often than the French. However, country differences were also expected for the question about frequency of fast-food patronage, which were *not* found. Therefore, either the French have caught up with U.S. American fast-food habits, or this result is due to the fact that the large majority of respondents came from Paris or its suburbs, where fast food outlets have become more frequent than in the countryside or small towns in France. All groups reported levels above or close to the mean on the fast food item, signifying that they eat fast foods at least “sometimes” and maybe “often.”

Contrasting with eating-out behaviors results, the question “how often do you eat regular meals with your family at home, sitting at the table together?” yielded significantly higher scores for the French group, which is consistent with the home-made meals subscale result. In sum, American adolescents eat out more at restaurants, while their French counterparts eat homemade food together at home more often, yet both groups partake of fast food equally.

A note on the item “do you eat a fourth meal or snack (i.e. after school snack)”: we expected country differences on this question, which would reflect the French custom of “goûter” which is not considered an unhealthy practice by nutritionists, and is not the same as grazing or eating between meals. On the factor analysis of the APE (77), this item loaded unexpectedly onto the “unhealthy/increased eating” component—APE subscale 2. This item perhaps confounds subscale 2 due to cultural differences in defining “healthiness of certain types of snacking.” Results on this item revealed a country difference for boys, with French boys scoring significantly higher than U.S. boys. However, all four groups scored above the mean on this question, signifying from “sometimes” to

“often.” It may be interesting to observe the results of subscale 2 (“unhealthy eating”) without including this item, which may be confusing the results. The question of whether a daily fourth meal or snack is healthy or unhealthy for adolescents remains to be answered. In the French population, where obesity is lower than in the U.S.A. for children and adolescents, arguments in favor of the consistent after school snack may be stronger than arguments in favor of letting children graze or stay hungry and wait several hours between meals, which could mimic dieting behaviors, known to be associated with weight problems and ED.

## **CONCLUSION**

French and U.S. American adolescents differed in certain attitudes and patterns with regard to every day eating. The present research hypothesized overall healthier eating patterns and attitudes for the French group, and results supported this hypothesis in that the “homemade meals” subscale score was higher for the French than for the U.S. group, while scores on two of the three subscales which reflect non-recommended eating behaviors, i.e. “eating diet/light foods” and “skipping meals” were higher in the U.S. sample. Mixed results were observed, between countries and between genders, on specific individual items. The overall trend is towards healthier practices and attitudes for the French compared to the U.S. group, and for the male compared to the female group.

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**Weight status, ideal-actual weight discrepancy, eating  
and weight control behaviors:  
A comparative study between French and U.S. adolescents**

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## Abstract

**Purpose:** Over the past few decades, an important increase in the body mass of adolescents has been observed in many countries worldwide, and to a greater extent in North America compared to Europe. It is not known how differences in weight status may impact adolescents' weight concerns and weight control behaviors. This study examined differences in weight status, ideal-actual weight discrepancy, eating behaviors, and weight control methods between French and U.S. adolescents.

**Methods:** Participants were 1456 U.S. and 1076 French adolescents recruited from urban and rural high schools. Self-reported weight and height were used to calculate body mass index (BMI), and define obesity, overweight, normal weight, thinness grade 1, and thinness grade 2 as per International Obesity Task Force cut points. Participants completed self-report questionnaires on weight concerns, eating attitudes and behaviors, and weight control strategies.

**Results:** Higher rates of obesity (15.9%) and overweight (18.9%) were reported among U.S. compared to French adolescents (8.0 and 6.6%, respectively), and higher rates of thinness among French (11.5%) compared to U.S. (3.2%) adolescents. Despite a higher ideal BMI among the Americans than the French, the ideal versus actual BMI discrepancy was also higher among the Americans. Consistently, concerns about weight and shape were greater in the Americans. Although U.S. adolescents reported higher use of exercise for weight control than their French peers, the frequency of any unhealthy weight control behaviors (purging, use of laxative or diuretics, use of diet pills, fasting) did not differ between countries. Females in both countries reported greater ideal-actual weight discrepancy and more extreme weight control behaviors (vomiting, fasting, diet pill use, and excessive exercise) than their male counterparts.

**Conclusion:** These findings likely indicate the effect of sociocultural influences on weight status and attitudes in adolescent boys and girls, and the need for differing prevention interventions specifically tailored to the health and cultural climate of the U.S. and France.

## INTRODUCTION

Over the past few decades, a shift in the body mass of adolescents toward overweight and obesity has been observed in many countries worldwide, notably Western countries such as the U.S. and France (1–5). Recent estimates indicate that between 22% and 28% of North American adolescents are overweight or obese (6). Among youth in France, estimates vary from 8.6 - 11.7% for obesity and 8.8-17.5% for overweight, with a higher prevalence of obesity and overweight among males than females (7,8). Direct comparisons between countries have shown higher rates of adolescent obesity in the U.S. compared to France (9,10).

The rise in the prevalence of overweight and obesity in youth has been accompanied by sustained, if not increased, socio-cultural pressures to be thin (11,12). It is unclear how the apparent conflict between adolescents' higher body mass and these continued socio-cultural pressures impact youths' perceptions of their body weight, and their body image. Research suggests that media exposure to thin and/or muscular body images may contribute to adolescents' ideal-actual weight discrepancy (12–14). A variety of other influences in the adolescent's cultural milieu may also impact their perception of an ideal body shape, including action toys (15), peers' weight (16,17), and family members' weight (17).

Body dissatisfaction arises when individuals perceive a significant discrepancy between their actual and ideal weight or shape (18). High body dissatisfaction may result in youth resorting to

unhealthy or extreme weight control behaviors, which can lead to an increase in body mass index (BMI) over time (19–21). Indeed, compared with peers who did not engage in these behaviors, youth who resorted to extreme weight control strategies had approximately a three-fold increase in the odds of being overweight over a five-year period (OR [95%CI] = 2.7 [1.36, 5.31] for girls, and 3.2 [1.86, 5.50] for boys) (20). Body dissatisfaction and unhealthy weight control practices are also known to be powerful proximal risk factors for eating disorders (i.e., anorexia nervosa and bulimia nervosa) (22,23). Body concerns and weight control behaviors are highly prevalent in adolescent girls (24,25) and contribute to the preponderance of eating disorders in females compared to males (26).

In the present study, two Western countries in which adolescents' weight status was thought to differ, i.e. France and the U.S., were compared in order to determine how current trends in overweight and obesity and the cultural climate in each country might differentially impact adolescents' weight perception, body dissatisfaction, eating behaviors, and weight control practices. Identifying differences between countries on factors that affect body dissatisfaction and other risks for an eating or weight disorder might indicate prevention interventions specifically tailored to the health and cultural climate of each country, as well as help formulate hypotheses regarding the environmental factors which contribute to their etiology. Thus, our goal was to examine differences across the U.S. and France on the aforementioned weight-related variables, taking into account gender, age and SES, as these are known to have effects on these variables (27–30).

The first objective was to compare the prevalence of obesity, overweight, normal weight, and thinness according to international growth curves (4,27), by country and gender. We expected that the rates of overweight and obesity would be higher in the U.S. adolescents compared to the French, both overall and by gender. The second objective was to examine ideal-actual BMI discrepancy, an index of body dissatisfaction, by country and gender. Females were hypothesized to report greater ideal-actual

BMI discrepancy than males in both countries. Due to a higher actual weight among U.S. adolescents, we also hypothesized that a greater discrepancy between ideal and actual BMI would be reported by U.S. compared to French adolescents, and that U.S. females would have the greatest discrepancy of all subgroups. The third objective was to assess weight and shape concerns by gender and country, with the hypotheses that females in both countries would report greater weight and shape concerns than their male counterparts, and that the Americans would report greater weight and shape concerns than the French; the U.S. females were expected to have the greatest level of concerns of all subgroups. The fourth objective was to examine country and gender differences in the frequency of unhealthy eating and weight control practices defined as: bingeing, self-induced vomiting, misuse of laxatives, diuretics or diet pills, fasting, or excessive exercise. We hypothesized a greater frequency of these behaviors in females than in males, and in the U.S. relative to the French participants.

## **METHODS**

### *Participants*

Data from 1456 students (586 males and 870 females) ranging in age from 13 to 20 years and attending grades 9 to 12 in the U.S., and 1076 students (439 males and 637 females) ranging in age from 10 to 23 years and attending the equivalent grades (“Troisième” to “Terminale”) in France, were collected for this study. The study population and procedures were described in detail in a previous article (31).

### *Measures*

*Weight status.* Participants’ weight and height were assessed by self-report. All measures in the U.S. were collected in Imperial units and converted to metric units. All measures in France were collected in



metric units. BMI was calculated as the ratio of the weight (kg) to squared height (m). Weight classifications were computed using the International Obesity Task Force (IOTF) cut-offs, based on gender- and age-specific centile curves drawn to pass at age 18 through the adult cut-off points of 30 kg/m<sup>2</sup> for obesity, 25 kg/m<sup>2</sup> for overweight, 18.5 kg/m<sup>2</sup> for thinness grade 1, and 17 kg/m<sup>2</sup> for thinness grade 2.<sup>4,5</sup> That is, obesity was defined as a BMI >= 95<sup>th</sup> percentile, overweight as a BMI >= 85<sup>th</sup> - < 95<sup>th</sup> percentile, normal weight as a BMI >= 16<sup>th</sup> - < 85<sup>th</sup> percentile, thinness grade 1 as a BMI >= 3<sup>rd</sup> - < 16<sup>th</sup> percentile, and thinness grade 2 as a BMI < 3<sup>rd</sup> percentile. Both thinness categories were combined, due to low numbers in the grade 2 category. For adolescents older than 18, adult cut-points were used.

*Perceived BMI discrepancy.* Values for actual and ideal weight were obtained using questionnaire items: “What is your present weight?” and “What is your desired weight?”, respectively. These values were used in conjunction with self-reported height in order to calculate actual and ideal BMI. The discrepancy score was then calculated by subtracting actual BMI from ideal BMI.

*Weight and Shape Concerns.* These were assessed using the *Overconcern with weight and shape* subscale from the McKnight Risk Factors Survey (MRFS) (32,33), which is a self-report questionnaire that assesses diverse risk factors for the development of eating disorders, including: eating behaviors and attitudes (e.g., dieting, exercising, bingeing), social influences on eating behavior (e.g., family variables, weight teasing, media modeling, sexual pressure), and personal attributes (e.g., self-confidence, coping). The MRFS has been validated with youth ranging in age from 8-18 years (grades 4-12), with good internal consistency, test-retest reliability, and convergent validity with measures of mood and self-perception (32,33). For the present study, the MRFS-IV was translated into French by bilingual members of the research team (MF, DQB, BR). Translation of individual items was reviewed by the group of researchers, and any discrepancies in the wording of items resolved by consensus. The *Overconcern with weight and shape* subscale from the MRFS includes 5 items, each answered on a Likert scale from 1

("never" or "not at all"), to 5 ("always" or "totally"), and the mean subscale score was used as a continuous variable in subsequent analyses. In the current study, scale reliability was good in both the French ( $\alpha = .86$ ) and the U.S. sample ( $\alpha = .91$ ).

*Binge-eating.* Answers to MRFS items were used to assess binge eating: "in the past year, how often have you kept eating and eating and felt like you could not stop?", and "in the past year, did you eat a lot of food in a short amount of time when it was not a meal or a holiday?", both answered from 1 ("never") to 5 ("always"). An additional item that asked about the frequency of binge eating per week over the previous three months was included to reflect DSM-IV binge frequency criterion for the diagnosis of bulimia nervosa (34). Participants who scored positive on these MRFS items and who endorsed binge-eating more than twice per week over the past 3 months were identified as binge-eaters.

*Weight control behaviors.* Five MRFS items were used to assess weight control behaviors: "in the past year, have you made yourself throw-up to lose weight?", "in the past year, have you taken laxatives or 'water pills' to lose weight?," "in the past year, have you starved (not eaten) for a day or more to lose weight?," "in the past year, have you taken diet pills (like Dexatrim) to lose weight?," "in the past year, have you exercised to lose weight?" Answers were dichotomized into 1 ("never") versus 2-5 (any frequency). Test-retest reliability coefficients for these weight control items in high school students have been reported as  $r = .93$  (32).

### **Statistical analyses**

For comparison of sociodemographic characteristics and weight-related variables across country and gender, independent samples *t*-tests were conducted for continuous variables and Pearson's chi square ( $\chi^2$ ) analyses for categorical variables. Effect sizes of all comparisons were also calculated, using Cohen's

$d$  for continuous variables and Cramer's  $\phi$  for categorical data. Effect sizes were defined as small ( $d = .2$ ), medium ( $d = .5$ ), or large ( $d = .8$ ).<sup>9</sup>

In order to examine country and gender differences in weight categories, BMI discrepancy, weight and shape concerns, and unhealthy weight practices hierarchical linear or logistic regressions were used where appropriate. For all analyses, age and SES were entered in the first step as control variables, main effects of gender and country were entered into the second step, and the interactions of country and gender expressed as dummy coded variables were entered into the third step. An examination of change in  $R^2$  and the standardized  $\beta$  coefficients at each step were conducted, in order to study the unique effects of the control variables, main effects, and subsequent interaction effects.

As only gender effects emerged for weight control practices, and as a correlation analysis revealed very few relationships amongst the covariates and the weight control practices, logistic regression analyses were omitted as they did not reveal very relevant findings and consistently emerged with poor model fit indices.

All analyses were conducted using the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL), Version 18.

## RESULTS

### Sociodemographic characteristics

Sociodemographic characteristics for all participants separated by gender within country are displayed in Table 1. French adolescents were on average older than U.S. adolescents ( $t = 18.54$ , Cohen  $d = 0.72$ ,  $p = 0.001$ ), but no difference in age was found across genders ( $t = 1.45$ ,  $p = 0.015$ ). Parental education was used as an indicator of socio-economic status (SES), with the U.S. students reporting a

higher parental level of education than the French students ( $\chi^2 = 144.81$ ,  $\phi = 0.24$ ,  $p = 0.001$ ), but no difference across genders ( $\chi^2 = 1.80$ ,  $p = 0.18$ ).

### **Distribution of BMI categories**

Results of a hierarchical regression analysis in which BMI category was the dependent variable are displayed in Table 2. The overall  $R^2$  was significant, indicating that the set of variables emerged as significant predictors [ $F(5,2361) = 42.585$ ,  $p < .001$ ] and accounted for 8.3% of the variance in BMI category. In step 1, the covariates age and SES accounted for 0.4% of the variance in distribution of BMI categories. Specifically, lower parental education was significantly associated with higher BMI category. The addition of country and gender into the model accounted for an additional 7.5% of the variance. The country of the sample uniquely accounted for 6.6% of variance in BMI categories after accounting for the role of age and SES. That is, compared to French adolescents, U.S. adolescents reported a higher BMI category. Gender accounted for 1.0% of the variance in weight category after controlling for age and SES, such that boys were significantly more likely to report higher weight category than girls. The interaction of gender and country was also significant and accounted for an additional 0.3% of the variance in BMI category.

