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EMBODIED EDUCATION: ENHANCEMENT OF SOCIAL AFFORDANCES IN A DISABLED YOUNG PERSON TROUGH THE PRACTICE OF SITTING VOLLEY

EMBODIED EDUCATION: POTENZIAMENTO DELLE AFFORDANCE SOCIALI IN UN GIOVANE DISABILE ATTRAVERSO IL SITTING-VOLLEY

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Abstract

Cognitive sciences have a necessary interdisciplinary nature due to the fact that no single discipline can do full justice to the complexity of the various issues. The present case considers a young student born without his left hand. People with congenital limb deficiency sometimes experience the movement of their ghosts; they are self-aware of it, even without being embodied by it. The absence of input does not block neural networks from generating messages on the missing parts of the body; they continue to produce such messages that can emotionally unbalance the subject if there's not an adequate *Embodiment Education*. Exercise and Sports Sciences also have an interdisciplinary nature; this work presents a modality of intervention for the rehabilitation of a class and a disabled scholar (G) and of the relational dynamics revolving around the phenomenon of disability. One question remains unanswered: can talking about *Embodied Cognition* and *Social Affordance* also mean using "the other" or understanding how to "use it"?

Le scienze cognitive hanno una natura interdisciplinare resa necessaria dal fatto che nessuna singola disciplina può rendere piena giustizia alla complessità delle varie questioni. Il caso in oggetto tratta di un giovane studente nato senza la mano sx. I soggetti con deficit congenito degli arti a volte sperimentano il movimento dei loro fantasmi; ne sono autocoscienti, pur senza esserne incarnati. L'assenza di input non blocca le reti neurali dal generare messaggi sulle parti mancanti del corpo; esse continuano a produrre tali messaggi che possono squilibrare emotivamente il soggetto se non vi è un'adeguata Embodiment Education. Le Scienze Motorie e Sportive hanno anch'esse una natura interdisciplinare; in questo lavoro si presenta una modalità di intervento di recupero di una classe e di un alunno disabile (G) e delle dinamiche relazionali che ruotano intorno al fenomeno della disabilità. Resta irrisolta una questione: parlare di Embodied Cognition e di Social Affordance, può anche significare prendere in uso "l'altro", o comprendere come "usarlo"?

Keywords

Embodied Cognition; Embodied Education; Hand Agenesis; Phantom limb; Sitting Volley

"We must perceive in order to move,
but we must also move in order to perceive"
J. Gibson

"An education is truly "fitted for freedom"
only if it is such as to produce free citizens,
citizens who are free not because of wealth or birth
but because they can call their minds their own"
M. Nussbaum

Introduction

A pressing request from Pedagogy and Didactics today sees, in the foreground, methodologies in which the cognitive is improved through a relational mind: *an experience-dependent* mind (D'ambrosio, 2019; Siegel, 1999); for this purpose, particularly for Special Educational Needs, it is necessary to overcome the classic process of integration/inclusion, to get Interaction, as a focus for a school capable of giving sensible and sensitive answers. To encourage interaction, the school must (definitively) recognize the first device that enables the relationship itself: the body. It is also true in the case - or above all - in which its functionality may be compromised by disability. Quoting D'ambrosio (2019), we can say that [...] *The body, its living matter, has its own cognition that extends and then mutates with the changing processes of social interaction that, that body is able to activate on a biomechanical level, sensory and locomotor, to learn and generate other cognition/action.*

Neuroscience with *Embodied Cognition*[1] (EC) provides the theoretical substratum to bring together the vast range of human movement and offers the possibility of its didactic use, as part of a special methodology with which the teacher - in this case of Motor Science - may be able to design the learning as functional *to other things*. EC scholars have as their theoretical starting point not a mind that works on abstract problems, but a body that requires a mind to make it work (Wilson, 2002; Gallese, 2009; Borghi, Caruana 2013; Gomez et al. 2017); that is to say that the EC preliminarily examines the role of the physical body, and how its properties affect its ability to think. Within the EC we have the possibility to use movement as a didactic form, precisely because it feeds thought by becoming one with it; this additional experiential set contributes to the birth of *Embodied Education* (EE) also through movement and sport (Ceciliani, 2018).

The activities of the body, therefore also the sports ones, shape and build learning, also using emotions,(Gomez et al. 2017) aspects of great importance for educators who aim to train young people also from an ethical point of view as future citizens of the world; on this point *Capabilities Approach* by Martha Nussbaum (2007) has greatly contributed, emphasizing the equality between human beings, to overcome the distinction between normal people and people with disabilities, giving everyone equal rights.

