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SELF-REGULATION AND EATING BEHAVIOUR IN PORTUGUESE CHILDREN AND ADOLESCENTS: CONCEPT MAPPING METHODOLOGY

AUTO-REGULAÇÃO E COMPORTAMENTO ALIMENTAR EM CRIANÇAS E ADOLESCENTES PORTUGUESES: METODOLOGIA DE MAPAS CONCEPTUAIS

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Resumo: O presente estudo analisa perspectivas de auto-regulação relacionadas com comportamentos alimentares saudáveis. A investigação tem como objectivo analisar as ideias que as crianças e os adolescentes têm acerca da sua auto-regulação e quais os aspectos importantes para resistir a tentações alimentares. Este estudo está incluído num projecto de investigação Europeu chamado TEMPEST http://tempestproject.eu/.

Journal of Child and Adolescent Psychology
Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

73

Foi utilizado o método qualitativo de mapas conceptuais. À amostra, composta por 100 indivíduos de ambos os géneros, com idades compreendidas entre os 12 e os 17 anos de idade, foram aplicadas as três fases do processo de mapa conceptuais. Os estudantes pertenciam a diferentes escolas dos distritos de Leiria e Santarém, em Portugal. Foram seleccionadas duas turmas com alunos com idades entre os 12 e os 14 anos, uma de estatuto socioeconómico baixo e outra de estatuto socioeconómico alto. Também foram seleccionadas duas outras turmas, com alunos de idades entre os 14 e os 17 anos, com as mesmas características socioeconómicas. O estatuto socioeconómico foi definido através da escolha do tipo de escola e a sua localização.

Foram formados e discutidos quatro clusters principais para a auto-regulação e o comportamento alimentar saudável. A análise dos mapas conceptuais releva dois aspectos importantes sobre a alimentação saudável: comportamentos de promoção de saúde e estratégias de evitamento surgem como facilitadores. Enquanto oposição, ambos parecem contribuir para a obtenção e manutenção de uma alimentação saudável. Outros factores também parecem ter um papel importante: nível económico, motivação e procura de conhecimento. São apresentadas linhas orientadoras para a intervenção na promoção de saúde.

Palavras-chave: auto-regulação; comportamento alimentar; crianças; adolescentes; metodologia de mapas conceptuais.

Abstract: The present study analyses self-regulatory perspectives related to healthy eating behaviour. The research aims to examine the ideas that children and adolescents have about their own self-regulation and what aspects are important in order to resist food temptations. This study it is included in a major European research project named TEMPEST http://tempestproject.eu/.

The qualitative method concept mapping was used. To the sample composed by 100 individuals of both genders, aged between 12 and 17 years old, were applied the three stages of concept mapping process. The students belonged to different schools of districts of Leiria and Santarém, in Portugal. Two classes were selected with students between 12 and 14 years old, one with a low socio-economic status and other with a high socio-economic status. At the same time, two other classes were selected with students with ages between 14 and 17 years and with the same socio-economic status features. Socio-economic status was defined according to the type of school and its location.

Four main clusters about self-regulation and influences on healthy eating behaviour were formed and discussed. Concept maps analyzed reveal two important aspects of a healthy eating: health-promoting behaviours and avoidance strategies that emerge as contributors. While opposing, both seem to contribute to the achievement and maintenance of a healthy eating. Other factors seem to play an important role: economic level, motivation and search for knowledge. Guidelines to intervention in health promotion were presented.

Journal of Child and Adolescent Psychology
Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

74

Key-words: Self-regulation; eating behaviour; children; adolescents; concept mapping methodology

Introduction
Self-regulation

In psychology the term self-regulation has gained the regulation meaning by the self as an active participant. Usually, the psychological self is not very involved in the biological regulation functions, like body temperature regulation, but may be requested for an action that needs more energy, as resisting to a temptation or overcoming an anxiety state. The importance of the regulation by the self has been one of the central topics of interest to researchers who study the self (Carver & Scheier, 1998).

Several studies show that the ability to regulate the actions is developed progressively during childhood and adolescence (Mueller, 2008). These periods require adjustments to the context and vice-versa, which is a bi-directional regulation of the developmental process (Gestsdottir & Lerner, 2008). When applied to young children the term self-regulation is used to refer to various capacities, such as quickly switch between different tasks, focus attention or control emotions. Moreover, self-regulation measures the adolescents' ability to monitor their activities, evaluate their performance, motivate them and keep their resilience while experiencing school and social disappointments (Zimmerman, 2002).

All the definitions of self-regulation refer that when the individual is self-regulatory he is meeting or adjusting his behaviour to pursue a goal or desired state (Carver & Scheier, 1998).

De Ridder and De Wit (2006) note that a self-regulation particular characteristic is connected to the fact that this is a process that involves the actual goals pursuit that often run for long periods and usually faces obstacles and temptations.

Self-regulation behaviour models have in common the goals concept. Several authors proposed different types of goals, including the personal efforts/commitments, the life tasks, personal projects and self-guide models, each emphasizing different goals aspects, but all of them giving the idea that challenging goals give a meaning to the individual's life (Austin & Vancouver, 1996; Baumesteir, 1989). By definition, future goals are guidelines related to what people think of their potential for achievement and the number of things they want to achieve. The goals are the principles that guide aware individuals and intentionally orienting their behaviours effectiveness (Austin & Vancouver, 1996), although there are actions to achieve the goals that are not fully conscious (Fitzsimons & Bargh, 2004; Strack & Deutsch, 2004; Vohs & Baumeister, 2004).

Journal of Child and Adolescent Psychology
Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

75

Self-regulation and Health Behaviours

According to Gebhardt (2006) any health conduct is only one goal behaviour in a multiple goals context that are followed simultaneously, in a way that personal goals compete continuously between them. If one health behaviour is adopted, it becomes a priority compared to other goals, depending on the connection strength to other value goals and the absence of conflict between the goals. For its part, the conflicts between different goals and inter-goals have impact on other behavioural change stages, such as the preparation for action at the behavioural change start and its maintenance over time.