### **BMI discrepancy**

Table 2 also presents the results of a hierarchical regression analysis performed with BMI discrepancy as the dependent variable. The overall  $R^2$  was significant, indicating that the set of variables emerged as significant predictors [ $F(5,1815) = 41.726$ ,  $p < .001$ ] and accounted for 10.3% of the variance in the dependent variable, BMI discrepancy. The covariates, age and SES, in this model accounted for 0.4% of the variance in BMI discrepancy. Specifically, lower parental education was significantly associated with greater BMI discrepancy. The main effects of country and gender accounted for an

additional 9.6% of the variance in BMI discrepancy. The variable country uniquely accounted for 0.8% of variance in BMI discrepancy after accounting for the role of the covariates. That is, BMI discrepancy was greater in the US compared to French adolescents. Gender accounted for 8.2% of the variance such that women had greater BMI discrepancy compared to males. The interaction of gender and country accounted for an additional 0.2% of the variance but was not statistically significant.

### **Weight and shape concerns**

The results of a hierarchical regression analysis in the dependent variable was weight and shape concerns are also displayed in Table 2. The overall  $R^2$  was significant, indicating that the set of variables emerged as significant predictors [ $F(5,2478) = 147.322, p < .001$ ] and accounted for 22.9% of the variance in weight and shape concerns. The covariates, age and SES, were not significant predictors in this model, and accounted for only 0.1% of the variance. The main effects of country and gender were significant and together accounted for 22.8% of the variance. The variable country was significant and uniquely accounted for 0.3% of variance in weight and shape concerns after accounting for the role of the covariates. That is, adolescents in the U.S.A. had greater weight and shape concerns than French adolescents. Gender accounted for an additional 22.3% of the variance, indicating that adolescent females had greater weight and shape concerns than males. The interaction of gender and country was not significantly associated with weight and shape concerns above other variables.

### **Unhealthy Eating and Weight Control Practices**

Frequencies of unhealthy eating and weight control practices for all participants separated by gender within country are displayed in Table 1. There was a trend for a higher frequency of reported binge eating in the U.S. compared to the French adolescents ( $\chi^2 = 3.85, p = 0.05$ ), but significant gender differences emerged for frequencies of purging ( $\chi^2 = 1.23, p = 0.27$ ), laxative/diuretic use ( $\chi^2 = 1.52, p =$

0.22), fasting ( $\chi^2= 0.99, p= 0.32$ ) or diet pills use ( $\chi^2= 0.72, p= 0.40$ ). The only significant gender difference was that more U.S. youth than French youth identified themselves as engaging in exercising practices for weight loss ( $\chi^2= 10.33, p= 0.001$ ), but the size of the effect was small ( $\phi= 0.07$ ).

Although males and females did not differ for frequencies of reported binge eating ( $\chi^2= 2.08, p= 0.15$ ), significant gender differences emerged for frequencies of all unhealthy weight control practices, although the effect sizes were generally small: compared to males, females reported engaging in more frequent purging ( $\chi^2= 52.36, \phi= 0.14, p= 0.001$ ), laxative/diuretic use ( $\chi^2= 14.02, \phi= 0.07, p= 0.001$ ), fasting ( $\chi^2= 83.82, \phi= 0.18, p= 0.001$ ), diet pills use ( $\chi^2= 25.12, \phi= 0.10, p= 0.001$ ), and exercising for weight loss ( $\chi^2= 35.06, \phi= 0.12, p= 0.001$ ).

## DISCUSSION

France and the U.S. are both part of the Western culture. However, distinct differences in weight status, ideal BMI, and BMI discrepancy emerged between adolescents from the two countries. The prevalence of obesity was about double among American compared to French adolescents, and for overweight it was almost triple. In contrast, the overall rate of thinness was more than three times higher among French compared to American adolescents. Despite a higher ideal BMI among the Americans compared to the French, the ideal versus actual BMI discrepancy was also significantly higher among the Americans. Thus, as hypothesized, the actual higher body mass in the Americans was associated with greater levels of concern about their weight and shape. These differences, however, did not translate into differences regarding frequencies of unhealthy eating and weight control practices between the two countries. The only significant difference was that more American than French adolescents reported exercising for the purpose of weight loss. Regarding gender differences across countries, our results indicated that more males than females were in the higher BMI categories, while

the usual female predominance was seen for BMI discrepancy between actual and ideal body weight, weight and shape concerns, and all unhealthy weight control strategies.

Our results are consistent with recent estimates for the prevalence of overweight and obesity among American youth (9), although they are lower than in some previous reports (35). They are also consistent with previous findings among French youth in which objective measures of BMI were used (10). The finding of an overall rate of thinness more than three times higher among the French than the American adolescents is novel, since we are not aware of previous data regarding the comparative prevalence of thinness in the two countries. Gender differences for weight categories are less pronounced than differences across countries. The higher rates of overweight and obesity among males compared to females in the current study is congruent with most previous data (9,10).

Several explanations can account for the differences in ideal weight between U.S. and French participants in this study. First, our results indicated differences in the actual body weight between countries, and this may impact adolescents' perceptions of what is a desirable weight. U.S. males were on average heavier than everyone else and may have been inclined to compare themselves to their peers and report a higher ideal weight. This is consistent with the suggestion that youth compare themselves to their peers more than to media ideals when it comes to characterizing their weight (16), nevertheless, media exposure may affect the perception of an ideal weight. The higher ideal weight among U.S. males may reflect a drive for muscularity, consistent with increased use of muscular images of men in the media and action toys in the U.S.A. (15).

Although the ideal BMI was, on average, higher among US than French adolescents, the discrepancy between actual and ideal BMI was greater for the US youth. That is, they were further away from their ideal. This is probably why concerns about weight and shape were greater among the US youth, although the size of the difference was small.

We had anticipated that greater actual BMI among the American group would lead to greater BMI discrepancy and more weight concerns, and that more weight concerns would in turn lead to more frequent use of unhealthy weight control behaviors. The latter was not true, except for “exercising for weight loss”. There were no differences, whatsoever, between the US and French youth for purging (vomiting), use of laxatives or diuretics, taking diet pills, or fasting. However, comparisons revealed an increased use of exercise for the purpose of weight loss among U.S. adolescents relative to their peers in France.

The frequencies of certain weight control behaviors, such as diet pill use, reported by females in the current study, are lower in comparison to previous estimates using a North American sample (6% vs. 19%) (7). Low SES has been associated with the more frequent use of unhealthy weight control practices among students in the U.S. (36). It is possible that the students in the present sample were of higher SES on average relative to that in previous research (6).

Unlike the previous purging and restricting behaviours, which are universally considered as unhealthy by dietiticians and other clinicians, engaging in physical exercise is generally viewed as healthy for many reasons including weight control. Except for clinical cases of anorexia nervosa, what represents “excessive” exercise is difficult to define. As in many other questionnaires regarding ED behaviors, the question that we use, i.e., “In the past year, how often have you exercised to lose weight” might not discriminate healthy vs. unhealthy exercise for weight loss. The higher frequency of “excessive exercise” among the Americans may reflect the fact that there may be greater cultural emphasis on physical exercise in the U.S. as a means of controlling one’s weight and being healthy and/or that there are more American adolescents who are overweight, and/or the drive for muscularity is greater among American males, leading to increased use of excessive exercise.



Differences in weight and shape concerns were more salient between genders than between countries. The finding that females were more likely to report a greater BMI discrepancy than males is consistent with previous literature (35,37,38). Females appear at greater risk for weight discrepancy, and there are data that link weight discrepancy (rather than actual weight) with depressive symptoms (39) as well as eating pathology (40).

While the frequency of regular binge-eating (at least twice a week for 3 months) ranged from 2.7 to 6.0% in the study subgroups, no significant gender or country differences emerged, although females in both countries reported more frequent use of unhealthy weight control behaviors. Defining and evaluating binge-eating is difficult at all ages, because of the highly subjective interpretation of what constitutes a “binge” (41).

The present findings confirm the presence of ideal vs. actual weight discrepancy and weight and shape concerns among adolescents, and more so in females than in males, and in the US than in France. These perceptions need to be considered in both obesity and eating disorders prevention programs, as well as general promotion of mental health.

This study has several strengths. First, it is one of the few studies that have compared the French and U.S. youth population across several parameters that are important for both obesity and eating disorder research, namely weight status as well as body dissatisfaction and disturbed eating and weight control practices. Second, this study is the first to use international growth curves to compare French and U.S. adolescents.

The study also has limitations. First, there was reliance on self-reported measures of weight and height. However, other studies have shown that self-reported measures of height and weight are viable alternatives for objective measures (42). Second, the French translation of the main measure used in this study, the MFRS,<sup>6,7</sup> has not yet been validated. However, this measure is mainly descriptive, separate

translations were conducted by several native French speakers and differences resolved by consensus. Third, this study could not examine temporality between the variables under study, and thus causality cannot be inferred.

It would be important to examine the relationships between weight status, weight discrepancy, and weight control strategies in future research. In the current study, the next step will involve comparing differences in factors that influence BMI and eating and weight control behaviors between the two countries. Of interest to policy makers and healthcare practitioners is how accurately adolescents perceive messages from their environment regarding appropriate weight, or the means by which to achieve healthy weight. Weight loss techniques employed by adults are not necessarily appropriate for children or adolescents.

## **Conclusion**

Adolescents consistently experience a discrepancy between their actual and ideal weight (and resulting BMI), likely to be related to dissatisfaction about their weight and body shape. The extent of these findings differs between genders and between countries. The gender differences are well known and have been associated to the much higher rates of eating disorders in females compared to males. Differences between countries like France and the U.S., which are both representative of the Western culture, have less often been studied. They may reflect divergent cultural and environmental influences on adolescent weight status and weight perception. Cross-cultural comparisons provide useful information regarding the relative importance of contributing factors to weight status, weight perception, and weight control behaviors (37,43). These comparisons also highlight the similar and differing needs of each country regarding the specific content required in interventions aimed at promoting healthy weight and healthy eating behavior.

**Table 1. Sample characteristics according to country and gender**

<i>Characteristic</i>	<i>FRANCE</i>			<i>U.S.</i>		
	Males (n=439)	Females (n=637)	Overall N=1076	Males (n=586)	Females (n=870)	Overall N=1456
Age in years [mean (SD)]	16.51 (1.59)	16.63 (1.47)	16.65 (1.52)	15.59 (1.00)	15.66 (1.09)	15.63 (1.06)
Parental education [n (%)]						
Neither parent: post-secondary	263 (59.9%)	395 (62.0%)	658 (61.1%)	238 (40.6%)	300 (34.5%)	538 (37.0%)
One/both parents: post-secondary	177 (40.2)	242 (38.0%)	419 (38.9%)	348 (59.4%)	570 (65.5%)	918 (63.0%)
BMI category [n (%)]						
Thin	35 (8.2)	77 (14.2%)	112 (11.5%)	8 (1.4%)	37 (4.5%)	45 (3.2%)
Normal weight	325 (75.8%)	394 (72.4%)	719 (73.9%)	315 (55.8%)	548 (66.1)	863 (61.9%)
Overweight	40 (9.3%)	24 (4.4%)	64 (6.6%)	127 (22.5%)	137 (16.5%)	264 (18.9%)
Obese	29 (6.8%)	49 (9.0%)	78 (8.0%)	115 (20.4%)	107 (12.9%)	222 (15.9%)
Body Mass Index (kg/m <sup>2</sup> ) [mean (SD)]						
Actual BMI	20.94 (2.69)	20.25 (2.43)	20.72 (2.78)	23.25 (4.69)	22.59 (4.57)	23.02 (4.70)
Ideal BMI	20.99 (2.45)	19.26 (1.79)	20.12 (2.22)	23.33 (4.09)	20.81 (2.66)	21.78 (3.51)
BMI discrepancy (Ideal – Actual)	-0.12 (2.27)	1.28 (1.91)	.60 (2.21)	0.06 (3.24)	1.99 (3.23)	1.24 (3.32)
Weight/Shape concerns [mean (SD)]	1.54 (.73)	2.63 (1.09)	2.19 (1.10)	1.68 (.75)	2.73 (1.10)	2.30 (1.11)
Unhealthy weight practices [n (%)]						
Binge eating	20 (5.2%)	33 (6.0%)	53 (5.7%)	13 (2.7%)	35 (4.6%)	48 (3.9%)
Purging	3 (0.7%)	68 (10.8%)	71 (6.6%)	16 (2.8%)	65 (7.5%)	81 (5.6%)
Laxatives/diuretics	3 (0.7%)	28 (4.4%)	31 (2.9%)	15 (2.6%)	40 (4.6%)	55 (3.8%)
Diet Pills	6 (1.4%)	40 (6.3%)	46 (4.3%)	16 (2.7%)	57 (6.6%)	73 (5.0%)
Fasting	33 (7.6%)	158 (25%)	191 (17.7%)	56 (9.6%)	183 (21.0%)	239 (16.4%)
Exercise for weight loss	45 (10.4%)	122 (19.4%)	167 (15.5%)	87 (15%)	213 (24.75%)	300 (20.6%)

Table 3: Summary of Hierarchical Regression Analysis for Variables Predicting Distribution of Weight Categories, BMI Discrepancy, and Weight and Shape Concerns

<i>Variable</i>	<i>B</i>	<i>SE B</i>	$\beta$	<i>Eta</i> <sup>2</sup>	<i>R</i> <sup>2</sup>	<i>Adjusted</i>	$\Delta R^2$
<b>WEIGHT CATEGORIES</b>					.083**		
Step 1						.004	.005**
Age	-.021	.012	-.035	.001			
SES	-.108	.032	-.069**	.004			
Step 2						.078	.075**
Country	-.437	.034	-.276**	.066			
Gender	-.160	.031	-.101**	.010			
Step 3						.081	.003**
Country x Gender	-.168	.063	-.083**	.003			
<b>BMI DISCREPANCY</b>					.103**		
Step 1						.004	.005**
Age	-.019	.057	-.008	.000			
SES	-.446	.146	-.072**	.005			
Step 2						.099	.096**
Country	-.634	.034	-.276**	.008			
Gender	1.787	.139	-.289**	.082			
Step 3						.101	.002
Country x Gender	.537	.293	-.065	.002			
<b>WEIGHT AND SHAPE CONCERNS</b>					.229**		
Step 1						.000	.001
Age	.026	.016	.032	.001			
SES	.040	.045	.018	.000			
Step 2						.228	.228**
Country	-.148	.043	-.066**	.003			
Gender	1.066	.040	.474**	.223			
Step 3						.228	.000
Country x Gender	-.038	.081	-.013	.000			

\*\*p<.01; \*p<.05

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## **Prevalence of eating disorders in French and American high school students**

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## Introduction

The eating disorders (ED), anorexia nervosa (AN) and bulimia nervosa (BN) are common, serious, and often chronic psychiatric illnesses affecting young people, mainly female adolescents and young women. Polivy and Herman (1,2) have argued that EDs are concentrated in cultures in which food is abundant, where obsession with thinness arises, and where ideals include the striving for that which is difficult to achieve. According to Nasser, the forces behind the so-called “westernization” of cultures are at work, namely, consumerism, a shift from collectivist to individualistic patterns, changing gender roles, and increased alienation of the individual (195); and ED are an example of “socio-pathology...symptomatic of cultures caught in a process of change.”

