

IX. Dubrovnik Conference on Cognitive Science

25 May – 28 May, 2017, Dubrovnik, Croatia

**Intuitive sociologists:
Representing social relations and social categories**



Invited Speakers:

Alan Fiske, David Pietraszewski, Gil Diesendruck,
Lotte Thomsen, Nichola Raihani, Olivier Mascaró

Chairs:

Katalin Oláh, Nazlı Altınok & Ildikó Király

Organizers:

Gergely Csibra, Paula Fischer, Georgina Török,
Francesca Bonalumi, Laura Schlingloff

Centre for Advanced Academic Studies (CAAS) Dubrovnik
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Program

Thursday, May 25

- 16.00 – 18.00 Registration
- 18.00 – 19.00 Welcome Reception

Friday, May 26

- 09.00 – 10.00 Alan Fiske: “The Four Fundamental Forms of Social Relationships”
- 10.00 – 11.30 Coffee break and poster session I
- 11.30 – 12.30 Olivier Mascaró: “Infants’ representations of social power: From interactions to social structures”
- 12.30 – 14.30 Lunch
- 14.30 – 15.30 Nichola Raihani: “Reputation: a driving force in the evolution of cooperation and punishment”
- 15.30 – 17.00 Coffee break and poster session II
- 17.00 Social program

Saturday, May 27

- 09.00 – 10.00 Lotte Thomsen: “Core relation motives”
- 10.00 – 11.30 Coffee break and poster session III
- 11.30 – 12.30 David Pietraszewski: “Applying an evolutionary and computational approach to social categorization: Examples from race, accent and social groups”
- 12.30 – 14.30 Lunch
- 14.30 – 16.00 Young researchers’ session: selected talks
1. Gaye Soley: “Children’s and adults’ selective inferences of shared cultural knowledge”
 2. Kristen Dunfield: “Evaluation Others: When the Evidential and Interpersonal Conflict”
 3. Antonia Misch: “Infants’ expectation of moral conformity in social groups”
 4. Anika Weinsdörfer: “‘Seen One, Seen Them All?’ People’s Sampling Strategies as a Function of Group-Membership”
- 16.00 – 16.30 Coffee break
- 16.30 – 17.30 Gil Diesendruck: “The motivational roots of social categorization: Evidence from infants”
- 17.30 – 18.00 Committee meeting
- 18.00 Farewell words
- 20.30 Social program

Sunday, May 28

Departure

Abstracts – Invited speakers

THE FOUR FUNDAMENTAL FORMS OF SOCIAL RELATIONSHIPS

Alan Fiske

Department of Anthropology, UCLA, USA

Humans generate the infinite complexity and diversity of their sociality by implementing combinations of just four elementary relational models. The four fundamental models are Communal Sharing, Authority Ranking, Equality Matching, and Market Pricing. Each of these relational models is intrinsically motivated, and people implicitly use each of them to generate, interpret, coordinate, and evaluate virtually all of their social relationships. However, people can only implement a relational model with reference to cultural prototypes, precedents, and precepts that specify how, when, where, and with whom it should operate. Thus the social relational differences among cultures consist largely of difference in implementation of the four universal relational models, along with diversity in the manner in which the models are combined. People recognize, communicate, motivate, and commit to each relational model using a distinct semiotic-constitutive medium that is specific to that relational model. That medium is uniquely evocative of the particular emotions that regulate the specific relational model. Relational models theory has been supported by hundreds of experimental and observational studies on a wide range of phenomena by hundreds of researchers using a great variety of methods to study populations from many cultures.

INFANTS' REPRESENTATIONS OF SOCIAL POWER: FROM INTERACTIONS TO
SOCIAL STRUCTURES

Olivier Mascaro
CNRS

This talk will outline the building blocks of humans' representation of power structures. I will present evidence suggesting that from infancy on, humans represent conflict between goals as social interactions between distinct individuals. Infants use representations of conflicts and of their outcomes to recognize dominance relationships. They build representations of dominance structures by organizing dyadic relationships into hierarchical structures using two inferential principles: an expectation of transitivity, and an expectation of derived dominance. These principles are supported by abstract reasoning over sets of relationships, rather than by compression heuristics or by representational constraints. Furthermore, infants are also sensitive to power relationships that are not based upon conflict: They recognize leadership relationships by tracking who is imitated by others. These results reveal how complex social representations can emerge during ontogeny. Infants appear to build incrementally upon representations of individual actions to create representations of social interactions, social relationships, and social structures.

REPUTATION: A DRIVING FORCE IN THE EVOLUTION OF COOPERATION
AND PUNISHMENT

Nichola Raihani
University College London

Evolution is a strict accountant. Costly actions must be ultimately repaid if they are to come under positive selection. In this talk, I will consider the role of reputation in explaining the evolution of costly helping and costly punishing. I will explore when helping might improve an individual's reputation and - conversely - when reputation costs might lead individuals to hide their helpful actions from others. Although harming others is typically expected to result in reputation costs, there might nevertheless be scenarios where harming others actually improves an individual's reputation. I will present a conceptual framework and empirical evidence to describe when harmful actions result in reputation gains to the actor - and offer an evolutionary explanation as to why. Ultimately I will argue that reputation offers a powerful incentive for both helping and punishing in nature.

