Interview With Andrea De Cesarei

Andrea De Cesarei is a postdoctoral fellow working in the Emotional Perception Laboratory, (directed by Maurizio Codispoti), at the University of Bologna, Italy. We caught up with him recently to ask him some questions about emotion, perception and judo...

Research

Several of your papers have explored the ways in which physical stimulus properties (e.g., blurring, size) may affect the processing of affective and non-affective stimuli. Emotion researchers are generally interested in identifying effects that persist above and beyond the perceptual differences that may exist between emotional and non-emotional stimuli, yet it can be difficult (if not impossible) to completely equate the physical properties of these types of stimuli. What are your thoughts on this/what have you learned about these issues in your research?

This is a fascinating issue for me! I am indeed interested in the way perception and emotion interact in the analysis of natural scenes. In the continuum between simple and controlled stimuli on one side, and natural and complex ones on the other, I am biased toward the latter, as they are part of the environment in which the brain operates, and in which it evolved. In fact, research using complex stimuli (e.g. IAPS) has proved to be a fertile ground for emotion research. On the other hand, it is true that, as natural scenes are complex, they are also less controllable than simple artificial stimuli in terms of perceptual features (color, complexity, and so on), and this could represent a perceptual confound. But, may it be that what appears as a "confound" is in fact a "distinctive feature"? Some low-level perceptual features may signal the presence of a relevant stimulus, and thus trigger an emotional response; should these be considered confounds, or distinctive features? While this question may be hard to answer, one of the aims of my research is to identify the role of perceptual features in the elicitation of an emotional response, at the level of specific stages of processing. This can allow us to determine to which extent the affective modulation of separate emotion-sensitive processes depends on perceptual features (which ones? Color? Size? Spatial frequencies?...) or on the semantic meaning. From this point of view, to "completely equate the physical properties" of emotional stimuli makes little sense (in addition to, as you note, being impossible); an emotional scene will never look like a neutral scene, simply because they are different things. However,

knowing which perceptual features differ between stimulus categories, and the extent to which these features affect specific processes, may shed light on the processing stages that are carried out in order to analyze complex emotional scenes and eventually trigger an emotional response.

You are interested in the link between perception and emotion, and the ways in which our "sensory systems allowed our ancestors, and eventually us, to detect dangers and appetitive affordances and to regulate behavior adaptively". How did you become interested in these topics?

While studying, I was fascinated by the evolutionary perspective on the development of motivational systems. What is the function of motivational systems? Where does their origin lie? One answer to these questions is that they allow organisms to respond adaptively to a number of situations, and promote the survival of the individual and the species. Thus, on the perceptual side, detecting dangers and appetitive affordances must have been of primary importance for our "ancestors". Similarly, research from the field of perception suggests that the functioning of the perceptual systems reflects the properties of the environments where organisms evolved. Therefore, it is fascinating for me to explore the relationship between perception and emotion, since both developed under the driving force of evolution and they share at least one common aim – promoting adaptive interaction with the environment.

To what extent do your research interests make *psychophysiological* methods particularly important for your research?

In most of my research until now, I have measured Event Related Potentials. ERPs are particularly interesting to me, as they allow one to examine brain activity with a fine temporal resolution, making it possible to determine the latency of specific effects (modulations due to experimental manipulations). Latency can be thought of as "the first processing stage that is modulated by..." or "the timing in milliseconds of ...", and in both cases useful data are gained regarding the brain dynamics and processing stages involved in a task. This type of information may be more difficult to obtain from, for instance, behavioral responses, and in any case it supplements the behavioral data with information prior to (or in the absence of) an overt response.

Moreover, modulation of a physiological function reflects its sensitivity to a factor that is manipulated. However, not all functions are sensitive to the same factors, because of the different processing stages that they reflect

and the different purposes they serve. The examination of multiple psychophysiological responses provides a unique view as to the effects of an experimental factor on several sub-components of the emotional response.

You have research experience using both EEG and peripheral physiology. What new tools or techniques would you like to learn in the future, and why?

Concerning central responses, I have mainly focused on EEG, and more specifically on ERPs. Recently, I became interested in EEG oscillations, and in their functional significance. I look forward to continuing my study of EEG oscillations in the near future, as well as developing skills in related analyses (e.g. connectivity), as I find that these analysis techniques can add information to the understanding of brain activity dynamics. MEG and fMRI are also appealing to me, for the same reason.