In the U.S., AN is the third most common chronic condition of adolescent females (4,5). ED and subthreshold ED are prevalent in the U.S. adolescent population (6).

A meta-analytic review of 35 studies from Canada, the U.S., and many European and non-Western countries found that sociocultural variables appear to play a more significant role in influencing the development of sub-clinical eating disturbances than they do for clinical ED (7). For Western Caucasian females, media exposure to a thin body ideal and pressure to be thin from peers may influence the development of sub-clinical ED (8). It has also been noted that discord arises with the increase in weight of the general population and a drive for thinness in Western countries, resulting in dieting, which is a known precursor to EDs (9). Moreover, it has been shown in adolescents that concern about weight is a significant predictor of developing a sub-clinical ED (10).

### **Epidemiological studies: Worldwide, Europe, France and the U.S.**

#### **Worldwide prevalence**

The average prevalence for anorexia nervosa is 0.3% for young females, and for bulimia it is 1% for young females and 0.1% for young men (11,12) (See Table 1). The overall incidence, is at least 8 per 100 000 person-years for AN, and 12 per 100 000 person-years for BN. Only a minority of people who meet the strict criteria for EDs are seen in mental health care services (11,12).

	AN	BN
Prevalence	0.3% (young females)	1%
Prevalence		0.1% (young men)
Incidence	overall 8/100 000 person-years 1/100 000 Person years (young men)	Overall 12/100 000 person-years

Table 1 Prevalence, incidence of ED according to Hoek & Van Hoeken (2003, 2005)

Approximately 10% of individuals who present for treatment of AN or BN are men (13). Only few studies report the incidence of AN among males, with an estimated overall rate below 1 per 100 000 persons per year (14). The ratio of men to women has been reported as 1:1.8 for partial BN, and 1:1.5 for partial AN syndromes (15). Although boys report less body dissatisfaction than females, 5-20% of males report restrained eating, vomiting, laxative abuse, or smoking cigarettes for weight control (16,17).

Surveys in the community show that subclinical (also called subthreshold or partial syndrome) cases of EDs are linked, like clinical cases, to significant co-morbidity (18,19). Most patients who present for ED treatment do not meet full criteria for clinical AN or BN (20). Sub-clinical EDs are more prevalent than clinical EDs (20,21) and may lead to full blown EDs (10). In young females, the estimated prevalence of partial syndrome AN and BN have ranged from 0.3% and 1 - 1.1%, respectively (12,19,22)

### Europe: Prevalence

Even with a slight global increase in the incidence of AN throughout the 20<sup>th</sup> century (23), there has been a stable European incidence of both AN and BN since the 1970's (12,24,25). Incidence rates for AN are highest for females 15-19 years, who make up for approximately 40% of all identified cases (12). In a large (2009) study of six European countries (Belgium, France, Germany, Italy the Netherlands and Spain), which used the Composite International Diagnostic Interview, the lifetime prevalence estimates for ED were found to be similar to previous worldwide studies for AN, but lower for BN (26). (See Table 2)

	AN	BN	BED	SubThreshold BED	Any Binge Eating
Prevalence	0.48%	0.51%	1.12%	0.72%	2.15%
females	0.93%	0.88%	1.92%	0.55%	3.73%

TABLE 2. Preti et al (2009) Combined Results of the Composite International Diagnostic Interview of 6 countries: Belgium, France, Germany, Italy, the Netherlands and Spain

Tölgyes et al (2004)(27) reported prevalence ranges for ED in seven Northern, Central and Eastern European countries (Austria, the U.K., Norway, Sweden, the Czech Republic, Poland, Hungary and Holland), based on separate studies. Prevalence of AN was higher in Austria and Sweden, and prevalence of BN higher in young females from Prague and Hungary; otherwise rates were within the range of those reported worldwide (See Table 3).

	<u>AN</u> full syn	SubClin <u>AN</u>	<u>BN</u> full syn	SubClin <u>BN</u>	Pathological eating attitudes
Austria	<b>1.3%</b>	<b>1.3%</b>			
U.K.	<b>0.1%</b> (19- 29 yr-old females)				
Norway	<b>0.4%</b> (lifetime prevalence)		<b>1.0%</b> (lifetime prevalence)		
Sweden	<b>0.84%</b> (DSM-III-R)				
Czech Rep (young females from Prague)	<b>0.14%</b>		<b>5.7%</b>		
Poland	<b>0</b>		<b>0</b>		<b>2.34%</b> (14 – 16 yr-olds)
Hungary	<b>0</b>	<b>3%</b>	<b>0.6%</b>	<b>4.5%</b> (females) <b>0.8%</b> (males)	
Holland	Incidence: <b>6.3/100000</b> capita/year				

Tölgyes and Nemessury (2004) reported prevalence rates for EDs in Northern, Central and Eastern European Countries

### U.S.A. Prevalence

In 2007, Wade et al (28) analyzed three epidemiological studies which included White, Latino and Black populations. According to the National Comorbidity Study in the United States (29) (Hudson 2007) the lifetime prevalence for AN was much higher than in Wade’s report but similar for BN (29).

	AN	SubClin AN	BN	SubClin BN	BED	BE
Wade et al. (2007) adult females	0.12-0.14%		1.42-1.91%		2.31-2.67%	4.71-5.82%
National Comorbidity Study. lifetime prevalence (Hudson 2007)	0.9% females 0.3% (males)		1.5% (females) 0.5% (males)		3.5%(females) 2.0% (males)	
Swanson (2011) 13-18 yr olds. Lifetime prev estim	0.3%	0.8% Male/female ratio: 0.1/1.5	0.8% Male/female ratio: 0.5/1.3	2.5%	1.6% Male/female ratio: 0.8/2.3	

TABLE 4: U.S.A. ED prevalence from 3 different large studies

In a recent study by Swanson et al (6), related to the National Comorbidity Study (2011), a nationally representative sample of 10,123 U.S.A. adolescents aged 13 – 18 in a population-based survey yielded lifetime prevalence estimates for AN and BN in this age group. Prevalence estimates for ED were consistently higher for females. (See Table 4).

### France Prevalence

Previous epidemiological studies performed in France found prevalence rates of AN and BN in adolescents (30) similar to reported rates worldwide. The prevalence of AN, according to Flament et al (31), was between 0.5% and 1% (DSM-III-R criteria) for girls in late adolescence. Although there have been far fewer studies assessing the prevalence of disordered eating in boys than in girls, the prevalence of AN and BN in adolescent males has been estimated in community samples in France at 0.2% and 0.2-0.8%, respectively (32).

	AN	SubClin AN	BN	SubClin BN	ED
Ledoux DSM-IIIR adolescents			0.2% boys 1.1% girls		
Flament DSM III-R Late adolescents	0.5% - 1% girls				
Flament, Ledoux et al. community sample estimates	0.2% boys		0.2% - 0.8% boys		
Callahan (2008) adolescents	0.3%	5%	0.3%	11.3%.	30%

TABLE 5 Prevalence studies ED France

A recent epidemiological study done in France (33) estimated prevalence rates for AN full syndrome similar to worldwide rates and U.S.A. rates, while the prevalence of subclinical AN was estimated at 5%, i.e. higher than reported rates in the U.S.A. Prevalence of clinical BN was low compared to worldwide and U.S.A. rates, but prevalence of subclinical BN was higher than the U.S. rates. For all EDs altogether, including subclinical ED with “light” to “heavy” intensity of symptoms, a prevalence of 30% was found. Also, half of the subjects, boys and girls together, placed themselves in the categories of “thin” (BMI = 18.1 – 20) and “very thin” (BMI = <18).

In the study by Preti et al. (26) (see Table 2) comparing prevalence estimates across European countries, lifetime prevalence rates for EDs all together were higher in France than in the other countries studied (26).

### Europe vs. North America Previous Studies

Differences in prevalence of EDs between regions or countries cannot be meaningfully deduced by observing different studies using different diagnostic criteria and different methodology. Research on EDs in community samples of adolescents are rather rare, (6) and few studies have looked simultaneously at the symptoms and prevalence of EDs in North American and European subjects. Subjects from these Western regions are assumed to be similar. A study of U.S. Americans by Cachelin et al. (34) (2009) compared European

American (Anglo) subjects to Mexican American (Latino) subjects and found that orientation toward Anglo American culture was significantly associated with EDs, whereas orientation toward Mexican culture and strength of ethnic identity were not associated with ED status. The authors believe that their results implicate the role of European American cultural orientation in the development of EDs. If this is true, then, in worldwide estimates and studies of ED it may indeed be justified to consider U.S. American groups (of European descent) and European groups as one homogenous group. If not, then, differences between these groups may assist future research in delineating more clearly the cultural aspects involved in the etiology and maintenance of ED.

Although not prolific, some previous research has been done comparing European countries and the U.S.A. Studies which have compared prevalence of BN between Europe and the U.S. have shown rates between 1.1% - 12.6% for European countries and 1.2% - 16% for the United States (35). These estimates seem to indicate equivalent representation across the Western world. However, once again, such comparisons may be inappropriate because methodology varies widely between studies, different diagnostic criteria and sampling techniques are employed, there are differences in operationalization of terms and finally, geographic or sociocultural differences make such studies difficult to compare (35,36).

Raich et al. (35) compared American and Spanish students (mean age, 15.45 years), using a questionnaire completed at school that included the Eating Attitudes Test (EAT) (37), and self-reported weight and height. On average, the U.S. boys and girls weighed more than the Spanish boys and girls, and were also taller. Twice as many American girls reported bulimic symptoms compared to the Spanish girls (3.5% vs. 0.9%,  $p < .001$ ), and the prevalence ratio for the overall level of ED symptoms was approximately 5:1 for American to Spanish girls, and 2:1 for American to Spanish boys. More American girls were interested in losing weight. The authors believed that their findings were related to the fact that obesity is more common in the U.S. than in Spain, and that American girls have a greater concern about becoming obese (i.e. greater body image preoccupation) because of a greater perceived risk. The American girls scored significantly higher than the Spanish girls on the EAT total score, and the Dieting and Bulimia subscales; however, the Spanish girls scored significantly higher on the Oral Control subscale.

Mangweth, Pope, Hudson and Biebl (38) compared American and Austrian bulimic and control college aged subjects. The difference between desired weight and actual weight was twice as great in America than in Austria. Remarkably, the differences between the two cultures on these indices were so marked that the Austrian bulimic subjects actually resembled American control subjects. The Americans consistently reported markedly and significantly lower satisfaction with body image than the Austrians. Similarly, when asked if their self-confidence improved with weight loss, 97% of the Americans responded positively, as opposed to 67% of the Austrians. Mangweth et al. (38) also found that although the American females had a higher average weight

than the Austrian females, the Americans had lower ideal weights, indicating more pronounced body dissatisfaction.

A number of studies, undertaken to validate the Eating Attitudes Test (EAT)(39) and the Eating Disorders Inventory (EDI) (40) in Canada and European countries, have assessed both clinical and control samples in order to establish normative data for these instruments. Thereby, they also provide interesting cross-national comparisons of eating attitudes in ED patients as well as healthy subjects. Steinhausen(41) used the EAT in two samples of normal German female adolescents and young adults, and compared his results to the mean and cut-off scores obtained in Anglo-Saxon studies. He found marked transcultural differences, the German samples scoring the lowest. Steinhausen et al. (42) also compared EDI scores of East and West Berliners and found that on five of the eight subscales (drive for thinness, bulimia, body dissatisfaction, ineffectiveness, and interoceptive awareness) East Berlin patients scored significantly lower than West Berlin patients.

A Swedish study by Norring and Sohlberg (43) compared adult ED patients and controls with normative Canadian samples. Participants completed the EDI (40) questionnaire and results indicated that the Swedish controls reported clearly lower levels of symptoms and attitudes that are thought to be relevant to ED when compared with the Canadian controls.

Boyadjieva & Steinhausen (1994) in their study of Bulgarian students, found scores on the EAT and the EDI which were higher than Steinhausen et al.'s (1992) scores from East and West Germany, but lower than the above mentioned Swedish scores, and therefore, lower than Canadian scores. However, they noted that the Bulgarian samples of adolescents were younger than both the Swedish and Canadian samples, which could have an effect on the results.

The European countries observed in these papers all had lower levels of symptoms for ED than the original Canadian group.

## **ED and Culture**

Unlike many other psychiatric disorders affecting young people, such as depression or schizophrenia, which appear relatively ubiquitous around the world, the prevalence of EDs has been found to be, at least partly, dependent on socio-cultural factors (44). Research into the prevalence of eating and weight disorders in different societies or different cultures is needed for at least two reasons. For health care purposes, it is important to plan treatment and prevention strategies targeted to the specific needs of each population and to inform policy (45,46). For research purposes, information about EDs and weight problems in various cultures can help formulating hypotheses regarding the social factors which contribute to their etiology.

The possible role of such factors can be tested by examining the rate of EDs in populations which differ in terms of standards for physical beauty and media influences, social roles for women, beliefs and customs regarding food and eating, family values and habits, etc. A comparative research design is needed in order to reach any conclusion regarding the influence of differing cultural values on the overall prevalence and characteristics of EDs. As of yet, there do not appear to have been any comparative studies specifically done on prevalence of ED symptoms in France and the U.S.

The current paper is a comparative study of disordered eating in French and American adolescents. It is hypothesized that differences exist between the values and attitudes related to body image, food and eating in different Western cultures, and that these differences are accompanied by variations in the prevalence of eating disorders, both clinical and sub-clinical. In a second step (and future reports), we will investigate the differences in socio-cultural and other environmental factors in boys and girls from the two countries, and examine the relationships between those and the frequencies and characteristics of eating and weight disorders.

The objective of the current study was to determine the prevalence of full- and partial-syndromes of ED in adolescents, according to gender and country of residence.

## **Method**

### ***Study Population and Procedure***

The study was conducted among high school students in France and the U.S. The details of the sample and procedure were described in a previous article (47). The total sample size was 2,604 participants (1,573 in the U.S. and 1,031 in France).

### ***Assessment measures***

#### ***General sociodemographic data***

The study questionnaire started by asking information pertaining to participants' age, grade, gender, parental education background, parental marital status, ethnic background of the family, and language spoken in the home.

***The McKnight Risk Factor Survey IV (MRFS-IV; Shisslak et al., 1999; McKnight Investigators, 2003)***



The MRFS-IV (*McKnight Investigators, 2003*)(48) is a revised version of the McKnight Risk Factor Survey III, designed in English by Shisslak et al in 1999 (49) . The MRFS-IV was translated into French by the investigators of this study. The translation team included two psychiatrists and one psychologist; all were bilingual, with one having English, and two French as their native language; each drafted a translation of the instrument, and divergences were resolved by consensus.