CORE RELATIONAL MOTIVES

Lotte Thomsen

Department of Psychology, University of Oslo

Humans are an ultra-social species. Young children must not only discover the structure of their social world – who is friend or foe, who will lead and follow / win or lose, who is their peer. They must also come to act appropriately towards other people depending on their relationship with the child as well as with others. To solve this learnability problem, core cognition of relational models, as well as the accompanying core relational motives, should emerge early in development. Whereas there is now good evidence across several labs that infants represent fundamental forms of social relations, less is known about the ways in which infants and young children use such relational information to regulate their own behavior. Here, I present a series of collaborative lines of research addressing this question, focusing on how young children regulate their behavior towards dominant and grateful agents and suggesting that such elementary relational motives also underpin large-scale political phenomena.

APPLYING AN EVOLUTIONARY AND COMPUTATIONAL APPROACH TO SOCIAL CATEGORIZATION:
EXAMPLES FROM RACE, ACCENT AND SOCIAL GROUPS

David Pietraszewski

Max Planck Institute for Human Development, Berlin, Germany

In this talk I will present a body of work investigating how different social categories — including race, sex, age, and accent — are represented across different social contexts. These studies suggest that we now have an adequate answer to why people categorize by race, to the point that we can experimentally-manipulate categorization by race — both up and down, and in some cases eliminate it. Furthermore, the same manipulations have zero effect on other socially-important categories, such as age, sex, and accent. These results suggest that we have discovered a hidden logic to racial categorization, and that we are probably missing large and important features of the psychology of race in our current theories and methods. This research program also represent a new and slowly-emerging trend in social cognition: shifting from a primary focus on experimental effects, to instead focusing on claims about psychological systems and functions. The current findings, for example, suggest that the rule-governed principles of social categorization will not be found at the level of uniform patterns of experimental effects, but will instead be found at the level of psychological models of why social perceivers are attending to social categories in the first place.

THE MOTIVATIONAL ROOTS OF SOCIAL CATEGORIZATION: EVIDENCE FROM INFANTS

Gil Diesendruck

Department of Psychology and Gonda Brain Research Center, Bar-Ilan University, Israel

Human history has been plagued by violent inter-group conflicts. Such conflicts are arguably grounded on group biases – particularly, a tendency to favor “ingroups” over “outgroups” – manifest in adults and children. A question these findings prompt is what motivates social categorization? Social psychologists offer various factors as candidate motivators, e.g., people’s concerns about dominance hierarchies, social systems, or social identities. Here I will present findings that intergroup biases appear already in infancy. Such a discovery intimates that the candidate factors social psychologists have identified are unlikely to account for the very roots of intergroup biases. I will thus present additional studies investigating more fundamental motivations that may account for the roots of social categorization. In particular, based on evolutionary arguments, the studies address how a coalitional psychology would give rise to social categories. The studies target both the criteria by which 1-year-olds form social categories, and the roles of affiliative vs. avoidance needs in driving this categorization process.

Abstracts – Young researchers' talks

CHILDREN'S AND ADULTS' SELECTIVE INFERENCE OF SHARED CULTURAL KNOWLEDGE

Gaye Soley, Bogazici University, Istanbul, Turkey

Abstract: Children show social choices based on various social categories, yet it is not clear whether these choices are driven by children's sensitivity to agents' group membership, or whether they reflect certain emotional biases (e.g., preference for the familiar or for the individuals who are perceived as similar to the self) that become linked to social groups only later in life. Shared cultural knowledge is a reliable cue to group membership as its transfer among individuals often requires direct social contact.

Four experiments investigated children's and adults' (N=24 per experiment) inferences of shared knowledge of songs and shared preference for songs based on two prominent social categories: language and gender. The results show that both 5-6 years old children and adults tend to generalize knowledge across individuals who speak the same language rather than individuals who are from the same gender category. No such tendency was observed for attributions of shared preference, a likely basis for perception of similarity to the self, yet a less informative cue about group membership. These results might suggest that young children and adults selectively infer group membership among individuals who speak the same language, yet they do not make such inferences based on gender.

Keywords: social cognition, music, social groups, language, gender

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EVALUATING OTHERS: WHEN THE EVIDENTIAL AND INTERPERSONAL CONFLICT

Maryam Nemati, Concordia University, Canada

Kristen A. Dunfield, Concordia University, Canada (presenting author)

Abstract: Learning from others is critical but risky. However, evaluating the source can mitigate the risks. Evidential factors such as the type of information sought, informant expertise are used to identify good sources by early childhood. Yet, children also appear to use less relevant, interpersonal information such as attractiveness, strength, and benevolence. The current project examines this apparent contradiction. Specifically, we asked whether children's goals affected their social preferences.

Five and seven year olds were introduced to two individuals: a gruff truth-teller, who provided accurate information but was not nice, and a white liar, who provided inaccurate information nicely. Following familiarization half of the participants were asked to select an individual to help them complete a difficult puzzle (accuracy condition), the other half were asked to select an individual to play with (interpersonal condition). In both conditions the younger participants preferred to interact with the kind but inaccurate informant whereas, the older participants preferred the truth-teller in the accuracy condition and the white-liar in the interpersonal condition.