Also, I developed an interest in the fields of perception and psychophysics, on which I focused during a stay at Geoff Loftus' lab at the University of Washington. My research interests extend to the field of perception, and this field has been thoroughly investigated for more than a century using refined psychophysical techniques. I think that very valuable knowledge can be gained by incorporating methods and results from this field into the reasoning about research topics.

Career/Professional

You have worked with some very accomplished and well-known researchers throughout your training (e.g., Harald Schupp, Maurizio Codispoti) and in several different labs (and countries!). Can you offer any insights into what students may learn from working with a variety of different researchers and in different labs?

It's great! Concerning science, of course it has been (and is) very stimulating to learn from different experienced researchers, in light of their experience, and of the individual focus of each of them. This process has contributed greatly to my education, in a way that would not have been possible by studying only from books.

At the level of everyday laboratory experience, it has been highly valuable for me to be exposed to a variety of different laboratories, as this has forced me to adapt to different settings – PC or Mac, different EEG instrumentation, presentation programs, operating procedures, and so on.

It may sound trivial, but it is not. It really helps generalizing learning – for example, am I really aware of the steps necessary to carry out an experiment, or am I just following a stereotyped procedure that I learned in one laboratory setting? Concrete lab experience (along with studying, studying, and more studying) is the very basis of research.

One chapter in itself is language... I stayed in Germany for one year and, while my English is at a decent enough level to fluently engage in everyday communication, the same cannot be said about my German. Although I spent some time studying, my German speaking skills never went beyond the basic level ("ich hätte gerne ein dunkles hefe*" and little more). I was lucky enough to find nice people who did not complain about speaking English all the time with me. But speaking the local language is very important for social interaction, both inside and outside the lab. So, my suggestion to people who are moving abroad is to follow a language course before traveling, and try to speak the native language as much as they can!

Last but not least, during my travels I established enduring friendships with great people from around the globe!

* I'll have a dark wheat beer, please.

You have technical expertise in a number of computer programming languages, including Matlab. While experience with computer programming is extremely valuable, it can also be really intimidating to those of us who are just getting started. What advice do you have for researchers who are learning computer programming for the first time?

I luckily learned the basis of programming from my father, when I was about 12. This, indeed, provides me with an advantage compared to people who have no programming experience. However, my programming skills are extremely rough compared to real programmers. After having talked with several programmers and non-programmers, my opinion is that all that is critical to program at a basic level is some paper, a pencil and a lot of patience. Once one can write down on paper the steps needed to solve a problem, it's just a matter of syntax, time and patience to get a program up and running, and to generalize this experience in several programming languages. At a basic level, everyone can do it. The intimidating part, with which I am struggling just like everyone else, is that at the beginning it takes more time to write a program that executes a task, than to do that same task by hand – but this situation reverses quickly.

Regarding advice... Follow tutorials (there are excellent ones on the web!) or, even better, brief programming courses at your university. Find programs that are similar to your requirements, and modify them (open source software helps in this process). In case you have to write a program yourself, be patient, and think first about what your program should do, then how it should work (the steps, even on paper). Only as a last step, work on the syntax of your programming language of choice.

You've been active with SPR for a number of years, with numerous poster presentations and two articles published in Psychophysiology. What's your experience been like as an international member of SPR?

I joined SPR when I was at the University of Konstanz. Being in the SPR community has been a useful point of reference for me, and it was helpful for me to regularly receive copies of Psychophysiology, with research articles, guideline papers, and so on. Through this constant reading, I became aware of a number of research topics, both related and unrelated to the research I was conducting, and of the features and applications of interesting research methodologies.

All of this – learning about research and methods, meeting the community of reference – takes concrete form once a year at the SPR meetings. Whenever possible, I like to be there to present my data, and I usually get useful comments there. And, very importantly, it is a great place to meet friends!

Personal

Tell us more about your judo experience!

I practiced judo (translation: the way of gentleness) in two distinct periods of my life: as a child, and when I was about 30. In both cases, it was great – it's a fantastic martial art. What I found most beautiful is that it's all about balance and gentleness: dealing with the other, and always controlling your strength and that of your opponent. Always respect your opponent. On the agonistic side however, I was never really good, and in the long term I decided to quit. At least for now...

Where would you like to see yourself in 5 years? 10 years?

In 5 years: Iceland! It's the most beautiful country I have visited, and I look

forward to going back there!

In 10 years: Italy! Isn't it the place where everybody would like to live? ;-)