

# Helping Active Lives through Targeting Healthy Youth



## PROCEEDINGS OF JOINT STAFF TRAINING EVENT



# Helping Active Lives through Targeting Healthy Youth



Encouraging children's motor activities through schools  
Olga Kouli, Democritus University of Thrace, Greece

## The contribution of physical activity in education

Early aged children display a very strong tendency to movement. A big part of their learning is realized through the use of their body, which renders movement one of the most basic learning factors. Movement and the use of body have a multiple meaning for a child (Gallahue, & Donnelly, 2003). A research relative to the study of brain gives emphasis to the fact that early learning is based on motor development, which means that movement is the most preferable and most dominant way of learning because children comprehend concepts in a better way if they are physically active (Promislow, 2005). For instance, it is easier for children to comprehend certain quantitative concepts such as small-big, high-low, wide-narrow when they use their body.

In other words, it seems that using kinetic games and motor activities is a particularly important means of learning effectively at preschool and school age children. Respectively, a daily program which includes an abundance of motor activities can bridge the distance between playing and more official ways of learning which can be met in school athletic activities. Most motor development experts (e.g. Byrne, & Hills, 2007), agree that playing is an essential part of a highly qualitative learning program. Playing is not a mere break from learning, but the way young children learn. The self-guided, informal game offers young children a chance to participate in a wide range of motor activities which possibly provide young children with various possibilities to develop a positive attitude towards sports, kinetic games, physical activities and a more active way of living in the future (Zachopoulou & Kouli, 2017). Organized activities and the free nature of kinetic games create an environment which facilitates the sense of enjoyment and satisfaction, something that may be absent from the children's daily routine in and out of school. This kind of activities and their consequent emotional feedback (the euphoria and joy deriving from physical activities and movement) are described by researchers and teachers as the safest way to enforce children's motivation in order that they participate in motor activities (Liukkonen, 2010).

Consequently, motor activity programs should be an inextricable part of the natural development of all children (Byrne, & Hills, 2007; Sutterby, 2009). When researchers investigate children's general development, they cannot underestimate the contribution of physical activity programs to their overall progress. A daily program enriched with various kinds of motor activities, such as kinetic games, will most probably lead children to a healthier way of living. According to R. Wickstrom (1970), "where there are children, there is an almost incessant movement".

## Helping Active Lives through Targeting Healthy Youth



### Children's sensitization towards a naturally active way of living

The first years of life are considered a landmark for the health and welfare of the rest of life. The adoption of a healthy way of living even at an early age is an important target, especially when it is related to existing genetic and environmental dimensions. More specifically, children's lack of knowledge and familiarization with healthy diet and physical activity, combined with a genetic tendency to gain weight, may possibly lead to an unhealthy weight development, which will cause consequent negative health implications in the future (Byrne, & Hills, 2007; Yanovski, & Yanovski, 2003).

While children are encouraged to increase their levels of physical activity, they should also develop strategies to reduce the behaviours of a non active way of living (Parizkova, & Hills, 2005). In order to influence the knowledge and attitudes of the children, parents, teachers and policy makers should combine forces in a coordinated way.

As concerns planning educational interventions, it is important to focus on the children's crucial behaviours and attitudes leading to excessive weight rather than the environment of the class or the content of the activities. The environment factors which lead to a healthier or unhealthier way of living must be examined in the light of their ability to contribute to the frequency of the behaviours that increase or reduce the possibility of becoming obese (Hill & Peters, 1998; Hill, Wyatt, Reed & Peters, 2003; Young & Hills, 2007). For instance, teachers can influence the nature and quantity of the physical activities in which children participate. This influence can be direct or indirect. When teachers provide children with a school environment (internal or external) which promotes well explained physical activities, they can be directly influential. In addition, they can influence the children with their personal attitude, i.e. setting an example by participating in an abundance of physical activities. Similar arguments have been developed by Moore et al. (1991), in relation to the influence of parents. The writers mention that the children whose parents are physically active are more likely to behave in a similar way, compared to their peers whose parents are physically inactive. Furthermore, Young and Hills (2007) mention that adults who create environments which promote physical activity and function as models of physical activity themselves influence young children to adopting a significantly higher frequency of physical activity behaviours, in relation to children who live in environments less motivational.

As concerns the role of educational programs and initiatives, most efforts to prevent child obesity and teach a healthier way of living have focused mainly on primary school children rather than preschool ones. Nevertheless, researchers and health professional seem to enlarge their interests to include preschool aged children. Considering that obesity does not show signs of recession, it is obvious that the 'battle' against the environments which lead to the gradual increase of children's body weight must begin at a younger age (Hill, Wyatt, Reed & Peters, 2003). Preventing sedentary life at an early age offers important advantages against child

## Helping Active Lives through Targeting Healthy Youth



obesity and encourages children to adopt a healthier way of living. This can be achieved through the creation and realization of programs that will help children acquire knowledge on the components of a healthy and physically active life. Such programs must be planned carefully, taking into consideration the children's age and needs. The educational institutions responsible for creating policies must comprehend the necessity to develop intervention programs and syllabuses that will not only provide chances for physical activity but they will also promote an attitude towards a healthy way of living and its adoption for life (Zachopoulou & Kouli, 2017).

Another reason for which the adoption of a healthy way of living is important at early age children is the fact that most habits (dietary or athletic) are easier to acquire at this age rather than at the age of high school (Wetton, 2005). Consequently, it is hard to design and apply actions which prevent obesity effectively and promote a healthy way of living without reinforcing children's comprehension on what is important or without changing the basic behaviours that contribute to the increase of body weight.

### **Children's acquisition of positive experiences from their participating in motor activities**

In order that children acquire positive experiences through their participating in motor activities or games, it is important that these activities and games as well as the general environment of the class provoke fun and interest, cover their needs and motivate their participation (Papaioannou, Theodoraki & Gouda, 2003).

Motivation refers to human action and its defining factors. Through motivation one can explain and analyze the reasons why people choose to do something, the intensity with which they do it and whether they will continue doing it or not (Alderman, 1974). According to Singer (1980) motivation is responsible for: (1) choosing and preferring an activity, (2) continuing doing this activity, (3) the intensity and vitality of its performance and (4) the adequacy of its performance, according to the existing levels. More specifically, the result of motivation reflects people's reaction to internal motives, since they choose activities which they believe are capable of producing satisfaction.

The ability and success in motor activities is a basic factor of motivation (Roberts, Kleiber & Duda, 1981). Thus, children who feel skillful in motor activities display high motivation, while children with limited skills are not easily motivated to participate. Nonetheless, children should take up motor activities which respond to their individuality i.e. present challenges which meet their personal abilities. At this point it is very important for children to be able to evaluate their skills by themselves (Papaioannou & Kouli, 1999).

Furthermore, there are theories in the field of motivation for achievement (Dweck & Leggett 1988; Nicholls 1992) and researches (Duda 1989; Duda, Fox, Biddle & Armstrong 1992) which mention that there are at least two aspects concerning the way someone perceives his/her participation in motor activities or Physical

## Helping Active Lives through Targeting Healthy Youth



Education. The first aspect which is called “orientation to the task” focuses on learning, improving and responding to the demands of the activity. Any perception concerning personal ability comes from the person him/herself. The success criteria are subjective and depend on whether the person believes that he/she has improved or learnt something. Thus, any subjective failure is rather improbable, since mistakes are considered as part of the learning process and a guide for future improvement. The state of “orientation to the task” renders a child happy with his/her personal achievement, interested in improving and hard working. The second aspect which is called “orientation to the ego” mainly focuses on “surpassing the others” (Duda 1989; Duda, Fox, Biddle & Armstrong 1992). At this state, a person creates his/her perception concerning personal ability according to models and his/her success is based on the comparison with other people’s performances. Such persons develop negative feelings when they are found to be on a lower level than the others. As a result, they hardly try to succeed, in order to have a plausible excuse for failing and it is very possible that they will stop trying after a number of failures.

As mentioned in a research by Nicholls (1989), the above two aspects are not inter-dependable. This means that orientation to the project and orientation to the ego are not necessarily opposite concepts. A person can be intensely orientated to the project and ego at the same time, a little orientated to both states or highly orientated to the first in relation to the other (Duda, 1988).

Concerning the role of school environment, there are older researches (e.g. Treasure & Roberts, 1995) highlighting the inability of teachers to reinforce children’s motivation in order to participate in motor activities at an early age. Teachers and children alike create a psychological climate that intervenes in their effort to achieve any intended targets (Ames, 1992; Roberts, 1992; Ames & Archer, 1988). This psychological climate implicates children in certain self-evaluation procedures and leads them to adopt either an orientation to the project or to ego. Teachers have two important options as concerns motivation climate: they can choose the “competitive” model where the criterion of success is the result of the performance and the “educational” model, where the criterion of success is learning/improvement. There are researches (Ames & Archer, 1988; Duda, Chi, Newton, Walling & Catley, 1995) which prove that a motivation climate based on work is positively related to the orientation to the project and interest to the task. On the contrary, a competitive motivation climate leads children to adopt an orientation to the ego.

According to the above, when a teacher gives more emphasis to competition and evaluation using the performances of the others as criteria, it is obvious that the children will be driven to the orientation to the ego. On the contrary, when the environment emphasizes on learning, improvement of skills, hard effort and participation for pleasure, then the children will be driven to the orientation to the task. In addition, many researches (Ames & Archer 1988; Ames 1992; Papaioannou, 1994) have shown that a “motivational climate” can influence children towards an orientation to the task or ego. As a result, in order that children get a positive

## Helping Active Lives through Targeting Healthy Youth



experience from a motor activity, a teacher should create a favorable motivation climate, which will improve their skills within an ambient of acceptance and encouragement, which creates many chances for learning.

Finally, it is widely accepted that organized programs of motor activity can influence children's motivation and commitment to physical activity, because movement has the ability to promote positive experiences for them (Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003; McKenzie, 2007; Pratt, Macera, & Blanton, 1999). The above conclusions are generally valid for all ages but they are particularly significant for early aged children (Liukkonen, 2007), because that age establishes the basis of their social behaviour and their incorporation to the social environment, as well as their attitude towards physical activity and a generally active way of living (Liukkonen, 2010).

### **Practical instructions for encouraging children towards a naturally active way of living**

A way to familiarize and encourage children towards an healthy and naturally active kind of living is the daily participation in kinetically active programs with a suitable developmental organization, during which the teacher uses various strategies to induce children's active participation for the biggest part of the activity. According to Zachopoulou and Kouli (2017), to apply these strategies a teacher should:

- Plan the activities so as to give children enough time to be kinetically active to run, bounce, climb etc.
- Give emphasis to cooperation instead of competition, so that every child has the chance to complete the activity.
- Give motives to children (e.g. verbal praise and small awards) for their naturally active way of living.
- Organize indoor activities, because children need to be active even when the weather deters outdoor activities.
- Encourage children to participate in activities, without pressing them when they are reluctant.
- Participate actively in the activities becoming a role model. Young children copy adults and follow their example.
- Adjust the intensity levels of the activities to the physical condition of the children.
- Change or modify the activities when some children show signs of fatigue and invent games and activities with the children, motivating their interest.
- Create a program incorporating activities which activate different muscular units.

Furthermore, according to various researchers (Jones-Hamilton, 2002; Siedentop & Tannehill, 2002; Good & Brophy, 1987; Siedentop, 1983), teachers should apply certain strategies, in order to create a motivational and therefore



## Helping Active Lives through Targeting Healthy Youth



positive learning environment, in which children could enjoy the positive results of their participation. These strategies are:

- To separate the children in to small groups (no more than four children per group).
- To take advantage of all the available material.
- To organize the groups in a way that they do not obstruct one another.
- To reduce the instruction time (give plain, clear and precise instructions).
- To individualize training considering the personal differences among children and allow them to participate in the activities continually and successfully. In order to do so, a teacher must:
  - Modify the degree of difficulty of an activity (use variations of an exercise or change its style),
  - Create challenging exercises (slightly more difficult than the children's ability to perform),
  - Create different kinds of challenges (simultaneous performance of different movements, different complexity).
- Manage lesson time effectively, since the time which is devoted to effective practical training is a strong learning index. In order to do so, a teacher must:
  - Start lesson immediately (minimize gathering time, absence control, etc)
  - Minimize the time needed for organizing the lesson, using routines (applying fast and effective ways to divide groups, distribute material, etc).
  - Maximize the time during which children are occupied with the subject.

### Bibliography

Alderman, R.B. (1974) *Psychology Behavior in Sport*. Philadelphia: W.B. Saunders Company.

Ames, C. (1992). Classrooms: goals, structures and student motivation. *Journal of Educational Psychology*, 84(3) 261-271.

Ames, C., & Archer, J., (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology*, 80, 260-267.

Byrne, N.M., & Hills, A.P. (2007). The importance of physical activity in the growth and development of children. In: A.P. Hills, N.A. King, & N. M. Byrne. (Eds.). *Children, Obesity and Exercise. Prevention, treatment and management of childhood and adolescent obesity*, pp. 50-60. London & New York: Routledge.

Duda, J.L., (1988). The relationship between goal perspectives and persistence and intensity among recreational sport participants. *Leisure Sciences*, 10, (95-106).

Duda, J.L., (1989). Relationship between task and ego orientation and the perceived purpose of sport among high athletes. *Journal of Sport & Exercise Psychology*, 11, 318-335.

## Helping Active Lives through Targeting Healthy Youth



Duda, J.L., Chi, L. Newton, M., Walling, M., & Catley, D., (1995). Task and ego orientation and intrinsic motivation in sport. *International Journal of Sport Psychology*, 26, 40-63.

Duda, J.L., Fox, K.R., Biddle, S.J.H., & Armstrong, N., (1992). Children's achievement goals and beliefs about success in sport. *British Journal of Educational Psychology*, 62, 313-323.

Dweck, C.S., & Leggett, E.L.,(1988). A Social cognitive approach to motivation and personality. *Psychological Review*, 95, 256-273.

Gallahue, D. Donnelly, F. (2003). *Developmental physical education for all children*. Champaign: Ill: Human Kinetics.

Hagger, M., Chatzisarantis, N., Culverhouse, T., & Biddle, S.J.H. (2003). The Processes by Which Perceived Autonomy Support in Physical Education Promotes Leisure-Time Physical Activity Intentions and Behavior: A Trans-Contextual Model. *Journal of Educational Psychology*, 95(4), 784-795.

Good, T.L. & Brophy, J.E.(1987). *Looking in classrooms*. NY: Harper & Row.

Hill, J.O., & Peters, J.C. (1998). Environmental contributions to the obesity epidemic, *Science*, 280, 1371-1374.

Hill, J.O., Wyatt, H.R., Reed, G.W., & Peters, J.C. (2003). Obesity and Environment: Where Do We Go from Here? *Science*, 299 (5608), 853-855.

Hill, J.O., Wyatt, H.R., Reed, G.W., & Peters, J.C. (2003). Obesity and Environment: Where Do We Go from Here? *Science*, 299 (5608), 853-855.

Jones-Hamilton, L. (2002). Measuring effective teaching. [www.uncw.edu/cte/et/Resnotes/Jones-Hamilton/index.htm](http://www.uncw.edu/cte/et/Resnotes/Jones-Hamilton/index.htm)

Liukkonen, J. (2007). Teacher's role in promoting children's intrinsic motivation towards physical activity. In E. Zachopoulou, N. Tsangaridou, I. Pickup, J. Liukkonen, V. Grammatikopoulos, (Eds.) 'Early Steps'. *Promoting healthy lifestyle and social interaction through physical education activities during preschool years*. pp. 23-26, Thessaloniki: Xristodoulidi Publications.