Two models of self-regulation are often applied in health behaviour studies, the Cyber Control Theory (Carver and Scheier, 1998) and the Leventhal's Common Sense Model (Leventhal, Brissette & Leventhal, 2003).

Cyber Control Theory is a self-regulation theory based on the classical view that individuals live their lives identifying goals and setting up to achieve those (Scheier & Carver, 2003). In health's domain, the general goal is remaining healthy. Thus, health self-regulation consists essentially on regular assessments of the current state of the individual's health in accordance with the main goal (Gebhardt, 2006).

The Common Sense Model (Leventhal et al., 2003) was created as an attempt to explain how people detect and react to a threat or health problem presence. In one hand, the individual may face the threat from a rational perspective, choosing corrective action and appropriate strategies for coping. By the other hand, the individual can face it from an emotional perspective, which includes drawing up a strategy for dealing with negative emotional responses that warn to the problem emergence. The individuals' perceptions about the problem and their action plans usually reflect their common sense models or beliefs about the problem, as well as the associated treatment (Gebhardt, 2006). This model also includes a social influence component, where the other perspectives are considered, at least potentially, in every step of the process of assessing the individual health status (Leventhal et al., 2003).

These two models have some similar points, namely a central goal and periodically individual assessment of the health state regarding their goals, which reflects that self-regulation is a dual process that involves cognition and affection. Most adolescents do not have their goals clearly defined for health maintenance like adults do because diseases are relatively rare in young people. However, this does not mean that young people have no health goals, these are simply not relevant. They can exist in an abstract sense, but are unlikely to influence daily actions. The responses of many teens that have risk behaviours suggest, directly or indirectly, that they don't plan to conduct this way before it happens (Gebhardt, 2006).

Journal of Child and Adolescent Psychology

76   Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

Self-regulation and eating behaviour

In practice can be seen the deep impact that self-regulation has on the daily life battles experienced by individuals. According to Vohs and Baumeister (2004), near any personal or social problem that arises and affects a significant number of civilized society members is a self-regulation failure.

Some cases of obesity and other eating disorders reflect the inability to stop eating, especially fat food, as well as the inability to resist temptation (Baumeister & Vohs, 2004).

Eating is usually considered a highly regulated activity, as it should be, to perform its biological function. However, a deeper observation shows that this activity is not as well regulated as you might imagine. Since eating is essential to life is not surprising that it is part of a well regulated system. Before learning to do anything else babies cry to express their hunger and stop crying when someone feeds them. For children the regulation requires another person's assistance, providing the food, but as they become older the principle remains the same. When they feel hungry, seek out and eat, experience a satiety feeling and they will become hungry again after the nutrients have been consumed by the body, and the cycle repeats itself. Social influences on eating behaviour are extremely powerful, often overcoming other influences, including the individual's main intentions or his goals. Frequently the individuals use meal companies as models for food quantity and quality for what they should eat. Most of the temptations that interfere in the self-regulation process and make it fail are related to the individual's lack of ability to resist them. Some temptations are more attractive than others and the self-regulatory process prediction should take this into account. Thus, considerations about the temptation magnitude and intensity recall that resisting to temptation is a dynamic process and the success of a task depends not only on our ability but also on the task difficulty (Herman & Polivy, 2004).

The present study it is about self-regulatory perspectives related to healthy eating behaviour. The research pretends to analyze the ideas that children and adolescents have about their own self-regulation and what aspects are important in order to resist food temptations. The main objective of this research was study the self-regulation strategies that Portuguese children and adolescents perceive as the most important to have a healthy eating behaviour through a concept mapping methodology. The results obtained in Portugal, as well as the results from other European countries involved in Tempest Project (http://tempestproject.eu/), will be the basis to build a Self-Regulatory Competence Scale for adolescents in the area of self-regulation and the temptations that exist in the environment in order to have a healthy eating behaviour.

Journal of Child and Adolescent Psychology
Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

77

Methodology
Participants

The sample where the three stages of concept mapping were applied is composed by 100 individuals of both genders, aged between 12 and 17 years old. They belong to different schools from the districts of Leiria and Santarém, in Portugal. Two classes were selected with students between 12 and 14 years old, one with a low socio-economic status and other with a high socio-economic status. At the same time, two other classes were selected with students with ages between 14 and 17 years and with the same socio-economic status features. Socio--economic status was defined according to the type of school and its location.

Only the first part of the concept map was performed in a class of 25 students of both genders, aged between 8 and 12 years old in order to avoid new and different responses.

Instruments

Participants were involved in the process of concept mapping, exploring and discussing the factors influencing healthy eating behaviours. Concept mapping is a structured qualitative method that is used to help groups describe ideas on any subject of interest. The demographic questionnaire used is consisted by questions related to the participants' demographic data, including age, gender and grade. It was also applied a pool of items related with food and the Adolescent Self Regulatory Questionnaire (ASRI) (Moilanen, 2007).

Procedure

The present study was conducted with the consent of the Education Ministry, the schools involved, the students and their parents. All sessions took place according to the protocol established by the TEMPEST team. Documents about statements importance and content have been translated and back translated into Portuguese, as well as the pool of items related with food and ASRI. The last scales were applied in the last session.

After getting the approval of the principal for the research, informed consent letters were given to the students of the participating classes to hand out to their parents. The study was divided into two parts, and took approximately forty minutes in total per class to complete. Five classes participated in this study, and each class was given the information that the participation in the study was voluntary and could be stopped at any time. The aim of the study, as well as its importance was explained during the introduction.