The MRFS-IV contains 16 sociodemographic variable items and 106 items covering diverse risk and protective factors for eating disorders, including: family variables, dieting and other methods of weight control, eating habits, substance use, body image and dissatisfaction, self-esteem, emotional and affective regulation, peer relationships, influence of cultural and media images, and coping strategies (*McKnight Investigators, 2003*). Most items are scored on a 5-point Likert scale from 1 (never) to 5 (always). Items were chosen and grouped by the authors of the instrument into 41 domains (sub-scales), based on theoretical considerations. Test-retest reliability coefficients of individual items on the MRFS-III have been shown to be all greater than .40 (49). Some of the important scales in terms of eating behaviors have exhibited very high test-retest reliability. For instance, the overall test-retest reliability coefficients for weight control behaviors in elementary, middle, and high school students were  $r = .76, .86, \text{ and } .93$ , respectively. The MRFS-III has been shown to have strong internal consistency, with the majority of alpha coefficients for the risk and protective factor domains greater than .60 (49). Overall, the convergent validity of the MRFS-III with related measures of self-confidence, over concern with shape and weight, and symptoms of depression was also satisfactory, specifically for middle and high school students (49).

***The SCOFF(Sick, Control, One stone, Fat, Food; Morgan, Reid, & Lacey, 1999).***

The SCOFF is a brief questionnaire which has been designed in English to screen for EDs. It was translated into French by the investigators, according to the same modalities as described for the MRFS-IV. The SCOFF includes 5 questions, and has shown strong validity in a clinical population (50) ; in a student population, it has demonstrated good reliability when administered as a written questionnaire compared to oral interview (kappa coefficient 0.81; (51)). One item from the SCOFF: “Do you believe yourself to be fat when others say you are too thin?” was taken as criterion B (“intense fear of gaining weight or becoming fat, even though underweight”) for AN according to the DSM-IV.

***Additional items***

The MRFS-IV and the SCOFF contained most but not all of the diagnostic items for AN and BN, as defined in the DSM-IV (APA, 1994). Upon careful review of existing questions, the investigators further modified the MRFS-IV by adding a few items to match up with DSM-IV criteria for AN and BN. For example, the DSM-IV states that,

to meet criterion C for BN, an individual needs to binge eat and use compensatory behaviors both, on average, at least twice a week for 3 months. Thus, following each of the MRFS-IV questions on bingeing (“have you kept eating and eating and felt like you could not stop?”) and compensatory behaviors (e.g., “have you made yourself throw-up to lose weight?”), the investigators added a little box containing complementary questions asking how often (i.e., less than two times a week or two times a week or more) and how long (i.e., for less than three months or three months or more) these behaviors had occurred. The last addition was to ask the study participants to report their current height and weight, as well as their “desired” weight.

After addition of the SCOFF and the slight modifications to the MRFS-IV described above, we ended up with a total of 16 demographic items and 111 items in the study questionnaire (See Appendix 1).

### **Outcome variables**

#### **Eating Disorders**

*The MRFS-IV (including the additions described above) was used to record presence or absence of all DSM-IV diagnostic criteria for AN and BN. Thus, for females, a diagnosis of full syndrome AN included fulfilling criteria:*

*A -abnormally low body weight: BMI  $\leq$  17.5 (as suggested in the ICD-10 for adolescents),calculated from self-reported height and weight*

*B -a self-perception of being overweight when others felt the respondent to be too thin (answering yes to question 109 on MRFS-IV),*

*C -overconcern with weight and shape (scoring  $\geq$  3 on question 53 or 54 on MRFS-IV), and*

*D -three consecutive missed periods or have not started menstruating.*

*For males, a diagnosis of full syndrome AN included fulfilling criteria A, B, and C (criterion D does not apply).*

*For males and females, full syndrome BN required meeting criteria:*

*A -recurrent episodes of binge eating (scoring  $\geq$  2 on questions 23 and 48 on MRFS-IV),*

B -inappropriate compensatory behavior in order to prevent weight gain [any of the following: vomiting (MRFS-IV item 34  $\geq 2$ ); laxative/diuretic use (MRFS-IV item 18  $\geq 2$ ); fasting 1 day or more (item 4  $\geq 2$ ); diet pill use (item 41  $\geq 2$ ); exercising a lot to lose weight (item 29  $\geq 4$ )],

C -frequent bingeing and compensatory behaviors (at least twice a week for the past 3 months or more),

D -over concern with weight or shape (scoring  $\geq 3$  on question 55 or 71 on MRFS-IV), and

E -no diagnosis of AN.

Based on the literature, we were also interested in examining the frequencies of partial syndromes of AN and BN. A review by Chamay-Weber (18) et al. (2005) highlights the range of diagnostic criteria used in the literature to define “partial ED,” alternatively called “ED not otherwise specified (EDNOS),” “atypical ED,” “subclinical ED,” or “subthreshold ED.” Based on this review, and our own clinical experience, we chose to examine “partial syndrome ED,” defined as an individual meeting all but one of the DSM-IV diagnostic criteria for a given disorder. Thus, for females, partial syndrome AN required meeting three out of four diagnostic criteria, and for males, partial syndrome AN required meeting two out of three diagnostic criteria. For males and females, partial syndrome BN required meeting all but one of the five diagnostic criteria.

## Statistical Analysis

Data were entered and statistical analyses conducted using the Statistical Package for the Social Sciences (SPSS, Version 14). Since grade is classified differently in France and the U.S., data for grade were standardized between countries into the U.S. system (French 3<sup>ème</sup> = 9<sup>th</sup> grade; Seconde = 10<sup>th</sup> grade; Premiere = 11<sup>th</sup> grade; Terminale = 12<sup>th</sup> grade). BMI was calculated as the weight (in kilograms) divided by the square of height (in meters).

Chi-square analyses per gender and per country (2x2) were used for categorical variables including socio-demographic variables, eating disorder symptoms and diagnoses, BMI categories according to international percentiles, and weight control strategies. For variables that had a sample size of less than five in any cell, we used the Fisher’s exact test as recommended by Tabachnick & Fidell (2007) (52). A two-way Analysis of Variance (ANOVA) was used to determine significant differences in age between males and females in France and the U.S. Due to the significant difference in age between France and U.S. students, a two-way Analysis of Covariance (ANCOVA) with age as a covariate was used to compare the mean BMI ( $\text{kg/m}^2$ ) of students in each country.

## RESULTS

### ***Sociodemographic characteristics***

***Sample size per gender, age and grade.*** Valid data were available for 413 males and 618 females in France, and 645 males and 928 females in the U.S. Due to the different school systems in France and the U.S., there were significant differences in age between French and U.S. students, as indicated by an ANOVA (significant country effect [F (1, 2541)=398.14,  $p<.001$ ,  $\eta^2=.135$ ]; there was no significant effect of gender [F (1, 2541)=1.65,  $p=.19$ ], or the interaction [F (1, 2541)=0,  $p=.99$ ]). As seen on [Table 1](#), the French students, both males and females, were on average a year older than their peers from the U.S. Therefore, age was included as a covariate in further comparisons between countries. Chi-square analysis indicated that grade differed between France and the U.S. for both males ( $\chi^2=117.15$ ,  $df=3$ ,  $p=.0001$ ) and females ( $\chi^2=426.31$ ,  $df=3$ ,  $p=.0001$ ). In addition, the grade repartition differed significantly between males and females in both France ( $\chi^2=119.21$ ,  $df=3$ ,  $p=.0001$ ), and the U.S. ( $\chi^2=19.43$ ,  $df=4$ ,  $p=.001$ ), with more males in the lower grades, and more females in the higher grades in both countries.

***Ethnicity and language spoken in the home.*** (see [Table 1](#)). Chi-square tests indicated that ethnicity differed between France and the U.S. for both males ( $\chi^2=737.115$ ,  $df=3$ ,  $p=.001$ ) and females ( $\chi^2=796.929$ ,  $df=3$ ,  $p=.0001$ ). In addition, ethnicity differed significantly between males and females in both France ( $\chi^2=45.376$ ,  $df=3$ ,  $p=.001$ ), and the U.S. ( $\chi^2=22.442$ ,  $df=2$ ,  $p=.001$ ).

The main language spoken at home was French and English in the respective countries ([Table 1](#)). Chi-square tests indicated that the percentage of participants speaking their country's main language differed between France and the U.S. for males ( $\chi^2=16.276$ ,  $df=1$ ,  $p=.001$ ), and there was also a significant gender difference in France ( $\chi^2=5.119$ ,  $df=1$ ,  $p<.05$ ).

***Parental status and education.*** Parental marital status and levels of education are shown in [Table 1](#). The frequency of youth whose parents were separated or divorced ranged from 17.1% to 31.8%, with no significant group differences, except for more French than U.S. females having parents separated ( $\chi^2=14.84$ ,  $df=1$ ,  $p=.001$ ).

There were significant differences between countries for father's ( $\chi^2=85.32$ ,  $df=3$ ,  $p=.001$ ) and mother's education ( $\chi^2=77.04$ ,  $df=3$ ,  $p=.0001$ ) in males; and for father's ( $\chi^2=229.19$ ,  $df=3$ ,  $p=.001$ ) and mother's education ( $\chi^2=201.74$ ,  $df=3$ ,  $p=.0001$ ) in females as well. In the U.S., more fathers and mothers had at least a College degree. In addition, there was a significant difference between genders in terms of mother's education status in

the U.S. ( $\chi^2=20.235$ ,  $df=3$ ,  $p=.001$ ) and in France ( $\chi^2=27.842$ ,  $df=3$ ,  $p=.001$ ). There was also a significant difference between genders in France in terms of father's education status ( $\chi^2=9.214$ ,  $df=3$ ,  $p=.027$ ).

Table 1

**Sociodemographics**

	France		United States	
	Males (n = 413)	Females (n = 618)	Males (n = 645)	Females (n = 928)
Age years(SD?)*	16.61 (1.60)	16.68 (1.47)	15.58 (.98)	15.65 (1.07)
Age range (years)	10-23	13-22	14-20	13-20
Grade <sup>a,b,c,d</sup>				
7 <sup>th</sup> Grade	0 (0%)	0 (0%)	1 (.2%)	0 (0%)
8 <sup>th</sup> Grade	0 (0%)	0 (0%)	53 (8.3%)	52 (5.6%)
9 <sup>th</sup> Grade	117 (28.5%)	32 (5.2%)	367 (57.3%)	470 (51%)
10 <sup>th</sup> Grade	161 (39.2%)	351 (56.9%)	132 (20.6%)	204 (22.1%)
11 <sup>th</sup> Grade	92 (22.4%)	123 (20%)	69 (10.8%)	155 (16.8%)
12 <sup>th</sup> Grade	41 (10%)	111 (18%)	18 (2.8%)	41 (4.4%)
% Speaking country's main language <sup>b,c</sup>	322 (86.8%)	489 (81.2%)	468 (76.2%)	710 (78.3%)
Ethnic origin of the family <sup>a,b,c,d</sup>				
France	321 (77.7%)	354 (57.6%)	0 (0%)	0 (0%)
(Other) European countries	15 (3.6%)	51 (8.3%)	46 (7.4%)	138 (15.3%)
North America	1 (.2%)	1 (.2%)	299 (47.8%)	380 (42.1%)
Other	76 (18.4%)	209 (34%)	280 (44.8%)	384 (42.6%)
Mother education <sup>a,b,c,d</sup>				
Didn't finish High School	106 (26.1%)	224 (37.3%)	68 (10.7%)	89 (9.7%)
High School diploma	77 (19%)	100 (16.6%)	119 (18.7%)	194 (21.1%)
College degree or higher	104 (25.6%)	175 (29.1%)	314 (49.4%)	519 (56.4%)
Doesn't know	119 (29.3%)	102 (17%)	134 (21.1%)	119 (12.9%)
Father education <sup>a,b,c</sup>				
Didn't finish High School	112 (27.9%)	216 (36.2%)	52 (8.2%)	85 (9.2%)
High School diploma	49 (12.2%)	61 (10.2%)	114 (18.1%)	178 (19.4%)
College degree or higher	137 (34.2%)	165 (27.7%)	331 (52.5%)	506 (55.1%)
Doesn't know	103 (25.7%)	154 (25.8%)	134 (21.2%)	150 (16.3%)
Parent's separated/divorced/split up <sup>a</sup>	70 (27.5%)	77 (31.8%)	58 (21.6%)	44 (17.1%)

Note: all frequencies were compared per gender and per country using Chi-square test; mean ages were compared using ANOVA

\*significant country effect [F (1, 2541) = 398.14, p < .001, n2 = .135], no significant gender effect, no country x gender effect

<sup>a</sup> significant difference between France and US females

<sup>b</sup> significant difference between France and US males

<sup>c</sup> significant difference between males and females in France

<sup>d</sup> significant difference between males and females in US

all statistical tests: .0001 ≤ p ≤ .05

## ***Diagnostic criteria for eating disorders***

### ***Anorexia Nervosa*** (See [Table 2](#))

**Criterion A:** BMI <17.5. There was a significant difference between countries, with the French group meeting this criterion more often ( $X^2=92.3$ ,  $df=2$ ,  $p < .001$ ). There were also gender differences whereby females met this criterion more often than males both in France ( $X^2=52.31$ ,  $df=2$ ,  $p < .001$ ) and in the U.S. ( $X^2=11.10$ ,  $df=2$ ,  $p < .01$ )

**Criterion B:** think he/she is overweight while others think he/she is too thin

Chi-square analyses yielded a significant difference between males in U.S. and France ( $X^2 = 4.474$ ,  $df = 1$ ,  $p < .05$ ), with more U.S. males meeting this criterion. There was also a significant difference between males and females in France ( $X^2 = 69.661$ ,  $df = 1$ ,  $p < .001$ ), and in the U.S. ( $X^2 = 53.774$ ,  $df = 1$ ,  $p < .001$ ): in both countries more females than males met this criterion.

**Criterion C:** weight or shape concern.

Chi-square analysis indicated a significant difference between females in the U.S. and France ( $X^2 = 5.769$ ,  $df = 1$ ,  $p < .05$ ), with a higher proportion of U.S. females reporting being concerned by their weight or shape. There was also a significant difference between males and females in France ( $X^2 = 50.167$ ,  $df = 1$ ,  $p < .001$ ), and the U.S. ( $X^2 = 155.168$ ,  $df = 1$ ,  $p < .0001$ ): in both countries, females were more concerned than males.

**Criterion D:** No menarche or no period in the past three months.

Chi-square analysis revealed a significant difference between females in U.S. and France ( $X^2 = 30.700$ ,  $df = 1$ ,  $p < .001$ ), with more females in the U.S. having either not started menstruating or missed their period in the past three months. This result was likely related to the age difference between the two countries. There was no significant difference between French and U.S. girls in the 11<sup>th</sup> or 12<sup>th</sup> grades.