Liukkonen, J. (2010). Promoting Children's Sound Personality Development and Intrinsic Motivation Towards Physical Activity. In E. Zachopoulou, J. Liukkonen, I. Pickup, N. Tsangaridou (Eds.) *Early Steps Physical Education Curriculum. Theory and Practice for Children Under 8*. pp. 31-40, United States: Human Kinetics.

McKenzie, T.L. (2007). The Preparation of Physical Educators: A public health perspective. *Quest*, 59, 346-357.

Moore, L.L., Lombardi, D.A., White, M.J., Campbell, J.L., Oiveria, S.A., & Ellison, R.C. (1991). Influence of parents' physical activity levels on activity levels of young children, *Journal of Pediatrics*, 118, 215-19.

Nicholls, G.J. (1992). The general and the specific in the development and expression of achievement motivation. In G. Roberts (Ed.). *Motivation in sport and exercise* (pp. 31-55). Champaign, IL: Human Kinetics.

Nicholls, J.G. (1989). *The Competitive Ethos and Democratic Education*. Cambridge M.A.: Harvard University Press.



## Helping Active Lives through Targeting Healthy Youth



Papaioannou, A. (1994). The development of a questionnaire to measure achievement orientations in physical education. *Research Quarterly for Exercise and Sport*, 65, 11-20.

Papaioannou, A., Theodorakis, Y., & Goudas, M. (2003). *For a better physical education*. Thessaloniki: Publications, Christodoulidi. [in Greek language]

Papaioannou, A., & Kouli, O. (1999). The effect of task structure, perceived motivational climate and goal orientations on students' intrinsic motivation and anxiety. *Journal of Applied Sport Psychology*, 11, 51-71.

Parizkova, J., & Hills, A.P. (2005) *Childhood Obesity: Prevention and Management*, 2nd edition, Boca Raton, FL: CRC Press.

Pratt, M., Macera, C.A., & Blanton, C. (1999). Levels of physical activity and inactivity in children and adults in the United States: current evidence and research issues. *Medicine & Science in Sports & Exercise*, 31, 526-533.

Promislow, S. (2005). *Making the brain – body connection*. Vancouver, BC: Enhanced Learning and Integration.

Roberts, G.C. (1992). *Motivation in sport and exercise*. Champaign, IL: Human Kinetics.

Roberts, G.C., Kleiber, D.L., Duda, J.L., (1981). An analysis of motivation in children's sport. The role of perceived competence in participation. *Journal of Sport Psychology*, 3, 206-216.

Siedentop, D. (1983). Academic learning time; reflecting and prospect. *Journal of Teaching in Physical Education*. (Monograph 1), 3-7.

Siedentop, D., & Tannehill, D. (2002). *Developing Teaching skills in Physical Education*. CA: Mayfield

Singer, R.N. (1980). Motivation in Sport. In *Psychology in Sports: Methods and Applications*. R. Suin (Ed.), Min: Burgess Pub. Co.

Sutterby, J. (2009). What kids don't get to do anymore and why. *Childhood Education*, 85(5), 289-292.

Treasure, D.C., & Roberts G.C., (1995). Applications of Achievement Goal Theory to Physical Education: Implications for Enhancing Motivation. *Quest*, 47, 475-489.

Wetton, P. (2005). *Physical education in the nursery and infant school*. London: Routledge.

Wickstrom, R. (1970). *Fundamental Motor Patterns*, Philadelphia, PA: Lea and Febiger.

Yanovski, J.A., & Yanovski, S.Z. (2003). Treatment of pediatric and adolescent obesity. *Journal of the American Medical Association*, 289(14), 1851–1853.

Young, J., & Hills, A.P. (2007). Childhood obesity. In: A.P. Hills, N.A. King, & N. M. Byrne. (Eds.). *Children, Obesity and Exercise. Prevention, treatment and management of childhood and adolescent obesity*, pp. 1-10. London & New York: Routledge.

Zachopoulou, E. & Kouli, O. (2017). *Physical Education at the Beginning of the 21st Century. Aims-Goals-Purposes in Preschool Age*. Thessaloniki, Publications: Afoi

**Helping Active Lives through  
Targeting Healthy Youth**



Kyriakidi. [in Greek language]



**Ancient & Traditional Greek children's games**  
**Evangelos Albanidis, Democritus University of Thrace, Greece**

**Introduction**

Most people know that the ancient Greeks loved sports and worshipped athletes. Much of their leisure time was taken up with running, jumping and throwing the javelin and discus. This was because they believed that the gods wanted their bodies to be as near to perfection as possible. Apart from exercising a daily routine of children in ancient Greece included plays, in other words, games.

If someone studies games in an historic era of 4.000 years he/she will presume that people stay the same. They love playing. If someone asks himself why we play, the answer is because we try to escape our loneliness and our tiring everyday life. Play has a universal nature and ancient and traditional children's games in the Mediterranean world have many analogies, have a great number of similarities due to common context and cultures.

Just like children of today, children in ancient Greece enjoyed playing a variety of games. Apparently Greek parents viewed games as a good way for their children to develop certain skills, just like parents do today. Traditional games are those that are played informally with minimal equipment. Children learn by example from other children, and play them without reference to written rules. Children's traditional games are those that are passed from child to child, generation to generation, informally, by word of mouth.

The purpose of this presentation is to reveal the resemblance between the ancient and traditional physical activity games synoptically. Data collected from ancient Greek pottery paintings and descriptions from sources of literacy, as well as from folkloric recordings prove these liaisons. The most important source for the ancient games is the *Onomasticon* by Pollux which cataloguing the games and songs of Greek children.

Greeks gave great value on physical activity games as an educational component for their body and soul. Plato advises parents to leave their children to play freely as in this way they learn to take part in public activities and decisions. They had to obey rules and accept winning or losing<sup>1</sup>. It was considered to be an educational instrument for the understanding of simple or more sophisticated knowledge in a more pleasant way. Plato<sup>2</sup> recommended teachers to use playing and not violence in their lessons. Aristotle<sup>3</sup> suggests playing as a recreational remedy that helps body and soul to rest. Galen talks about the value of ball games

---

<sup>1</sup> Lazos Christos: *Playing through time. Ancient Greek and Byzantine games (1700 BC-1500 AC)*, Athens 2002, p.35 (In Greek)..

<sup>2</sup> Plato, *Republic* 536e-537a

<sup>3</sup> Aristotle, *Politics* 1337b.

## Helping Active Lives through Targeting Healthy Youth



pointing out that they exercise body in a symmetrical way, they benefit spirit and they don't put people in risk as other games do<sup>4</sup>.

Physical activity games were categorized as following together with the traditional games that have a great resemblance to them (*ball games, games of changing roles, team, running and skill games*). The majority of these games appear to have many similarities that have travelled through time with exceptional accuracy.

### Ball games

Games involving a ball (“sfaira”, from where the word “sphere” is derived) were very popular in ancient Greece. Balls were filled with fibers, hair or feathers, rather than being inflated with air as occurs today. The most popular ball games in antiquity were *Phaininda* and *Harpaston*.

*Phaininda* was played by two teams, and the team in possession of the ball threw it to each other, while their opponents tried to take it from them. To avoid this, they had to deceive the opposition, and the man who held the ball would pretend that he was going to send it to one player, but in the end throw it to another.

*Harpaston* was the same as *phaininda*. The aim of the player was to “snatch” the small ball in fight, amongst the crowd of opponents, by means of violent pushing, running and feinting. *Phaininda* and *Harpaston* are similar to the traditional game Sucker Game (*Koroido*).

One of the most popular ball game among the traditional games is *Apples* (*mela*). In this game children are divided into two groups. Two players of one group stand opposite one another and the players of the other group gather between them. The two players throw a ball at each other trying to hit one of the children of the rival group. If the ball hits a player then they get “burned” and exit the game. However, if a player catches the ball, he wins an “apple.” The goal of this game is to get as many “apples” as possible. Each “apple” gives the player an extra “life” he can use in case he gets “burned.”

*Episkyros*, “stone chip”, a very well known ball game in antiquity in which teams try to force each other over an end line by throwing a ball over their opponents’ heads. It was played by youths at Sparta as part of their transition to the status of adult warriors. The game is named for the stone chips (*skyroi*) which separated the teams; it is also called *ephebike*, (“ephebe ball”), and *epikoinos*, (“team ball”). It is resemblance to modern rugby.

### Games of changing roles

---

<sup>4</sup> Galen, *On exercise with the small ball* 1-23.

## Helping Active Lives through Targeting Healthy Youth



Games of changing roles were very familiar to young children as in modern times. One of the most popular was the *bronze fly* (chalki myia). In antiquity, they blindfolded a child with a scarf and the others hit him with their belts until he caught another child. Nowadays is known as blindfold (*Tyflomiga*).

Another popular game was *schoinofilinda*. According to the rules, the squad of players was squatting facing the center of the circle. A player, chosen by lot, ran around their backs, holding a small rope that he left suddenly. If the squatted player did not understand the rope, then the player who placed the rope would hit him with it for a whole circle. *Schoinofilinda* was a game somewhat like our “hunt –the-slipper” (the belt of a mother).

*Ephedrismos* was also a popular game in antiquity. It’s name is derived from the Greek word for sit “sit upon”. Two players place a stone upright on the ground and throw other stones at it from a distance. The player who fails to knock over the upright stone then carries the other layer on his back while the winner’s hands cover his eyes. The pair around in this fashion until the losing player touches the stone. *Ephedrismos* was a kind of piggyback game (*makria gaidoura*).

Another game known as *ostrakinda* (“the piece”) involved dividing the group into two sides, who would face each other on either side of a line. They would throw into the air a piece of something (such as from a broken jar) that had a black face painted on one side and nothing on the other (called night and day, or “nyx” and “mera”). Whoever caught the white piece chased those who touched the black piece, and whoever was caught had to carry the winner on their shoulders like a donkey (“onos”).

### Running games

“Hide and seek” is nowadays a popular children’s game in Greece in which any number of players conceal themselves to be found in one or more seekers. In particular, ancient Greek games that are still played by children today and belongs to this category, include tag (“*apodidraskinda*” or “*drapetinda*”), hide-and-seek and blind man’s buff (“*mykinda*”). Even though it is possible to imagine how they developed, we do not know the rules used to play them.

In “*apodidraskinda*” a player closes his eyes and the others run to hide. The player opens his eyes and looks for them. Every time he finds a player he must run back to his original place first or else he loses. Similar to that game is the traditional game of *Abariza* (Prisoner’s base). The game is played by two groups. Each group draws on the ground an “*abariza*”, a circle of 3-4 m. diameter and a square used as a prison. Between the two “*abarizas*” there is a distance of 20-40 meters. A random player of the first team starts running between the two “*abarizas*” and a player of the other team tries to catch him and put him in prison. The winner os the team that manages to imprison all the opponents.



## **Team games**

Team games were believed to act as a means of self-education because the child was made to coordinate his forces with those of his teammates, to achieve common purposes. The most famous team game in antiquity was *diekistinda* (tug of war). It was a contest in which two teams put at opposite ends of a rope until one drags the other over a central line. This game could be played also by two players. The players nailed a pole with a hole in the middle into the ground. They put a rope through the hole and two players tied its ends round their waist so that they could not face each other. Pulling hard they tried to make their opponents come close to the pole.

Another popular team game in antiquity was the *Kerretizein* (from the ancient word “keras” which means bat). It was played with a bat and is the forerunner of field hockey. Moreover another traditional game called “gourouna” has many similarities with this game.

Another team game in antiquity which was familiar to young children was *akinitinda*. Once the players hear the cue word they have to stay still in whichever position they are. The first to move is expelled from the game. The same rules stand for the “marbles” (*agalmatakia*) which are played nowadays as a traditional game.

## **Skill games**

Skill games are very familiar in antiquity and the most popular of them were *askoliasmos*, *krikilasia*, *pentelitha* and *eis omilan*. In *askoliasmos* the players jumped on an oiled stuffed sack on one leg and tried to keep their balance. Among the traditional games we can now find the sack running game. In Greek and Roman ancient times children also played hopscotch, a play which was used by the Roman army for building strength. In many archaeological places we can find this pattern for hopscotch, for example in Greek or Roman roads or Forums. Hopscotch is still a very popular traditional game.

A very popular game was also the *Krikilasia* (*hoop rolling*) in which a large hoop is rolled along the ground. Hoop rolling is very popular in many European countries and it is also a popular Greek traditional game.

*Pedelitha* or *astragaloï* was for limitless participants. Each child had five pebbles near his feet. The player threw a pebble or knucklebone up in the air and had to pick up another pebble from the ground before catching the first which was thrown. *Pedovola* as a traditional game is played with a similar way.

The older boys of the gang played “*eis omillan*”, namely teams. Having drawn a circle in the ground and standing on a specific point they tried to throw their knuckles in the circle. They had agreed beforehand upon having ten attempts. The winner got to draw a circle, decide on its diameter and the point of throw. In the



## Helping Active Lives through Targeting Healthy Youth



traditional game of *amades* children try to hit the stone pyramid they built or to throw the stones nearer to another.

Other skill games are *teetotum* or *spinning top*. The Ancient Greeks called it *strombo* and *strovilos* or *rhombus* (because of its shape) and *vomvykia* (because of the sound while spinning).

### Epilogue

Comparing most popular ancient and contemporary traditional games drives to the conclusion that there isn't a single game that hasn't its pair nowadays. We have to accept that it's about having a continuing heritage from generation to generation through time. In many occasions this is more than obvious since even the names of the games are alike. The methods, the rules, the way of playing, the tools, even the words and the phrases for encouragement of the players seem to be quite alike.

### Bibliography

Lazos Christos: *Playing through time. Ancient Greek and Byzantine games (1700 BC-1500 AC)*, Athens 2002 (In Greek)

Eliseo Andreu –Cabrera, Mar Cepereo Conzalez, Javier Rojas Ruiz, Juan Chinchilla-Mira: Pay and Childhood in ancient Greece, *Journal of Human Sport and Exercise* 3, 5 (2010) 339-347.

Crowther Nigel: "Team sports in Ancient Greece: Some observations" in: *12 International Journal of the History of Sport* (1995), 127-136.

Kolobova M.K. & Ozereckaja L.E.: *The daily life in ancient Greece*, Athens 1989 (in Greek)

Sagonas George: *Traditional Games*, Athens 2008. (In Greek)

Daraki Pepe: *Team games of our children*, Athens 1986. (In Greek)

Chryssikopoulos Mihalis: *Greek traditional games*, Thessaloniki 2006. (In Greek)



**Teaching ancient and traditional physical activity Greek games in a primary school  
classroom with the method of Artfulthinking**

**Smaragda A. Karasimopoulou, Democritus University of Thrace, Greece**

**Introduction**

The purpose of this paper to reveal the use of the educational method of “Artfulthinking” in order to use data from Greek ancient and traditional games in a more meaningful and interesting way for Primary school students (aged 10-12years old) and the development of their critical thinking on this topic. Artfulthinking routines are short flexible easy and engaging strategies (questions, think-about) that use looking, listening and talking about art so as to promote academic speaking, listening, reading and writing skills. They are developed by Project Zero<sup>i</sup>, a renowned educational research group at Harvard University in order to help students develop critical thinking skills in a non-threatening and engaging atmosphere.

**Most popular ancient Greek games compared to traditional games of nowadays**

If we study games in an historic era of 4.000 years we will presume that people stay the same. They love playing. If someone asks himself why we play, the answer is because we try to escape our loneliness and our tiring everyday life<sup>ii</sup>.

Comparing most popular ancient and contemporary traditional games drives to the conclusion that there isn't a single game that hasn't its pair nowadays. We have to accept that it's about having a continuing heritage from generation to generation through time. In many occasions this is more than obvious since even the names of the games are alike<sup>iii</sup>.