These results suggest children's goals influence their social evaluations and that the ability to effectively seek information develops into middle childhood, contributing to current theories regarding credulity and social evaluation.

Keywords: social learning, social evaluation, social cognition

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INFANTS' EXPECTATION OF MORAL CONFORMITY IN SOCIAL GROUPS

Antonia Misch, Yale University, USA (presenting author)

Karen Wynn, Yale University, USA

Abstract: This experiment investigates whether infants generalize moral valence across members of a social group, after seeing some individuals from the group acting with either a positive (nice) or a negative valence (mean). Infants in three different age groups (6-, 12-, and 22-month-olds) watched familiarization videos featuring two groups A and B. Two members of A behaved nicely, while two members of B behaved badly towards a neutral character. In the test trials a third member of each group engaged in a new action towards a new neutral character in a way that was sometimes consistent, sometimes inconsistent with the valence of his group. Looking time was measured to assess infants' expectations.

Preliminary data analyses ($n=55$) reveal a significant age \times consistency \times valence interaction ($p<.05$). The two older age groups looked longer at inconsistent than consistent trials (Anova, $p<.05$), and this pattern did not differ for the positive and negative moral valence ($p>.05$). Six-month-olds looked longer at inconsistent than consistent trials for the negative moral valence only (consistency \times valence interaction, $p<.05$), suggesting that the tendency to generalize moral valence across members of a social group develops earlier for negative than for positive behavior.

Keywords: social cognitive development, morality, intergroup cognition

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“SEEN ONE, SEEN THEM ALL?” PEOPLE’S SAMPLING STRATEGIES
AS A FUNCTION OF GROUP-MEMBERSHIP

Reut Shilo, Bar-Ilan University, Israel

Anika Weinsdörfer, University of Göttingen, Germany (presenting author)

Hannes Rakoczy, University of Göttingen, Germany

Gil Diesendruck, Bar-Ilan University, Israel

The Out-Group-Homogeneity-Effect describes an asymmetry in social categorization: Whereas ingroup members are readily thought of as individuals, outgroup members often are seen via a stereotype, as homogeneous exemplars of their group.

In two cross-national studies, we investigated children’s and adult’s inductive reasoning as a function of group membership: Are people more likely to rely on a homogeneous sample when asked about out- as compared to ingroup members?

We presented 150 children ($M_{age} = 6.79$) with 8 questions about people (Israel: $n = 71$; Germany: $n = 79$). Half of the questions referred to an ingroup (Jews or Germans), half to an outgroup (Arabs or Turks); half referred to biological, half to psychological properties. In each trial, participants could draw a homogeneous or a heterogeneous sample to infer the answer. Adults ($n_{total} = 96$; $M_{age} = 24.53$) received 16 questions, group membership varying between subjects. The depended variable was the number of heterogeneous samples chosen (max. = 8 or 16).

Crucially, an interaction between group membership and property type was found both in children and adults: with biological properties, participants relied on a more homogeneous sample when asked about out- as compared to ingroup members (children: $F(1,146) = 6.65$, $p = .01$; adults: $F(1,87) = 4.83$, $p < .05$).

Keywords: social categorization, perception of group variability, inductive reasoning

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Poster sessions

Poster Session I: Friday, May 26, 10.00-11.30

Every rose has its thorn: Infants' behavioral responses to visible plant threats

Aleksandra Włodarczyk, Claudia Elsner, Annie E. Wertz

Children's conformity to their group members' prosocial and antisocial behavior

Antonia Misch, Yarrow Dunham

Social interactions today and their role in social cognition

Luca Settembrino

Whoever is the other matters! Influence of social cues in belief-based action prediction

Andrea Riquelme Esteve, Carlos Guerrero Mosquera, Núria Sebastián Gallés

Culture and categorization

Anett Ragó, Júlia Baross

Does associating the self with other races confirm the amygdala-social bias hypothesis?

Caitlin Duncan, Isabel Dziobek, Henrik Walter

Can 12-month-old infants attribute to others a preference for "more"?

Dora Kampis, Ágnes Kovács, Lisa Feigenson

Psychological foundations of commitment

Francesca Bonalumi, Christophe Heintz, John Michael

Possessive morphology in Hungarian children with specific language impairment

Bence Kas, Fruzsina Józsa

Preschoolers selectively trust non-dominant agents when learning the names of novel objects

Erik Kjos Fonn, Lotte Thomsen

The effect of explicit and implicit processing of religious content on intergroup attitudes among Jews and Muslims in Israel

Lipaz Shamo-Nir, Irene Razpurker-Apfeld

The power of bad information: how does social influence affects extends false memory vulnerability

Patrycja Maciaszek

Implicit theories of personality and intelligence in relation to assertiveness and intelligence

Maria Zirenko

Over-imitation as a byproduct of preschoolers' readiness to learn socially relevant information from demonstrators sharing the same language with them