In the first part of the study, students took part in the procedure of concept mapping, which is a generic technique that can be applied to various themes in order to help a group describe its ideas on any subject of interest. Before the beginning of

the process, a protocol for the concept mapping process was written. At the same time, a focus question about important things to ensure healthy eating behaviour was developed. The process of concept mapping is consisted by three phases: 1. Generating the statements. In this phase, the participants brainstorm to create a set of statements about the subject, using the focus question as a starting point. 2. Sorting the statements on content and priority. The participants sort the statements into piles of statements that belong together, labeling them in a meaningful way, and rate the importance of each statement. 3. Discussing the results. In the last phase, the maps are discussed with the group (Kane, & Trochim, 2007). Each of the phases was carried out by different classes.

In the first phase, generating statements about the focus question by free association, students of five classes were asked to complete the following sentence: "Things that are important to me in order to ensure my healthy eating, are…" on a sheet given to each of them. The first phase of the concept map was only performed in a class of 25 students of both genders in order to avoid new and different responses.The students were given 15 minutes to write their ideas down, and afterwards the sheets were collected. After a procedure of merging the statements with the same meaning, deleting some irrelevant statements, and making a selection of sixty statements, these were entered into the computer, and were each printed on separate cards. The statements were analysed and were selected the most relevant and illustrative.

In the second phase of the concept mapping, each of the students of the four classes received a set of numbered cards (from 1 to 33), containing the statements. The participants carried out two successive sorting tasks. First, the students were asked to cluster the statements on their content by organizing the cards into piles of statements that belong together. The students were given instructions to individually organize the statements in a way that made sense to them, received forms for writing the numbers of the created groups and created a name for each group. The following rules applied to the task: 1. Every card can be only used once. 2. A group has to consist of 2 cards or more. 3. It is not allowed to sort all statements into one pile. 4. All statements have to be placed into a pile. The participants were given 15 minutes to complete the task of organizing the cards into groups and writing them down. After collecting the forms, rating sheets were handed out for the second task, prioritizing of the statements. The students were given the instruction to individually go through all of the thirty statements on the forms before beginning rating the statements by importance, in order to determine the relative priority of each statement, using the full range of rating values, ranging from 1 (relatively unimportant) to 5 (extremely important). The students were given 15 minutes for completing the second task. The obtained data of the four classes of both organizing the statements on content and prioritizing the statements were separately entered into the computer, and four concept maps, the graphical view of the group opinion, were created. Each map consisted of four clusters of statements.

Journal of Child and Adolescent Psychology
Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

79

The third phase of the concept mapping consisted of a discussion of the results of both concept maps, and was performed in four classes. First, the students were asked to read the statements belonging to each of the eight clusters, showed on PowerPoint slides, and were asked to name the clusters. The maps, each containing four clusters, were then presented on slides. The students had the opportunity to express their opinion about whether the chosen names for the clusters were suitable for each cluster, what was the meaning of the clusters standing close to each other or in a distance, and which maps represented the best way of sorting. Concept mapping is often used when the concept is broad and complex, and can be used to develop a questionnaire about the subject. In this study, concept mapping was used because of the need to get a clearer view on the adolescents' ideas on the concept of self-regulation regarding their own healthy eating behaviours.

The second part of the study was the same for all five classes. The students were asked to complete a questionnaire on self-regulation and eating behaviour, which took about twenty minutes, in a classroom during school lessons. After explaining to the students that the questionnaires are anonymous, the instructions were given to remain in silence during and after finishing filling in the questionnaire, to work individually and to raise a hand if there they found any ambiguities in the questions.

Results

Data were entered and statistical procedures were calculated by Ariadne. First the viable statements obtained in the first session were introduced as well as the variables gender, age, item related with hunger and item related with the importance of healthy eating. After the second session the statements were introduce in the program in accordance to the content and its importance to each participant. The concept maps generated were discussed with the different classes in the third phase.

Table 1 Concept map 1 and mean preference scores of clusters

Clusters	Mean Preference
Avoidance	
Do not eat too many candies	4.13
Do not eat much fast food/soft drinks	3.16
Reduce fat/fried food/sauces/stews and eat more grilled and cooked meals	3.16
Do not eat food with excess of salt	2.72
Cluster Mean Score	3.26

Healthy Atitudes and Behaviours	
Eat a lot of fruit [a)]	**4.56**
Drink plenty of water	4.25
Always take your breakfast	4.00
Eat enough vegetables/salads	3.96
Do exercise often like walking, hiking, join an activity or go to the gym	3.91
Eat soup regularly with meals	3.40
Do not eat in front of the computer/television	2.48
Cluster Mean Score	3.71
Regularity and Self-Control	
Always eat at mealtimes	4.44
Try to eat healthy food when hungry	3.95
Eat a balanced and varied, making all meals throughout the day	3.71
Be motivated to eat more healthily	3.63
Eat every 3 hours/do not spend many hours without eating	3.56
If you eat unhealthy food at lunch try to compensate with healthier food at dinner	3.17
Taking time to prepare and eat healthy food	2.86
Bring healthy food to school	2.72
Eat in a smaller plate to eat less and to think that you ate a full plate	2.60
Eating in the cafeteria facilitates control over the type of food that are consumed	2.52
Eat little at a time, not to be filled	2.46
Drink water when you feel hungry	2.17
Cluster Mean Score	3.09
Family, Money and Knowledge	
Eat only when you are hungry	3.08
At home we are more tempted to eat, so we must be busy	2.80
Money influences the type of food that is bought	2.79
See programs about problems of overweight or obesity	2.52
Do not bring food to the room to not be tempted to eat it	2.48
Food machines in cafés difficult the eating control	2.40
Meals and grocery at home are more controlled by parents	2.32
Do not go often to the school bar or café to buy things to eat	2.28
Find information about food/healthy food	2.24
Cluster Mean Score	2.55

a) Statements that were rated as most important in order to ensure their healthy eating

The first concept map consists of four clusters 'Avoidance' (cluster 1), 'Healthy Behaviours and Attitudes' (cluster 2), 'Regularity and Self-Control' (cluster 3) and 'Family, Money and Knowledge' (cluster 4). The clusters were distributed each in its quadrant, which means that they are located opposite to each other. However, clusters 1 and 4 come closer, which was interpreted as the two ways of avoiding, to the extent that parental control and lack of money can be forms of control, although they are imposed. Cluster 1 is located as opposed to cluster 3, which shows two different ways to achieve a healthy eating and at the same sense is diagonally opposite to cluster 2. It was interpreted that clusters 3 and 4 would be opposed, since they refer to two different types of control, one exercised by the individual and the other induced by environmental conditions.