**The educational method of Artfulthinking in teaching ancient and traditional Greek games**

Thinking about works of art does good. This simple advice is given by Artfulthinking, a method that helps teachers regularly use works of art in their curriculum in ways that strengthen student thinking and learning. Developed between2004-2006 by Harvard Project Zero<sup>1</sup>, the program is being used by K-12 classroom teachers as well as art specialists in several schools in the Unites States

## Helping Active Lives through Targeting Healthy Youth



and Europe. It focuses on looking at and interpreting art, rather than making art, and its goals are twofold: To help teachers create rich connections between works of art and topics they are teaching; and to use the power of art as a force for developing students' thinking dispositions. This presentation provides material from an original lesson and its accession having as a theme a topic concerning history of sports and more specifically games played by children in Ancient and contemporary Greece.

After grouping physical games into five categories: group games, ball games, role playing games, running games, skill games, children are divided into 5 groups one for each category. They are encouraged to use a piece of art, for example a sculpture depicting ancient athletes of "kerrytizin", a game that has similarities with a traditional game named "gourouna" in order to approach the theme of our lesson. The basic steps of the activity are three. Students look, think, wonder. At first, each group has to look and write down what they notice. Secondly, they discuss their thoughts on the picture. Afterwards, they attend to a short lecture on ancient and traditional games. Each group is given extra sources in order to find similarities and relationships between games. Every step includes fruitful dialogue between the members of each group and announcements to the whole class. At the end, students are called to proceed to the creative writing of their own story on different eras and children playing games. Assessment for the method derives from the leaflet students have to attend to all through the lesson by comparing, reflecting and wondering about several matters on the topic.

### Epilogue

1. Object-centered learning aligns well with a constructivist viewpoint because students can directly experience objects through the senses. Doing so, leads students to generate their own impressions and thus provides them with a basis for building new knowledge. This connects to teaching thinking because one of the primary ways people build on their own impressions is by thinking about them, for example by probing and reflecting on them, purposefully extending them, and using them as a basis for asking questions and constructing interpretations<sup>iv</sup>.

A distinctive feature of thinking routines is that they encourage what cognitive psychologists call active processing. They don't ask that students simply list facts. Rather, they encourage students to actively engage with a topic by asking them to think with and beyond the facts they know by asking questions, taking stock of prior knowledge, probing the certainty of their ideas, and visibly connecting new knowledge to old.

## Helping Active Lives through Targeting Healthy Youth



“If a picture is worth a thousand words, a painting must be worth two thousand.”—  
Arianna Bonnes, 9th grade<sup>v</sup>

2. Artful thinking seems to be a very stimulating approach to teach through discovering all these similarities as well as evoking a number of critical thoughts concerning cultural and historical aspects. Students of primary school find it interesting to realize the evolutionary relationship of ancient and traditional kinetic games in Greece. The idea that the same games connect our lives, is a key to positive attitude towards the sport science and history. Using Artful thinking techniques is a powerful way to involve more energetically and critically childrens’ thoughts and imagination to matters of sports history.

### Bibliography

---

<sup>i</sup> Project Zero-Harvard University: <http://www.pz.harvard.edu/>

<sup>ii</sup> Lazos: *Playing through time*, p.37

<sup>iii</sup> Kakridis Ioannis: “Greek games”, in: *Emerologion megalis Elladas*, 4 (1925), 177 (In Greek).

<sup>iv</sup> Shari Tishman: “The Object of their Attention”, in: *65 Educational Leadership-Teaching Students to Think* „5 (February 2008) 44-46

<sup>v</sup> Shari Tishman & Patricia Palmer: “Visible Thinking”, in; *2 Leadership Compass*,4(2005)1-3.



**An approach to traditional Spanish games through experiential education  
Rodrigo Pardo & Teresa González Aja, Universidad Politécnica de Madrid, Spain**

**Introduction**

Experiential Education (or Experiential-Based Education) is not a new concept. Although its application in the formal education system has not been very widespread, it includes a pedagogical foundation of great importance within the different educational movements. We can identify three main influences: on the one hand, the pedagogical conception of classical authors, with Confucius, Plato and Aristotle as the most outstanding thinkers; on the other, the humanist pedagogy of Luis Vives. The heritage of classical pedagogues on praxis as a form of learning is taken up again in the 20th century by various authors, being John Dewey and Kurt Hahn the most outstanding. Other theorists such as Paulo Freire and Jean Piaget have also exerted an influence in the field of this pedagogy (Pardo & García-Arjona, 2015). From all these pedagogists we are going to further explain just one of them: Kurt Hahn.

**Kurt Hahn (1886-1974)**

We know Hahn's work through various interventions and discourses, although it has fallen to biographers and subsequent scholars to compile his pedagogical legacy. One of Hahn's main influences was, first of all, Plato, in terms of the development of citizenship and particularly citizen's need to serve the community; he thus established seven principles, also called "The Seven Laws of Salem" (Flavin 1996, p. 15):

1. Give children the opportunity for self-discovery.
2. Make the children meet with triumph and defeat.
3. Give the children the opportunity of self-effacement in the common cause.
4. Provide periods of silence.
5. Train the imagination.
6. Make games important but not predominant.
7. Free the sons of the wealthy and powerful from the enervating sense of privilege.

Hahn's innovation also lies in the importance he gave to natural environment as an attractive experiential learning scenario for students, thanks to the challenge of a space of uncertainty, limits and experiences; a classroom "outside the classroom". Thus, and based on this philosophy, the Schools of Adventure or Outward Bound arise, with a special expansion in the American and British context from the 1950s onwards (Zelinski & Shaeffer, 1991; Godfrey, 1980).

## Helping Active Lives through Targeting Healthy Youth



Nowadays, there are a large number of schools around the world that are inspired by Hahn's philosophy, especially in Europe and the United States. Some examples are: Outward Bound International<sup>1</sup>, Round Square Association<sup>2</sup> and Expeditionary Learning Schools<sup>3</sup>. The application of its educational proposal is not only limited to the formal school context, the pedagogy of the Outward Bound has also been applied in special populations: students in school failure or with intellectual giftedness, elderly people, war veterans, young people from disadvantaged neighborhoods or victims of gender violence (Zelinski & Shaeffer, 1991).

### Definition and characteristics of Experiential Education

More specifically, there are institutions at the international level such as the Association for Experiential Education, which defines Experiential Education as:

A teaching philosophy that informs many methodologies in which educators purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills, clarify values, and develop people's capacity to contribute to their communities (Association for Experiential Education, 2019).

Authors such as Carver (1998), Itin (1999) and Kolb (1984) explain more in detail what are the main characteristics of this pedagogy:

1. *It is focused on the process and not on the outcome.* The goal should be to involve students in a process that emphasizes learning, a process that includes information about the effectiveness of their efforts during learning and not just the final outcome.
2. *All learning is re-learning.* Students do not come to class with a blank mind but rather bring some ideas, being this previous knowledge the basis for new learning. The role of the teacher should not only be to provide new ideas but also to modify and even to get rid of some of them.
3. *Learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world.* Learning requires opposing skills (action/reflection, theory/practice) and therefore the learner must continuously choose what kind of skills to use in each specific learning situation (experience).
4. *Learning is a holistic process of adaptation to the world.* Experiential Education seeks to involve the whole individual, both intellectually, emotionally and physically.
5. *Learning is the result of transactions between the student and the environment.* The context in which it is taught is as important as the content and method used, since if we want to form individuals with a critical

<sup>1</sup> Available at: <https://www.outwardbound.net>

<sup>2</sup> Available at: <http://www.roundsquare.org>

<sup>3</sup> Available at: <https://eleducation.org>



## Helping Active Lives through Targeting Healthy Youth



conscience, responsible and committed, they must acquire such faculties in environments that favor their development.

6. *Learning is a knowledge-generating process.* Experiential Education follows constructivist postulates, since it takes experience as the basis of learning. It is the learner himself who constructs knowledge from direct experience, acquiring the skills and values necessary for his/her development as an individual (Luckmann, 1996).

### Learning sequence: From practice to theory

Because experience is not synonymous with learning, it is necessary to frame it within a broader framework in order to understand its function within the entire educational process. The learning process in Experiential Education has been described by several authors as a cycle, in which the elements of "experience", "reflection", "theory" and "application" must be intimately related (Dewey, 1938; Kolb, 1984).

David Kolb (1984), for the development of his model called "Experiential Learning Cycle", relied on the work of authors such as Kurt Lewin, who was interested in active participation in learning; John Dewey, who recognized the importance of experience in the learning process; and Jean Piaget, who posed the learning process as a continuous interaction between the individual and his/her environment (Kolb & Kolb, 2005). Based on these authors, Kolb proposes that learning should be continuous and holistic, so that success is based not so much on results but the process itself. If learning is conceived from this perspective, says Kolb, links can be built with everyday life situations at school and at work, so the knowledge acquired can be applied and at the same time perpetuated over time.

Figure 1 shows the learning sequence of the Kolb model, which is conceived as a four-phase cycle: (1) Concrete experience, (2) Reflective observation, (3) Abstract conceptualization, and (4) Active experimentation (Boyatzis & Kolb, 1995; Kolb, 1984). In this way, the learner initiates this cycle by living an experience (1) that is the basis of a reflective and subsequent observation process (2). These reflections and observations are assimilated and contrasted with more theoretical concepts (3) in order to elaborate new ideas that can be applied through new practical experiences (4). Thus, the learning cycle continues its course but increased in complexity (Atkinson & Murrell, 1988).

# Helping Active Lives through Targeting Healthy Youth

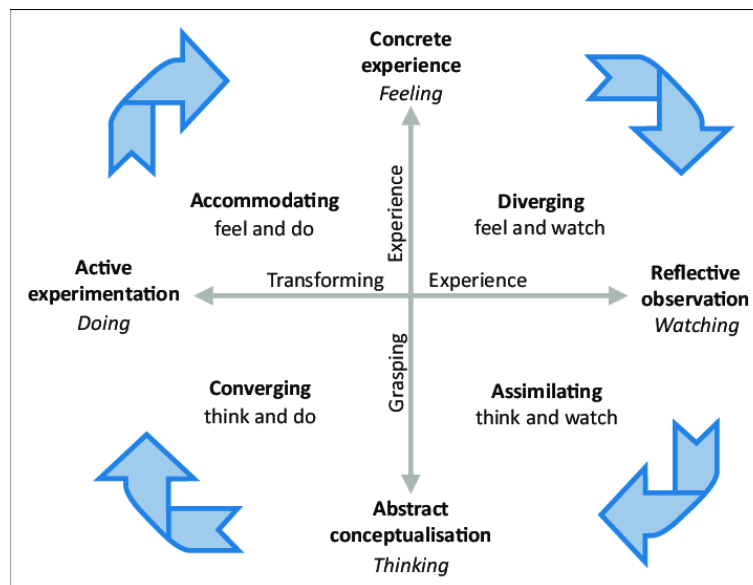


Figure 1. Experiential Learning Cycle (Van der Horst & Albertyn, 2018).

## The principles of practice

To conclude this presentation, the principles of practice of Experiential Education are presented as follows (Association for Experiential Education, 2019):

- Experiential learning occurs when carefully chosen experiences are supported by reflection, critical analysis and synthesis.
- Experiences are structured to require the learner to take initiative, make decisions and be accountable for results.
- Throughout the experiential learning process, the learner is actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning.
- Learners are engaged intellectually, emotionally, socially, soulfully and/or physically. This involvement produces a perception that the learning task is authentic.
- The results of the learning are personal and form the basis for future experience and learning.
- Relationships are developed and nurtured: learner to self, learner to others and learner to the world at large.
- The educator and learner may experience success, failure, adventure, risk-taking and uncertainty, because the outcomes of experience cannot totally be predicted.
- Opportunities are nurtured for learners and educators to explore and examine their own values.

# Helping Active Lives through Targeting Healthy Youth



- The educator's primary roles include setting suitable experiences, posing problems, setting boundaries, supporting learners, insuring physical and emotional safety, and facilitating the learning process.
- The educator recognizes and encourages spontaneous opportunities for learning.
- Educators strive to be aware of their biases, judgments and pre-conceptions, and how these influence the learner.
- The design of the learning experience includes the possibility to learn from natural consequences, mistakes and successes.

## Bibliography

Association for Experiential Education (2019). What is Experiential Education? Retrieved from: <https://www.aee.org/what-is-ee>.

Atkinson, G. & Murrell, P. H. (1988). Kolb's experiential learning theory: A meta-model for career exploration. *Journal of Counseling & Development*, 66(8), 374-377.

Boyatzis, R. E. & Kolb, D. A. (1995). From learning styles to learning skills: The executive skills profile. *Journal of Managerial Psychology*, 10(5), 3-17.

Carver, R. (1998). Experiential education for youth development. *Focus*, 4(4), 1-2

Dewey, J. (1938). *Experience and education* (1997 ed.). New York: Touchstone.

Flavin, M. (1996). *Kurt Hahn's schools and legacy*. Wilmington, Delaware: Middle Atlantic Press.

Godfrey, R. (1980). *Outward Bound, schools of the possible*: Anchor Press/Doubleday.

Itin, C. M. (1999). Reasserting the philosophy of experiential education as a vehicle for change in the 21st century. *The Journal of Experiential Education*, 22(2), 91-98.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice-Hall.

Kolb, A. Y. & Kolb, D. A. (2005). Learning styles and learning spaces: Enhancing experiential learning in higher education. *Academy of Management Learning & Education*, 4(2), 193-212.

Luckmann, C. (1996). Defining Experiential Education. *Journal of Experiential Education*, 19(1), 6-7.

Pardo, R. & García-Arjona, N. (2015). La Educación Experiencial. In T. González Aja, P. Irureta-Goyena & R. Pardo (Eds.), *La Educación Experiencial como innovación educativa* (pp. 71-94). Madrid: Plaza y Valdés.

Van der Horst, C.A., & Albertyn, R.M. (2018). The importance of metacognition and the experiential learning process within a cultural intelligence-based approach

## Helping Active Lives through Targeting Healthy Youth



to cross-cultural coaching. *SA Journal of Human Resource Management*, 16, a951.  
Doi: 10.4102/sajhrm.v16i0.951

Zelinski, M. & Shaeffer, G. (1991). *Outward bound: The inward odyssey*.  
Hillsboro, Oregon: Beyond Words Publishing.



**Obesity and related diseases in children related to inactivity  
Theodoros Xanthos, European University Cyprus, Cyprus**

**Introduction**

The term obesity refers to an excess of fat. Because of the unavailability and high cost of techniques that directly measure body fat, body mass index (BMI), derived from the body weight and height, has emerged as the accepted clinical standard measure of overweight and obesity for children 2 years and older. Body mass index is calculated by dividing the body weight in kilograms by the height in meters squared (1). However this measurement can underestimate or overestimate the level of adiposity. Waist circumference and waist-to-hip ratio can be used to assess abdominal obesity, whereas skinfold thickness is helpful as an indicator of adiposity (2,3). Currently, about one-third of children and adolescents in the United States are classified as either overweight or obese. The prevalence of overweight or obesity increases with advancing age: 22.8% of preschool children (age, 2-5 years), 34.2% of school-aged children (age, 6-11 years), and 34.5% of adolescents (age, 12-19 years) are afflicted with overweight or obesity<sup>1</sup> and 8.4% of preschool children (age, 2-5 years), 17.7% schoolaged children (age, 6-11 years), and 20.5% of adolescents (age, 12-19 years) have obesity (4). The prevalence of obesity varies by racial, ethnic, and socioeconomic factors. Childhood obesity is more common in African Americans, American Indians, and Mexican Americans than in non-Hispanic whites (5). Obesity is also more prevalent in low-income populations (6). Hereditary factors have a strong effect on the prevalence of obesity in children. Obesity in 1 parent increases the risk of obesity in the child by 2- to 3-fold, and up to 15-fold if both parents have obesity.