Nazlı Altınok, Mikołaj Hernik, Ildiko Király, György Gergely

Two-year-old toddlers prefer and align with resource-rich individuals

Melody Buyukozzer Dawkins, Renée Baillargeon

When the throne is shaking: Unstable power reduces advice taking

Ingvild Müller Seljeseth, Mehrad Moeini Jazani, Bob Fennis, Luk Warlop

The effect of language and ethnic origin on prosocial behavior in preschoolers

Rana Esseily, Uyen Tran, Eszter Somogyi

Giving is a cue of equality-matching relations for 12-month-old infants

Denis Tatone, Gergely Csibra

Perspective-taking during joint attentional tasks

Iulia Savoş, Fruzsina Elekes, Márton Nagy, Ildikó Király

Without illusions about delusions – social representations of schizophrenia: an exploratory study

Judit Borszéki, Dr. Zsolt Lipcsei, Dr. Mátyás Balázs Para, Andrea Turner, Dr. Zsuzsanna Martony

Poster Session II: Friday, May 26, 15.30-17.00

Is empathy always beneficial? Validity and reliability of the Hungarian version of the Self-Compassion Scale Short Form and Compassion for Others Scale

Andrea Turner, Monika Albu

Neural entrainment to rhythmic tone sequences in 6-7 year old children

Emese Maróti, Béla Weiss

The BDNF Val66Met polymorphism modulates the neural correlates of autobiographical memory

Géza Gergely Ambrus, Jessica Komes, Holger Wiese, Wiebke Struckmann, Ingo Kurth, Gyula Kovács, Stefan R. Schweinberger

Four-month-old infants' expectations about fairness and ingroup loyalty

Melody Buyukozzer Dawkins, Stephanie Sloane, Renée Baillargeon

How can novel metaphors be more concrete than concrete expressions?

Bálint Forgács

Who is the leader? How 18-month-old infants link success with leadership

Jesús Bas, Núria Sebastián-Gallés

Idiosyncratic switching patterns in multi-stable auditory perception are related to functional brain networks

Dávid Farkas, Susan L. Denham, István Winkler

Generic information supports the fast-mapping of novel labels

Cristina Galusca, Krisztina András, Gergely Csibra

21-month-olds distinguish between leaders and bullies

Francesco Margoni, Renée Baillargeon, Luca Surian

The role of memory for past events in diachronic cooperation, commitment and the dissemination of reputation

Johannes Mahr

Visual fixation patterns during viewing of half-face stimuli in adult humans: an eye-tracking study

Ágoston Galambos, Borbála Turcsán, Katalin Oláh, Fruzsina Elekes, Anna Gergely, Ildikó Király, József Topál

2-year-old children show flexibility in immediate re-enactment but not in memory retrieval in a delayed imitation paradigm

Krisztina Peres, Dóra Kampis, Ildikó Király

Shared cultural knowledge as the basis of social categorization in adults

Katalin Oláh, Fruzsina Elekes, Ildikó Király

Sensitivity to the principle of rationality guides infants' social preferences

Marc Colomer, Jesús Bas, Núria Sebastián-Gallés

From harm to unfairness: Two-year-old toddlers attribute broad deficiencies in moral character

Fransisca Ting, Renée Baillargeon

Measuring the immeasurable: developing behavioral tests for measuring mindfulness and compassion

Mónika Albu

Can children integrate information about efficiency in false belief reasoning?

Paula Fischer, Ágnes Melinda Kovács, Ernő Téglás

How does knowledge of multiracial, transgender, and bilingual identities affect essentialist intuitions?

Rebecca Lange, Paul Muentener

Comparing evidence for social generalization: diverse vs. narrow

Stella Christie, Rongzhi Liu

Poster Session III: Saturday, May 27, 10.00-11.30

Preschool metacognitive developments allow learning and use of co-referential words

Theodora Karadaki, Martin Doherty

Body knowledge acquisition: from global to local?

Lisa Jacquey, J. Kevin O'Regan

How learning can change social categorization into efficient individuation?

Maika Telga, Juan Lupiáñez

Gratitude: The sign of a trustworthy agent

Joakim H. Zahl, Victoria Born, Erik Kjos Fonn, Jonas Kunst, Lotte Thomsen

The role of pragmatics vs. novelty in a label assignment task

Hanna Marno, Dan Sperber

17-month-old infants expect leaders to rectify transgressions among subordinates

Maayan Stavans, Renée Baillargeon

Enhanced statistical learning after disruption of bilateral DLPFC

Anna-B. C. Trimborn, Géza Gergely Ambrus, Karolina Janacsek, Gyula Kovács, Dezső Németh

Twelve-month-olds use giving and taking as cues for mutually exclusive social relationships

Barbara Pomiechowska, Denis Tatone, Gergely Csibra

Epistemic drives of infants' social preferences

Katarina Begus, Teodora Gliga, Victoria Southgate, Ildikó Király, György Gergely

Group membership modulates toddlers' expectations about punishment and affiliative preferences following moral transgressions

Fransisca Ting, Renée Baillargeon, Zijjing He

The numerical size effect in symbolic numbers and everyday number frequency

Petia S. Kojouharova, Attila Krajcsi

It's not what you say, but how you say it: Children predict others' social relationships based on accent