Table 2 Concept map 2 and mean preference scores of clusters

Clusters	Mean Preference
Care and eating control	
Try to eat healthy food when hungry	4.12
Eating in the cafeteria facilitates control over the type of food that are consumed	4.08
Reduce fat/fried food/sauces/stews and eat more grilled and cooked meals	4.00
Do not eat too many candies	3.96
Do not eat too fast	3.60
Do not eat in front of the computer/television	3.56
Do not bring food to the room to not be tempted to eat it	3.04
Do not eat much fast food/soft drinks	2.92
Meals and grocery at home are more controlled by parents	2.76
Do not go often to the school bar or café buy things to eat	2.68
Money influences the type of food that is bought	2.61
Bring healthy food to school	2.60
Do not eat food with excess of salt	2.56
Eat little at a time, to not be filled	2.56
Eat in a smaller plate to eat less and think that you ate a full plate	2.56
Food machines in cafés difficult the eating control	2.28
Eat only when you are hungry	2.08
At home we are more tempted to eat, so we must be busy	1.96
Food machines in cafés difficult the control of eating	1.96
Drink water when you feel hungry	1.92
Cluster Mean Score	2.89

Journal of Child and Adolescent Psychology

82 Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

Health behaviours	
Always take your breakfast [a]	**4.32**
Drink plenty of water	4.16
Eat enough vegetables/salads	3.68
Eat soup regularly with meals	3.64
Eat a lot of fruit	3.64
Cluster Mean Score	3.88
Balance and mealtimes	
Always eat at mealtimes	3.76
Eat every 3 hours/Do not spend too many hours without eating	3.76
Eat a balanced and varied meal, making all meals throughout the day, Be motivated to eat more healthily	3.60
Taking time to prepare and eat healthy food	2.00
Cluster Mean Score	3.27
Motivation and information search	
Be motivated to eat more healthily	4.04
Do exercise often like walking, hiking, join an activity or go to the gym	3.77
See programs about problems of overweight or obesity	3.52
Find information about food/healthy food	2.96
Cluster Mean Score	3.51

a) Statements that were rated as most important in order to ensure their healthy eating

The second concept map consisted four clusters, namely, 'Care and Eating Control' (cluster 1), 'Health Behaviours' (cluster 2), 'Balance and mealtimes' (cluster 3) and 'Motivation and Information Search' (cluster 4). Clusters 2 and 3 are placed next to each other and this was seen as these two clusters may belong to only one cluster, because while meals can be distinguished of other behaviours that benefit health, meals also contribute to the overall benefit of health condition since they are complete, balanced and varied respecting the times between meals. Cluster 4 is located opposite to clusters 2 and 3, which has been explained by how people, many times, have very good information about proper behaviour to adopt, however there is no motivation or physical and psychological availability to do it. Cluster 3 is located diagonally opposite to others, care and eating control may mediate, someway, health promote behaviours and at the same time lead to greater demand for information on healthy food.

Journal of Child and Adolescent Psychology
Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

83

Table 3 Concept map 3 and mean preference scores of clusters

Clusters	Mean Preference
Avoidance and Economic Power	
Do not eat too many candies	3.24
Money influences the type of food that is bought	3.16
Reduce fat/fried food/sauces/stews and eat more grilled and cooked meals	3.12
Do not eat much fast food/soft drinks	3.08
Do not eat food with excess of salt	3.00
Food machines in cafés difficult the eating control	2.60
Do not go often to the school bar or cafe buy things to eat	2.25
Cluster Mean Score	2.92
Healthy Behaviours and Search Information	
Try to eat healthy food when hungry	4.20
Always take your breakfast	4.16
Eat a lot of fruit	3.88
Eat enough vegetables/salads	3.56
Do exercise often like walking, hiking, join an activity or go to the gym	3.33
Eat soup regularly with meals	2.44
Taking time to prepare and eat healthy food	2.33
Find information about food/healthy food	1.64
See programs about problems of overweight or obesity	1.44
Cluster Mean Score	3
Balance, Regulation and Discipline	
Drink plenty of water [a]	**4.44**
Eat a balanced and varied meal, making all meals throughout the day	3.64
Eat every 3 hours/Do not spend too many hours without eating	3.42
Be motivated to eat more healthily	3.40
Always eat at mealtimes	3.28
If you eat unhealthy food at lunch try to compensate with healthier food at dinner	3.20
Bring healthy food to school	2.38
Cluster Mean Score	3.39
Control	
Eat in a smaller plate to eat less and think that you ate a full plate	3.67
Eat only when you are hungry	3.21
Do not eat too fast	3.20

84

Journal of Child and Adolescent Psychology
Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

At home we are more tempted to eat, so we must be busy	3.08
Do not bring food to the room to not be tempted to eat it	3.08
Eating in the cafeteria facilitates control over the type of food that are consumed	2.76
Eat little at a time, not to be filled	2.75
Do not eat in front of the computer/television	2.64
Drink water when you feel hungry	2.56
Meals and grocery at home are more controlled by parents	2.32
Cluster Mean Score	2.92

a) Statements that were rated as most important in order to ensure their healthy eating

The third concept map consisted of the four clusters 'Avoidance and Economic Power' (cluster 1), 'Healthy Behaviours and Search Information' (cluster 2), 'Balance, Regulation and Discipline' (cluster 3) and 'Control' (cluster 4). Clusters 2 and 3 were placed next to each other on the map, which was interpreted by the class as the close relationship between balance and regulation through discipline, healthy behaviours adoption and seeking information. Cluster 1 appears on the opposite side of cluster 3, which represents appositive behaviours according to participants, although they are both ways of power controlling. On the other hand, cluster 4 is among others, and students considered that control is behind healthy behaviours, balance and avoidance.