Last but not least, in the activities of the body, there is also health promotion which indicates a process of change and adaptive development aimed at primary, secondary and tertiary prevention through the dissemination of healthy lifestyles (Risoli, 2015). As shown by Caruana & Borghi (2013), the EC presents a perceptive and a motor soul, which combined with self-awareness, allows the cognitive functions to experience emotions, decisions, their representation in life situations, thanks to interactions with people, objects and spaces. From this point of view,

1 Embodied Cognition: knowledge develops in a constant relationship between the mind, body and environment of one or more individuals. For this reason, cognition is the result of the interaction between the organism, which acts through actions directed towards multiple purposes, and the environment. These studies born in the 1980s with Lakoff & Johnson, carried out by Thelen & Smith (1994) and further developed by neuroscience with Gallese & Lakoff (2005).

the concept of *affordance*[2] becomes important, that is the need to create situations in which the environment is able to provide sufficient information, not only to guide the action concretely, but also to stimulate it.

According to Borghi (2011), and Becchio (2008; 2010) affordances also have a dimension that goes beyond objects, also considering sociality and relationships with others. Jayawickreme and Chemero (2008) use the concept of affordance to also give a theory of moral value, and successively Jayawickreme and Stefano (2012) extend the concept to theory of moral heroism. To give full value to an educational experience, it is necessary to involve the subject in interesting and motivating activities, which activate the awareness of acting thanks to the presence and awareness of oneself; for this purpose, the various languages of movement or even of theater, or dance, *can also be a pretext to introduce experiential elements in a set, that of the class, which in Italy, unlike some international experiences, often remains rigid. (Zambaldi, 2016)*

Case history

This work stems from the need to solve a problem - initially postural - by a teacher of motor science, (and the entire teaching team) of a student of the school annexed to the "Don Bosco" Salesian institute in Naples. The Institute takes its name from its founder S.G. Bosco whose purpose was welcoming young people with social problems and/or hardships indicated by the Juvenile Court who entrust them to the Salesians as they lack parental authority or because they have other problematical behavioural stories. For these reasons, study programs are lighter and focused on topics that are more appreciated by the students; in this case, Motor Sciences are the most popular.

In this paper we will examine the case of a student called Guglielmo (G), he is sixteen years old, he is m. 1, 70, he is the first of four siblings (two m. and two f.) and he is facing his post-pubertal period. Its weight and state indixes have had a big rise in the past two years; there are primary and secondary sexual characteristics and it has been possible to trace his spermatogenesis (he reported nocturnal pollution in July 2016).

The physical feature that distinguishes G. is the lack of the left hand, the particular stump and the hypotrophy of the forearm and arm. In relation to this deficit, the boy has a particular posture, as a consequence of placing (or hiding) the stump on the left side or, if he has the possibility (almost always), he keeps the stump in the jacket pocket. The lack of the hand is due to a genetic malformation, which arose during the embryonic period of pregnancy for the transmission of an exanthematous disease (rubeola). The jacket is a fundamental garment for the boy; he wears it or holds it on his left arm as a cover; even during the summer months the boy wears jackets or long-sleeved shirts. The particular attitude he assumes unconsciously, unbalance his equilibrium; it's not uncommon to see him falling during lessons, playing five-a-side football as a result of the lack of balancing function due to the use of the left upper limb that he folds.

During an examination it is possible to notice an unstructured scoliotic attitude with the possibility of consolidation. He claims to be very good at volleyball, but when invited to play with the class he declares that he cannot play because the sweat bothers him. During the various interviews held at the beginning of the study, limb-phantom phenomena emerged, in conjunction with dreams, sometimes even of an erotic/sexual nature; in addition, rhythmic muscle contractions (twitches) occurred in the eyes, cheeks and forehead during the interviews.

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2 The concept of affordance was introduced by JJ. Gibson in the decade 1950/60, and then formalized (1979) with the text *The ecological approach to visual perception*; the term is translated as offer, give, provide, grant availability, but we could briefly say it is an invitation to use. An example, much cited and experienced, concerns the motor action directed towards grasping a cup: it is an evaluation of the compatibility between the image of the object and the subsequent action of use. The mental representation of one's body does not necessarily correspond to the physical representation of the body; sometimes individuals perceive that they can reach objects that are out of reach. (Ambrosini, 2012)

From all this springs the first proposal - accepted by the boy - that is to do postural gymnastics to overcome the various problems on the manifested imbalances. Clearly it is not the only proposal, as the behavioural difficulty of the adolescent cannot be ignored it is necessary to include a psychological/relational intervention through motor science lessons (the only subject accepted by G. and the class) by agreeing to use team sports for the purpose.