Jocelyn B. Dautel, Margaret H. Schiller, Katherine D. Kinzler

Statistical patterns in vocabulary development

Bálint Varga, András Szántó, József Venczeli, Dániel Czégel

Investigating efficiency and rational decision-making in sequential joint action

Georgina Török, Natalie Sebanz, Barbara Pomiechowska, Gergely Csibra

Selectivity in spontaneous level-2 PT: the role of attention versus shared goals

Fruzsina Elekes, Máté Varga, Ildikó Király

Action prediction based on others' beliefs about object identity in 2-year-old human infants

Dora Kampis, Ildikó Király, Josep Call, György Gergely

Culture's crucial role in acquiring artifact-specific knowledge

Réka Pető, Fruzsina Elekes, Katalin Oláh, Ildikó Király

Understanding false belief and pretense in storybook reading with ASD children

Marie-Lyne Smadja, Ortal Shamir

Mindfulness 1.0 application: Using Necker-cube illusion for online measurement of mindfulness

Fülöp Kovács, Mónika Albu

Abstracts – Posters

Poster session I

Friday, May 26, 10.00-11.30

EVERY ROSE HAS ITS THORN: INFANTS' BEHAVIORAL RESPONSES TO VISIBLE PLANT THREATS

Aleksandra Włodarczyk, Max Planck Institute for Human Development, Berlin, Germany

Claudia Elsner, Max Planck Institute for Human Development, Berlin, Germany

Annie E. Wertz, Max Planck Institute for Human Development, Berlin, Germany

Infants differentially attend to and learn about threats such as dangerous animals and angry faces (LoBue, 2013; Barrett & Broesch, 2012). Little is known, however, about reactions to ancestrally recurrent dangers in broader naturalistic contexts. Although they may seem harmless, plants produce toxic chemical defenses that can be quite dangerous to humans. Accordingly, infants are reluctant to touch benign-looking plants; a behavioral strategy that protects them from potential plant dangers (Wertz & Wynn, 2014). Here we explore whether the reluctance to touch plants is influenced by the presence of visibly threatening features (e.g., thorns). Eight- to eighteen-month-old infants (N=42) were presented with a series of 12 stimulus objects (plants, familiar, and novel artifacts) with and without thorns. Infants' latency to touch each object, and the frequency and duration of their subsequent touches, were coded. The results showed that infants took longer to reach out and touch plants versus other object types, replicating previous findings. Infants also showed sensitivity to visible plant threats: They touched thorny parts of plants significantly less than thorny parts of familiar and novel artifacts. We propose that one function of this behavioral avoidance strategy may be to mitigate harm while facilitating subsequent social learning.

Keywords: threat, infancy, behavioral avoidance, naturalistic social cognition

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CHILDREN'S CONFORMITY TO THEIR GROUP MEMBERS' PROSOCIAL AND ANTISOCIAL BEHAVIOR

Antonia Misch, Yale University, USA

Yarrow Dunham, Yale University, USA

Children learn a lot by imitating others, but it is unclear to what extent this holds true in the moral domain, and how their moral behavior is influenced by other underlying motivations, such as moral concerns, reputation and conformity. This study investigates how watching ingroup or outgroup members engage in prosocial or antisocial acts influences 5-6 and 8-9-year-olds' subsequent moral behavior. Children were allocated into one of two minimal groups and received five stickers. They then observed either their ingroup or outgroup members (adult models) engaging in prosocial sharing or antisocial stealing behavior, before they themselves had the opportunity to privately donate their stickers or take away stickers from others. Preliminary analysis of children's sharing ($n=129$) reveals main effects of age and moral valence: Older children share more than younger children, and watching prosocial models elicits higher sharing than watching antisocial models ($p's < .01$). Surprisingly, group membership did not affect children's sharing ($p=.51$), even though children showed a general preference for their ingroup members ($p < .05$). A second experiment (ongoing) investigates whether children are influenced differently by models of their own age. To determine the direction of the effect a baseline condition was added without any information about others' behavior.

Keywords: social cognitive development, morality, intergroup cognition, prosocial behavior

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SOCIAL INTERACTIONS TODAY AND THEIR ROLE IN SOCIAL COGNITION

Luca Settembrino, Berlin School of Mind and Brain, Humboldt-Universität zu Berlin, Germany

The aim of my work is to clarify the role that social interactions play in the mechanisms of social understanding. I will argue that this role depends on how we could conceptualize social interactions today, thanks to contemporary communication technologies. Indeed, social encounters no longer happen only between two or more people who are physically present one in front of the other (embodied interaction). In the course of what I shall call a video-interaction, for example, one can interact with someone else while seeing her through a video

device, such as a webcam. Two or more subject can also talk to each other even if they cannot see each other (e.g., during a phone call), thus being involved in what could be named tele-conversation. Finally, another form of social interaction that has emerged in the last decades thanks to the Internet is the online chat, i.e. a real-time transmission of text messages from sender to receiver. On the base of the previous theoretical distinctions and empirical evidence from developmental and social psychology, I will try to show that our various current possibilities for interacting could play different roles (constitutive, enabling or contextual) in our ability to understand each other.

