Neuroscience within companies: some case studies

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ABSTRACT

It is possible to understand many crucial processes within organizations such as change planning and management, training, decision making and leadership thanks to organisational neuroscience. For example, poorly managed change can result in alarm messages within our brains. Managers must be aware of how their words, emotions and conduct have a significant impact on team mood and results. Another fast-growing area of research is neuromarketing, thanks to company investments. This article presents a success story: a company that, faced with the need to change its selling proposition, uses neurometric techniques to analyse possible resistance of the sales force and then acted accordingly. Even training can significantly improve company efficiency thanks to neuroscience. This article also discusses some experiments carried out by the Training Department of a large public transport company.

Keywords: Organizational neuroscience; Change management; Training; Leadership

1. Introduction

Organisational neuroscience uses the findings on how the human brain works to expand the general knowledge of topics that, classically, fall within the scope of management studies and applications, and that are useful to organisational psychologists, managers, trainers or consultants.

In fact, nowadays the brain is a less mysterious object thanks to advances in neuroscience. Various aspects of particular interest that have a major impact on our working life have been described in more and more detail over the last few decades.

For example, we now know that we are far more conditioned than we think or would like to be. However, on the other hand, we are perfectly capable to constantly adapt to contexts that open up new scenarios and make the continuous changes we are subject to more acceptable, provided that they consciously comply with the rules of the brain. But, what are some of those basic rules? What kind of basic information must a leader have? What role does emotion play in decision making? It is essential for leaders to have a greater awareness of their decision-making mechanisms (Kahneman, 2012) and the brain both to better manage complexity and above all in their relationships with employees (Boyatzis & McKee, 2006; Goleman & Boyatzis, 2008).

Therefore, let us try to think of a few examples of critical processes within an organisation where neuroscience can make a significant contribution, starting from the planning and management of *change management* we have to face on a daily basis.

2. Change management

Uncertainty generates alarm messages in our brain: in fact, our brain hates ambiguity and constantly needs to make predictions (Scarlett, 2016). It quickly calculates threats and opportunities so that it is in a position of control: it has to make plans to feel it is in control of situations and able to handle them. The fear generated by uncertainty weakens cognitive and social resources, increases stress and lowers defences. This results in difficulties in managing situations and problems and a tendency to blow them out of all proportion. In short, we have fewer operational resources at a time when organizations most need them (Sinek, 2014).

A leader's role in these situations is crucial: managers must be aware of how their words, emotions and conduct may have a significant impact on their teams' results, and research within the field of neuroscience can decidedly

contribute to create the right climate to maintain performance.

In this case, two keywords for the brain are information and inclusion (Lieberman, 2013). Indeed, our brain craves information to make its predictions. The sooner they are provided, the sooner it returns to normal operation. Moreover, our brain is social, needing to feel included and listened (Riva & Eck, 2016). That is a survival instinct, that is linked to the limitation of available resources when feeling excluded. Time spent with employees and relationships with employees is then never wasted during times of change.

In addition, another basic need of the brain that must not be forgotten in all this is autonomy, that is making people feel they have a choice; this is necessary to make them feel capable of controlling the situation (Rock, 2008).

In other words, numeric and business variables should not only be considered when planning a change management process, but also providing the settings needed to reprocess all those emotional aspects that will impact on people, and neuroscience can help with this.

3. Neuromarketing

Another rapidly growing trend, thanks to company investments, is *neuromarketing*. It investigates consumer buying patterns and in particular the effectiveness of adverts and communications in general (Gallucci, 2014) using brain activity visualization techniques.

Take, for example, a large Italian company faced with an important choice. Imagine it needs to change its selling proposition by introducing contractual terms that are difficult for the customer to understand and wants to test sales force resistance to this new proposal. It would be faced with various possibilities: impose the decision using financial and contractual requirement related arguments or see whether its sales force is willing to rethink how it interacts with its customers, to better understand the extent and nature of its resistance.

Nowadays, the latest applications on how the brain works could help this company to better understand this phenomenon by knowing the nature of internal resistance to change and, thus, by introducing all the corrective motivational, technical and human actions necessary to successfully tackle the appropriate changes.

This is what happened recently at a large company and the result was impressive.

The need was that of knowing the real opinion of a 150 strong sales force with regard to a contract amendment to be proposed to the network of dealers

on the territory. The risk was clear: undeclared resistance to the proposed changes and resulting system inertia.