Table 4 Concept map 4 and mean preference scores of clusters

Clusters	Mean Preference
Avoidance and control	
Do not eat too many candies	3.60
Reduce fat/fried food/sauces/stews and eat more grilled and cooked meals	3.16
Do not eat much fast food/soft drinks	2.96
Money influences the type of food that is bought	2.91
Do not bring food to the room to not be tempted to eat it	2.83
Do not eat in front of the computer/television	2.76
Do not eat food with excess of salt	2.72
At home we are more tempted to eat, so we must be busy	2.64
Food machines in cafés difficult the eating control	2.36
Do not go often to the school bar or café to buy things to eat	2.28
Meals and grocery at home are more controlled by parents	2.16
Cluster Mean Score	2.76

Healthy habits and behaviour

Drink plenty of water [a]	**4.28**
Always take your breakfast	4.20
Eat a lot of fruit	4.04
Eat enough vegetables/salads	3.68
Be motivated to eat more healthily	3.64
Do exercise often like walking, hiking, join an activity or go to the gym	3.57
Eat soup regularly with meals	2.92
Bring healthy food to school	2.72
Taking time to prepare and eat healthy food	2.45
See programs about problems of overweight or obesity	2.42
Find information about food/healthy food	2.36
Cluster Mean Score	3.29

Eating healthy

Try to eat healthy food when hungry	4.22
Eat a balanced and varied, making all meals throughout the day	3.84
Eat every 3 hours/Do not spend many hours without eating	3.64
Always eat at mealtimes	3.60
Do not eat too fast	3.25
Eat in a smaller plate to eat less and think that you ate a full plate	3.12
Eat only when you are hungry	3.08
If you eat unhealthy food at lunch try to compensate with healthier food at dinner	2.96
Eating in the cafeteria facilitates control over the type of food that are consumed	2.84
Eat little at a time, not to be filled	2.58
Drink water when you feel hungry	2.52
Cluster Mean Score	3.23

a) Statements that were rated as most important in order to ensure their healthy eating

The final concept map consisted of 3 clusters 'Avoidance and Control' (cluster 1), 'Healthy Habits and Behaviours' (cluster 2) and 'Healthy Eating' (cluster 3). It was interpreted that clusters 2 and 3 are found close to each other, despite seeming opposite and that the establishment of healthy eating was part of what are healthy behaviours, thus being considered closely related. Fairly cluster 1 is located on the opposite side of the other 2 clusters, suggesting that the avoidance behaviours and food control over food and other tempting items on the environment may be another face of what may be called eating behaviour, and in a wider sense healthy behaviours.

Journal of Child and Adolescent Psychology
Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

86

Class 8-10 years old

To a class of the 5th grade, composed by 26 students (15 girls and 11 boys) aged between 10 and 12 years old it was applied only the first phase of the concept mapping. It was requested to students to generate sentences related to the central issues: self-regulation and healthy eating behaviour.

For the main question "Things that are important to me in order to ensure healthy eating are… ", students indicated statements associated to principles that should be taken to obtain a healthy eating behaviour, including which food to avoid (eg. fast-food, soft drinks, candies, salt) and which ensure a healthy eating behaviour (eg. fruit, vegetables, soup).

Moreover, to the question "Things I find important for healthy eating, and being in control of my eating behaviour are …", regarding the control that students need to obtain and/or maintain a healthy eating, the answers were connected to balance, respect mealtimes and food portion at meals, based on ideas behind the food wheel, such as the need for diverse, balanced meals, eat food from each group of the wheel and drink a lot of water throughout the day.

Figure 1. Concept Map 1 - 12-14 years old, low social-economic status
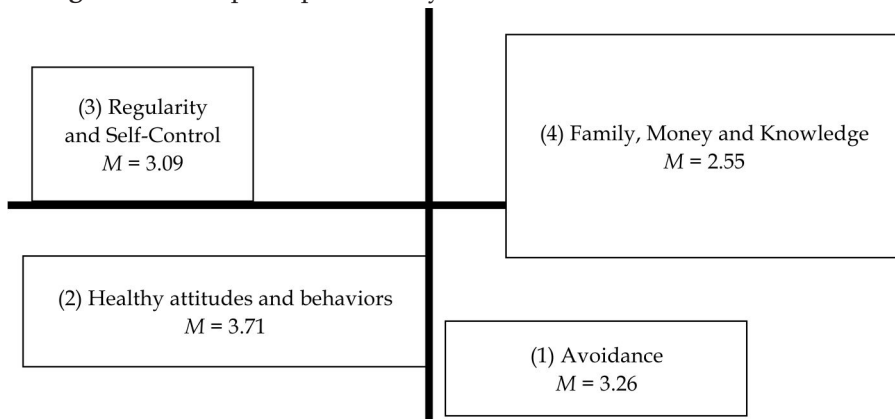
Concept Map 1 - 12-14 years old, low social-economic status

The first concept map class is based on a class of 25 students, of whom 15 were boys and 10 were girls, aged between 12 and 14 years, with a low socio-economic status.