Table 2

*Frequencies and percentages of participants fulfilling DSM-IV diagnostic criteria and diagnosis of Anorexia Nervosa (AN) per country and gender*

	France		United States	
	Males	Females	Males	Females
	(n = 413)	(n = 618)	(n = 645)	(n = 928)
A. BMI $\leq 17.5$ <sup>a,b</sup>	23 (6.0)	52 (9.3)	16 (2.8)	39 (4.5)
B. Think overweight, others think too thin (MC108) <sup>b,c,d</sup>	21 (5.2)	152 (25.3)	38 (8.9)	199 (26.7)
C. Weight or shape concern ( $\geq 3$ ) <sup>a,c,d</sup>	126 (31.5)	329 (54.2)	165 (27.6)	548 (60.4)
D. No menarche or no period in past 3 months <sup>a</sup>	N/A	93 (15.9)	N/A	234 (28.7)
AN full syndrome	1 (0.2)	1 (0.2)	0 (0)	2 (0.2)
AN partial syndrome	16 (4.0)	35 (5.9)	24 (4.4)	46 (5.8)

Note: MC = McKnight Risk Factor Survey IV; AN partial syndrome: based on meeting 3/4 criteria for females and 2/3 criteria for males; all frequencies were compared per gender and per country using Chi-square test

<sup>a</sup> significant difference between France and US females

<sup>b</sup> significant difference between France and US males

<sup>c</sup> significant difference between males and females in France

<sup>d</sup> significant difference between males and females in US

all statistical tests:  $.0001 \leq p \leq .05$

### ***Bulimia Nervosa*** (See [Table 3](#))

**Criterion A:** Episodes of binge eating.

Chi-square analyses revealed significant differences between France and the U.S. for both males ( $X^2 = 8.699$ ,  $df = 1$ ,  $p < .01$ ), and females ( $X^2 = 5.845$ ,  $df = 1$ ,  $p < .05$ ). Females and males in France reported more episodes of binge eating than their U.S. counterparts. There was also a significant difference between males and



females in France ( $X^2 = 4.581$ ,  $df = 1$ ,  $p < .05$ ), and in the U.S. ( $X^2 = 14.324$ ,  $df = 1$ ,  $p < .001$ ); within each country, more females than males reported episodes of binge eating.

**Criterion B:** Use of any compensatory behaviors.

Overall in the U.S. both females and males used compensatory behaviors to lose weight more often than their French counterparts, and the difference was significant for both males ( $X^2 = 51.617$ ,  $df = 1$ ,  $p < .0001$ ), and females ( $X^2 = 8.457$ ,  $df = 1$ ,  $p < .01$ ). There was also a significant difference between males and females in France ( $X^2 = 143.492$ ,  $df = 1$ ,  $p < .001$ ), and the U.S. ( $X^2 = 84.272$ ,  $df = 1$ ,  $p < .0001$ ). Within each country, more females use compensatory behaviors.

**Criterion C:** Binge eating and use of compensatory behaviors at least twice a week for 3 months or more.

There was a significant difference between France and U.S. males ( $X^2 = 4.149$ ,  $df = 1$ ,  $p < .05$ ), with more France males meeting this criterion, and significant difference between males and females in the U.S. only ( $X^2 = 8.074$ ,  $df = 1$ ,  $p < .01$ ). In the U.S., more females than males met this criterion, and the difference was significant ( $X^2 = 8.074$ ,  $df = 1$ ,  $p < .01$ ).

**Criterion D:** Weight or shape concern (same as Criterion C for AN)

**Criterion E:** No diagnosis of AN.

Fisher's exact test revealed no significant differences between and within countries and no differences between genders.

Table 3

*Frequencies and percentages of participants fulfilling DSM-IV diagnostic criteria and diagnosis of Bulimia Nervosa (BN) per country and gender*

	France		United States	
	Males (n = 413)	Females (n = 618)	Males (n = 645)	Females (n = 928)
Aa. Binge eating over past year (MC48 $\geq$ 2) <sup>a,b,d</sup>	270 (66.5)	405 (66.5)	328 (52)	525 (57.1)
Ab. Loss of control (MC23 $\geq$ 2) <sup>d</sup>	191 (46.4)	316 (51.4)	256 (40.5)	461 (50)
A. Episodes of binge eating <sup>a,b,c,d</sup>	158 (38.4)	277 (45.2)	188 (29.7)	359 (39)
B. Use of any compensatory behaviours <sup>a,b,c,d</sup>	126 (31.2)	425 (69.4)	344 (53.9)	702 (76.1)
Ca. Frequent binges ( $\geq$ 2/wk + 3 mo) (MC23b & MC23c)	21 (6)	33 (6.4)	17 (3.5)	39 (5)
Cb. Frequent compensatory behaviours <sup>b,c,d</sup> ( $\geq$ 2/wk + 3 mo)	47 (11.9)	143 (24.7)	109 (17.8)	256 (28.8)
C. Frequent binge eating and compensatory behaviours ( $\geq$ 2/wk + 3 mo) <sup>b,d</sup>	6 (1.5)	12 (2.1)	2 (.3)	18 (2.1)
Da. Weight concern (MC53 $\geq$ 3) <sup>a,c,d</sup>	41 (10.2)	177 (29)	64 (10.5)	374 (40.8)
Db. Shape concern (MC94 $\geq$ 3) <sup>a,c,d</sup>	104 (25.6)	279 (45.7)	142 (23.1)	473 (52.1)
D. Weight or shape concern <sup>a,c,d</sup>	126 (31.5)	329 (54.2)	165 (27.6)	548 (60.4)
E. No AN	409 (100)	608 (99.5)	614 (99.8)	912 (99.6)
BN full syndrome <sup>b,d</sup>	6 (1.5)	9 (1.5)	1 (.2)	16 (1.8)
BN partial syndrome <sup>c,d</sup>	34 (8.4)	149 (24.9)	46 (7.5)	228 (25.6)

Note: MC = McKnight Risk Factor Survey IV; BN partial syndrome: based on meeting 4/5 criteria for females and males; all frequencies were compared per gender and per country using Chi-square test

<sup>a</sup> significant difference between France and US females

<sup>b</sup> significant difference between France and US males

<sup>c</sup> significant difference between males and females in France

<sup>d</sup> significant difference between males and females in US

all statistical tests: .0001  $\leq$  p  $\leq$  .05

## **Full and partial syndromes of eating disorders**

### ***Anorexia Nervosa***

One or two cases (0.2%) in each group, except U.S. males (no case), fulfilled all diagnostic criteria for AN. Partial syndromes of AN were identified in 5.8% of the U.S. females and 5.9% of the French females, and in 4% of the French males and 4.4% of the U.S. males, with no significant difference between genders or between countries.

### ***Bulimia Nervosa***

The prevalence of full syndrome BN ranged from 0.2% for U.S. males, to 1.5% for both males and females in France, and 1.8% in U.S. females. The differences were significant between French and U.S. males, and between males and females in the U.S. Partial syndrome BN was identified significantly more often in females than males; with respective prevalence estimates of 25% and 8%.

Overall prevalence estimates were between 0.1% and 0.2% for AN and between 1.0% and 1.5% for BN with no significant country differences except for boys for BN. For subclinical AN, the prevalence was 5%, with no country difference. There was a 16.5 % rate of subclinical BN overall.

## **DISCUSSION**

While previous research outlined stark differences between France and the United States for weight disorders and every day eating attitudes and behaviors, the French showing healthier patterns, the present research project found no clear country differences in terms of clinical ED. Gender differences in ED emerged as expected, with females showing overall higher rates of diagnostic criteria or clinical ED than males. These prevalence rates were consistent with previously reported estimates.

There were a few unexpected country differences in ED symptomatology, such as episodes of binge eating which were significantly more reported among the French than among Americans. In contrast, the U.S. group used compensatory behaviors more often than their French counterparts.

Country differences emerged for weight status in females whereby twice as many French girls were underweight compared to U.S. girls. This could either indicate that French females are more at risk of developing AN, or that their morphology is naturally smaller and that the weight classifications used in this study (the IOTF cut-offs) were not appropriate across these two countries: Cole et al (53) argues that more internationally based alternatives should help to provide internationally comparable prevalence rates in children.

The higher proportion of U.S. females than French females reporting overconcern with their weight or shape might reflect the fact that they indeed had higher BMI overall. As Raich et al (35) noted, since the U.S. population has higher rates of obesity and overweight it may follow that concerns about weight are more prevalent there, especially given the opposing message of the thin ideal, commonly diffused in western media, which may engender anxiety about not measuring up to the images portrayed therein.

For adolescent males, our results highlighted a few country differences. More U.S. males than French males “thought they were fat while others said they were too thin” which may indicate a higher risk of developing AN for U.S. boys. In contrast, rates of binge eating and use of compensatory behaviors were unexpectedly higher in French males than U.S. males which may put the French boys at higher risk for developing BN. Indeed, there were more “cases” of full syndrome BN among French males than U.S. males (and as much as the French female group).

Certain sociodemographic differences between the two countries may have affected the results. The U.S. students came from more educated families, most probably because there were more private schools in the U.S. sample. A future comparison of students from only public schools might yield different results. Another socio-demographic phenomenon which emerged was the rate of subjects whose ethnic origin was other than European or North American (range: 18-45%). Future analyses separating out these groups and comparing them may also be of interest and could possibly clarify results.

Although the sample groups in this project were large, they were perhaps still too small to detect significant differences in disorders whose prevalence gravitate around the 1% mark. For future studies of the two populations in question, we would recommend still larger sample groups (although this is highly time and cost intensive) in order to achieve enough differential power to compare clinical cases of ED (12). We would also change the methodology to include the use of a two-stage screening approach: i.e., the use of a structured clinical interview to make more viable diagnoses of ED, after screening with a self-report instrument such as the SCOFF. The weighing and measuring of subjects by researchers, as opposed to self-report, is recommended for future studies and finally, validation and reliability studies of the McKnight VI French version are in order.

## **CONCLUSION**

France and the United States appear to be similar for prevalence of clinical and subclinical ED. While it remains nonetheless possible that cultural differences in eating behaviors and weight differences between countries have some relation to the etiology of ED, these relationships remain unclear. Certain researchers have noted the protective role of certain eating behaviors and attitudes; however, direct links between every day eating patterns and the prevalence of EDs did not emerge from this study.

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## APPENDIX 1

Date:

day      month      year

Student number:

**Please circle one answer for each question and/or fill in the blanks**

1. What is your date of birth?

day      month      year

2. What grade are you in?

1. 7<sup>th</sup>

2. 8<sup>th</sup>

3. 9<sup>th</sup>

4. 10<sup>th</sup>

5. 11<sup>th</sup>

6. 12<sup>th</sup>

3. What is your gender?

1. Male

2. Female

4. How much school has your mother had?

1. She didn't finish High School

2. High School diploma

3. College or University Degree

4. I don't know

5. How much school has your father had?

1. He didn't finish High School

2. High School diploma

3. College or University Degree

4. I don't know

6. Which one of the following groups best describes your ethnic origin?

*(mark two responses ONLY IF your parents each have a different origin)*

1. European

2. Aboriginal

3. Caribbean

4. Central or South American

5. Oceanian (Australia, New Zealand)

6. North American (Canada, US)

7. African

8. Asian

9. Middle Eastern

10. Other: \_\_\_\_\_

7. What is the main language you speak at home with your parents? *(mark ONLY one)*

1. English

2. French

3. Italian

4. German

5. Arabic

6. Chinese

7. Vietnamese

8. Spanish

9. Somali

10. Other: \_\_\_\_\_

**If you were NOT born in the United States:**

8. I have been living in the U.S.A. for    year(s)

The USA    The country my    Both    Neither

**family is from**

- |   |   |   |   |   |
|---|---|---|---|---|
| 9. I am most comfortable being with people from                   | 1 | 2 | 3 | 4 |
| 10. My best friends are from                                      | 1 | 2 | 3 | 4 |
| 11. The people I fit in best are from                             | 1 | 2 | 3 | 4 |
| 12. My favorite music is from                                     | 1 | 2 | 3 | 4 |
| 13. My favorite TV show is from                                   | 1 | 2 | 3 | 4 |
| 14. The holidays I celebrate are from                             | 1 | 2 | 3 | 4 |
| 15. The food I eat at home is from                                | 1 | 2 | 3 | 4 |
| 16. The way I do things and the way I think about things are from | 1 | 2 | 3 | 4 |

The questions below ask about what it is like to be a teenager today. There are no right or wrong answers. We just want to know what you think. If you have problems with any of the questions, please raise your hand and we will help you. For each question, circle the number that best applies to you.



**In the past year, how often...**

**Never    A little    Sometimes    A lot    Always**

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1. did you feel confident?.....   | 1 | 2 | 3 | 4 | 5 |
| 2. have you <u>been on a diet</u> TO LOSE WEIGHT?.....                        | 1 | 2 | 3 | 4 | 5 |
| 3. have you worried about having fat on your body?.....                       | 1 | 2 | 3 | 4 | 5 |
| 4. have you <u>starved (not eaten) for a day or more</u> TO LOSE WEIGHT?..... | 1 | 2 | 3 | 4 | 5 |

**IF YES:**

- a. How often does this happen? Less than two times a week    0    Two times a week or more    1
- b. Since when?                      Less than three months    0    Three months or more                      1

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| 5. did you drink alcohol when you were by yourself or with friends?.....  | 1 | 2 | 3 | 4 | 5 |
| 6. did you eat <u>less</u> than usual when you were <u>bored</u> ?.....   | 1 | 2 | 3 | 4 | 5 |
| 7. have you felt fat?.....  | 1 | 2 | 3 | 4 | 5 |
| 8. have you tried to lose weight?.....  | 1 | 2 | 3 | 4 | 5 |
| 9. have you thought about wanting to be thinner?.....   | 1 | 2 | 3 | 4 | 5 |
| 10. has your father made a comment to you about your weight or your eating that made you feel bad? ( <i>"Father" refers to the adult man in your life who acts most like a father to you</i> )..... | 1 | 2 | 3 | 4 | 5 |
| ** I do <u>not</u> have any contact with anyone that I think of as my father.....   | 0 |   |   |   |   |
| 11. have you changed your eating when you were around girls/young women?...   | 1 | 2 | 3 | 4 | 5 |
| 12. have you had someone you can count on to listen to you when you need to talk?.....  | 1 | 2 | 3 | 4 | 5 |
| 13. have you <u>cut back on what you ate</u> TO LOSE WEIGHT?.....   | 1 | 2 | 3 | 4 | 5 |
| 14. did you use drugs (not medicine)?.....  | 1 | 2 | 3 | 4 | 5 |
| 15. did you eat <u>less</u> than usual to try to <u>feel better about yourself</u> ?.....   | 1 | 2 | 3 | 4 | 5 |

16. have you had someone to share your most private worries and fears with?.... 1 2 3 4 5
17. have girls/young women (including sisters) made fun of you because of your weight?..... 1 2 3 4 5
18. have you taken laxatives or "water" pills TO LOSE WEIGHT?..... 1 2 3 4 5
19. have you felt ugly?..... 1 2 3 4 5
20. have you skipped meals TO LOSE WEIGHT?..... 1 2 3 4 5
21. have you liked most things about yourself?..... 1 2 3 4 5
22. have you had headaches?..... 1 2 3 4 5



**In the past year, how often...**

**Never    A little    Sometimes    A lot    Always**

23. have you kept eating and eating and felt like you could not stop?..... 1 2 3 4 5

<b><u>IF YES</u></b> :	a. Does it bother you?	No	0	Yes	1
	b. How often?	Less than two times a week	0	Two times a week or more	1
	c. For how long?	Less than three months	0	Three months or more	1