**Body Mass Index and Etiology of obesity**

The following BMI-based definitions are used for overweight and obesity for children and adolescents between 2 and 20 years of age: Overweight: BMI at or greater than 85th to less than 95th percentile for age and sex. Obesity: BMI at or greater than 95th percentile for age and sex. Severe obesity: BMI at or greater than 120% of the 95th percentile, or BMI at or above 35 kg/m<sup>2</sup> (whichever is lower). This corresponds to approximately the 99th percentile, or BMI score at or above 2.3 above the mean. Some experts recommend classifying obesity in 3 classes: class I

## Helping Active Lives through Targeting Healthy Youth



obesity (BMI at or above 95th percentile to less than 120% of the 95th percentile), class II (BMI at or above 120% to less than 140% of the 95th percentile, or BMI at or above 35 kg/m<sup>2</sup>), and class III (BMI at or above 140% of the 95th percentile, or BMI at or above 40 kg/m<sup>2</sup>) (7).

The prevalence of obesity has increased dramatically in school-aged children (age, 6-11 years) and adolescents (age, 12-19 years) between 1976 and 1980 and between 2009 and 2010 (from 6.5% to 18.0% in children and from 5.0% to 18.4% in adolescents). However, the percentage of children and adolescents in each weight category remained almost stable between 2000 and 2012.<sup>1</sup> In addition, limited evidence suggests that obesity prevalence may have decreased in preschoolaged children (age, 2-5 years) from 13.9% in 2004 to 8.4% in 2011 and 2012. In addition, limited evidence suggests that obesity prevalence may have decreased in preschoolaged children (age, 2-5 years) from 13.9% in 2004 to 8.4% in 2011 and 2012 (8). Despite the recent plateau in the overall prevalence of childhood obesity in the United States, the prevalence of severe obesity in children aged 2 to 19 years has continued to increase. In 2012, 5.9% of children had severe obesity (defined in this report as BMI >120% of the 95th percentile, or BMI >35 kg/m<sup>2</sup>).

Heritable factors appear to be responsible for 30% to 50% of the variation in adiposity. Although polygenetic obesity is by far the most commonly observed, several single gene defects and syndromes associated with obesity have been identified. However, these account for less than 1% of childhood obesity in tertiary care centers. There are other secondary causes of obesity including neurological, endocrine, psychological, drug induced and hypothalamic. There is increasing evidence for an association between shortened sleep duration and/or poor sleep quality and obesity (9).

### Comorbidities

Childhood obesity is associated with comorbidities affecting almost every system in the body including, but not limited to, the endocrine, gastrointestinal, pulmonary, cardiovascular, and musculoskeletal systems. Many of the comorbidities encountered in youth with obesity, including type 2 diabetes mellitus (T2DM), dyslipidemia, obstructive sleep apnea (OSA), and steatohepatitis, used to be previously considered “adult” diseases. The severity of these comorbidities typically increases with the severity of obesity. Children with obesity are at an increased risk of hyperinsulinemia, insulin resistance, prediabetes, and subsequently T2DM (10). The prevalence of prediabetes and T2DM varies with severity of obesity, race,



## Helping Active Lives through Targeting Healthy Youth



ethnicity, and age of the child. Those who present with T2DM during adolescence appear to have more rapid deterioration of glycemic control and progression of diabetes-related complications such as microalbuminuria, dyslipidemia, and hypertension as compared with those who present later in life. Children with obesity also have a high prevalence of other cardiometabolic risk factors including elevated blood pressure, low levels of high-density lipoprotein cholesterol, and elevated levels of triglycerides. Echocardiographic findings include left ventricular hypertrophy, increased left ventricular and left atrial diameter, and systolic and diastolic dysfunction (11). Obesity may be associated with early onset of sexual maturation in girls and with accelerated linear growth and advanced skeletal maturation. Adolescent girls are also at higher risk of developing hyperandrogenism and polycystic ovary syndrome. Children with obesity have a considerably higher prevalence of OSA than do healthy weight children. The prevalence and severity of OSA increase with increasing BMI. Children with severe obesity may also have alveolar hypoventilation associated with severe oxygen desaturation. Childhood obesity has also been shown to be associated with asthma (12). Nonalcoholic fatty liver disease (NAFLD) in children is strongly associated with obesity. The spectrum of NAFLD can range from simple steatosis to progressive steatohepatitis and cirrhosis. Nonalcoholic fatty liver disease is now the most common cause of liver disease in children. Although most patients with NAFLD are asymptomatic, laboratory abnormalities include elevations in levels of liver transaminases (alanine aminotransferase and aspartate aminotransferase), alkaline phosphatase, and gamma-glutamyl transpeptidase. Imaging may confirm the presence of fatty liver, indicated by increased echogenicity on ultrasonography, but liver biopsy is the only way to reliably distinguish between simple steatosis, steatohepatitis, and fibrosis and can also be helpful in excluding other causes of elevated levels of serum aminotransferases (13). Other comorbidities include musculoskeletal problems, dermatologic and neurological problems. There are also long term associated risks. Children whose obesity persists into adulthood have a significantly increased risk of T2DM, hypertension, dyslipidemia, and carotid-artery atherosclerosis than do adults who were never afflicted with obesity. Higher BMI during childhood has also been associated with an increased risk of fatal and nonfatal cardiovascular events during adulthood in both men and women, though this may be partially mediated by the association between childhood obesity and adult obesity (14).

### **Clinical Interventions for the treatment of obesity**

## Helping Active Lives through Targeting Healthy Youth



The Expert Committee on the Assessment, Prevention, and Treatment of Child and Adolescent Overweight and Obesity recommends a staged approach to weight management in children. Stage 1 (Prevention Plus) includes specific dietary and physical activity recommendations, such as encouraging fruit and vegetable consumption and limiting sedentary activities such as watching television, playing video games, and using computers. If there is no improvement in BMI in 3 to 6 months, stage 2 (Structured Weight Management) should be considered. This stage includes recommendations on low energy-dense, balanced diet; structured meals; supervised physical activity of at least 60 min/d; 1 hour or less of screen time per day; and self-monitoring through food and physical activity recording. Referral to dietitians is needed for this stage. Monthly contact is recommended and should be tailored to the needs of the patient and family. Advancement to the next stage (stage 3, Comprehensive Multidisciplinary Intervention) is recommended depending on responses to treatment with stage 2, age, health risks, and motivation of the patient and family. Stage 3 is characterized by more frequent patient-provider contact and more active use of behavioral strategies and monitoring. Weekly visits for the first 8 and 12 weeks, followed by monthly contact, are recommended as being most efficacious. Moderate to strong parental involvement is recommended for children younger than 12 years. This stage requires a multidisciplinary team with expertise in childhood obesity, including a behavioral counselor (eg, social worker, psychologist, and trained nurse practitioner), registered dietitian, and exercise specialist. Children with inadequate response to stage 3 treatment, health risks, and motivation should be considered for stage 4 (Tertiary Care Intervention). This stage often includes the use of meal replacement, low-energy diets, medications, and/or surgery. Stage 4 requires a multidisciplinary team with expertise in childhood obesity at a pediatric weight management center that has specific clinical and research protocols for the assessment of outcomes and risks (15).

### Bibliography

1. Freedman DS, Sherry B. The validity of BMI as an indicator of body fatness and risk among children. *Pediatrics*. 2009; 124(suppl 1):S23-S34.
2. Lee S, Bacha F, Gungor N, Arslanian SA. Waist circumference is an independent predictor of insulin resistance in black and white youths. *J Pediatr*. 2006;148(2):188-194.

## Helping Active Lives through Targeting Healthy Youth



3. Moreno LA, Rodríguez G, Guillén J, Rabanaque MJ, León JF, Ariño A. Anthropometric measurements in both sides of the body in the assessment of nutritional status in prepubertal children. *Eur J Clin Nutr.* 2002;56(12):1208-1215.
4. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of childhood and adult obesity in the United States, 2011-2012. *JAMA.* 2014;311(8):806-814.
5. Anderson SE, Whitaker RC. Prevalence of obesity among US preschool children in different racial and ethnic groups. *Arch Pediatr Adolesc Med.* 2009;163(4):344-348.
6. Pan L, Blanck HM, Sherry B, Dalenius K, Grummer-Strawn LM. Trends in the prevalence of extreme obesity among US preschool-aged children living in low-income families, 1998- 2010. *JAMA.* 2012;308(24):2563-2565
7. Skinner AC, Skelton JA. Prevalence and trends in obesity and severe obesity among children in the United States, 1999- 2012. *JAMA Pediatr.* 2014;168(6):561-566.
8. Ogden CL, Flegal KM, Carroll MD, Johnson CL. Prevalence and trends in overweight among US children and adolescents, 1999-2000. *JAMA.* 2002;288(14):1728-1732.
9. Jiang F, Zhu S, Yan C, Jin X, Bandla H, Shen X. Sleep and obesity in preschool children. *J Pediatr.* 2009;154(6):814-818.
10. HEALTHY Study Group; Kaufman FR, Hirst K, Linder B, et al. Risk factors for type 2 diabetes in a sixth- grade multiracial cohort: the HEALTHY study. *Diabetes Care.* 2009;32(5): 953-955.
11. Chinali M, de Simone G, Roman MJ, et al. Impact of obesity on cardiac geometry and function in a population of adolescents: the Strong Heart Study. *J Am Coll Cardiol.* 2006;47(11): 2267-2273.
12. Papoutsakis C, Priftis KN, Drakouli M, et al. Childhood overweight/obesity and asthma: is there a link? A systematic review of recent epidemiologic evidence. *J Acad Nutr Diet.* 2013; 113(1):77-105.
13. Huang JS, Barlow SE, Quiros-Tejeira RE, et al; NASPGHAN Obesity Task Force. Childhood obesity for pediatric gastroenterologists. *J Pediatr Gastroenterol Nutr.* 2013; 56(1):99-109.
14. Baker JL, Olsen LW, Sørensen TI. Childhood body-mass index and the risk of coronary heart disease in adulthood. *N Engl J Med.* 2007;357(23):2329-2337.
15. Spear BA, Barlow SE, Ervin C, et al. Recommendations for treatment of child and adolescent overweight and obesity. *Pediatrics.* 2007;120(suppl 4):S254-S288.



**Musculoskeletal disorders in obese children – Guidelines for exercise  
Anastasia Beneka, European University Cyprus, Cyprus**

**Introduction**

Today unfortunately we spend more hours sitting! The lack of physical activity undoubtedly has contributed to the alarming increase in the obesity rate of children and adolescents. Childhood obesity is a serious health problem, and an obesity epidemic is spreading in alarming rates among children (Smith et al, 2014). Currently about 16% of the children in Europe are overweight, and 8% are obese (International Association for the study of obesity, 2004). Obesity-associated problems and diseases decrease the quality of life and life span. Many studies have shown that overweight children are more likely to become overweight adults than their normal-weight peers (Guo et al, 2002; Whitaker et al, 1997; Eriksson et al, 2003).

The severity of this phenomenon points out the need for establishing good exercise habits early! (Department of Health and Human Services, USA, 2012)

**Description of the problem**

In specific, the impact of obesity in children is a significant public health problem, and it has the potential to have an impact on a child's osteoarticular health, resulting in ongoing chronic pain (Smith et al, 2014). In this large study of children aged 2 to 17 years seen in Dutch general practice, the researchers revealed overweight and obese children reported musculoskeletal problems and lower extremity problems more frequently in daily life than did their normal-weight peers.

The impact of being overweight or obese on a child's skeletal system seems very severe with pain, joint dysfunction and even bone fractures (de Sa Pinto AL 2006), ankle, foot and knee problems. These consequences are more frequent in obese or overweight children than in children who are within a normal-weight range for their age (Krul et al, 2009).

Considering all these data, it seems that overweight is strongly related to disability. In specific, degenerative osteoarthritis and cartilage breakdown along with musculoskeletal pain have been reported as part of the disability spectrum related to obesity (Mazzuca et al, 2014). These conditions significantly reduce a person's ability to exercise, and in addition chronic pain has been reported to negatively influence a person's quality of life (Marcus, 2004).

Especially overweight and obese children reported musculoskeletal pain primarily due to changes within articulating joints such as knee and ankle (Taylor et al, 2006; Krul et al, 2009).

## Helping Active Lives through Targeting Healthy Youth



Chronic nonspecific musculoskeletal pain in children and adolescents has been reported as a common occurrence. Moreover, children affected by chronic musculoskeletal pain have been found to have increased levels of anxiety and depression, as well as lower levels of activity (Hakala et al, 2002; El-Metwally et al, 2004)

Given that being overweight or obese in adult life affects health and well-being, overweight or obese in childhood requires further attention.

Adult obesity has been associated with a higher prevalence of musculoskeletal disorders, primarily affecting the lower limbs, but comparative data in children are scarce. Some musculoskeletal disorders that are unique to childhood, such as slipped capital femoral epiphysis and tibia vara (Blount's disease) (Krul et al, 2009). In addition, general musculoskeletal pain in children was found in the lower limbs, for 24% of children aged between 6 and 10 years of age. (Al-Khattat, 2000; Kaspiris et al, 2009).

An increase in adiposity and fat distribution across the body is related to foot pain, and yet this relationship is not evident with an increase in muscle mass (Tanamas et al, 2012).

In conclusion, more BMI brings more pain! Interestingly, children who reported musculoskeletal pain in the **back, hip, knee and/or ankle** were found to have a significantly higher BMI than those without pain, with the odds of having joint pain increased by 10% for every 10-kg increase of weight and an increase of 3% for every unit increase in BMI (Stovitz et al, 2008).

The sites of pain in these overweight and obese paediatric populations differ and data differ. Other studies support that obesity causes pain in lower back, knees, ankles and feet (Taylor et al, 2006; Krul et al, 2009) others on neck pain (Krul et al, 2009) and others reported nonspecific musculoskeletal pain without specifying the pain site (Hainsworth et al, 2009).

Obviously, obesity increases **spine problems** but WHY is this happening? Spine deformities are very usual in childhood because also the kids have to carry very heavy school bags. Guides such as "Use both straps and keep upright posture" or "Put heavier books towards the back of the backpack" are easy to apply but no one pays so much attention.

### Knees problems

A specific refer must be made for knees problems. **Blount's disease** is a growth **disorder** of the shin bone (tibia) characterized by inward turning of the lower leg (bowing) that slowly worsens over time. While it is not uncommon for young children to have bowed legs, typically the bowing improves with age. The Growth plate is the part of a long bone where new bone growth takes place; the whole bone is alive, with maintenance [remodeling](#) throughout its existing [bone tissue](#), but the growth plate is the place where the long bone grows longer (adds length).

## Helping Active Lives through Targeting Healthy Youth



The **Osgood–Schlatter disease** (OSD) describes an inflammation of the patellar ligament at the tibial tuberosity. It is characterized by a painful bump just below the knee that is worse with activity and better with rest. In that case, episodes of pain typically last a few weeks to months.

**Hip and knee flexion** are also affected in obese children owing to an increase in concentric contraction of hip flexors, creating higher energy transfer and loads across hip joints, resulting in a change in gait to cope with the child’s increased body mass. (Nantel et al, 2006; Shultz et al, 2009)

Therefore, the reporting of musculoskeletal pain by overweight children may reflect a significant marker of a reduction in osteoarticular health and changes to skeletal structure.

This situation has specific consequences that reduce significantly a person’s ability to exercise. In addition, we already know that chronic pain has been reported to negatively influence a person’s quality of life (Marcus, 2004).