The content analysis resulted in seven clusters, which were reduced to four (figure 1). The sentence that was perceived as the most important for this group was "Eating too much fruit" (M = 4.56).

The first cluster, 'Avoidance' (M = 3.26), consists of four sentences associated to food you should avoid ingest, where are statements like 'Do not eat too much

Journal of Child and Adolescent Psychology
Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

87

candies' or 'Do not eat food with excess of salt'.

The second cluster, 'Healthy Attitudes and Behaviours' (M = 3.71), consists of seven statements, such as 'Eat a lot of fruit' and 'Do exercise often like walking, hiking, join an activity or go to the gym'. Pre-adolescents considered relevant the combination of healthy behaviours, such as eating certain food, with a set of attitudes, such as not eating too fast or physical exercise.

The third cluster, 'Regularity and Self-Control' (M = 3.09), comprises 12 statements about the role that self-control plays in the regulation of the eating behaviour. The influence of regularity was also highlighted, like a standard which helps regulate eating behaviour. Statements such as 'Eat in a smaller plate to eat less and think that you ate a full plate' and 'Bring healthy food to school' are included in this cluster.

Ultimately, the fourth cluster, 'Family, Money and Knowledge' (M = 2.55) reflects the influence of family and home routines on eating habits of adolescents by influencing the type of food they buy and through programs they assist on television, and the purchase that economic level may have in the acquisition, or not, of certain kind of food. Statements like 'Money influences the type of food bought' or 'At home we are more tempted to eat, so we must be busy' are examples of this cluster consists of nine statements.

Figure 2. Concept Map 2 - 12-14 years old, high social-economic status
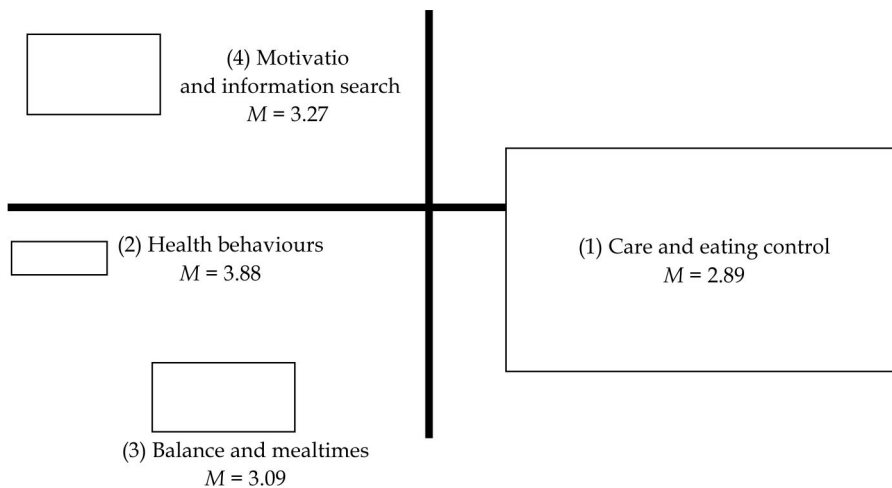
Concept Map 2 - 12-14 years old, high social-economic status

The class in which the second concept map was developed consisted of 25 students, 14 girls and 11 boys aged between 12 and 14 years old, belonging to a high socio-economic level. Content analysis resulted, initially, in six clusters which were reduced to four (figure 2). These regarded the evaluation of statements

88

Journal of Child and Adolescent Psychology
Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

made by participants and the most important statement related to have a healthy eating behaviour was 'Always take your breakfast' (M = 4.32).

The first cluster, 'Care and Eating Control' (M = 2.89), refers to the related to a healthy eating, control made and economic conditions that were interpreted as being linked. Statements such as 'Try to eat healthy food when you are hungry', 'Drink water when you feel hungry' and 'Money influences the type of food bought' are part of a total of 20 statements of this cluster.

The second cluster, 'Health behaviours' (M = 3.88), consisted of five statements that are viewed as behaviours that benefit health, such as 'Always take your breakfast' or 'Eat soup regularly with meals'.

The third cluster, 'Balance and meal time' (M = 3.27), consisted of four statements which address the role of time and the variety of healthy food. Not only it is necessary to take time to 'eat well', but also to respect the time between meals. The diversity and variety of a meal also assume an important role. Thus, a statement like 'Taking time to prepare and eat healthy food' is contained in this cluster.

Finally, the fourth cluster, 'Motivation and Information Search' (M = 3.51), consisted of four statements, including 'Be motivated to eat more healthily' or 'Find information about food/healthy food'. This cluster, in the opinion of young people, reflects that motivation and seeking appropriate help and information are crucial to a healthy eating.

Figure 3. Concept Map 3 - 15-17 years old, low social-economic status
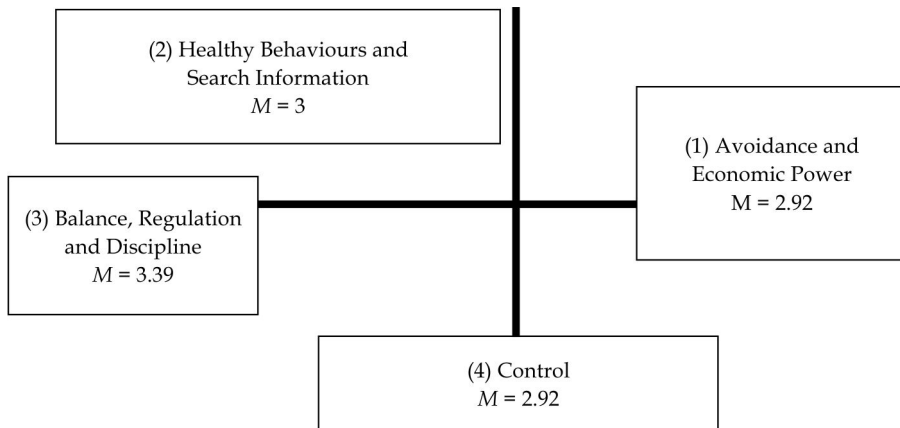
Concept Map 3 - 15-17 years old, low social-economic status