Methodology

To set the case of G. we had to verify some essential conditions:

-Can sports science help G? - Does G need special help? -Does he live his condition with discomfort? - Does he want to be helped? - Are his mates helpful?

We get a positive sign from the empathy that naturally arose with the motor science teacher, with whom both G. and the others have a positive relationship; thanks to this it was possible to interview and analyse their stories. In order to formulate an action plan, we discussed with the whole teaching team, with the school psychologist (Dr. A. Di Costanzo), with local health unit (ASL NA 1), with classmates, and with the family. Relying on the concept of team, all the operators of this project have adhered to a use of their sensitive data limited to the research in progress, recognizing the validity of the initiative, and deciding to:

Listen to the entire teaching team;

(B) Interview G and the class;

(C) Interview G's family;

(D) Administer a Clinical Transactional Analysis[3] questionnaire to G and the class;

(E) Administer a Rorschach test[4] to G

(F) Obtain a medical diagnosis on posture and limb-phantom phenomenon;

(G) Examine the most recent literature on similar phenomena;

(H) Draw a path that, starting from the "wishes" of the class (game and / or sport), is capable of intercepting the motivations for collaboration.

RESULTS

The teaching team, from the daily feedback in the classroom, agreed in defining G. a student "*who, while striving to have natural attitudes, manifests an unsatisfactory integration with the school environment, so much so that he always prefers to be seated at the desk alone*." The discourses that G. makes with the teachers are mostly aimed at demonstrating that "*I can do it alone*", sometimes with arrogance and with an authoritarian tone.

In the interview with G, we report the story of a dream that have left a vivid memory in his mind: *... I was by the sea, in Vasto Marina on vacation, I went out with a girl I had met and we went to the disco; during the dance I hugged her and felt that I had both hands. I perfectly felt the hand that I don't have, also because it hurt, and I felt, through my fingertips, the body of the girl I was dancing with. At the end of the evening, I accompanied the girl home and we said goodbye by hugging each other with a kiss. Again, I felt my missing hand and pain. Then my uncle came to pick me up (he is young, I like the way he behaves, I talk to him a lot) and took me home*. G confirmed that he had other dreams of this kind but for two years now he hasn't had dreams like that anymore.

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3 Clinical transactional analysis (AT, W.H. Holloway, 1973) is a psychotherapy approach that allows us to evaluate the patient's relationships with his peers and his fear of society. The intervention methodology is based on contractuality: it is based on an agreement between therapist and client/s, who have a joint responsibility in working to achieve the shared goals of the therapy defined in a clear and specific way.

4 The Rorschach test created by Hermann Rorschach (1884-1922), is a famous psychological projective test used for the investigation of personality, it provides useful data regarding the functioning of thinking, reality testing, emotional distress and ability of a correct representation of oneself and of others in relationships (Boncori, 1993).

Regarding the family, it was only possible to interview G.'s mother, who never mentioned the word HK or impairment, ensuring that the boy behaves normally at home, without hiding his arm, and often quoting all the positive things that the guy does with one hand.

With Dr. A. Di Costanzo - a school psychologist - various TA sessions were carried out with the whole class; the results, leaving aside the in-depth analysis of the content, highlighted [...] *the typical difficulties of adolescents, that is, those connected to the relationship with the family, with their body, and the negative judgment regarding the school and teachers. In particular, the questions related to the sphere of corporeality have shown a very poor knowledge of these phenomena and a considerable embarrassment in trying to deal with them. Then the class, excluding G., was interviewed; the interviews were done individually and the contents anonymous. The focus of the interview was the relationship with G. and his handicap.*

Once again, thanks to Dr. A. Di Costanzo, G. was given the Rorschach test; here is the summary:

the test indicates an intellectual inhibition of neurotic origin due to the repression of affects. The subject tries to exercise a strong control over his emotional life to the point of being deprived of it. Thought is predominantly abstract in nature; it has a tendency to neglect the concrete things of everyday life. The subject has a strong ambition to establish himself, has good ability to adapt and control especially in new and unknown situations. He presents quite controlled states of anxiety and insecurity, frustrated needs for more intense and deepened personal and social emotional contacts. The need to hide or cover oneself indicates an attempt to conceal aspects of one's personality. The greatest area of conflict is linked to the father figure or authority in general.