### **Other factors predisposing children to obesity and low levels of physical activity.**

Sedentary activity and “screen time” are at an all-time high, with youth ages 8 to 18 years spending an average of about 7.5 hours per day in front of a computer or TV screen (Bradford et al, 2012). Nevertheless, our body is designed for physical activity, without enough exercise it starts to slow down, clog up and become unhealthy.

### **WHAT is being healthy? The role of exercise for prevention and deal with the symptoms**

First, **being happy** means being able to do what you want to do! For the children, this means being able to move all the time, play, doing physical activity or any sports activity, dance etc. That is also the content of being physically healthy; running around; playing sports; dancing, playing without limitations or restrictions!!! A **physically healthy child** gains also better grades at school, meaning that it has also better mental health, it learns more effectively, it is more socially healthy as well, playing with friends during the school hours.

In conclusion, the message to the kids should be: **Why should you be physically active?** Because that makes them happier and smarter! That makes them also better at activities they enjoy as they have more energy, they become more effective, they will live longer and healthier, with less sickness and diseases, stronger bones and muscles and they must be convinced that their heart and lungs get stronger!

Finally, they grow up looking great!!!

**Who is the happiest?** The winner is the one who participates in sports, having fun and having more hours of participation in sports or any kind of physical activity!



# Helping Active Lives through Targeting Healthy Youth



## Exercise prescription

But how much physical activity do the kids need?

There is a general rule: The kids need at least 60 minutes or more, everyday!!!

Any specific instructions about exercise prescription? The kids need some kind of aerobic activity with a duration of 60min. As Hippocrates, used to mention “Walking is a man’s best medicine?” The kids could just walk, or bike, or jump etc.

They also need one hour of muscle strengthening activity, meaning exercises focused on making muscles strong and bone strengthening activity, such as jumping, skipping ropes etc. Games are everywhere and the chances for physical activity are all around, just organize the environment for them and motivate them to follow what the like.

## How does the teacher ensure that the children needs are met?

Realizing that, although children may vary in ability, each is capable of an individual maximum effort and by encouraging each child to make that effort. Always follow the basic rule: Physical Education is based on the importance of the child as individual!!!

## Bibliography

Al Khattat, A., Campbell, J. (2000) Recurrent Limb pain in childhood (‘growing pains’). *Foot*; 10: 117–123.

Bradford, K., Kihlstrom, M., Pointer, I., Cockrell Skinner, A., Slivka P, & Perrin, E.M. (2012) Parental Attitudes Toward Obesity and Overweight *Screening and Communication for Hospitalized Children*, 2, 3, pp 126-132.

De Sá Pinto, A.L., de Barros, Holanda, P.M., Radu, A.S., Villares, SMF, Lima, F.R. (2006) Musculoskeletal findings in obese children (2006). *J Paediatr Child Health*; 42: 341–344.

El-Metwally, A., Salminen, J.J., Auvinen, A., Kautiainen, H., Mikkelsen, M. (2004) Prognosis of non-specific musculoskeletal pain in preadolescents: a prospective 4 year follow-up study till adolescence. *Pain*; 110: 550–559.

Eriksson, J., Forsén, T., Osmond, C., Barker, D. (2003) Obesity from cradle to grave. *Int J Obes*;27(6):722-727.

Guo, S.S., Wu, W., Chumlea, W.C., Roche, A.F. (2002) Predicting overweight and obesity in adulthood from body mass index values in childhood and adolescence. *Am J Clin Nutr*;76(3):653-658.

## Helping Active Lives through Targeting Healthy Youth



Hainsworth, K.R., Davies, W.H., Khan, K.A., Weisman, S.J. (2009) Co-occurring chronic pain and obesity in children and adolescents: the impact on health-related quality of life. *Clin J Pain*, 25: 715–721.

Hakala, P., Rimpela, A., Salminen, J.J., Virtanen, S.M., Rimpela, M. (2002) Back, neck and shoulder pain in Finnish adolescents: national cross-sectional surveys. *Br Med J*, 325: 743–746.

International Association for the Study of Obesity. International Obesity Taskforce. (2004). EU “childhood obesity out of control”.  
<http://www.iaso.org/popout.asp?linkto=http%3A//www.iotf.org/media/IOTFmay28.pdf>.

Kaspiris, A., Zafiropoulou, C. (2009) Growing pains in children: epidemiological analysis in a Mediterranean population. *Jt Bone Spine*, 76: 486–490.

Krul, M., Van Der Wouden, J.C., Schellevis, F.G., Van Suijlekom-Smit, LWA, Koes, B.W. (2009) Musculoskeletal problems in overweight and obese children. *Ann Fam Med*; 7: 352–356.

Marcus, D. (2004) Obesity and the impact of chronic pain. *Clin J Pain*; 20: 186–191.

Nantel, J., Brochu, M., Prince, F. (2006) Locomotor strategies in obese and non-obese children. *Obesity*, 14: 1789–1794.

Shultz, S.P., Sitler, M.R., Tierney, R.T., Hillstrom, H.J., Song, J. (2009) Effects of paediatric obesity on joint kinematics and kinetics during 2 walking cadences. *Arch Phys Med Rehabil*, 90: 2149–2154.

Smith, S.M., Sumar, B. & Dixon, K.A. (2014) Musculoskeletal pain in overweight and obese children, *International Journal of Obesity* 38, 11–15; doi:10.1038/ijo.2013.187

Stovitz, S.D., Pardee, P.E., Vazquez, G., Duval, S., Schwimmer, J.B. (2008) Musculoskeletal pain in obese children and adolescents. *Acta Paediatr*, 97: 489–493.

Tanamas, S.K., Wluka, A.E., Berry, B., Menz, H.B., Strauss, B.J., Davies-Tuck, M. et al. (2012). The relationship between obesity and foot pain is related to fat mass and fat distribution but not muscle mass. *Arthritis Care Res*, 64: 262–268.

Taylor, E.D., Theim, K.R., Mirch, M.C., Ghorbani, S. (2006) Orthopedic complications of overweight in children and adolescents. *Pediatrics*, 117: 2167–2174.

Whitaker, R.C., Wright, J.A., Pepe, M.S., Seidel, K.D., Dietz, W.H. (1997) Predicting obesity in young adulthood from childhood and parental obesity. *N Engl J Med*.337(13):869-873.



**Games with Balance and Improvement of Neuromuscular Control - Prevention of Injuries**

**Asimena Gioftsidou, Democritus University of Thrace, Greece**

The key elements of effective injury prevention programs are core strength, neuromuscular control and balance (Gioftsidou & Malliou, 2006; Rössler, Faude, Bizzini, Junge, Dvořák, 2016).

Core training: The “core” represents a functional unit, which not only includes the muscles of the trunk (abdominals, back extensors) but also of the pelvic-hip region. The preservation of core stability is one of the keys for optimal functioning of the lower extremities (especially the knee joint). There is growing scientific evidence that core stability has an important role to play in injury prevention (Rössler, Faude, Bizzini, Junge, Dvořák, 2016).

Neuromuscular control and balance: Neuromuscular control does not represent a single entity, but rather complex interacting systems integrating different aspects of muscle actions (static, dynamic, reactive), muscle activations (eccentric more than concentric), coordination (multi-joint muscles), stabilization, body posture, balance and anticipation ability. There is strong empirical and growing scientific evidence that sport-specific neuromuscular training programs can effectively prevent knee and ankle injuries (Gioftsidou & Malliou, 2006; Gioftsidou et al., 2013; Rössler, Faude, Bizzini, Junge, Dvořák, 2016).

Poor balance or otherwise postural control is associated with injury or falls in many populations and consequently is considered to be a critical component of common motor skills (Burke-Doe et al., 2008; Gabbard, 2008; McGuine et al., 2000). Balance is generally defined as the ability to maintain the body’s center of gravity within its base of support and can be categorized as either static or dynamic balance. Static balance is the ability to sustain the body in static equilibrium or within its base of support (Goldie, Bach, Evans, 1989; Olmsted et al., 2002). Dynamic balance is believed to be more challenging because it requires the ability to maintain equilibrium during a transition from a dynamic to a static state (Ross & Guskiewicz, 2004). Both static and dynamic balance require effective integration of visual, vestibular, and proprioceptive inputs to produce an efferent response to control the body within its base of support (Guskiewicz & Perrin, 1996; Irrgang, Whitney, & Cox, 1994).

## Helping Active Lives through Targeting Healthy Youth



An interruption or deficit in any part of the sensorimotor system can result in a loss of balance, which can result in injury. Balance training is an effective intervention to improve static postural sway and dynamic balance in both athletes and non-athletes (Zech et al., 2010). Improving balance with training in a healthy population has positive effects on reducing injury.

It is important to understand the difference between proprioception and balance. It has been hypothesized that proprioception is important for providing smooth, coordinated movement as well as protection and dynamic stabilization of joints (Fu, & Stone, 1994). According to Sherrington, (1994) proprioception is the awareness of body segment positions and orientations. Hanney (2000) states that proprioception is “the reception of stimuli produced within organism,” whereas balance is “physical equilibrium.” This means that proprioception is a neurologic process, whereas balance is the ability to remain in an upright position (Hanney, 2000). Balance exercises are aimed at improving proprioception; train the brain to recognize the body’s segment position every moment. Therefore, a balance program will train proprioception pathways more effectively under competitive circumstances. Specifically, to prevent limb injuries, peripheral and central nervous system receptors (Hanney, 2000), mechanoreceptors within muscles; tendons; and ligaments have to be activated. Balance exercises seem to help this activation occur faster and more effectively (Sammarco, 1995). In other words, the goal of balance exercises should be to reduce the time between neural stimuli and muscular response (Zachazewski, Magee, Quillen, 1996).

However, few are the investigations that have dealt with the design and implementation of childhood prevention programs.

The new “FIFA 11+ for Kids” injury prevention program, was developed by a group of international experts for 7-13-year-olds. Is a new kind of warm-up program aims to minimize the risk factors that can cause injury, lasting 15 to 20 minutes and comprises seven exercises. Every exercise has five levels that become progressively harder (levels 1 to 5). Three exercises focus on unilateral and dynamic stability of the lower limbs, three exercises on whole body strength, and one on falling technique. The program should start with level 1.

These exercises were designed to increase the physical attributes of players and lead to a reduction in injury.

In particular, the FIFA 11+ kids focuses on: (a) spatial orientation, anticipation, and attention, particularly while dual-tasking (to avoid unintended contact with other players or objects); (b) body stability and movement coordination (more general than specific neuromuscular or proprioceptive training).

# Helping Active Lives through Targeting Healthy Youth



A major study of over 4,000 children in four countries has proved that the “FIFA 11+ for Kids” can prevent injury: players who used the program suffered 38% fewer injuries than children in the group that used a normal warm-up program, and where serious injuries were concerned, i.e. those involving a period of over 28 days without playing, the figure even exceeded 50%, particularly severe and lower limb injuries (Rössler, Faude, Bizzini, Junge, Dvořák, 2016).

Another study showed that the “FIFA 11+ for Kids” can improve motor skills, and, in particular, agility, dynamic balance, jumping power and technical skills. With its targeted exercises and challenging training workouts, the “FIFA 11+ for Kids” can help children avoid injury while enhancing their performance. It is a focused and efficient program that you should use regularly in training (Rössler et al., 2016).

The instructions that you give to the children should be as short and clear as possible. Make sure that the children adopt the correct posture and body control:

## POSTURE

### Correct execution and core elements.

Straight legs and stable, upright upper body When viewed from the front, the foot, knee and hip of the supporting leg are in a straight line.

- The feet of the supporting leg are pointing forwards.
- The upper body is upright and in a central position.
- The left and right hips are at the same level.



Bent knee when standing on one leg and when landing

- The feet of the supporting leg are pointing forwards.
- The knee of the supporting leg is slightly bent when standing and bent when landing, to cushion the impact.
- The upper body is upright and in a central position.
- The head is in a neutral position.



# Helping Active Lives through Targeting Healthy Youth



## Feet pointing forwards

- The feet of the supporting leg are pointing forwards.
- The knee of the supporting leg is slightly bent when standing and bent when landing, to cushion the impact.
- The upper body is upright and in a central position.
- The head is in a neutral position



## Body tension in spider position

- Head, upper body and thigh in as straight a line as possible.
- Buttocks and back muscles are tensed.
- The tension is also maintained for forward movement.
- Hands are about hip-width apart.



## Body tension in press-up position

- Head, upper body and thigh in as straight a line as possible.
- The stomach muscles are tensed.
- The head is in a neutral position.
- Hands and feet about hip-width apart.



## FIFA 11+ FOR KIDS Exercises



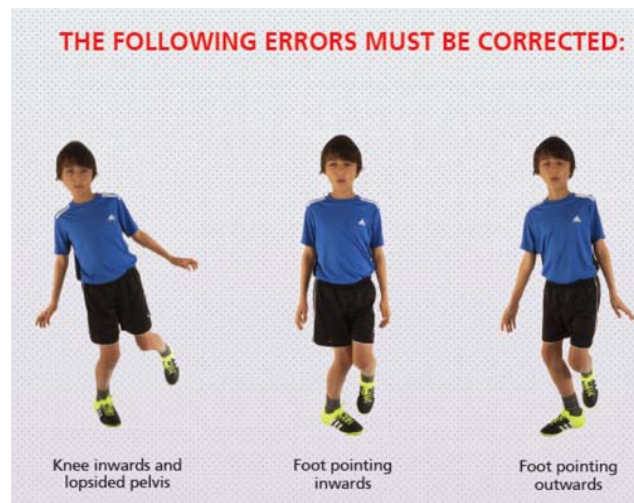
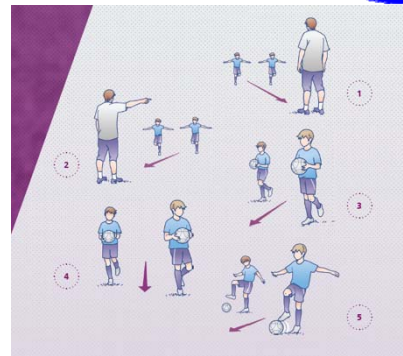
# Helping Active Lives through Targeting Healthy Youth



## 1<sup>st</sup> Exercise: “Alertness Running Game”

**FOCUS:** improving balance and coordination.

**OBJECTIVE:** after every command to stop, stand still on one leg for 3 seconds.



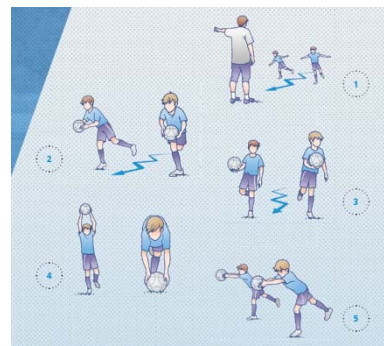
### Important

- When viewed from the front, the hip, knee and foot should form a straight line.
- The knee of the supporting leg should be slightly bent
- Straight foot with front of foot pointed forwards.

## 2<sup>nd</sup> Exercise: Skating jumps

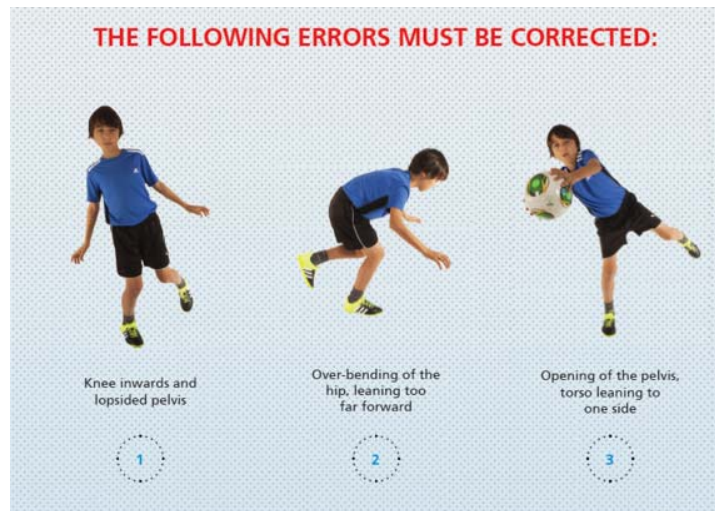
**FOCUS:** stability of foot and knee joints.