24. has a teacher or coach made a comment to you about your weight that made you feel bad?..... 1 2 3 4 5
25. did you eat more than usual when you were bored?..... 1 2 3 4 5
26. did you smoke cigarettes?..... 1 2 3 4 5
27. did you feel worthless?..... 1 2 3 4 5
28. did you notice you didn't have as much energy as you usually do?..... 1 2 3 4 5
29. have you exercised TO LOSE WEIGHT?..... 1 2 3 4 5

<b><u>IF YES:</u></b>	a. About how many hours a week?	I ___ ___  hours
-----------------------	---------------------------------	------------------

30. did you feel "down in the dumps" or "depressed"?..... 1 2 3 4 5

<b>IF YES:</b> a. For how long?	Less than three months 0	Three months or more 1
---------------------------------	--------------------------	------------------------

31. have you felt pretty/handsome?..... 1 2 3 4 5
32. have you had stomach aches?..... 1 2 3 4 5
33. have you tried to change your weight so you would not be teased by boys/young men (including brothers)?..... 1 2 3 4 5
34. have you MADE yourself throw-up TO LOSE WEIGHT?..... 1 2 3 4 5

<b>IF YES:</b> a. Does it happen:	Less than two times a week 0	Two times a week or more 1	b. For how long?	Less than
	three months 0	Three months or more 1		

35. have you been happy just the way you are?..... 1 2 3 4 5
36. have you eaten less sweets or fatty foods TO LOSE WEIGHT?..... 1 2 3 4 5
37. have boys/young men (including brothers) made fun of you because of your weight?..... 1 2 3 4 5
38. has your mother made a comment to you about your weight or your eating that made you feel bad? (*"Mother" refers to the adult woman in your life who acts most like a mother to you*)..... 1 2 3 4 5  
 \*\* I do not have any contact with anyone that I think of as my mother.... 0
39. have you had someone to help you understand a problem when you needed it?..... 1 2 3 4 5
40. did you eat less than usual when you were upset?..... 1 2 3 4 5



**In the past year, how often...**

**Never A little Sometimes A lot Always**

41. have you taken diet pills TO LOSE WEIGHT?..... 1 2 3 4 5
42. did you eat more than usual to try to feel better about yourself?..... 1 2 3 4 5
43. have your female friends talked about wanting to lose weigh?..... 1 2 3 4 5
44. have you changed your eating when you were around boys/young men?..... 1 2 3 4 5

45. did you have trouble concentrating?..... 1 2 3 4 5

46. did you eat more than usual when you were upset?..... 1 2 3 4 5

47. did you have trouble enjoying activities you usually enjoy?..... 1 2 3 4 5

48. did you eat a lot of food in a short amount of time when it was NOT a meal or a holiday?..... 1 2 3 4 5

**IF YES:** a. Does this happen: Less than two times a week 0 Two times a week or more 1  
three months 0 Three months or more 1 b. For how long: Less than

49. have you tried to change your weight in order to avoid teasing from girls/ young women (sisters included)?..... 1 2 3 4 5

50. I worry about what other people will think of me..... 1 2 3 4 5

**51. For girls only:**  
In the past year, how often have photographs/pictures of thin girls/women made you wish that you were thin?..... 1 2 3 4 5

**In the past year...**

Not A little Pretty A lot Totally  
at all much

52. how much have you worried about gaining two pounds (1 kg)?..... 1 2 3 4 5

53. if boys (including brothers) have teased you about your weight, how much has it changed the way you feel about yourself?..... 1 2 3 4 5  
\*\* I have not been teased..... 0

54. how much has your weight made a difference in how you feel about yourself?..... 1 2 3 4 5

55. how happy have you been with the way your body looks?..... 1 2 3 4 5

56. how much do you think your weight made the opposite sex NOT like you?..... 1 2 3 4 5

57. how important has it been to your friends that you be thin? 1 2 3 4 5

58. If girls (including sisters) have teased you about your weight, how much has it changed the way you feel about yourself?..... 1 2 3 4 5  
\*\* I have not been teased..... 0

59. how important has it been to your friends that they be thin?..... 1 2 3 4 5

60. how important has it been to your mother that you be thin? ("Mother" refers to the adult woman in your life who acts most like a mother to you)..... 1 2 3 4 5  
 \*\* I do not have any contact with anyone that I think of as my mother..... 0

61. how important has it been to your father that you be thin? ("Father" refers to the adult man in your life who acts most like a father to you)..... 1 2 3 4 5  
 \*\* I do not have any contact with anyone that I think of as my father..... 0

<b><u>For girls only:</u> In the past year...</b>	<b>Not at all</b>	<b>A little</b>	<b>Pretty much</b>	<b>A lot</b>	<b>Totally</b>
62. how much have you tried to look like the girls/women you see on <u>TV</u> , in <u>movies</u> , or in <u>magazines</u> ?.....	1	2	3	4	5
63. how much do you think your weight made other <u>girls</u> NOT like you?.....	1	2	3	4	5

**Is this true?**

**Never A little Some- A lot Always**  
**times**

64. Only outstanding performance is good enough in my family..... 1 2 3 4 5  
 65. I try very hard to avoid disappointing my parents and teachers..... 1 2 3 4 5  
 66. I need to be the best at things..... 1 2 3 4 5  
 67. I feel that I must do things perfectly or not do them at all..... 1 2 3 4 5  
 68. I have extremely high goals..... 1 2 3 4 5



**Is this important?**

**Not at all A little Pretty much A lot Totally**

69. To feel good about yourself, how important is it to be physically strong?..... 1 2 3 4 5  
 70. To feel good about yourself, how important is it to be smart?..... 1 2 3 4 5  
 71. To feel good about yourself, how important is it to be thin?..... 1 2 3 4 5  
 72. To feel good about yourself, how important is it to stand up for yourself?..... 1 2 3 4 5



**Yes or No ?**

73. Do you go to a different school now than you did last year?..... 0. No 1. Yes  
 74. In the past year, has your body changed?..... 0. No 1. Yes

**If yes:**a. How bothered are you about your body changing?

1. Not at all    2. A little    3. Pretty much    4. A lot    5. Totally

**75. For girls only:** Have you gotten your first period yet?..... 0. No    1. Yes

**If yes:** a. At what age?..... | | | years    b. In what grade at school?    | | |

..... b. In the last year, has your period ever stopped for 3 months in a row or more? 0. No    1. Yes    c.

If your period did stop for three or more months, has it come back? 0. No    1. Yes

76. have you lost a friend (i.e. because of a fight or a move)?..... 0. No    1. Yes

77. Have you started to date?..... 0. No    1. Yes

**If yes:** a. At what age?..... | | | years    b. In what grade at school?    | | |

**In the past year...**

78. have you broken up with a boyfriend or girlfriend?..... 0. No    1. Yes

79. have you been seriously injured or seriously ill?..... 0. No    1. Yes

80. have any of your pets died?..... 0. No    1. Yes

81. have you felt rejected by someone important to you?..... 0. No    1. Yes

**In the past year...**

82. have you felt threatened at school?..... 0. No    1. Yes

83. has anyone important to you died?..... 0. No    1. Yes

84. have your parents separated, divorced, or split up?..... 0. No    1. Yes

85. have you felt threatened outside of school?..... 0. No    1. Yes

86. have other people noticed changes in your body?..... 0. No    1. Yes

**If yes:**a. How bothered are you about other people noticing changes in your body?

1. Not at all    2. A little    3. Pretty much    4. A lot    5. Totally

87. have either of your parents gotten remarried?..... 0. No    1. Yes

88. have you been a cheerleader, a song leader or on a dance team?..... 0. No    1. Yes



89. have you had to take medication (like Ritalin) to help you pay attention and do better in school?.....  0. No  1. Yes

90. have you had to take insulin to help you control diabetes?.....  0. No  1. Yes


91. have you felt, or have others told you, that you eat less than you should?.....  0. No  1. Yes

92. In the past year, has there been a supportive person (role model) in your life you look up to and/or talk to about the things that happen to you?.....  0. No  1. Yes

93. In the past year, have you felt pressured to have sex?.....  0. No  1. Yes

94. In the past year, have you trained for competition in any of the following sports?  
ice skating:  0. No  1. Yes    swimming:  0. No  1. Yes    gymnastics:  0. No  1. Yes    track and field:  0. No  1. Yes

95. In the past year, how have you been doing in school?  
0. Failing    1. Below average    2. Average    3. Above average

 **No or Yes ?**

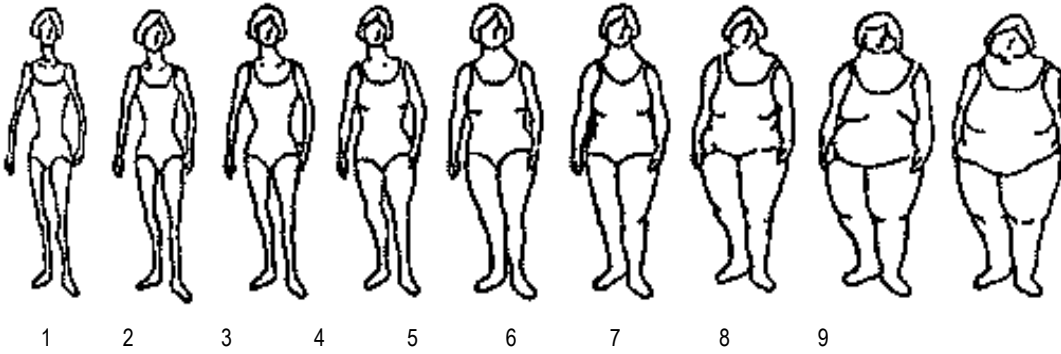
96. Have other people told you that you have an eating disorder (like anorexia or bulimia, not simply being overweight)?.....  0. No  1. Yes

97. Are you training to become a professional dancer or ballerina?.....  0. No  1. Yes

98. Do you think that you have an eating disorder (like anorexia or bulimia, not simply being overweight)?.....  0. No  1. Yes

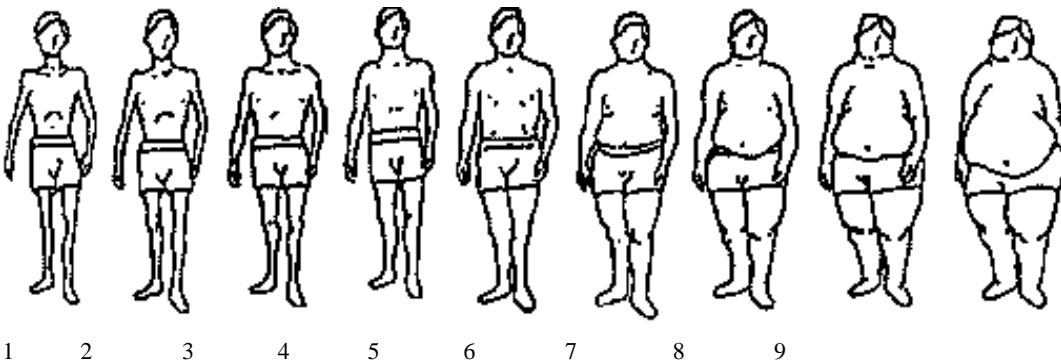
99. Has anyone in your family ever had an eating disorder?.....  0. No  1. Yes

100. Please circle the number of the figure below that best looks like the MOST you have ever seen your real (biological) MOTHER weigh (not including when she was pregnant).



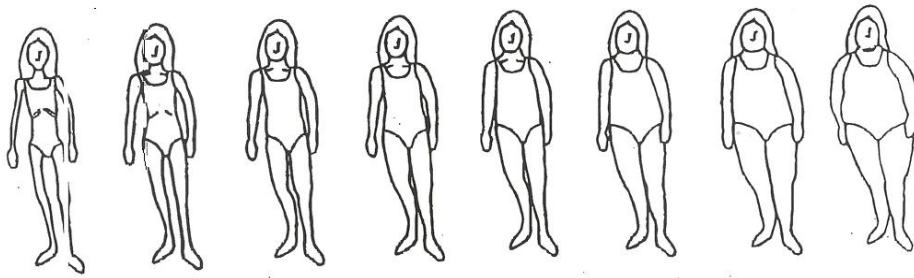
0 = I have not seen my biological mother in a very long time

101. Please circle the number of the figure below that best looks like the MOST you have ever seen your real (biological) FATHER weigh.

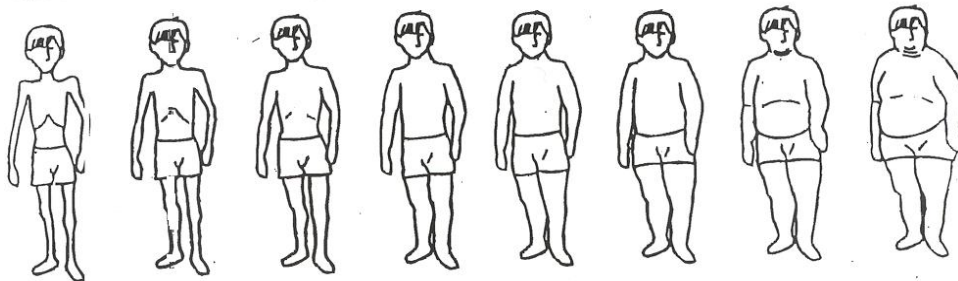


0 = I have not seen my biological father in a very long time

102. Please circle the number of the figure below that best looks like the most you weighed in elementary school.



1      2      3      4      5      6      7      8



**Circle all that apply (you may circle more than one)**

**103.** Circle any of the following member(s) of your family who is (are) currently very overweight.

- A. Sibling(s)                      B. Step/Half Sibling(s)                      C. Mother's Sibling(s)  
D. Father's Sibling(s)              E. Maternal Grandparent(s)                  F. Paternal Grandparent(s)

**104.** Circle any of the following member(s) of your family who is (are) currently very underweight.

- A. Sibling(s)                      B. Step/Half Sibling(s)                      C. Mother's Sibling(s)  
D. Father's Sibling(s)              E. Maternal Grandparent(s)                  F. Paternal Grandparent(s)

**105.** Circle any of these activities THAT YOU PARTICIPATE IN that make you feel really good about yourself.

- A. Organized sports (i.e. basketball, soccer, etc.)                  G. Church youth groups  
B. Swimming/Diving    H. Journal club/Creative writing/Newspaper/Yearbook  
C. Track and field    I. Dance  
D. Gymnastics    J. Theater/Drama  
E. Community service (i.e. volunteer at a hospital)                  K. Music/Band/Choir  
F. Scouting    L. Other: \_\_\_\_\_

**106.** Please circle any of the people you talk to when you have a problem. *(you can circle more than one)*

- A. Mother/Stepmother                      B. Father/Stepfather                      C. Brother/Stepbrother  
D. Sister/Stepsister                      E. Other Relative                      F. Friend  
G. Boyfriend/Girlfriend                      H. Coach/Teacher                      I. Counselor/Minister/Priest/Rabbi  
J. Other Person: \_\_\_\_\_                      K. No one

- 107.** a. Your present height :    |\_\_|      feet              |\_\_|\_\_| inches  
b. Your present weight :    |\_\_|\_\_|\_\_|      pounds  
c. What is your desired weight?    |\_\_|\_\_|\_\_|      pounds

**108.** Have you recently lost more than 15 pounds in three months or less?      No      0      Yes      1

**109.** Do you think you are fat even though others say you are too thin?      No      0      Yes      1

**110.** Would you say that food dominates your life?      No      0      Yes      1

**111.** At your present weight, do you feel:      too thin      1                      fine      2                      too fat      3

**APPENDIX 2**  
MCKNAIGHT IN VERSION FRANCAISE



15. La type de nourriture que je mange à la maison est de .....1 2 3 4
16. Ma façon de penser et de faire les choses ressemble à celle de .....1 2 3 4

Les questions suivantes s'intéressent à ce que cela signifie pour vous d'être un(e) adolescent(e) aujourd'hui. Encercliez la réponse convient le mieux à chaque question.