In fact, it is now known that our "internal attitudes" to particular concepts or ideas are not always reflected by what we say, without necessarily referring to a type of misleading communication. Both aspects of social desirability (i.e. putting relationships with others first, saying what is best and omitting everything else) and the inability to be introspective, and, finally, to verbally express one's internal emotional processes in a timely manner (Babiloni, Meroni & Soranzo, 2007) all contribute to this fact. Therefore, how can I work on potential company resistance if people say (reasonably truthfully from their perspective) they do not have any?

Often even anonymous questionnaires fail to determine possible internal resistance to a concept or particular product. This resistance can even remain completely hidden from an individual's verbal conscience. In these cases, individuals will even state they have no criticisms. There is where the ability to associate classical social survey techniques with brain activity and psychometric behaviour measuring techniques is a mean of highlighting the presence of this implicit resistance in those individuals subject to training.

In fact, internal resistances can be highlighted with brain activity and psychometric measuring techniques, so to detect "unconscious internal conflicts" with regard to concepts, ideas or even single words. More precisely, people's brain activity and emotions can be measured with an electroencephalogram (EEG) and psychometric responsiveness testing tools (Balconi et al., 2016) to highlight instinctive "interior" responses to messages.

Going back to our example, once the main critical issues with these neurometric techniques were identified, 10 trainers accompanied participants, divided into groups, through an emotional storytelling process that led them to spell out their views on the selling proposition and the new contract, till they found emotional space for their shared narratives and, above all, a container in which to develop their resulting resistance over a very limited space of time.

4. Training

Another elective application of neuroscience within companies is *training*, starting from the valuable instructions on the best ways to promote learning from the brain's point of view.

A recent article published on the October 2016 edition of the Harvard Business Review (Beer, Finnström & Schrader, 2016) sheds, even with its title, a decidedly negative light on the delicate issue of the effectiveness of company

training: “Why leadership training fails”. The authors point out that:

> *American companies spend enormous amounts of money on employee training - $160 billion in the United States and close to $356 billion globally in 2015 alone—but they are not getting a good return on their investment. For the most part, the learning doesn't lead to better organizational performance, because people soon revert to their old ways of doing things.* (Beer et al., 2016, p. 50)

At the same time the CEOs of some companies, increasingly faced with the need for spending cuts, reduce budgets for management and behavioural training. Therefore, company training has to change significantly if it wants to survive the crisis and become more effective. This means, in short, helping people working within the organisation to change some behaviours, in order to improve their performance and the one of their working groups.

Neuroscience represents a valuable contribution within this context, by helping to look into the soft processes within a company. Therefore, training managers have the chance to broaden their vision and to become "key figures" within the organisation, since they lie at the meeting point between two skill fronts that no organization can live without: the one on company processes and the one on mental and emotional processes. It is therefore necessary to build a bridge between the worlds of scientific research, business, and education. This is starting to happen in the training Campus of A.T.M. – the public transport company of Milan (9,300 employees) – thanks to the people who work there, psychologists and humanities graduates, that started to study neuroscience, to meet neuroscientists, and consequently to change the way they do in-house training some years ago.

4.1 The training gym

An initial example of a different way of providing management training within A.T.M. is the so-called "training gym" that, even in the name, forewarns of important changes and stems from certain neuroscientific evidence. The first one is that some types of learning are more rewarding than others as stimulating the dopamine pleasure centres: in particular, training involving the active participation of students is definitely more rewarding than the classic classroom approach where students listen to the teacher’s explanations. The second one points out that a certain period of time - roughly 20 days/one month - is necessary to learn new behaviours and make them routine (i.e. to create a new brain circuit), thus changing the tough and resistant spontaneous structures of our brain and, above all, enabling strategies based on the repetition of the new behaviours to be adopted. Therefore, didactic methods

that produce change by activating repetition based on constant and precise work are necessary: therefore, change that involves the choice of small actions to be repeated over time. An activity that, slowly but surely, reshapes neural structures. The third one points out how emotions and physical experience help make learning more effective. The fourth and last one, coming from psychology even before neuroscience, is that you cannot change by yourself since the relationship with others is necessary (Rivoltella, 2012, 2014).