**OBJECTIVE:** balance after each landing and stand on one leg for 3 seconds





# Helping Active Lives through Targeting Healthy Youth



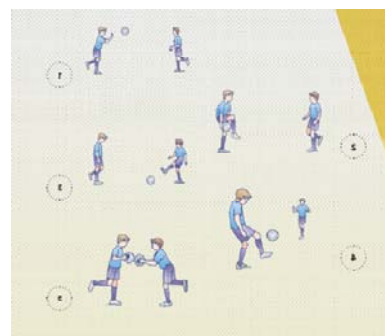
## Important

- When viewed from the front, the hip, knee and foot of the launching leg are in a straight line.
- Knee to be bent when landing softly to cushion the impact.
- Body tension: the stomach and back muscles should be tensed, with the back straight and the head extending the spine.
- The hips and the knee of the supporting leg are always slightly bent.
- Players should find their balance on each landing.

## 3<sup>rd</sup> Exercise: **Single Leg Stance**

**FOCUS:** maintaining balance when given additional tasks.

**OBJECTIVE:** being able to stay standing on one leg in difficult situations without moving.



# Helping Active Lives through Targeting Healthy Youth



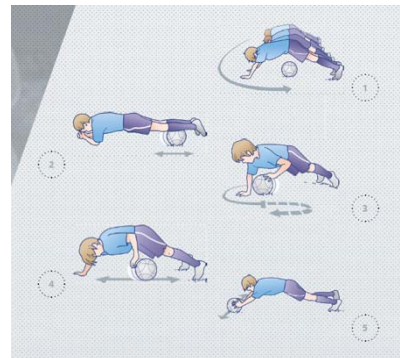
## Important

- The pelvic line is horizontal.
- When viewed from the front, the hip, knee and foot of the launching leg are in a straight line.
- The foot of the supporting leg points forwards.
- The hips and the knee of the supporting leg are always slightly bent.
- Body tension: the stomach and back muscles should be tensed, with the back straight and the head extending the spine.

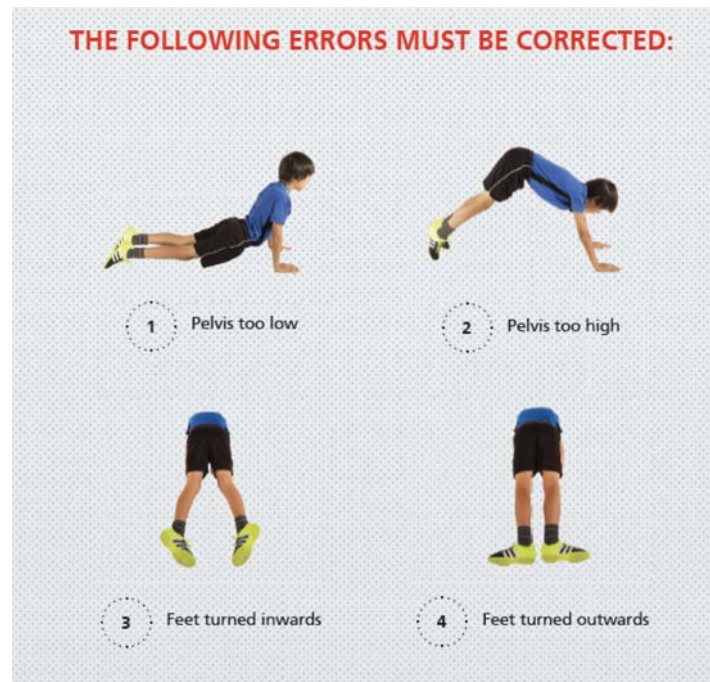
## 4<sup>th</sup> Exercise: **Press Ups**

**FOCUS:** strengthening the core and arm muscles.

**OBJECTIVE:** maintaining body tension during the exercises.



# Helping Active Lives through Targeting Healthy Youth



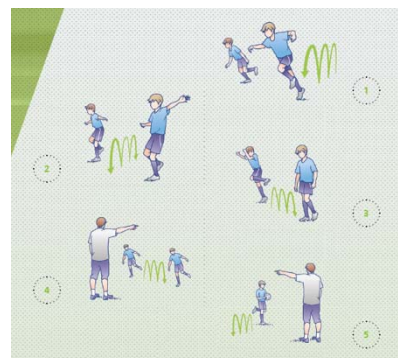
## Important

- Head, shoulders, back and pelvis are in a straight line
- Look down towards the ground
- Pull in the stomach and buttocks
- Movements should be slow and deliberate

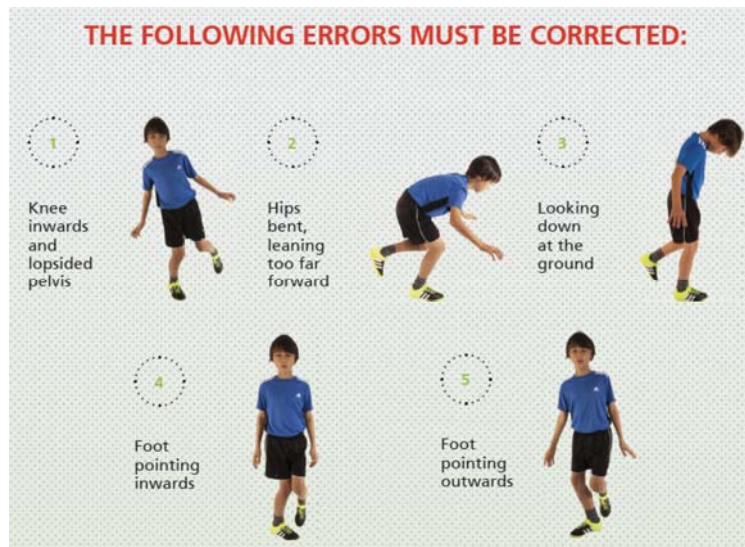
## 5<sup>th</sup> Exercise: **Single Leg Jumps**

**FOCUS:** strengthening the leg muscles, improving balance and coordination.

**OBJECTIVE:** safe, controlled landing and big jumps.



# Helping Active Lives through Targeting Healthy Youth



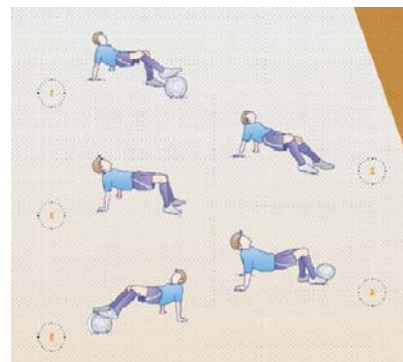
## Important

- When viewed from the front, the hip, knee and foot of the launching leg are in a straight line.
- Knee to be bent when landing softly to cushion the impact.
- Body tension: the stomach and back muscles should be tensed, with the back straight and the head extending the spine.
- The hips and the knee of the supporting leg are always slightly bent.
- Players should find their balance on each landing.

## 6<sup>th</sup> Exercise: **Spiderman**

**FOCUS:** strengthening the core muscles and the hamstrings.

**OBJECTIVE:** maintaining the body tension throughout the exercise.





# Helping Active Lives through Targeting Healthy Youth



## Important

- Keep the buttocks up.
- The body should be in as straight a line as possible from the shoulders to the knees.
- The head should be in a neutral position.
- The feet are always under or in front of the knees (knee angle always more than 90°)

## Can games help us prevent injuries ????

In order for games to be a way of preventing injuries, in addition to their entertaining character, they should have some other characteristics, according to the information mentioned above with regard to injury prevention programs.

To achieve this they should have some characteristics:

- to improve **neuromuscular control and stability**.... by training the balance ability
- to **strengthen leg** and **core** muscles

I have to pay attention to the **quality of the movement** and the **correct technique** during the games:

- the foot, knee and hip of the supporting leg are in a straight line.

## Helping Active Lives through Targeting Healthy Youth



- the upper body is upright and in a central position
- the left and right hips are at the same level
- the knee of the supporting leg is slightly bent when standing and bent when landing, to cushion the impact.
- after landing, stay still for 3 seconds

Below will be exemplified some games that with a slight modification of their regulations may have the characteristics required to contribute to the prevention of injuries

### «One, two, three red light»

- ✓ A child on the wall with eyes closed
- ✓ The rest on one line at a distance of 10-12m, aiming of moving to the wall
- ✓ The child on the wall says "one, two, three red light", and turns to the children
- ✓ The children, while moving they should remain immobile when the phrase " one, two, three red light » completed
- ✓ If a child fails to stay stable, then he/she loses



In order to improve neuromuscular control



The regulation can change and every time the children have to stop, they should be on one leg

### «Koutso»

- ✓ The child throws his stone into the first box, and starts with a one leg jump and passes all the boxes
- ✓ Returns and stands with one leg in the previous box of what the stone is
- ✓ Bends, takes the stone and returns to the start
- ✓ If the stone or he/she touches a line loses





his/her turn

In order to improve neuromuscular control



The regulation can change and the children should stay still in each box for 3 sec

### **Bibliography**

Burke-Doe A, Hudson A, Werth H, Riordan, DG. Knowledge of osteoporosis risk factors and prevalence of risk factors for osteoporosis, falls, and fracture in functionally independent older adults. *J Geriatr Phys Ther.* 2008; 31: 11–17.

Fu F., & Stone D. *Sports Injuries. Mechanisms, Prevention, Treatment.* Baltimore: Williams & Wilkins, 1994. pp. 603–624.

Gabbard CP. *Lifelong Motor Development (5th ed).* San Francisco, CA: Pearson Benjamin Cummings, 2008.

Gioftsidou A., Malliou P. Preventing lower limb injuries in soccer players. *Strength and Conditioning Journal,* (2006), 28(1), 10-13.

Gioftsidou A., Vernadakis N., Malliou P., Batzios S., Sofokleous P., Antoniou P., Kouli O., Tsapralis K., Godolias G. Typical balance exercises or exergames for balance improvement? *Journal of Back and Musculoskeletal Rehabilitation* (2013), 26, 299-305.

Goldie PA, Bach TM, Evans OM. Force platform measures for evaluating postural control: Reliability and validity. *Arch Phys Med Rehabil.* 1989; 70: 510–517.

Guskiewicz KM & Perrin DH. Research and clinical applications of assessing balance. *J Sport Rehabil.* 1996; 5: 45–63.

Hanney, W. Proprioceptive training for ankle instability. *Strength Cond. J.* 22(5):63–68. 2000.

Irrgang JJ, Whitney S, Cox E. Balance and proprioceptive training for rehabilitation of the lower extremity. *J Sport Rehabil.* 1994; 3: 68–83

McGuine TA, Greene JJ, Best T, Levenson G. Balance as a predictor of ankle injuries in high school basketball players. *Clin J Sport Med.* 2000; 10: 239–244.

Olmsted LC, Carcia CR, Hertel J, Shultz SJ. Efficacy of the star excursion balance tests in detecting reach deficits in subjects with chronic ankle instability. *J Athletic Train.* 2002; 37: 501–506.



## Helping Active Lives through Targeting Healthy Youth



Pomares-Noguera C, Ayala F, Robles-Palazón FJ, Alomoto-Burneo JF, López-Valenciano A, Elvira JLL, Hernández-Sánchez S, De Ste Croix M. Training Effects of the FIFA 11+ Kids on Physical Performance in Youth Football Players: A Randomized Control Trial. *Front Pediatr.* 2018 Mar 5;6:40.

Ross SE, & Guskiewicz KM. Examination of static and dynamic postural stability in individuals with functionally stable and unstable ankles. *Clin J Sport Med.* 2004; 14: 332–338.

Rössler R, Donath L, Bizzini M, Faude O. A new injury prevention programme for children's football - FIFA 11+ Kids – can improve motor performance: a clusterrandomised controlled trial. *J Sports Sci.* 2016 Mar;34(6):549-56.

Rössler R., Faude O., Bizzini M., Junge A., Dvořák J. (2016). FIFA 11+ FOR KIDS Manual. A Warm-Up Program for Preventing Injuries in Children's Football. FIFA Medical and Research Centre (F-MARC).

Sammarco, G.J. Rehabilitation of the Foot and Ankle. St. Louis, MO: Mosby-Year Book, Inc., 1995. pp. 295–301.

Sherrington, G.S. The integrative action of the nervous system. In: Review of the Afferent Neural System of the Knee and Its Contribution to Motor Learning. J. Nyland, T. Brosky, D. Currier, A. Nitz, and D. Cabon. *J. Orthop. Sports Phys. Ther.* 19(1):2–11. 1994.

Soligard T, Nilstad A, Steffen K, Myklebust G, Holme I, Dvorak J, et al. Compliance with a comprehensive warm-up programme to prevent injuries in youth football. *Br J Sports Med* (2010), 44(11):787-793.

Zachazewski, J., D. Magee, Quillen Z.. Athletic Injuries and Rehabilitation. W.B. Saunders Company, 1996. pp. 236–261.

Zech A, Hubscher M, Vogt L, Winfried B, Hansel F, Pfeifer K. Balance Training for Neuromuscular Control and Performance Enhancement: A Systematic Review. *Journal of Athletic Training.* 2010; 45(4): 392–403.



**Habit Formation in Exercise and Eating Behaviours for Young Children  
Manos Georgiadis & Benjamin R. Holmes, University of Suffolk, UK**

The health of young people is a valuable topic with regard to disease prevention and quality of life throughout adolescence and adulthood. Eating and exercise habits, and what ultimately influences them, play a huge role in determining a young person's present and future health. Acquiring a better understanding of what these habits are and how we can influence and improve them, will aid in ensuring the health of young people and help reduce potential disease risk, related to a poor diet and lack of exercise.

**Modelling**

Adults' modelling, which is a parent's ability to influence their children with their own eating behaviours and consumption, has been shown to influence children's food consumption either in a negative or positive way. This is because the influence of modelling is food dependant, if the parent eats healthy food and sets a good example, this will then be more likely reflected in the child's eating behaviour. This is also true with unhealthy food, where a parent's unhealthy diet will be reflected in their children's (Brown, 2004).

**Habit**

Habit can be defined as a process by which a stimulus generates an impulse to act as a result of a learned stimulus response association, or that a behavioural tendency occurs with minimal conscious awareness or reflection, in response to a specific number of contextual cues and conditions (Gardner, 2014). Orbell and Verplanken (2010) identifies three aspects that are central to a habit: a behaviour that is frequently repeated, has acquired a high degree of automaticity and is cued in stable contexts. Also, that decisions to perform an action that is initially dictated by a goal/reward (e.g. feeling hungry), becomes less goal orientated the more the action is repeated, which results in the integration of the behaviour as habitual that can be triggered by the cue alone (Orbell and Verplanken, 2010).

**Habitual Instigation**

Habitual instigation describes habitual selection and initiation of behaviour whereby an action that may have sub-actions associated with it, is completed without the need for individual cues for each sub-action (Gardner, Phillips and Judah, 2016). In the example in Figure 1; 'Going for a run' is cued by the initial sub-

# Helping Active Lives through Targeting Healthy Youth



action of 'put on sneakers' but then the total action of 'Going for a run' becomes an automatic behaviour, with each sub-action within it being completed habitually.

## Habitual Execution

Habitual execution refers to the completion of individual sub-actions, with the cessation of a sub-action that leads onto the automatic trigger of the next via cues (see Appendices Figure 1).