Keywords: social interaction, social cognition, communication technology, enactivism

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WHOEVER IS THE OTHER MATTERS! INFLUENCE OF SOCIAL CUES IN BELIEF-BASED ACTION PREDICTION

Andrea Riquelme Esteve, Universitat Pompeu Fabra, Spain

Carlos Guerrero Mosquera, Universitat Pompeu Fabra, Spain

Núria Sebastián Gallés, Universitat Pompeu Fabra, Spain

Successful social interactions depend on the ability to track the mental states of others and predict their behavior (Theory of Mind). However, there are cues that bias people's social perception and induce them to form certain affiliations with particular others. Based on a previous research, we investigated if the prediction of an action could be modulated by actor's social status and language spoken. The indication of action prediction was assessed by a false belief task performed by agents with three different social profiles, analyzing the sensorimotor suppression of mu (8-13 Hz) and beta (15-30 Hz) frequency bands as a measure of motor cortex activation. While preliminary results showed differential motor excitation across profiles, none could assert the predisposition to interact with individuals perceived as members of our own linguistic group, and with those that positively bias our social attention inside the group. There is theoretical background suggesting that the uncertainty of another's person predictable movements can be surpassed incorporating noticeable hand actions. For this reason, methodological changes are being submitted in our paradigm to highlight the functional significance of hands in movement expectancy in order to facilitate the motor system excitation in relation to action prediction.

Keywords: theory of mind, action prediction, social cognition, false belief task

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CULTURE AND CATEGORIZATION

Anett Ragó, Eötvös Loránd University

Júlia Baross, Eötvös Loránd University

The aim of the present study is to explore the origins of cultural differences, and their role in cognitive processes. According to previous results, East-Asian participants are better at holistic processing, co-variation detection and implicit, global sequence learning, which might indicate an advantage in certain category learning tasks. Furthermore, East-Asians are more likely to categorize based on family resemblance structure and overall similarity, contrary to North-Americans, who prefer to rely on unidimensional rules.

In the present study, the performance of Korean and Hungarian participants was measured on an implicit, perceptual category learning task, expecting Korean participants to outperform Hungarians. No significant cultural differences emerged between the two groups, as both Hungarian and Korean participants were equally likely to process holistically and learn perceptually complex categories based on family resemblance structure. However, Hungarian participants seemed to rely more on explicit processes compared to Koreans. In a follow-up study, the traditional distinction of analytic-holistic and explicit-implicit processes and their possible interactions are re-examined, to further investigate whether Eastern and Western cultures promote different strategies during category learning.

Keywords: culture, category learning, implicit learning, family resemblance structure, holistic processing

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DOES ASSOCIATING THE SELF WITH OTHER RACES CONFIRM THE AMYGDALA-SOCIAL BIAS HYPOTHESIS?

Caitlin Duncan, Berlin School of Mind and Brain, Humboldt-Universität zu Berlin, Germany

Isabel Dziobek, Berlin School of Mind and Brain, Humboldt-Universität zu Berlin, Germany

Henrik Walter, Berlin School of Mind and Brain, Charité-Universitätsmedizin Berlin

Recent studies have shown that after White participants experience themselves as having a Black body or face, their negative implicit bias, as measured by the Implicit Association Test (IAT), toward Black individuals is significantly reduced. This is likely mediated by the amygdala, whose activation during race processing predicts the amount of negative social bias that a participant will exhibit. A recently developed self-association task (Maister et al., under review), in which participants learn to associate the 'self' label with same- or other-race faces, has been shown to reduce both amygdala activation and negative bias during the IAT. Can these results generalize to other groups and forms of bias? In this study, we will evaluate the effectiveness of the self-association task in reducing two social bias measures, as well as the role of the amygdala in mediating this process. During fMRI, White-German participants (n=30) will perform the IAT and an economic trust game before and after performing the self-association task, in which they will learn to associate themselves with a Middle-Eastern face. If the amygdala is involved in social biases generally, we predict that the post-association trust bias and IAT bias will be reduced, and this will be correlated with changes in amygdala activity.

Keywords: implicit bias, race, embodiment, amygdala

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CAN 12-MONTH-OLD INFANTS ATTRIBUTE TO OTHERS A PREFERENCE FOR "MORE"?

Dora Kampis, Central European University, Hungary

Ágnes Kovács, Central European University, Hungary

Lisa Feigenson, Johns Hopkins University, USA

Infants already in their first year of life can do addition on large number sets (McCrink & Wynn, 2004), can compute ratio relationships between arrays (McCrink & Wynn, 2007); and show a

preference for the more numerous of two large arrays (van Marle, 2013). In addition, already young infants represent others' beliefs and preferences (Onishi & Baillargeon, 2005; Luo & Baillargeon, 2005, Kovács et al., 2010), but it is an open question whether they can attribute mental states about quantifiers. In the present study we aimed to test whether 12-month-olds can attribute to others a preference for more items. First, infants repeatedly witnessed an actor observing two large arrays each disappearing in a cup, and then choosing the cup containing "more" items. In test, infants saw a scenario where she chose the smaller array (inconsistent choice trials) or again the larger one (consistent trials). Infants looked longer at events when the actor chose the smaller array, suggesting that they expected her to continue to choose the larger quantity. These results indicate that infants are capable of representing beliefs involving quantifiers such as more, contradicting recent theories on mindreading claiming systematic limitations to such mental contents in infants (Apperly & Butterfill, 2009).

