Summary of the focus of the meeting

Facial mimicry of perceived facial expression of emotion has been recently accorded a critical causal role in the decoding of facial expression. This claim is, for instance, central to embodied emotion approaches to emotional information processing. It has also been applied to the understanding of deficiencies of particular populations such as autistic individuals and Parkinson's disease patients. Empirical evidence in favor of any causal role of mimicry in the accuracy of decoding, however, is very sparse. And whatever evidence exists is far from conclusive at this time.

A careful reading of the extant literature suggests that this fact may be due to problems of definition, timing, and measurement of facial mimicry and its neural support. This was the focus of the Expert Meeting reported here. If facial mimicry has a causal role in producing an accurate representation of facial expression of emotion, then mimicry should affect performance on tasks that measure recognition and access to meaning (Adolphs, 2002, 2003; Heberlein & Atkinson, 2009; McIntosh, 2006). In their review of facial mimicry, however, Hess and colleagues (Hess, Lairy & Philippot, 1999) did not find evidence that mimicry was causally related to the simple recognition of emotional facial expressions, either directly or as mediated by changes in self-reported emotional state (e.g., Blairy, Herrera, & Hess, 1999). Hess and Blairy (2001) considered the possibility that failure to support a causal path from facial mimicry to emotion recognition may have resulted from the use of very prototypical facial expressions. When they used naturalistic dynamic stimuli to remedy this problem, they observed facial mimicry, along with a relationship between the perceived expression and self-reported emotional responses (e.g., happiness when viewing smiles). Nevertheless, they found no evidence of a link from motor mimicry to recognition accuracy either directly or through changes in emotional responding.

Many findings further demonstrate that mimicry does not always play a central role in emotion recognition tasks. Recognition tasks on prototypic expressions can be accomplished by perceptual analysis alone, without motor mimicry (e.g., Adolphs, 2002). Some evidence suggests, however, that mimicry does facilitate recognition. Niedenthal, Brauer, Halberstadt, and Innes-Ker (2001), observed effects of mimicry when participants had to detect the boundary of facial expression between happiness vs. sadness. In a more recent study, Stel and van Knippenberg (2008) found that blocking mimicry affected the speed, but not the accuracy, of categorizing facial expressions as positive or negative. Additionally, individuals showing strong automatic facial mimicry tended to have high levels of empathy (Sonnby-Borgstrom, 2002; Zajonc et al., 1987). These findings point to the possibility that mimicry does become important in recognition tasks when they require fine distinctions in expression meaning.

The focus of the Expert meeting was to attack the above issues and to outline research necessary to provide advances in and coherence to research on facial mimicry and its relation to social, emotional and brain processes. The formal presentations focused on three issues: 1) recent research from the represented laboratory, 2) special tasks, measures,

or indicators that have been developed, and 3) suggested concrete research solutions.

Scientific content of the event
In order to assess the scientific content, we will first give a brief overview of the presentations, and then summarize the topics that were discussed.

Scientific Program

Sunday, 24 April 2011
>12h30 – 20h00 Arrival
>20h30 – Welcome Dinner

Monday, 25 April
>9h00 – **Paula Niedenthal**
>>Welcome, Comments, and Introduction,
>10h00 – **Gün Semin**
>>When Facial Muscle Activation Meets Rapid Evaluation Processes
>11h30 – **Peter Weyers**
>>Modulations of Facial Muscular Reactions to Facial Emotional Expressions: Do They Help Understand 'Facial Mimicry'?
>13h00 – Buffet Lunch and Discussion

Tuesday, 26 April
>9h00 – **Paula Niedenthal**
>>Simulation of Smiles and Eye Contact as a Trigger for Facial Mimicry
>10h00 – **Eva Krumhuber**
>>Facial Mimicry and Expression Understanding
>11h30 – **Sebastian Korb**
>>Testing the Roles of Motor Output and Facial Feedback in Facial Mimicry and Emotion Recognition – a TMS Project
>13h00 – Buffet Lunch and Discussion

Wednesday, 27 April
>9h00 – **Leonhard Schilbach**
>>Are You Looking at Me? Using Interactive Eyetracking as a New Tool for Social Neuroscience
>10h00 – **Magdalena Rychlowska**
>>Validating a Smile Typology: Mimicry as a Tool for Bootstrapping Perceived Facial Expressions
>11h30 – **Ursula Hess**
>>Do We Mimic What We Feel or What We Know?
>13h00 – Buffet Lunch and Discussion

Thursday, 28 April
>9h00 – **Geoffrey Bird**
>>Theoretical Approaches and Atypical Processing
>10h00 – **Piotr Winkielman**

Mimicry: What is it Good For?
11h30 – **Eva Gilboa-Schechtman**
Smile or Sneer: The Effects of Rejection and Social Anxiety on
Processing of Emotional Faces
13h00 – Buffet lunch and Discussion

Friday, 29 April
9h00 – **Markus Brauer**
Male Pacifier Users Show Reduced Facial Mimicry and Compromised
Emotional Development
10h00 – **Agneta Fischer**
Mimicry as Social Regulation: The Role of Context
11h00 – Coffee Break
11h30 – Final Discussion and Proposals for Advancing Research

In addition to these formal presentations, we planned to discuss the following topics during
the meeting:

Problems of definition. What is facial mimicry exactly and how can we distinguish this
from an emotional response to a face? Is it possible to isolate and separately evaluate
the motor from the emotional processes in mimicry?