\* Depuis un an... Jamais Rarement Parfois Souvent Tout le temps

1. vous êtes-vous senti(e) sûr(e) de vous?..... 1 2 3 4 5
2. avez-vous suivi un régime AMAIGRISSANT?..... 1 2 3 4 5
3. vous êtes-vous inquiété(e) d'avoir trop de graisse dans certaines parties de votre corps ?..... 1 2 3 4 5
4. vous êtes-vous privé(e) de manger pendant un jour ou plus POUR MAIGRIR ? 1 2 3 4 5

<b>SI OUI : a. Cela arrive-t-il :</b>	Moins de deux fois par semaine	Deux fois par semaine ou plus
	1	2
<b>b. Depuis combien de temps :</b>	Moins de trois mois	Trois mois ou plus
	1	2

5. avez-vous bu de l'alcool seul ou avec des amis ?..... 1 2 3 4 5
6. avez-vous mangé moins que d'habitude parce que vous vous ennuyiez ?..... 1 2 3 4 5
7. vous êtes-vous senti(e) gros(se) ?..... 1 2 3 4 5
8. avez-vous essayé de maigrir ?..... 1 2 3 4 5
9. avez-vous souhaité être plus mince ?..... 1 2 3 4 5
10. votre père a-t-il fait des commentaires sur votre poids ou sur ce que vous mangez qui vous ont contrarié(e) ? (votre père ou un homme adulte qui se comporte en père avec vous) ..... 1 2 3 4 5  
 \*\* Je n'ai pas de contact avec mon père (ou équivalent)..... 0
11. avez-vous changé vos habitudes alimentaires quand vous étiez avec des filles ou des jeunes femmes ?..... 1 2 3 4 5
12. avez-vous pu compter sur quelqu'un quand vous aviez besoin de parler ?..... 1 2 3 4 5
13. avez-vous mangé moins que d'habitude POUR MAIGRIR ?..... 1 2 3 4 5
14. avez-vous fait usage de drogues (autres que des médicaments) ?..... 1 2 3 4 5
15. avez-vous mangé moins que d'habitude pour vous sentir mieux avec

vous-même ? ..... 1 2 3 4 5

16. avez-vous pu partager vos soucis personnels ou vos angoisses avec  
quelqu'un ? ..... 1 2 3 4 5

17. des filles ou des femmes (sœurs incluses) se sont-elles moquées de vous  
à cause de votre poids ? ..... 1 2 3 4 5

18. avez-vous pris des laxatifs ou des diurétiques POUR MAIGRIR ? ..... 1 2 3 4 5

19. vous êtes-vous senti(e) laid(e) ? ..... 1 2 3 4 5

20. avez-vous sauté des repas POUR MAIGRIR ? ..... 1 2 3 4 5

\* Depuis un an... Jamais Rarement Parfois Souvent Tout le temps

21. vous êtes vous senti(e) bien dans votre peau ? ..... 1 2 3 4 5

22. avez-vous eu mal à la tête? ..... 1 2 3 4 5

23. vous est-il arrivé de manger et manger sans pouvoir vous arrêter? ..... 1 2 3 4 5

<b>SI OUI :</b> a. Cela vous préoccupe-t-il ?	Non	Oui
	0	1
b. Cela arrive-t-il :	Moins de deux fois par semaine	Deux fois par semaine ou plus
	1	2
c. Depuis combien de temps	: Moins de trois mois	Trois mois ou plus
	1	2

24. un professeur ou un entraîneur a-t-il fait des commentaires au sujet de  
votre poids qui vous ont contrarié(e) ? ..... 1 2 3 4 5

25. avez-vous mangé plus que d'habitude quand vous vous ennuyiez ? ..... 1 2 3 4 5

26. avez-vous fumé des cigarettes ? ..... 1 2 3 4 5

27. vous êtes-vous senti(e) bon ou bonne à rien? ..... 1 2 3 4 5

28. avez-vous eu l'impression d'avoir moins d'énergie que d'habitude? ..... 1 2 3 4 5

29. avez-vous fait de l'exercice physique POUR MAIGRIR? ..... 1 2 3 4 5

<b>SI OUI :</b>	
a. Combien d'heures par semaine, en moyenne ?	_ _  heures

30. vous êtes-vous senti(e) triste ou "déprimé(e)"? ..... 1 2 3 4 5



<b>SI OUI :</b> a. depuis combien de temps :	Moins de trois mois	Trois mois ou plus
	1	2

31. vous êtes-vous senti(e) beau ou belle ?..... 1 2 3 4 5

32. avez-vous eu mal à l'estomac ?..... 1 2 3 4 5

33. avez-vous essayé de changer votre poids pour éviter que les garçons  
(frères inclus) se moquent de vous?..... 1 2 3 4 5

34. vous êtes-vous FORCÉ(E) à vomir POUR MAIGRIR?..... 1 2 3 4 5

<b>SI OUI :</b> a. Cela arrive-t-il :	Moins de deux fois par semaine	Deux fois par semaine ou plus
	1	2
b. Depuis combien de temps :	Moins de trois mois	Trois mois ou plus
	1	2

35. vous êtes-vous senti(e) bien comme vous êtes ?..... 1 2 3 4 5

36. avez-vous mangé moins de sucreries ou d'aliments gras POUR MAIGRIR ?.. 1 2 3 4 5

37. des garçons ou des jeunes hommes (frères inclus) se sont-ils moqués de  
vous à cause de votre poids?..... 1 2 3 4 5

38. votre mère a-t-elle fait des commentaires sur votre poids ou sur ce que  
vous mangez qui vous ont contrarié(e) ? (*votre mère ou une femme adulte  
qui se comporte en mère avec vous*)..... 1 2 3 4 5

\*\* Je n'ai pas de contact avec ma mère (ou équivalent)..... 0

39. y avait-il quelqu'un qui pouvait vous aider quand vous aviez un problème ?... 1 2 3 4 5

40. avez-vous mangé moins que d'habitude quand vous étiez contrarié(e) ?..... 1 2 3 4 5

41. avez-vous pris des médicaments (comme **Dexatrim**) POUR MAIGRIR ?..... 1 2 3 4 5

42. avez-vous mangé plus que d'habitude pour tenter de vous sentir mieux ?..... 1 2 3 4 5

43. vos amies ont-elles parlé de leur désir de maigrir ?..... 1 2 3 4 5

\* **Depuis un an...** Jamais Rarement Parfois Souvent Tout le temps

44. est-ce que vous mangez différemment quand vous êtes en présence  
de garçons ou de jeunes hommes ?..... 1 2 3 4 5

45. avez-vous eu des problèmes de concentration ?..... 1 2 3 4 5

46. avez-vous mangé plus que votre habitude quand vous étiez contrarié(e)?..... 1 2 3 4 5

47. avez-vous eu moins de plaisir à faire des activités, des passe-temps que d'habitude vous aimez?..... 1 2 3 4 5

48. vous est-il arrivé de manger beaucoup en peu de temps en dehors des repas quand ce n'était PAS un jour de fête?..... 1 2 3 4 5

<b>SI OUI :</b> a. Cela arrive-t-il :	Moins de deux fois par semaine	Deux fois par semaine ou plus
	0	1
b. Depuis combien de temps :	Moins de trois mois	Trois mois ou plus
	0	1

49. avez-vous essayé de changer votre poids pour éviter que les filles (sœurs incluses) se moquent de vous?..... 1 2 3 4 5

50. vous inquiétez-vous de ce que les autres pensent de vous?..... 1 2 3 4 5

<b>Cette question est pour les filles seulement.</b>
51. Depuis un an, des photos de filles ou femmes minces vous ont-elles donné envie d'être plus mince ?..... 1 2 3 4 5

\* Depuis un an... Pas du tout Un peu Pas mal Beaucoup Enormément

52. vous êtes-vous inquiété(e) de grossir de deux livres (1 kilo) ?..... 1 2 3 4 5

53. Si des garçons (frères inclus) vous ont taquiné(e) sur votre poids, cela a-t-il changé votre opinion de vous-même ?..... 1 2 3 4 5

\*\* Je n'ai pas été taquiné(e)..... 0

54. votre poids a-t-il influencé l'image que vous avez de vous-même ?..... 1 2 3 4 5

55. êtes-vous satisfait(e) de l'apparence de votre corps ?..... 1 2 3 4 5

56. pensez-vous que votre poids est la raison pour laquelle les personnes du sexe opposé ne vous aiment PAS ?..... 1 2 3 4 5

57. pensez-vous que pour plaire à vos amis vous devez être mince ?..... 1 2 3 4 5

58. Si des filles (sœurs incluses) vous ont taquiné(e) sur votre poids, cela a-t-il

changé votre opinion de vous-même ?..... 1 2 3 4 5  
\*\* Je n'ai pas été taquiné(e)..... 0

59. quelle importance attachent vos ami(e)s au fait qu'ils (elles) soient minces?.. 1 2 3 4 5

60. le fait que vous soyez mince (ou devriez l'être) a-t-il de l'importance pour votre mère ? (votre mère ou une femme adulte qui se comporte en mère avec vous)..... 1 2 3 4 5  
\*\* Je n'ai pas de contact avec ma mère (ou équivalent)..... 0

\* **Depuis un an...** Jamais Rarement Parfois Souvent Tout le temps

61. le fait que vous soyez mince (ou devriez l'être) a-t-il de l'importance pour votre père ? (votre père ou un homme adulte qui se comporte en père avec vous)..... 1 2 3 4 5  
\*\* Je n'ai pas de contact avec mon père (ou équivalent)..... 0

**Ces questions sont pour les filles seulement**

62. avez-vous essayé de ressembler aux filles et femmes de la télévision, des magazines ou des films?..... 1 2 3 4 5

63. pensez-vous que votre poids est la raison pour laquelle les autres filles ne vous aiment pas?..... 1 2 3 4 5

64. Ma famille n'accepte que l'excellence..... 1 2 3 4 5

65. Je fais beaucoup d'efforts pour éviter de décevoir mes parents et mes professeurs..... 1 2 3 4 5

66. J'ai besoin d'être le meilleur/la meilleure dans tout ce que j'entreprends..... 1 2 3 4 5

67. Je sens que je dois faire les choses parfaitement ou ne pas les faire du tout. 1 2 3 4 5

68. Je me fixe des objectifs extrêmement élevés..... 1 2 3 4 5

\* **Pour vous sentir bien...** Pas du tout Un peu Pas mal Beaucoup Enormément

69. Est-il important d'être fort(e) physiquement?..... 1 2 3 4 5

70. Est-il important d'être intelligent(e)?..... 1 2 3 4 5

71. Est-il important d'être mince?..... 1 2 3 4 5

72. Est-il important d'être capable de vous défendre ou de vous faire respecter? 1 2 3 4 5

**\* Non ou Oui?**

73. Avez-vous changé d'école depuis l'année dernière ?..... 0. Non 1. Oui

74. Votre corps a-t-il changé depuis un an ?..... 0. Non 1. Oui

**Si oui:**a. Ces changements vous dérangent-ils ?

1. Pas du tout 2. Un peu 3. Pas mal 4. Beaucoup 5. Énormément

**Cette question est pour les filles seulement**

75. Avez-vous eu vos premières règles ?..... 0. Non 1. Oui

**Si Oui:**a. En quelle année étiez-vous quand c'est arrivé ? (Entourez la réponse)

- |                        |                                   |                                   |
|------------------------|-----------------------------------|-----------------------------------|
| 1. Avant le CM1        | 7. Été après la 6 <sup>ème</sup>  | 13. Été après la 3 <sup>ème</sup> |
| 2. En CM1              | 8. En 5 <sup>ème</sup>            | 14. En 2 <sup>nde</sup>           |
| 3. Été après le CM1    | 9. Été après la 5 <sup>ème</sup>  | 15. Été après la 2 <sup>nde</sup> |
| 4. En CM2              | 10. En 4 <sup>ème</sup>           | 16. En 1 <sup>ère</sup>           |
| 5. Été après le CM2    | 11. Été après la 4 <sup>ème</sup> | 17. Été après la 1 <sup>ère</sup> |
| 6. En 6 <sup>ème</sup> | 12. En 3 <sup>ème</sup>           | 18. En Terminale                  |

b. Depuis un an, avez-vous eu un arrêt de vos règles pendant au moins trois mois ?..... 0. Non 1. Oui

c. S'il y a eu un arrêt, vos règles sont-elles maintenant revenues ?..... 0. Non 1. Oui

76. Depuis un an, avez-vous perdu un(e) ami(e) (par exemple à cause d'une dispute ou d'un déménagement) ?..... 0. Non 1. Oui

77. Avez-vous commencé à sortir avec des garçons ou des filles ?..... 0. Non 1. Oui

**Si oui:** a. En quelle année étiez-vous quand vous avez commencé ?

- |                        |                                   |                                   |
|------------------------|-----------------------------------|-----------------------------------|
| 1. Avant le CM1        | 7. Été après la 6 <sup>ème</sup>  | 13. Été après la 3 <sup>ème</sup> |
| 2. En CM1              | 8. En 5 <sup>ème</sup>            | 14. En 2 <sup>nde</sup>           |
| 3. Été après le CM1    | 9. Été après la 5 <sup>ème</sup>  | 15. Été après la 2 <sup>nde</sup> |
| 4. En CM2              | 10. En 4 <sup>ème</sup>           | 16. En 1 <sup>ère</sup>           |
| 5. Été après le CM2    | 11. Été après la 4 <sup>ème</sup> | 17. Été après la 1 <sup>ère</sup> |
| 6. En 6 <sup>ème</sup> | 12. En 3 <sup>ème</sup>           | 18. En Terminale                  |

**\* Depuis un an...**

78. avez-vous rompu avec un(e) petit(e) ami(e)?..... 0. Non 1. Oui

**\* Depuis un an...**

79. avez-vous été gravement blessé(e) ou malade?..... 0. Non 1. Oui
80. est-ce que votre animal de compagnie est mort ?..... 0. Non 1. Oui
81. vous êtes-vous senti(e) rejeté(e) par quelqu'un d'important pour vous ?..... 0. Non 1. Oui
82. vous êtes-vous senti(e) menacé(e) à l'école ?..... 0. Non 1. Oui
83. une personne dont vous étiez proche est-elle morte ?..... 0. Non 1. Oui
84. vos parents se sont-ils séparés ou ont-ils divorcés ?..... 0. Non 1. Oui
85. vous êtes-vous senti(e) menacé(e) en dehors de l'école ?..... 0. Non 1. Oui
86. est-ce que les autres ont remarqué des changements dans votre corps?..... 0. Non 1. Oui