Key words: infants, theory of mind, preferences, numerosity

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PSYCHOLOGICAL FOUNDATIONS OF COMMITMENT

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We characterise social commitment as a process in which a committing agent engages her reputation as a reliable partner in order to lead another agent to expect that she will do something for her. A person feels committed to do something when she will tend to do it in spite of temptations not to do so, and conversely a person feels that another agent is committed to do something when she expects her to do it and if she will tend to condemn her for not having done it.

In our studies we aim to assess when minimal conditions for commitment occur by measuring these variables. We present several scenarios to participants and ask questions that reveal whether they would feel that they or their partner are committed to do something. We vary elements of the scenarios, and test the hypothesis that the level of moral disapproval felt by an agent when a commitment is broken by her partner depends not only on the consequences of the breaking, but also, and decisively so, on the perceived intentions of her partner, including

her preventive intentions to minimize the loss that the agent is bound to suffer. Furthermore, we also test the hypothesis that the emergence of a feeling of commitment and a consequent moral disapproval is not decisively sensitive to whether an agreement is made explicit but whether the expectations of the agents are mutually manifest.

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POSSESSIVE MORPHOLOGY IN HUNGARIAN CHILDREN WITH SPECIFIC
LANGUAGE IMPAIRMENT

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A great amount of studies analysed language-specific symptoms of children with specific language impairment (SLI) aiming to enhance clinical practice and address theoretical explanations of SLI. The present study focuses on expressive use of Hungarian possessive morphology in SLI and typical development. 20 children with SLI between 4-7 years participated in an elicited production task. Their performance was compared to two groups matched on chronological age (CA) and receptive grammar (RG), respectively. The results showed that (i) typically developing preschool children are not yet at the adult level in the use of possessive morphology, (ii) multiple suffixes marking plural and possessive pose difficulties for all groups, (iii) children with SLI perform below the CA group in general but performed similarly to the RG group, (iv) children with SLI show marked difficulties in the use of the plural possessive marker, (v) the error patterns in the SLI group are different from those in the control groups. The theoretical relevance and possible clinical applications of the results are discussed.

Keywords: specific language impairment, possessive morphology, Hungarian, language acquisition

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PRESCHOOLERS SELECTIVELY TRUST NON-DOMINANT AGENTS WHEN LEARNING THE NAMES OF NOVEL
OBJECTS

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This study examines preschoolers' relative trust towards non-dominant and dominant agents in a world-learning task. Insofar as dominant agents possess important know-how that has helped them achieve their dominant position, it might be adaptive to pay selective attention to them, trusting their claims. 28 children between the ages of 3 and 6 ($M = 4.52$, $SD = .90$) were presented with an animated video of a right-of-way conflict scenario in which two agents blocked each other's way and one prevailed while the other yielded. Next, each agent made competing claims about the name of a novel object presented to participants, and participants were asked whether they believed the dominant or subordinate agent knew the correct name. Surprisingly, a significant majority of the participants trusted the claim of the non-dominant over the dominant agent in the world-learning task (20 out of 25 children, binomial test, two-tailed, exact $p = .004$).

Keywords: social dominance, word learning, testimony

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THE EFFECT OF EXPLICIT AND IMPLICIT PROCESSING OF RELIGIOUS CONTENT ON INTERGROUP
ATTITUDES AMONG JEWS AND MUSLIMS IN ISRAEL

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This research explored the mechanism of social-cognitive structures and intergroup attitudes following priming of religious content. Two studies were conducted in order to examine the influence of visual exposure to religious concepts on out-group stereotypes among Jews and Muslims in Israel. In Study 1 participants were exposed to religious concepts (e.g., Mezuzah, yarmulke or veil) and then they filled questionnaires assessing their stereotypes.

Supraliminal priming did not affect out-group stereotypes of Jews. However, Muslims perceived Jews as more unpleasant when primed by Jewish symbols, and as more antagonistic when primed by Islamic symbols. In Study 2 participants were subliminally exposed to religious concepts followed by questionnaire-filling concerning threat perception, stereotypes and prejudice about individuals of the opposing religion. It was found that subconscious exposure of Jews to their own religious content moderated negative attitudes towards the Muslim out-group, especially realistic and symbolic threats and perceived social distance. Priming did not affect out-group stereotypes of Muslims.

Taken together, this research highlights the differential influence of evoked religious content on out-group attitudes as a function of level of consciousness to the primes and minority-majority relations. We also discuss the role of implicit vs. explicit content in holding dual attitudes towards the out-group.

Keywords: priming, implicit, religion, intergroup attitudes

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THE POWER OF BAD INFORMATION: HOW DOES SOCIAL INFLUENCE AFFECTS EXTENDS FALSE MEMORY VULNERABILITY

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Jonathan Carroll in "Bathing Lion" claims that "memory is always and for everything an unreliable witness. Never trust it to tell you the truth about who you are or how you got here." The aim of presented studies is to shed some light into this issue with use of experimentally evoked false memories. First study allows to describe false memories as long-lasting, sustainable memory traces, which are comparable to true ones, as accompanied by a similar level of confidence and subjective sense of remembering declared by participants (43% and 33% respectively compared to 4% for random mistakes). Second study was designed to verify whether subjects show significant difference among tendency to generate FM under influence of suggestion-content differing conditions (positive/negative/neutral). Obtained results demonstrated vast impact of suggestion on a tendency to generate false memories: both positively (63%) and negatively (58%) suggested groups notably extended false memories production compared to neutral (50%) and control conditions (50% and 38%, respectively).