We underwent G. to an initial inspection with a school doctor and subsequently to an orthopedic specialist from which this diagnosis was made: *"Agenesis of the hand in the left upper limb. The clavicle joint — left scapula-humeral, slightly adducted and with hypotrophic musculature. The elbow joint in extension does not reach the maximum opening. From the examination of the spine, at the moment there are no phenomena of vertebral deviations and rotations.*

The phantom limb phenomenon may be due to amputation or congenital aplasia (Aglioti, 1994). For a long time, it was believed that children born without a limb or part of it did not have phantom limb phenomena; on the other hand, a considerable number of children with congenital aplasia report feeling the phantom limb (Weinstein and Sersen 1961; Saadah & Melzack, 1994)

The examination of the literature on the cases of agenesis of the hand is scant; nevertheless, the casuistry is interesting and harold of developments from other research angles: what kind of *affordances* can be found in agenesis?

(H) Considering G's unspoken passion for volleyball, a recent story of an athlete of the Italian women's national team of Sitting-Volleyball is very enlightening (Silvia Biasi, hand amputated since the age of five by accident, keen on volleyball, she switched to Sitting with an aesthetic prosthesis); we have also found a well-known blogger, followed by very young people, who posted her story: *My name is Federica Napoli and this is my truth: I was born with left hand aplasia (2017);* from the reflections on these stories, the structure of an educational path for the class and for G is outlined.

Conclusions

The construction of an experiment
or the simple fact of observing an object
can sometimes modify the object,
because in the human sciences the object
is the individual or a group of individuals?
sensitive to the look we give him.
G Devereux

Cognitive Sciences, Psychological Sciences and Pedagogical Sciences can be considered converging lines; several authors in fact merge them into a single science called *Mind Brain Education Science* (MBE See Tokuhama-Espinosa, 2010-2014; Howard-Jones, 2014).

The results of the eminently psychological approach to the case of G., although necessary, do not satisfy us: we think that the causes are attributable to the restlessness of the group (the proposals of lessons linked to competitive activities, experienced by "problematic adolescents" needed much more time than expected to be controlled) and cultural difficulties (talking about the body for many is talking about sexuality, a thorny topic). The latent risk resulted in a kind of pietism towards G.

The examination of the literature on missing limb pain in agenetic people happened to be full of inspirations and unanswered questions: is the *EC* detectable in agenetics? By *social affordances*, can we also mean -beyond objects- an invitation *to the use of oneself*? If so then the psychological approach is important and results as the first step to encourage the interaction between G, the class and the family. Finally, the most positive aspect we found: we proposed a Sitting Volleyball competition to the class; first of all, we gave an explanation both on the rules of the game and by telling the story of Silvia Biasi, libero of the Italian Paralympic National SV, who plays with the aid of a prosthesis of the hand, famous for a very recent book (2021) in which she tells her story. The proposal - which gathered all unnaturally - was accepted by the class and, albeit on only two occasions, G joined the competition while maintaining a long-sleeved shirt.

Overall, in accordance with Ceciliani (op. Cit.) *Embodied Education* combined with sports practice, can represent both an alternative way of initiation into sport, and a step forward to overcome the impasse of a "different" body in a "different" group. We call disease, the metamorphosis of a body that becomes the object of feelings and sufferings, so much so that it appears as an enemy; this happens because in the human body the uniqueness of the body is highly complex.

Transdisciplinarity is a must.

References

Aglioti S. et all. (1994) Phantom lower limb. The Royal society, 255:273-278

Alessandrini G. (a cura di) (2014), La "pedagogia" di Martha Nussbaum. Approccio alle capacità e sfide educative. F. Angeli, Milano.

Ambrosini E. et al. (2012) Which body for embodied cognition? Affordance and language within actual and perceived reaching space. *Consciousness and Cognition* 21, 1551–1557

Bagnara S. (2017) in www.medium.com/bsd-stories/psicologia-cognitiva-design-e-nuove-tecnologie-37d4c4a92a1c

Barsalou, L.W. (2008). Grounded cognition. *Annual Review of Psychology*, 59, 617- 645.

Becchio C, Sartori L, Bulgheroni M, Castiello U. The case of Dr. Jekyll and Mr. Hyde: A kinematic study on social intention. Consciousness and Cognition. 2008b; 17:557–564.

Becchio C, Sartori L, Castiello U. (2010) Toward you: The social side of actions. *Current Directions in Psychological Science*.;19:183–188.