The third concept map is based on a class of 25 students (24 girls and 1 boy), aged between 15 and 17 years old, with a low socio-economic status. Content analysis resulted in 10 clusters, of which were selected the four more evident clusters (figure 3). The perceived importance of the analyses' statements revealed that the statement

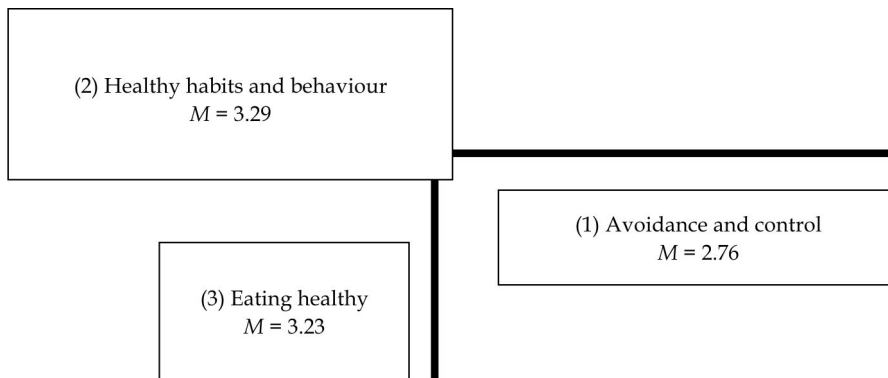perceived as the most important was "Drink plenty of water" (M = 4.44).

The first cluster 'Avoidance and Economic Power' (M = 2.92), consisted of seven statements, that emphasize avoiding certain types of food perceived as unhealthy in relation to the money they have to buy certain products. In this cluster are statements like 'Do not eat too many candies' or 'Money influences the type of food that is bought'.

The second cluster called 'Healthy Behaviours and Search Information' (M = 3), consists of nine statements. This cluster is next to the third one ('Balance, Regulation and Discipline) and is located opposite to cluster four ('Avoidance and Economic Power'). Statements such as 'Always take your breakfast' and 'Find information about food/healthy food' belong to this cluster, which reflects what teenagers consider to be healthy behaviours based on the demand for information on topics such as obesity or overweight.

The third cluster 'Balance, Regulation and Discipline' (M = 3.37), has seven statements about food regulation associated to behaviour regulation and discipline. Statements such as 'Eat a balanced and varied, making all meals throughout the day', 'Be motivated to eat more healthily' and 'Always eat at mealtimes' listed in this cluster.

Finally, the fourth cluster 'Control' (M = 2.92), reflects not only control over food, but also the control of external factors on adolescents, like family. It comprises 10 statements, including 'Do not bring food to the room to not be tempted to eat it' and 'Meals and grocery at home are more controlled by parents'.

Figure 4. Concept Map 4: 15-17 years old, high social-economic status

Concept Map 4: 15-17 years old, high social-economic status

The fourth group to be analyzed consisted 25 students (18 girls and 7 boys), aged between 15 and 17 years old, belonging to a high socio-economic status. The content analysis resulted in eight clusters, and it was made a selection of three clusters that were more evident (figure 4). The calculation of the perceived

90

Journal of Child and Adolescent Psychology
Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

importance of the statements revealed that the phrase perceived as the most important was "Drink plenty of water" (M = 4.28).

The first cluster, 'Avoidance and Control' (M = 2.76), consisted of 11 statements that emphasize the avoidance of certain kinds of food considered unhealthy and mechanisms that make this food available, while there is control, not only by the individual, but also by another elements. In this cluster we can find phrases like 'Do not eat in front of the computer/TV' or 'Food machines in cafés difficult the eating control'.

The second cluster, called 'Healthy Habits and Behaviours' (M = 3.29), consisted 11 statements reflecting a set of habits and behaviours they considered to be healthy like 'Do exercise often like walking, hiking, join an activity or go to the gym', 'Drink plenty of water' or 'Find information about food/healthy food'.

Finally, the third cluster, 'Healthy Eating' (M = 3.23), has eleven statements about what is implied in a healthy eating and ways to regulate it. Statements such as 'Eat a balanced and varied, making all meals throughout the day' and 'Always eat at mealtimes' are listed in this cluster.

In the concept map 4, the fourth cluster was integrated in the others because just has two items.

Comparing the concept maps from two groups of socioeconomic status, the participants with low SES give relevance to money and economic power, and the high SES participants do not indicate this aspect. Participants with low SES indicated the importance of the family and the other SES groups do not refer this category.

Cannot be found deep differences related to age groups. All give relevance at control, health behaviours, balance and avoidance as strategies to regulate eating behaviour. However, the younger participants (12-14 years old) give more relevance to family as strategy to regulate eating behaviour.

All students agreed the health behaviours, control and avoidance are very important in relation to eating behaviour and self-regulation.

Discussion

Self-regulation related to eating behaviour it is an important issue for children and adolescents. When the individual is self-regulatory he is meeting or adjusting his behaviour to pursue a goal or desired state (Carver & Scheier, 1998).

Strategies more relevant for the participant in order to self-regulation and eating behaviour in order to lead with temptations can be organized in two groups: health behaviour and restrictive behaviour, such as, control and avoidance. Self-regulation particular characteristic is connected to the fact that this is a process that involves the actual goals pursuit that often run for long periods and usually faces obstacles and temptations (De Ridder & De Wit, 2006).