## Habitual Formation

The formation of a habit occurs in phases and relies primarily on the repetition of a behaviour within a consistent context through associative learning. During the 'Initiation phase' a new behaviour and context will be selected, and the behaviour will start. Automaticity will then start to develop during the 'Learning phase' as the target action is repeated sufficiently, strengthening the habit (Gardner, Lally and Wardle, 2012). External cues are formed and the dependence on conscious attention and motivational processes is reduced (Lally, Wardle and Gardner, 2011), whilst habits are likely to remain even if after motivation or interest is reduced (Gardner, de Bruijn and Lally, 2011).

Lally and Gardner, (2013) suggested that habit formation typically followed an asymptotic curve during its development, with initial repetitions of behaviour causing a large increase in automaticity until reaching a plateau point at which the strength of the habit levels off and the "Stability phase" begins (see Figure 2). Automaticity was found to plateau on average at around 66 days after the inception of the behaviour (Lally et al., 2010), but there was substantial variance across participants and behaviour type. Gardner, Lally and Wardle (2012) suggested that it may be helpful to tell patients to expect habit formation (based on daily repetition) to take around 10 weeks, as people are reassured with the knowledge that behaviour becomes progressively easier as a habit forms.

## Initiation Phase

The ability to start a new behaviour is the most challenging aspect of habit formation, this can be seen when looking at intention-behaviour relationships. A review by Sheeran (2002) showed that across a number of health-related behaviours, the average rate of people who intended to perform a behaviour, only 47% were successful in doing so. A more recent meta-analysis demonstrated similar findings, it found that a medium to large change in intention produced only a small to medium change in behaviour (Webb and Sheeran, 2006). A better understanding

## Helping Active Lives through Targeting Healthy Youth



of the factors that improve the intention-behaviour relationship will ensure new behaviours are successfully implemented.

Planning has been shown to increase the chances that an intended behaviour will be performed and is a powerful self-regulatory tool that can help to translate goals into behaviour (Sniehotta et al., 2005). A distinction can be made between types of planning that find utility in different stages of behaviour change – Action planning, which Sniehotta et al., (2005) describes as “the process of linking goal-directed behaviours to certain environmental cues by specifying when, where and how to act”. Action Planning has been shown to have strong effects on putting goals into action and an important component of self-management of behavioural change for health outcomes. Coping planning, the other type, is reactive and self-regulatory, which tends to increase during the weeks after a new behaviour has been instigated and would be associated more with the learning phase of habit formation. It is used to combat unwanted influences on behaviour and to protect good intentions from distractions that may result in relapse (Sniehotta et al., 2005).

Instigating a behaviour that results in habit formation is more likely to be achieved when people anticipate courses of action (or its consequences) to result in positive outcomes. Motivation is a key factor to ensure the initiation phase of habit formation is successful, also choosing an appropriate context in which to perform the action, such as an event (e.g. when they arrive at school), or a time of day (e.g. before breakfast), that is ingrained within a daily routine, provides an opportunity and stable starting point to initiate the behaviour for habit formation (Lally, Wardle and Gardner, 2011). When the control of a behaviour is perceived as realistic and the person has the capability to achieve it, there is a greater chance for that behaviour to be initiated into a daily routine.

### Learning Phase

For a habit to form effectively, a behaviour must be repeated within the presence of the same contextual cues (Lally and Gardner, 2013), whilst remaining consistent (daily) over an adequate time scale (see Figure 2). Consideration must be given to the many factors that promote or discourage the maintenance of a new behaviour. People will maintain a new behaviour when they have a motive to do so, motivation to avoid negative health outcomes has been shown to be insufficient to maintain preventative behaviour that requires effort, compared to positive maintenance motives (Kwasnicka et al., 2016). Higgins’ (2005) regulatory fit theory describes how people will engage with a behaviour if they feel more strongly associated with it, or if it fits within their decisions and prior engagement compared to if they view it as a responsibility or something they ought to carry out. It’s important to set realistic goals that prompt positive emotions and adopt a small-changes approach as this can increase effort and commitment to change through success expectancy, rather than ones that prompt a negative effect, which can lead

## Helping Active Lives through Targeting Healthy Youth



to decreased effort or goal abandonment. Self-efficacy (capability) and satisfaction for the new behaviour was strong a predictor of long-term success in smokers who attempted to quit.

Extrinsic motivation is a mediated of behaviour initiation, although intrinsic motivation has been shown to have a stronger influence on the maintenance of behaviour compared to extrinsic motivation. Hypothesised by Ryan and Deci (2000) in self-determination theory. Self-regulation, which is one's ability to actively control behaviour by inhibiting thoughts, desires, emotions and urges that lie in contrast to the set goal has been shown to be important in controlling impulsive influences that could affect behavioural maintenance. Coping planning, as mentioned previously, represents a critical self-regulatory strategy for behavioural maintenance.

Some of these concepts have been discussed together in a model termed COM-B by Michie, van Stralen and West (2011), which represents behaviour and how it relates to capability, motivation and opportunity. This model can be seen in Figure 3, although it has been adapted to incorporate other influential factors (planning and repetition) that have been previously discussed, along with the representation of how an intention transforms into a behaviour, which then becomes habitual.

### Stability Phase

With successful self-regulation of a new behaviour, habit development will form with consciously controlled behaviours becoming automatic over time with repetition (Kwasnicka et al., 2016). While repetition is necessary for habits to develop, it should be not equated with frequency of occurrence, rather a mental construct holding features automaticity, such as mental efficiency, difficult to control and lack of awareness. This shows that maintaining a habit can be done with minimal effort, which is great if the habit is positive, but if there are habits that have negative outcomes that conflict with the new behaviour trying to be instigated it may be difficult to form a habit from a new behaviour. Also, that strong habits from the past, have the ability to cause an individual to lapse back to that prior habit replacing the new behaviour (Kwasnicka et al., 2016).

### The Dual Process Theory of Thought

There is the idea that there are two systems of thought, one being a quick, impulsive, associative, automatic and affective based form of reasoning and the other being a slow, thoughtful, calculated and deliberative processes (Gronchi and Giovannelli, 2018). Within cognitive and social psychology this idea has been given the name of "the dual process theory of thought" and there are multiple different theories within it, but they all share the theme of dualism. Strack and Deutsch (2004) describe this two-system model by how it explains social behaviour. The impulsive

## Helping Active Lives through Targeting Healthy Youth



system (System 1), which elicits behaviour through associative links and motivational orientations and the reflection system (System 2), which generates behavioural decisions based on knowledge about facts and values.

This theory was taken further to explain how it is integrated into behaviour change and habit formation outlines a conceptual matrix for explaining how reflective and automatic processes are associated with the initiation and maintenance of food choices with possible interventional strategies to aid in behaviour change (see Appendices Figure 4). The matrix shows where habit falls within this framework and that it is a key determinant of automatic processing during the maintenance of a behaviour, which we know is the product of repetition within a similar context, whilst using self-regulation to block out conflicting behaviours that would hinder that consistency.

### Personality

Personality can be defined as a set of thoughts, behaviours and emotional patterns that derive and evolve from environmental and physiological factors (Corr and Matthews, 2009). There are many theories involving personality, one prominent theory within psychology being the Five Factor Model, also known as the big five personality traits. A child's ability to self-regulate behaviour can be dependent on many factors early in life such as low-quality parenting, family/residential stressors, and sociodemographic risk (Li-Grining, 2007), as well as genetic factors (Lemery-Chalfant, Doelger and Goldsmith, 2008).

An ability to maintain self-regulation in early life has been associated strongly with preventing obesity later on (Schlam et al., 2013; Anderson and Keim, 2016; Miller et al., 2018), also with the use of self-regulation strategies that improve executive function, researchers demonstrated that there was an increase in physical activity with children (Bassett-Gunter et al., 2017) and adolescents (Lubans and Morgan, 2009; Matthews, 2011). Emotional dysregulation is predictive of eating disorders in children and adolescence, especially females and a failure to instil self-regulatory skills in early childhood predisposes children to excessive weight gain through early adolescence also individuals who were already obese appeared to be weaker in executive functioning and self-regulation (Dassen et al., 2018).

Trait conscientiousness itself which is known to be strongly dependant on self-regulation in early life has been shown to positively influence health outcomes in adulthood when measured at an early age by improved eating habits. It is also strong indicator of later health and longevity.





### **Improving Physical Activity Habits Knowledge**

Educational interventions that provide children with the knowledge of the importance of physical activity and the benefits that can be reaped from incorporating it into their routine, have been shown to improve physical activity levels (Cecchetto, Pena and Pellanda, 2017). Interventions are also more effective when implemented at a younger age.

Goal setting is an effective strategy when the goals that are set are appropriate (Haas, Mason and Haines, 2014), realistic able to be monitored and can be modified dependant on goal related performance. Goal setting has been demonstrated to be an effective strategy in increasing physical activity and behaviour change the use of character modelling in conjunction with goal setting has also been shown to produce significant further increases in physical activity in children specifically (Larson et al., 2018a, 2018b).

Providing individuals with appropriate feedback on physical activity progress and goal related performance is vital for sustaining physical activity levels and instilling permanent behaviour change. Immediate feedback such as steps, distance, floors climbed and heart rate has been shown to be an effective form of feedback with increasing physical activity (Buchele Harris & Chen, 2018). Although, studies that incorporated supportive coaching in conjunction with immediate measurement feedback resulted in higher physical activity levels compared to just immediate measurement feedback alone.

### **Helpful Contexts & Barriers**

The context and conditions that a child is presented with on a daily basis that can influence physical activity is another important factor to consider when trying to promote physical activity, a better understanding may help direct how schools, policy makers and parents can improve the environment that the child is exposed to increase physical activity levels. In regard to a school environment, studies have shown particular contexts and conditions to be more conducive to promoting physical activity whilst discouraging sedentary behaviour. Such as outdoor environments that provide active opportunities and enough open space with portable play objects such as balls to be interacted with. Within social groupings on the playground, children were found to initiate in physical activity more often when adults were not present or involved with the immediate group and activity context

### **Improving Healthy Eating Habits Knowledge**

Educational programmes that allow children to obtain a level of nutritional knowledge is vital to ensuring healthy eating habits are instilled and maintained. It



## Helping Active Lives through Targeting Healthy Youth



has been demonstrated that multicomponent interventional strategies that included an educational component, are positively associated with children's development of nutrition knowledge, dietary behaviour changes, intake of healthy foods and the prevention of obesity (Burgess-Champoux et al., 2008). Researchers that looked at the effect educational programmes had on fruit and vegetable consumption specifically found that intakes increased. Other studies have shown that educational interventions showed promise when educating the downsides to consuming unhealthy foods and drinks such as sugar sweetened beverages in reducing intake.

Nutritional education should not only be focused within a school environment, parents should look to be properly educated themselves in regard to nutrition so that education continues at home. Targeted interventions to improve parents or carers knowledge and techniques in relation to food has been shown to improve children's eating habits within the home we also know that from research, parental education level in general has an influence on children's eating habits (Scaglioni et al., 2018).

Teaching children goal setting strategies has also been seen to be beneficial when trying to change healthy eating habits, a 4 step goal-setting process that included 1) Recognising a need for change 2) Establishing a goal 3) Adopting a goal-directed activity and 4) Self-monitoring it was identified to promote dietary and behaviour change in children (Cullen, Baranowski & Smith, 2001). Other multicomponent interventions that included goal setting with group participation and tasting found promising results for fruit and vegetable consumption specifically but also nutrition knowledge and asking behaviours.

### Helpful Contexts & Barriers

There are many environmental and social factors that can influence a child's eating habits, these contexts and cues can promote the consumption of healthy foods like fruits and vegetables or act as barrier to healthy eating behaviours and promote unhealthy eating behaviours. Within schools, the importance of adopting and developing policies that are indicative of healthy eating habits is important for nurturing a healthy eating environment. Youths also consume between one-third to one-half of their meals at school making interventions that improve the environment at school crucial for children's eating habits (Micha et al., 2018).

### Promoting Healthy Eating at School

- Providing the child with the availability to purchase school meals
- The school should provide healthy food options and have high nutrition standards
- Vending machines in school should not contain unhealthy snacks and provide healthier alternatives

## Helping Active Lives through Targeting Healthy Youth



- Gardening programmes that the child can enrol into at school
- Free fruit and vegetables to be made available in school
- Cold filtered water to be provided within the school
- Healthy food to be made more convenient for students to purchase
- Multicomponent programmes with interventional components such as policy, education, family and community involvement, and/or food provision to improve the child's nutrition knowledge, dietary behaviour changes, and intake of healthy foods.
- Adopting traditional style games during PE to educate children on nutrition

### Practical Applications for Improving and Maintaining Physical Activity Habits Promoting Physical Activity at School

- Campus size should be big enough in relation to number of students
- A good student perception of support from teachers and staff to physical activity
- Provide an environment within school that fosters social cohesion between students and teachers
- Have policies that are specific to promoting physical activity
- The school to offer sporting activities within the building
- Providing break/recess physical activities
- Sports management and facilities to be of good standard
- Adequate size of instructional area during physical education
- Active supervision, active feedback and social support during physical education
- Providing children, the choice to choose between different physical educational activities
- Transformational behaviours by PE teacher (encourage, inspire and motivate)
- Non-controlling autonomy and relatedness support
- Avoid overcrowded class size during physical education
- Adopting traditional style games during PE to improve motor skills and increase physical activity

### Traditional Games in Physical Education

Traditional games, which are games that are often culture specific and passed down from generation to generation (e.g. Hide & Seek, Chase, Dodgeball, Tug-of-war, What's the time Mr Wolf?) have been shown to be an effective educational tool within a school environment such as during physical education

Traditional games have also shown the ability to improve motor skill development which is an important aspect to physical development and lifelong

# Helping Active Lives through Targeting Healthy Youth



physical activity in children (True et al., 2017) as well as having a positive impact on academic performance (Macdonald et al., 2018).

When delivering nutritional education, studies have shown that an integrated “learning through playing” approach to be successful in improving children’s knowledge about healthy foods and lifestyle. Other research has shown positive results when video games have been adopted to improve nutrition and health knowledge and changing behaviour (Baranowski et al., 2018).

Therefore, the use of traditional games to educate children on nutrition and health by adapting games to have a nutritional or health related theme within them, may be an efficacious in not only increasing children’s physical activity, but also motor skill development and nutritional knowledge in general. This would help contribute to improving healthy eating and physical activity habits in children.

## Hide & Seek

A game where any number of players will hide or conceal themselves within the environment for another player to close their eyes and count to a predetermined number before going to locate the concealed players. This could be adapted to teach nutrition and health in many ways such as:

The children hiding could wear coloured bibs/vests that represent either healthy or junk/bad food, when children wearing the colour related to bad food were located, they would then be allowed to chase the child seeking.

## Chase/tag/it

A playground game that involves two or more players chasing each other in attempt to “tag” or touch them, usually accompanied by saying “tag” or “it”. At this point the player touched then becomes the person chasing other players.

- Whoever the chaser is in the game would only be able to tag people with the addition of verbally naming an unhealthy food (e.g. chips, chocolate, burger, fizzy drink etc), this could be refereed by an adult qualifying successful ‘tags’ only when an unhealthy food was verbally named.

## Dodgeball

Dodgeball is a team sport where two teams try to throw balls and hit each other whilst trying to avoid being hit themselves. The objective of the game is to eliminate all the players on the other team which is done by either hitting them with a ball or catching a ball that they have thrown.

- This game could be adopted by simply having two different colours of balls (red & green), one colour would represent unhealthy foods (e.g. red) and the

## Helping Active Lives through Targeting Healthy Youth



other would represent healthy foods (e.g. green) with the obvious actions of avoidance and approach.