A.T.M.'s "training gym" firstly changes the classic strategy of the two-day management training course by favouring shorter periods of time but repeated over time (the overall course lasts around 2 months), so to avoid excessive concentration of contents and so to allow individuals to learn and change to actually take place. As you can see from Figure 1, the training gym includes seven brief moments. Firstly, certain materials concerning the theory of the skill to be strengthened are sent to participants to be read on their own. In fact, the theory can, at least in part, be studied individually, using the first meeting with the trainer for questions, clarifications, explanations and comparisons even with other participants, with that studied. This is the "flipped classroom" model that is ultimately linked to the "lectio medievalis" one. Indeed, students in the first great universities of the middle ages (Bologna, Padua, Paris and others) studied the theory independently whilst subsequent classes were dedicated to discussing the issues and dialectics with the Professor, via very intense debates (Castagna, 2007). In fact, the debate was considered the centre of learning.

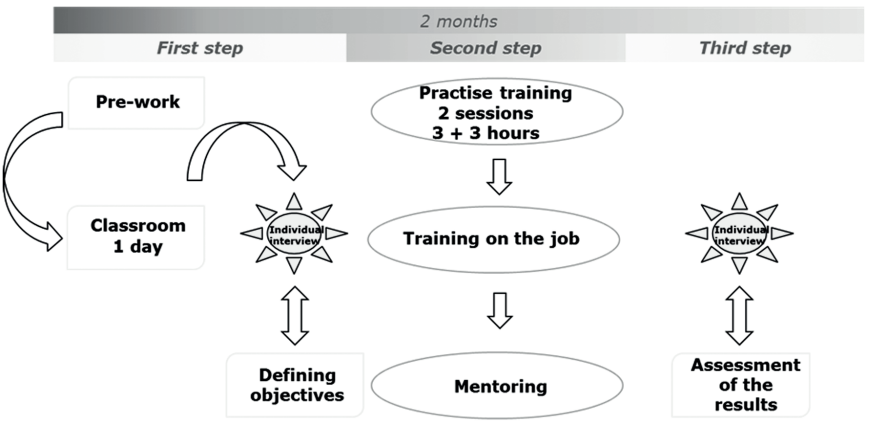

Figure 1. The A.T.M. training gym: overall structure and steps

The first meeting is followed, about ten days later, by the first individual meeting with the trainer, which lasts about an hour. That is also the time for students to clarify any doubts that might have arisen in the meantime but above all to define an individual improvement plan with the trainer – namely, what to do differently with respect to the past, how to do it, and a relative timeframe. This meeting begins to empower the participant by reaching an actual "agreement" with the trainer.

The individual meeting is followed, about two weeks later, by two "gyms" – i.e. short but intense training sessions (3 hours then back to the office) where participants, led by the trainer, practically and physically experience their new behaviours, thanks in part to theatrical techniques, in a safe environment (the classroom), where there is no fear of failure and imperfection. In fact, change is not solely a psychological issue, but rather a system based on three moments: cognitive but also physical and emotional. Individuals learn especially physically, i.e. with the body (Bara, 2015).

Another particularly intense training session consists of individual meetings with a mentor. The A.T.M. Campus has previously identified and trained six company mentors for this purpose; basically six managers that are recognized as the best and most practised ones in a specific skill. Each student meets a mentor once or twice to discuss how to best use that skill or to gain experience by shadowing the mentor (i.e. by observing the mentor that already uses the skill one wants to strengthen effectively).

The training gym concludes, about two months later, with a second and last individual meeting with the trainer, which serves both to discuss the initial successes and to make sure the improvements made continue. Up to now, four subjects have been addressed in the classroom: feedback management, negotiations, empowerment, and self-empowerment.

Returning to the initial topic that was raised in the Harvard Business Review, is this type of training really more effective than classic training? The A.T.M. Campus firstly noted, by using specific evaluation sheets, greater student satisfaction: on average +31% compared to more traditional management courses delivered over the previous two years. In addition, the analyses of data from a recent corporate skills assessment session highlighted that the scores of those individuals attending the training gym have increased on average by 21% compared to the previous assessment (2014). Lastly, many participants reported their use of expert skills in daily business and work groups during their last individual meetings – from setting up weekly meetings to closer relationships with employees and better listening skills to experimenting new ways of better managing the complexity of their job of manager. Such evidences are the first concrete signs of a real change in behaviour, beyond those few initial thoughts of increased awareness that often are the only benefit of more traditional training courses.