Our participants several other strategies in order to achieve the goal of healthy eating Can be identify different types of goals, including the personal

Journal of Child and Adolescent Psychology
Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

91

efforts/commitments, the life tasks, personal projects and self-guide models, each emphasizing different goals aspects, but all of them giving the idea that challenging goals give a meaning to the individual's life (Austin & Vancouver, 1996; Baumesteir, 1989). Some of these strategies are more internal related to self-regulation, motivation, balance, search information In self-regulation the self have to be an active participant (Carver & Scheier, 1998) and others more external such as family control, money. Some eating disorders reflect the inability to stop eating, especially fat food, as well as the inability to resist social and environmental temptation (Baumeister & Vohs, 2004).

Cannot be found deep differences related to age groups. All give relevance at control, health behaviours, balance and avoidance as strategies to regulate eating behaviour. The ability to regulate the actions is developed progressively during childhood and adolescence (Mueller, 2008).

Were found socio economic differences in children and adolescent´s self-regulation and eating behaviour but were found some similar aspects. In general the principal socio economic differences are related to the nature of the strategies indicated for each group related to self-regulation and eating behaviour and the role of social support, specially, related to family. SES may influence people's life styles, accesses to food supplies and health services (Wang, 2001; Wang, Monteiro & Popkin, 2002).

Comparing the concept maps from two groups of socio economic status, the participants with low SES give relevance to money and economic power, and the high SES participants do not indicate this aspect. Participants with low SES indicated the importance of the family and the other SES group does not refer this category. All students agreed the health behaviours, self-control and search for information are very important in relation to eating behavior and self-regulation, that result agrees with Wang (2001), different SES groups are at different risks. There has been a strong interest in understanding the relationship between SES and obesity, mainly, because it is argued that this relationship is not clear (Wang, 2001).

Conclusion

In general, the concept maps analyzed reveal two important aspects of a healthy eating: health-promoting behaviours and avoidance strategies that emerge as contributors. While opposing, both seem to contribute to the achievement and maintenance of a healthy eating.

Other factors seem to play an important role: economic level, motivation and search for knowledge.

Journal of Child and Adolescent Psychology
Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

92

References

Austin, J. T. & Vancouver, J. B. (1996). Goal constructs in psychology: Structure, process and content. *Psychological Bulletin, 120,* 338-375.

Baumesteir, R. F. (1989). The problem of life`s meaning. In D. S. Buss & N. Cantor (Eds), *Personality Psychology: Recent trends and emerging direction* (138-148). New York: Springer.

Baumeister, R. F. & Vohs, K. D. (2004). Self-regulation. In C. Perterson & M. E. P. Seligman (Eds), *Character strengths and virtues: A handbook and classification* (499-516). New York: Oxford Press.

Carver, C. S. & Scheier, M. F. (1998). *On the self-regulation behaviour.* New York: Cambridge University Press.

De Ridder, D. & De Wit, J. (2006). Self-regulation in health behavior: Concepts, theories and central issues. In De Ridder, D. & De Wit, J. (Eds), *Self-regulation in health behaviour* (3-23). England: John Wiley & Sons, Ltd.

Fitzsimons, G. M. & Bargh, J. A. (2004). Automatic self-regulation. In R. F. Baumesteir and K. D. Vohs (Eds), *Handbook of self-regulation. Research, theory and applications* (151-170). New York: Guilford.

Gebhardt, W. A. (2006). Contextualizing health behaviors: The role of personal goals.

In De Ridder, D. & Wit, J. (Eds), *Self-regulation in health behaviour* (27-43). England: John Wiley & Sons, Ltd.

Gestsdottir, S. & Lerner, R. M. (2008). Positive development in adolescence: The development and role of intentional self-regulation. *Human Development, 51,* 202-224.

Herman, C. P. & Polivy, J. (2004). The self-regulation of eating: Theoretical and practical problems. In R. F. Baumeister & K. D. Vohs (Eds), *Handbook of self regulation: Research, theory, and applications* (492-508). New York: Guilford Press.

Herman, C. P.; Roth, D. A. & Polivy, J. (2003). Effects of the presence of others in food intake: A normative interpretation. *Psychological Bulletin, 129,* 873-886.

Leventhal, H.; Brissette, I. & Leventhal, E. A. (2003). The common-sense model of self-regulation of health and illness. In L. D. Cameron & H. Leventhal (Eds.). *The self-regulation of health and illness behaviour* (42-65). London: Routledge.

Mueller, U. (2008). The development of self-regulation: Psychological and neuropsychological perspectives.

Scheier, M. F. & Carver, C. S. (2003). Goals and confidence as self-regulatory elements underlying health and illness behaviour. In L. D. Cameron & H. Leventhal (Eds.). *The self-regulation of health and illness behaviour* (17-41). London: Routledge.

Strack, F. & Deutsch, R. (2004). Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review, 8,* 220-247.

Vohs, K. D. & Baumeister, R. F. (2004). Understanding self-regulation: An introduction. In R. F. Baumeister & K. D. Vohs (Eds), *Handbook of self regulation: Research, theory, and applications* (1-9). New York: Guilford Press.

Wang, Y. (2001). Cross-National comparison of childhood obesity: the epidemic and the relationship between obesity and socioeconomic status. *International Journal of Epidemiology, 30 (1),* 129-136.

Wang, Y., Monteiro, C. & Popkin, P. (2002). Trends of obesity and underweight in older

Journal of Child and Adolescent Psychology

Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

93

children and adolescents in the United States, Brazil, China, and Russia. *American Journal of Clinical Nutrition, 75*, 971-977.

Zimmerman, J. (2002). Achieving academic excellence: A self-regulatory perspective. In M. Ferrari (Ed.). *The pursuit of excellence through education* (85-110). New Jersey: Erlbaum.

Journal of Child and Adolescent Psychology
Revista de Psicologia da Criança e do Adolescente. Lisboa, n.º 4 (2011)

94