Biasi S. Stelitano A. (2021) Volevo solo giocare a pallavolo (Pref. A Lucchetta) Ediciclo Ed. Venezia

Boncori, L. (1993) Teoria e tecniche dei test, Bollati Boringhieri, Torino

Borghi A M., Gianelli C, Lugli L. (2011) La dimensione sociale delle affordance: affordance tra io e gli altri. *Sistemi intelligenti* Il Mulino 2/2011, agosto pp. 291-300

Clark, A. (1997). *Being there: Putting brain, body and world together again.* Cambridge, MA: The MIT Press.

Devereux G. (1992) Trattamento qualitativo dei dati raccolti nelle situazioni di insegnarnento: riflessioni e riferimenti". UFR STAPS NIZZA 1992

Diamare S, et all (2019) Un metodo di Embodied Education in riabilitazione: approcci di valu-

tazione partecipata e di empowerment psicocorporeo. *Journal of advanced health care* V1 IS II
Gallese V., Lakoff G., (2005) The Brain's concepts: the role of the sensory-motor system in conceptual knowledge. *Cognitive Neuropsychology*, 21 (0), XXX–XXX
Garbarini, F., Adenzato, M. (2004). At the root of embodied cognition: Cognitive science meets neurophysiology. *Brain and Cognition*, 56, 100-106
Gibson J. J., (2014) Un approccio ecologico alla percezione visiva. Il Mulino, Bologna.
Gibson, J,. J. (1979) An ecological approach to visual perception. Houghton Mifflin, Boston.
Gomez Paloma F., Ascione A., Tafuri D., (2017) Embodied Cognition: the role of body in didactics. *Formazione & Insegnamento* XIV – 1 – 2016.
Holloway W.H. (1979), *Transactional Analysis. An Integrative View*, in Barnes, G. (1977), Transactional Analysis after Eric Berne, Harper & Row, New York.
Howard-Jones, P. A. (2014). Neuroscience and education: myths and messages. Nature Reviews Neuroscience, 15(12), 817-824.
Jin Zheng, Tirassa M., Borghi A. M., (2018) Editorial: Beyond Embodied Cognition: Intentionality, Affordance, and Environmental Adaptation *Front. Psychol.,* 21 December 2018.
Lakoff, G., & Johnson, M. (1980) *Metaphors we live by*. Chicago, IL: University of Chicago Press.
Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its challenge to western thought.* Basic Books, New York.
Lenggenhager B, Arnold CA, Giummarra MJ. (2014) Phantom limbs: pain, embodiment, and scientific advances in integrative therapies. *Wiley Interdiscip Rev Cogn Sci.* 2014 Mar;5(2):221-31.
Napoli F. (2017), www.news.mtv.it/gossip/il-pagante-federica-napoli-svela-perche-ha-sempre-tenuto-una-mano-tasca
Norman D.A., (2019) La caffettiera del masochista. Giunti, Firenze.
Novellino M. (1987), Redecision analysis of transference: the uncounscious dimension. *Transactional Analysis Journal* 17 1, 271-276.
Nussbaum M.C. (2007), Le nuove frontiere della giustizia. Disabilità, nazionalità, appartenenza di specie. Il Mulino, Bologna.
Risoli A, Antonietti A, (2015) *Il corpo al centro: Dalla teoria alla riabilitazione con il metodo SaM®.* LED Ed., Milano
Saadah E.S.M., Melzack R., (1994) Phantom Limb Experiences in Congenital Limb-Deficient Adults. *Cortex* 30:479-485,
Stelter R., & Roessler K.K. (2005). *New approaches to Sport and Exercise Psychology*, Oxford: Meyer and Meyer Sport (UK)
Thelen E., Smith L. B., (1994) *A dinamic system approach to the development of cognition and action.* Cambridge, MA: Bradford Books/MIT Press.
Tokuhama-Espinosa, T. (2010). Mind, brain, and education science: A comprehensive guide
Tokuhama-Espinosa, T. (2014). Making classrooms better: 50 practical applications of mind, brain, and education science. First Edition Norton & Company, New York.
Varela, F.J., Thompson, E.T., & Rosch, E. (1992). *The embodied mind: Cognitive science and human experience.* MA: The MIT Press, Cambridge.
Weinstein S, Sersen A, (1961) Phantoms in cases of congenital absence of limbs. *Neurology* Oct; 11:905-11.
Zambaldi N., (2016) Embodied Education at the center of a new paradigm: a contribution from art and theatre for a multimodal interface. *Formazione & Insegnamento* XIV.