4.2 Masters of the trade

A second successful A.T.M. project that also originates from neuroscientific evidence is "masters of the trade". In this case it is necessary to mention the extraordinary discovery of mirror neurons (Rizzolatti, Fadiga, Gallese & Fogassi, 1996; Rizzolatti & Gnoli, 2016), which marked a critical historic transition that many companies are still unaware of. The discovery of those neurons, which activates both when carrying out a given action and when seeing others doing so or when we observe the emotions of other humans, is a discovery that confirms, on a biological basis, that it is inconceivable to think of human beings as isolated and solitary entities: we are "doomed" to create and maintain relationships, and to exercise empathy. This is why, for example, a leader can be deemed as such if he/she is imitated, and if he/she leads by example. It will be a momentous step forward when those involved in organisations understand that relationships are the strategic hub of engagement. As Antonio Damasio effectively wrote, an entity's interactions with an object and context are the entity itself: the possibility of gaining experience results from these interactions (Damasio, 2012). Meanwhile, focusing on corporate training, that just mentioned on mirror neurons means definitively abandoning any solipsistic view of learning and emphasising the importance of the active presence, within companies, of competent people who can act as points of reference and masters, especially for young people. These people exist in all organizations, but the quantum leap takes place when they are publicly recognized as masters. Masters are not masters until acknowledged as such. This is why the A.T.M. Campus identified, in 2013 and 2014, a total of 40 "Masters of the trade" from the main company sectors: individuals who were at least 50, with great technical and relational skills and a strong sense of belonging, who lead by example and are willing to hand down their skills to their younger colleagues. Numerous candidates were selected with interviews and tests, Masters then attended a training course focused on relationships and the dissemination of skills. They have also been involved in a communication campaign with interviews on the corporate house organ and a photographic exhibition at a well-known exhibition space in Milan. In addition, the stories of masters and their tips and secrets of the trade formed the subject of a book entitled "Masters of the trade" available to all corporate employees. These masters of the trade, still continuing to perform their daily activities, are now also engaged in classroom training, supporting job interviews, and, especially, welcoming new employees. That project is also very interesting because it helped motivating elements of the senior staff that have worked in the company for many years and that, as a result of pension reforms, have seen their retirement age increased by six to seven years.

4.3 Training trainers

In recent years, A.T.M. Campus staff, involved both in training programming activities and teaching, have followed a structured trainers' training course, where they have also met with some neuroscientists. In particular, A.T.M. trainers have gained greater knowledge and understanding of the neuroscience field, the fledgling science that studies the mechanisms by which the mind learns thanks to the various neuroscientific discoveries made over recent years. This has led to changes in company training practices including:

- The introduction of adaptive and digital technologies (for example the 3d mapping for first aid courses), offering new opportunities for learning in and out of the classroom.
- The use of physical experiments with even emotional connotations such as training on active listening, enhanced by an engaging path in the dark at the Milan Institute for the Blind, where participants where guided by the voice of a blind person.
- Redesigning training courses by dividing the contents to be delivered into three dimensions: the essentials (5%), those required (15%), and those not required but that still are useful insights (the remaining 80%). This helps trainers simplify the content, bearing in mind the brain is able to process and store only a small part of all proposed contents. For this reason, the most important pieces of information are divided into modules, at the end of which there is a summary and individual or subgroup reflection.
- The use of multiple languages also consisting of videos (films, cartoons, mini video clip made even in the workplace etc.) and photos with a particular attention to the slides structure, too often saturated with text, that now consists mainly of images.

5. Conclusions

In conclusion, it is now a proven fact that not investing in training or scientific research means to remain on the fringes of global economic and social development (Cepollaro & Varchetta, 2014).

On the other hand, there is also the very real risk of marginalising training with spectacular entertainment activities characterized by the immediate and pleasant: "apparent training" incapable of contributing to real change (Cepollaro & Varchetta, 2014).

The A.T.M. Campus experience is proving that there is another way, where neuroscience can make a real and meaningful contribution, as part of a multidisciplinary approach that no one can afford to overlook. In other words, we are starting to apply neuroscience to the workplace, and before that, to the training and education system, which hopefully will lead to significant changes in our lives.

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