**Si oui:**a. Cela vous a-t-il dérangé(e) ?

1. Pas du tout 2. Un peu 3. Pas mal 4. Beaucoup 5. Énormément

87. un de vos parents s'est-il remarié ?..... 0. Non 1. Oui
88. avez-vous fait partie d'une troupe de danse ou chanté dans un groupe?..... 0. Non 1. Oui
89. avez-vous dû prendre des médicaments (comme **le Ritalin**) pour améliorer votre concentration et avoir de meilleurs résultats à l'école ?..... 0. Non 1. Oui
90. avez-vous dû prendre de l'insuline pour contrôler un diabète ?..... 0. Non 1. Oui
91. avez-vous pensé (ou d'autres vous ont-ils dit) que vous mangiez moins que vous ne devriez?..... 0. Non 1. Oui
92. y a-t-il eu une personne pour qui vous aviez de l'estime, qui vous a soutenu(e) et à qui vous avez pu vous confier facilement?..... 0. Non 1. Oui
93. avez-vous senti de la pression pour avoir des relations sexuelles?..... 0. Non 1. Oui
94. faites-vous de la compétition dans les sports suivants :
- a. Patin à glace..... 0. Non 1. Oui b. Natation/Plongeon..... 0. Non 1. Oui
- c. Gymnastique..... 0. Non 1. Oui d. Athlétisme..... 0. Non 1. Oui
95. Depuis un an, comment sont vos résultats scolaires ?
1. Mauvais 2. Sous la moyenne 3. Dans la moyenne 4. Au dessus de la moyenne

**\* Non ou Oui?**

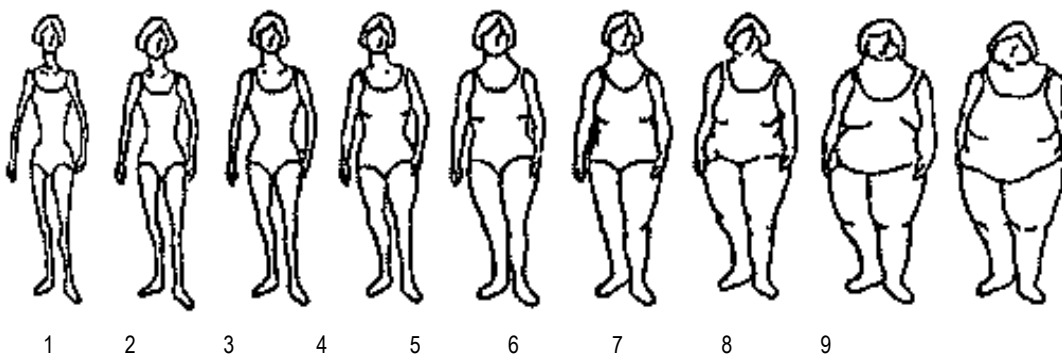
96. Quelqu'un vous a-t-il dit que vous aviez un trouble du comportement alimentaire (par exemple de l'anorexie, de la boulimie, et pas simplement un excès de poids) ?..... 0. Non 1. Oui

97. Vous entraînez-vous pour être un(e) professionnel(le) de la danse?..... 0. Non 1. Oui

98. Pensez-vous que vous avez actuellement un trouble du comportement alimentaire (par exemple de l'anorexie, de la boulimie, et pas simplement un excès de poids) ?..... 0. Non 1. Oui

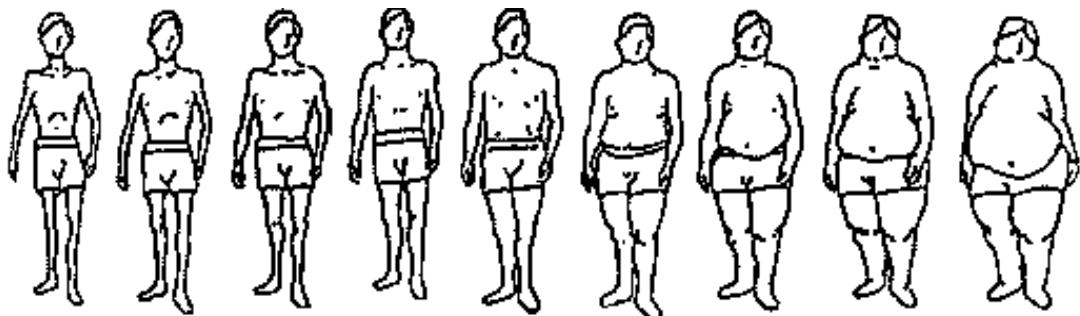
99. Quelqu'un dans votre famille a-t-il eu un trouble du comportement alimentaire (par exemple de l'anorexie, de la boulimie, et pas simplement un excès de poids) ?..... 0. Non 1. Oui

100. Entourez le numéro de la figure ci-dessous qui représente le poids le PLUS ELEVE auquel vous avez vu votre MERE (mère biologique) – grossesse exclue -



0 = Je n'ai pas vu ma mère (biologique) depuis très longtemps

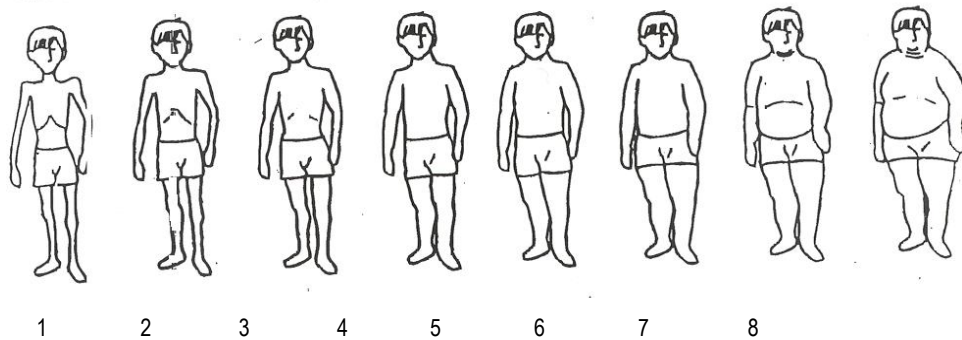
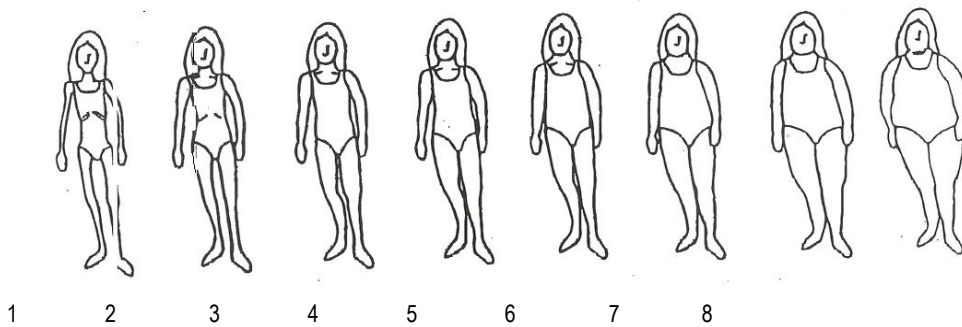
101. Entourez le numéro de la figure ci-dessous qui représente le poids le PLUS ELEVE auquel vous avez vu votre PÈRE (père biologique).



1 2 3 4 5 6 7 8 9

0 = Je n'ai pas vu mon père (biologique) depuis très longtemps.

102. Entourez le numéro de la figure ci-dessous qui VOUS ressemble le plus quand vous étiez À L'ÉCOLE PRIMAIRE.



103. Encerchez les membres de votre famille qui ont un surplus de poids (encerchez tous les membres concernés).

- A. Frère(s) et sœur(s)                       B. Demi-frère (sœur) ou par alliance                       C. Frères et soeurs de ma mère  
 D. Frère(s) et sœur(s) de mon père                       E. Grand-parent(s) maternel(s)                       F. Grand-parent(s) paternel(s)

104. Encerchez les membres de votre famille dont le poids est trop bas (encerchez tous les membres concernés).

- A. Frère(s) et sœur(s)                       B. Demi-frère (sœur) ou par alliance                       C. Frères et soeurs de ma mère  
 D. Frère(s) et sœur(s) de mon père                       E. Grand-parent(s) maternel(s)                       F. Grand-parent(s) paternel(s)

105. Entourez toutes les activités QUE VOUS PRATIQUEZ qui vous permettent de vous sentir bien avec vous-même.



A. Sports d'équipe (ex: Basket-ball, soccer, etc.)

B. Natation/plongeon

C. Athlétisme

D. Gymnastique

E. Bénévolat

F. Scoutisme

G. Associations religieuses ou groupes de jeunes

H. Rédaction d'un journal/Club d'écriture/Livre de fin d'année

I. Danse

J. Théâtre

K. Musique/Orchestre/Chorale

L. Autre: \_\_\_\_\_

106. Entourez le nom des personnes à qui vous parlez quand vous avez un problème. (Vous pouvez entourer plus d'un nom).

A. Mère/Belle-mère

B. Père/Beau-père

C. Frère/Demi-frère (ou par alliance)

D. Soeur/Demi-soeur (ou par alliance)

E. Autre personne de la famille (parenté)

F. Ami(e)

G. Petit ami/Petite amie

H. Entraîneur/Professeur

I. Conseiller d'éducation/Prêtre /Pasteur/Rabbin

J. Autre : \_\_\_\_\_

K. Personne

107. a. Votre taille actuelle |\_\_| |\_\_| |\_\_| |\_\_| cm  
b. Votre poids actuel |\_\_| |\_\_| |\_\_| kgs  
c. Le poids que vous souhaiteriez avoir |\_\_| |\_\_| |\_\_| kgs

108. Avez-vous récemment perdu plus de 6kg en trois mois (ou en moins de trois mois) ?

Non	Oui
0	1

109. Pensez-vous que vous êtes gros(se) alors que d'autres vous trouvent trop mince ?

Non	Oui
0	1

110. Diriez-vous que la nourriture domine votre vie ?

Non	Oui
0	1

111. A votre poids actuel, vous sentez-vous

trop maigre	bien	trop gros(se)
1	2	3

## Conclusion

Les objectifs de cette thèse furent d'identifier et de décrire les facteurs culturels et les pratiques alimentaires liées à la survenue de problèmes pondéraux et de troubles des conduites alimentaires chez les adolescents français et américains.

Dans le premier article, nous avons montré que notre questionnaire AHA (« *Attitudes et Habitudes Alimentaires* ») a une bonne cohérence interne, qu'il est approprié au traitement des échantillons d'adolescents et aux études des habitudes et attitudes de l'alimentation journalière (HAAJ). D'autres études de validité seront entreprises et la version française sera validée dans une future étude. Les résultats montrés dans le deuxième article soutiennent globalement nos hypothèses : les HAAJ sont nettement différentes entre adolescents français et américains ; les français ont des comportements et attitudes plus « saines » envers la nourriture et les repas. Dans le troisième article, les résultats sur le statut pondéral soutiennent nos hypothèses : les caractéristiques pondérales sont différentes entre adolescents français et américains : les américains ont un taux d'obésité (OB) et surpoids (SP) (15.9% et 18.9% respectivement) plus élevés que les français (8.0% et 6.6%). De plus, nous avons démontré que les adolescents français ont un taux de sous-poids élevé (11.5%) par rapport aux américains (3.2%). Dans le quatrième article, en revanche, nos hypothèses sur les troubles du comportement alimentaire (TCA) n'ont pas été confirmées : la prévalence de TCA pour les adolescents français et américains est similaire et semblable aux résultats des études sur la prévalence au niveau mondial. Pour l'anorexie (AN) la prévalence était de 0.15% ; pour la boulimie (BN) la prévalence était de 1.25%.

Les adolescents de tous les pays du monde sont confrontés à de nombreux changements physiques, développementaux et cognitifs qui font de l'adolescence une période potentiellement chaotique. Lorsque s'ajoutent les facteurs interpersonnels (comme les relations sociales et familiales), intra-personnels (comme les états psychologiques, la santé) et environnementaux (comme les messages médiatiques, les normes culturelles) cette période devient une véritable course d'obstacles pour l'adolescent qui désire vivre en équilibre avec lui-même et avec les autres. Dans les pays occidentaux, les changements dans le marché de l'alimentation des dernières décennies sont des causes probables de mauvaise alimentation, d'augmentation de poids et de maladies liés aux surpoids. La disparition de coutumes alimentaires culturelles protectrices est aussi intriquée aux problèmes de poids. Cette thèse confirme ces faits.

En ce qui concerne les HAAJ et l'OB les chiffres dans cette thèse sont consistants et cohérents avec d'autres études : un pays comme les Etats Unis, dans lequel les adolescents ont une alimentation moins « saine » que dans un pays comme la France, est aussi le pays qui montre des taux pondéraux élevés.

Les TCA sont des problèmes cliniques et psychologiques qui sont aussi prévalent en France qu'aux Etats-Unis. Malgré une hypothèse basée sur le sens commun, selon lequel les comportements alimentaires journaliers semblent être impliqués de quelque sorte, ou avoir un effet quelconque sur le développement (et donc la prévalence) des TCA, les HAAJ ne semblent pas d'avoir d'influence directe sur les TCA. Dans un pays où les adolescents mangent moins sainement et ont plus d'OB et de SP, nous n'observons pas plus de TCA. De plus, dans un pays comme la France, où les

adolescents ont plus un taux de sous-poids élevé, les TCA ne sont pas non plus différents des Etats Unis.

L'étiologie des TCA doit certainement être quelque part liée aux HAAJ, mais cette étude n'a pas montré de relation exacte. L'évolution des TCA est liée aux HAAJ dans la mesure où ces derniers deviennent de plus en plus malsains au cours de la maladie. De plus, la restauration des HAAJ normaux afin de restaurer un poids normal fait partie des traitements des TCA et l'OB. Dans l'intérêt de comprendre encore plus précisément le rôle des HAAJ dans les TCA, certaines analyses pourraient être entreprises à l'avenir en utilisant nos données, par exemple : observer si certains items de l'instrument APA ont des corrélations significatives avec les symptômes de TCA. De plus, il pourrait être éclairant de faire l'étude avec certains changements de méthodes, notés dans l'article sur les TCA.

L'échantillon, important en nombre, a montré une bonne photographie des différences culturelles entre adolescents français et américains en ce qui concerne les HAAJ et le statut pondéral. Pour les TCA, il semble que les facteurs personnels (i.e. état psychologique de l'individu) soient plus impliqués que les facteurs culturels ou comportementaux et attitudinaux envers la nourriture. En conclusion, les différences culturelles quant à la nourriture et aux repas observées entre adolescents français et américains sont fortement intriquées aux différences pondérales entre ces deux cultures. D'autre part, la différence des HAAJ entre les 2 pays ne semble pas avoir de lien avec les taux de TCA observés.