### What's the time, Mr Wolf?

This game is a form of tag that involves one person (Mr Wolf) to stand at the end of a playground or field facing away from the other players. A call and response will then take place, all the players besides 'Mr Wolf' will chant in unison: "Whats the time Mr Wolf?", and 'Mr Wolf' can either answer by giving a time such as '5 O'Clock' which will allow the other players to take 5 steps whilst counting out loud the steps they take. Mr Wolf can also reply by shouting "Dinner Time" whilst turning around and trying to chase the other players before they get back to the starting point.

This game can easily be adapted to help children understand specific foods that are good or bad for health or even different behaviours that have an influence on health positively or negatively (e.g. TV watching, sedentary behaviour, sport, outdoor activities). The players that are walking up on Mr Wolf could wear pre-made tshirts that have images of different healthy or unhealthy foods, practices or behaviours on the back.

### Bibliography

Brown, R. (2004). Children's eating attitudes and behaviour: a study of the modelling and control theories of parental influence. *Health Education Research*, 19(3), 261-271. doi:10.1093/her/cyg040

Burgess-Champoux, T., Chan, H., Rosen, R., Marquart, L., & Reicks, M. (2008). Healthy whole-grain choices for children and parents: a multi-component school-based pilot intervention. *Public Health Nutrition*, 11(8), 849-859. doi:10.1017/s1368980007001346

Cecchetto, F., Pena, D., & Pellanda, L. (2017). Playful Interventions Increase Knowledge about Healthy Habits and Cardiovascular Risk Factors in Children: The CARDIOKIDS Randomized Study. *Arquivos Brasileiros De Cardiologia*. doi:10.5935/abc.20170107

Cullen, K., Baranowski, T., & Smith, S. (2001). Using goal setting as a strategy for dietary behavior change. *Journal Of The American Dietetic Association*, 101(5), 562-566. doi:10.1016/s0002-8223(01)00140-7

Dassen, F., Houben, K., Allom, V., & Jansen, A. (2018). Self-regulation and obesity: the role of executive function and delay discounting in the prediction of weight loss. *Journal Of Behavioral Medicine*, 41(6), 806-818. doi:10.1007/s10865-018-9940-9

## Helping Active Lives through Targeting Healthy Youth



Gardner, B. (2014). A review and analysis of the use of 'habit' in understanding, predicting and influencing health-related behaviour. *Health Psychology Review*, 9(3), 277-295. doi:10.1080/17437199.2013.876238

Gardner, B., de Bruijn, G., & Lally, P. (2011). A Systematic Review and Meta-analysis of Applications of the Self-Report Habit Index to Nutrition and Physical Activity Behaviours. *Annals Of Behavioral Medicine*, 42(2), 174-187. doi:10.1007/s12160-011-9282-0

Gardner, B., Lally, P., & Wardle, J. (2012). Making health habitual: the psychology of 'habit-formation' and general practice. *British Journal Of General Practice*, 62(605), 664-666. doi:10.3399/bjgp12x659466

Gardner, B., Phillips, L., & Judah, G. (2016). Habitual instigation and habitual execution: Definition, measurement, and effects on behaviour frequency. *British Journal Of Health Psychology*, 21(3), 613-630. doi:10.1111/bjhp.12189

Gronchi, G., & Giovannelli, F. (2018). Dual Process Theory of Thought and Default Mode Network: A Possible Neural Foundation of Fast Thinking. *Frontiers In Psychology*, 9. doi:10.3389/fpsyg.2018.01237

Hampson, S. (2008). Mechanisms by Which Childhood Personality Traits Influence Adult Well-Being. *Current Directions In Psychological Science*, 17(4), 264-268. doi:10.1111/j.1467-8721.2008.00587.x

Higgins, E. (2005). Value From Regulatory Fit. *Current Directions In Psychological Science*, 14(4), 209-213. doi:10.1111/j.0963-7214.2005.00366.x

Kwasnicka, D., Dombrowski, S., White, M., & Sniehotta, F. (2016). Theoretical explanations for maintenance of behaviour change: a systematic review of behaviour theories. *Health Psychology Review*, 10(3), 277-296. doi:10.1080/17437199.2016.1151372

Larson, J., Brusseau, T., Newton, M., Fairclough, S., Wengreen, H., & Hannon, J. (2018). Fit "n" Cool Kids: Effects of Peer-Modeling and Goal Setting on Physical Activity. *Open Journal Of Preventive Medicine*, 08(04), 85-94. doi:10.4236/ojpm.2018.84008

Larson, J., Brusseau, T., Wengreen, H., Fairclough, S., Newton, M., & Hannon, J. (2018). Fit "N" Cool Kids: The Effects of Character Modeling and Goal Setting on Children's Physical Activity and Fruit and Vegetable Consumption. *Clinical Medicine Insights: Pediatrics*, 12, 117955651878429. doi:10.1177/1179556518784296

Lemery-Chalfant, K., Doelger, L., & Goldsmith, H. (2008). Genetic relations between effortful and attentional control and symptoms of psychopathology in middle childhood. *Infant And Child Development*, 17(4), 365-385. doi:10.1002/icd.581

Li-Grining, C. (2007). Effortful control among low-income preschoolers in three cities: Stability, change, and individual differences. *Developmental Psychology*, 43(1), 208-221. doi:10.1037/0012-1649.43.1.208



Lubans, D., & Morgan, P. (2009). Social, psychological and behavioural correlates of pedometer step counts in a sample of Australian adolescents. *Journal Of Science And Medicine In Sport*, 12(1), 141-147. doi:10.1016/j.jsams.2007.06.010

Macdonald, K., Milne, N., Orr, R., & Pope, R. (2018). Relationships Between Motor Proficiency and Academic Performance in Mathematics and Reading in School-Aged Children and Adolescents: A Systematic Review. *International Journal Of Environmental Research And Public Health*, 15(8), 1603. doi:10.3390/ijerph15081603

Micha, R., Karageorgou, D., Bakogianni, I., Trichia, E., Whitsel, L., & Story, M. et al. (2018). Effectiveness of school food environment policies on children's dietary behaviors: A systematic review and meta-analysis. *PLOS ONE*, 13(3), e0194555. doi:10.1371/journal.pone.0194555

Michie, S., van Stralen, M., & West, R. (2011). The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science*, 6(1). doi:10.1186/1748-5908-6-42

Orbell, S., & Verplanken, B. (2010). The automatic component of habit in health behavior: Habit as cue-contingent automaticity. *Health Psychology*, 29(4), 374-383. doi:10.1037/a0019596

Reinwand, D., Crutzen, R., Storm, V., Wienert, J., Kuhlmann, T., de Vries, H., & Lippke, S. (2016). Generating and predicting high quality action plans to facilitate physical activity and fruit and vegetable consumption: results from an experimental arm of a randomised controlled trial. *BMC Public Health*, 16(1). doi:10.1186/s12889-016-2975-3

Ryan, R., & Deci, E. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78. doi:10.1037//0003-066x.55.1.68

Scaglioni, S., De Cosmi, V., Ciappolino, V., Parazzini, F., Brambilla, P., & Agostoni, C. (2018). Factors Influencing Children's Eating Behaviours. *Nutrients*, 10(6), 706. doi:10.3390/nu10060706

Sheeran, P. (2002). Intention—Behavior Relations: A Conceptual and Empirical Review. *European Review Of Social Psychology*, 12(1), 1-36. doi:10.1080/14792772143000003

Sniehotta, F., Schwarzer, R., Scholz, U., & Schüz, B. (2005). Action planning and coping planning for long-term lifestyle change: theory and assessment. *European Journal Of Social Psychology*, 35(4), 565-576. doi:10.1002/ejsp.258

Strack, F., & Deutsch, R. (2004). Reflective and Impulsive Determinants of Social Behavior. *Personality And Social Psychology Review*, 8(3), 220-247. doi:10.1207/s15327957pspr0803\_1

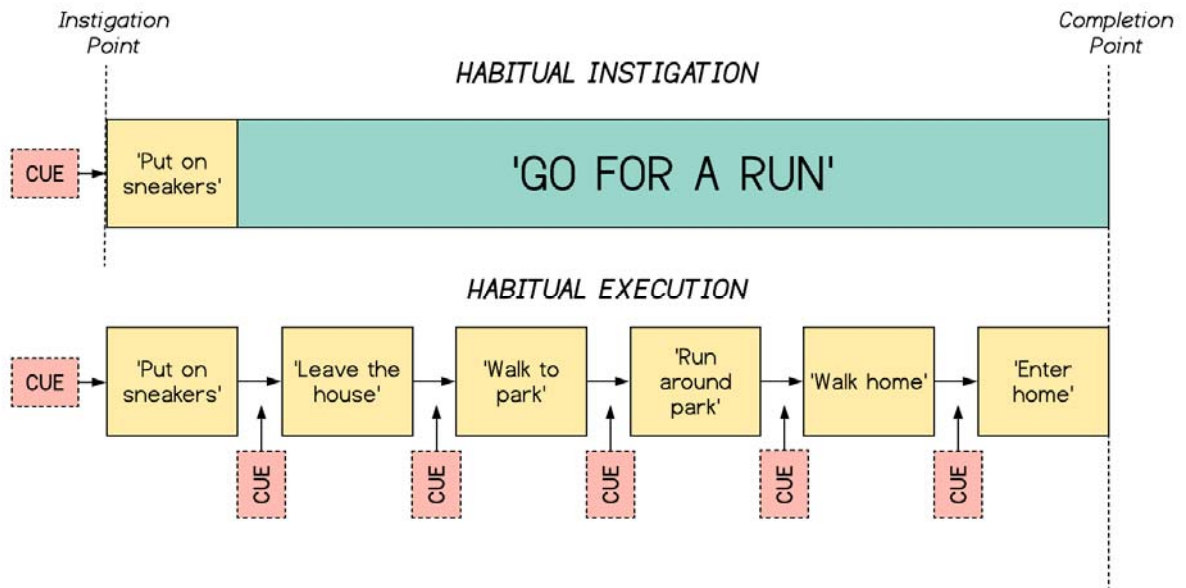
True, L., Pfeiffer, K., Dowda, M., Williams, H., Brown, W., O'Neill, J., & Pate, R. (2017). Motor competence and characteristics within the preschool environment. *Journal Of Science And Medicine In Sport*, 20(8), 751-755. doi:10.1016/j.jsams.2016.11.019





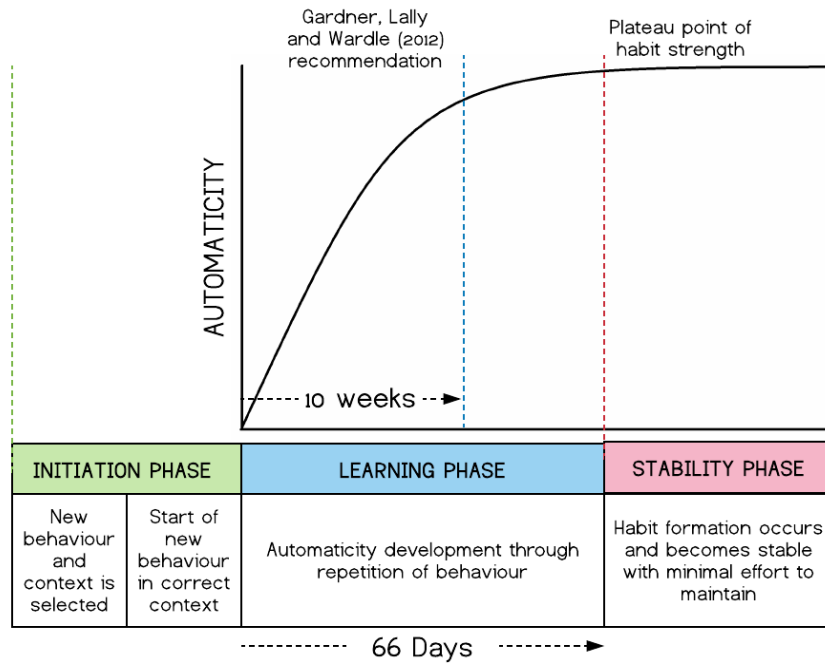
Webb, T., & Sheeran, P. (2006). Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychological Bulletin*, 132(2), 249-268. doi:10.1037/0033-2909.132.2.249

Appendix



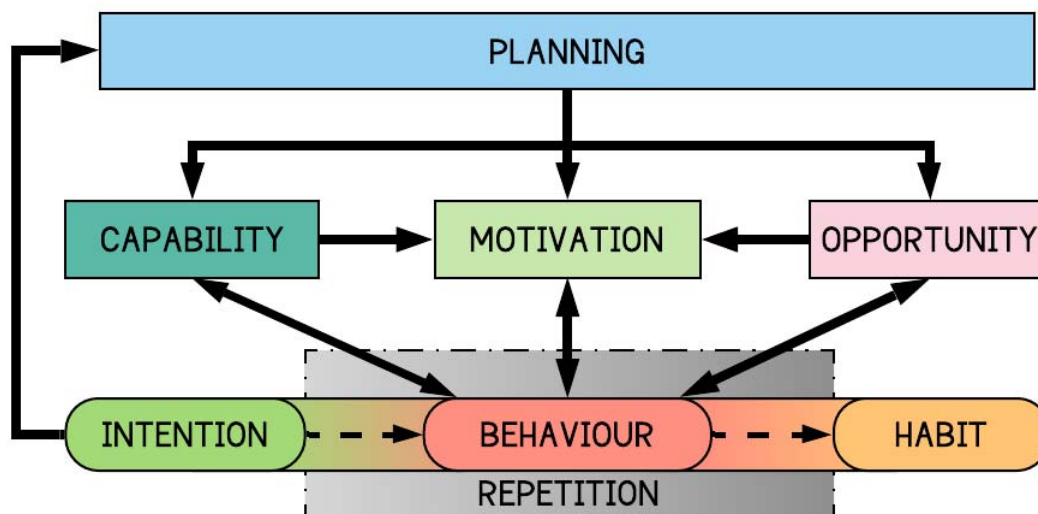
**Figure 1.** Figure adapted and simplified from a diagram by Gardner, Phillips and Judah (2016), It shows the difference between the concepts of habitual instigation and execution.





**Figure 2.** The three phases of habit formation and maintenance with the development of automaticity following an asymptotic curve.

Blue dotted line represents the 10 week point into habit formation and Gardner, Lally and Wardle (2012) recommendation of time point to inform patients. Red dotted line represents the point at which the strength of a habit reaches a plateau and the stability phase begins.



**Figure 3.** A framework that has been adapted from the COM-B system by Michie, van Stralen and West (2011). It shows the progression of how an intention becomes a habit through behavioural change and highlights some of the factors that influence that progression.

		BEHAVIOUR CHANGE	
ACTION CONTROL		Initiation	Maintenance
Automatic (System 1)	Key Determinants:	- Implicit attitudes - Behaviour primes	Key Determinants: - Habits
	Possible Interventions:	- Evaluating conditioning - Association training - Approach/avoidance training - Controlling food cues - Healthful primes - Implementation intentions	Possible Interventions: - Repeated and consistent performance of healthful responses - Breaking habits: Self-control over cues to unhealthy eating and changing cues to unhealthy eating
Reflective (System 2)	Key Determinants:	- Attitudes, social norms, self-efficacy, intentions	Key Determinants: - Satisfaction with behaviour change
	Possible Interventions:	- Theory-based persuasive, social influence and self-efficacy enhancement strategies - Self-monitoring coupled with additional strategies from control theory - Exploiting context changes that disrupt existing habits - Implementation intentions	Possible Interventions: - Temporal comparisons - Rendering outcomes salient - Making people mindful of behaviour change - Shifting expectations

**Figure 4.** A conceptual matrix model illustrating how reflective and automatic processes relate in the initiation and maintenance of food choice with key determinants and possible interventions (Rothman, Sheeran and Wood, 2009).