Tasks/functions. Since facial mimicry is not always necessary for the accurate execution
of some processing tasks, how can we define the operations in or tasks of facial
expression recognition/interpretation that require recourse to facial mimicry?

Mechanisms. What is the mechanism by which facial mimicry might inform facial
expression processing? Are the same brain circuits involved in all mimicry? Recently
some scholars have argued against the view that shared circuits view can account for
empathic responding. Is this true of simpler responses in emotion processing?

Moderators. What are the most theoretically informative moderators of facial mimicry?
There is evidence suggesting that various contextual cues impact the degree and
direction of mimicry. What does this tell us about the nature of mimicry?

Future research options and impact of the event
On the last day of the meeting, we discussed all of the above issues elaborately, which lead
to many new research questions. We all agreed that the meeting had been very fruitful in
informing each other about existing and planned research on the topic of facial mimicry.
More specifically, we discussed several options for joint research, some of which have been
established already, e.g. Hess, Weyers, and Fischer will submit an ORA proposal in order to
further study the context effects of mimicry in sept. 2011). In order to facilitate collaborative
research, we have set up a special website (http://facialmimicry.lapsco.fr), which contains
the presentations, and links to tools and stimuli.

The following themes have been discussed as potentially interesting collaborative research
options:

Facial mimicry and motor mimicry:
- Facial mimicry similar is not similar to all kinds of other motor mimicry
- We could evoke facial expressions in reaction to different kinds of cues (e.g. social versus non-social), and examine the activated brain regions
- Study of the automatic nature of mimicry: We can investigate whether it is possible to unlearn default compatibility effects and learn reverse effects? (e.g. frown to a smile). We should start this research project with single, isolated muscles (e.g., startle as cue) and then study the effect of each of these on subjective emotion. Another option is to create natural stimuli with strong negative or positive connotations (e.g., murderer, versus saint)

Functions of mimicry: Why we do it?
- Two functions have been mentioned in the literature to date: affiliation and emotional understanding. However, it is not clear whether these functions also operate with all emotion signals, and thus, we need to include affiliative intent
- Another option is to examine facial mimicry to learned and unlearned facial stimuli to investigate whether there are two pathways to mimicry: One innate, irreversible, the other trainable?
- Manipulation or measurement of intentions (why do you smile or frown): do these different intentions have different mimicry effects?

Mimicry in context
Facial mimicry may vary with context. It is yet unclear which context cues are most important and how these relate to the automatic mimicry effect.
- Is the mimicry reaction to contextual cues more an emotional reaction than a motor reaction, is it a more deliberate and controlled process?
- We should include different measures, such as fEMG, startle, or fMRI, EPN (motor vs valence-based responses)
- We should also include different groups: Alexythymias, Mobius patients, etc.

Several interactional and dynamic issues
- Online versus offline mimicry: the role of eye contact/gaze behavior/gaze direction
- The role of the other: looking versus avoiding
- Do context cues (identity, competitor) evoke a different mimicry pattern than expressive cues?
- Use of CERT

As you may infer from this summary of the discussion and collaboration plans, we were very enthusiastic about setting up new research and trying to find more definitive answers to these questions. The number of questions that arose were numerous, yet we also were aware of the fact that a firm base of knowledge already existed. Everyone present was convinced that our own research programs have benefitted much from this expert meeting and that plans for future research would never be developed without this meeting.

We are therefore very grateful to the ESF for funding this meeting.

**Final list of Participants
(alphabetical order)**

Dr. Markus Brauer
LAPSCO
34 av Carnot 63037 Clermont-Ferrand,
France

Dr. Agneta Fischer
Department of Psychology
Roetersstraat 15, University of Amsterdam
1018 WB Amsterdam
The Netherlands

Dr. Eva Gilboa-Schechtman
Director of Emotional Processing Laboratory
Department of Psychology and the Gonda Brain Science Center, Bar-Ilan University
Ramat-Gan, 52900 Israel

Dr. Ursula Hess
Institut für Psychologie
Humboldt-Universität Berlin
Rudower Chaussee 18
12489 Berlin Germany

Dr. Sebastian Korb
Department of Psychology
Swiss Center for Affective Sciences
University of Geneva,
Switzerland

Dr. Eva Krumhuber
Jacobs University Bremen, Research IV
Campus Ring 1, 28759 Bremen,
Germany

Dr. Paula Niedenthal
LAPSCO
34 av Carnot 63037 Clermont-Ferrand,
France

Magdalena Rychlowska
LAPSCO
34 av Carnot 63037 Clermont-Ferrand,
France

Dr. Leonhard Schilbach

Department of Psychiatry and Psychotherapy, University of Cologne
Kerpener Str. 62, 50924 Cologne,
Germany

Dr. Gün Semin
Department of Psychology
Utrecht University, Heidelberglaan 1
3584 CS Utrecht, The Netherlands

Dr. Peter Weyers
University of Würzburg, Department of Psychology,
Marcusstraße 9-11, 97070 Würzburg
Germany

Dr. Piotr Winkielman
Department of Psychology
University of California at San Diego
9500 Gilman Drive, Mailcode 0109
La Jolla, CA 92093-0109