Compellingly, analysis revealed “sense of remembering” under the negative-suggestion condition achieved 100% false recollection! Prevalent effect of providing negative suggestion were discussed in terms of source monitoring biases (Johansson & Stenberg, 2002) and general discrimination ability (Zhu et. al., 2013).

Key words: memory, false memories, susceptibility, suggestion, vulnerability

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IMPLICIT THEORIES OF PERSONALITY AND INTELLIGENCE IN RELATION TO ASSERTIVENESS AND INTELLIGENCE

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This paper extends the existing work on the role of implicit theories (IT) of intelligence and personality in students’ self-regulation. Numerous studies have shown how malleable and fixed IT of intelligence relate to goal orientations and academic performance. Since IT are beliefs individuals share about themselves and other people it is vital to investigate how those correlate with characteristics of personality, involved in social interaction. The purpose of the present study is to clarify how IT interplay with assertiveness, standing for one’s rights, and cognitive abilities. Undergraduate and postgraduate students from Moscow (N=97) completed the Assertiveness Inventory, Implicit Theories of Intelligence and Personality Scales and the Intelligence Test (ICAR). The analysis of contrast groups shows that students with high levels of assertiveness show significantly higher malleable IT of intelligence, then those with low levels of assertiveness. Another finding is that students with low fluid intelligence show significantly higher levels of assertiveness, while those with higher fluid intelligence demonstrate low levels of assertiveness. The results imply that assertiveness might be considered as a mediator for IT of intelligence in education. Furthermore assertiveness contributes to self-regulation where cognitive skills are lowered.

Key words: implicit theories, assertiveness, intelligence, personality

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OVER-IMITATION AS A BYPRODUCT OF PRESCHOOLERS' READINESS TO LEARN SOCIALLY RELEVANT
INFORMATION FROM DEMONSTRATORS SHARING THE SAME LANGUAGE WITH THEM

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Here we explore the hypothesis according to which the phenomenon of over-imitation is a consequence of children's preparedness to learn socially relevant information from reliable epistemic sources. We test whether native- versus foreign-language use in ostensive demonstration contexts modifies preschooler's evaluations of the degree of epistemic trust in different sources of information, by exploiting an over-imitation paradigm originally used by Hoehl et al. (2014) in two studies. In Study 1, preschoolers first saw an agent speaking in their native language (or a different agent speaking a foreign language), retrieving a sticker by performing superfluous actions on a puzzle-box. Later they saw the foreign-language-speaker (or the native-language speaker) retrieving a sticker from the same box by performing the relevant action only. In Study 2, preschoolers first saw a foreign-language-speaker retrieving the sticker by performing the relevant action only. Only later they saw superfluous actions demonstrated to them by their native-language-speaker. In both studies, children's imitation of the superfluous actions was assessed after each demonstration. In Study 1 we found that upon later seeing the relevant-action-only demonstration 4-y-old children reduced their over-imitation behavior but only if this demonstration was done by the native-language speaker. This interaction did not hold for older children. In Study 2 we found that despite first viewing the relevant-action-only demonstration by a foreign-speaker and copying this action faithfully, all children still imitated subsequently demonstrated superfluous actions by the agent speaking their own language.

Key words: social learning, over-imitation, social groups, language

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TWO-YEAR-OLD TODDLERS PREFER AND ALIGN WITH RESOURCE-RICH INDIVIDUALS

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Prior research indicates that children aged 4 years and older endorse resource-rich over resource-poor individuals. Here we examined whether 2-year-old toddlers would already share this bias and would indiscriminately endorse both preferences and opinions expressed by resource-rich individuals. An experimenter (E) first introduced two dolls, one resource-rich and one resource-poor. Next, in four tasks, the dolls expressed different preferences or opinions and then left; children then endorsed one of the dolls. Across tasks, (a) one doll preferred toy-A, one doll preferred toy-B, and children were asked which toy they preferred; (b) the dolls used different actions to ring a bell, and children then rang the bell; (c) when asked which of two toys was a “wug”, one doll pointed to toy-C, one doll pointed to toy-D, and children were asked to give E the wug; and (d) when asked which of two identical toys rattled when shaken, one doll pointed to toy-E, one doll pointed to toy-F, and children had to find the rattle. Across tasks, toddlers significantly endorsed the resource-rich doll, indicating that the bias favoring resource-rich individuals is already present by age 2 years and initially encompasses not only arbitrary preferences but also issues of epistemic reliability.

Key words: social cognition, morality, social class, social status hierarchies, social categories

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WHEN THE THRONE IS SHAKING: UNSTABLE POWER REDUCES ADVICE TAKING

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Experiencing power has been found to reduce advice taking, deteriorating powerholders' decision quality. In the current research, we make a novel prediction and propose that the link between power and advice-taking is not immutable. Particularly, we propose that the link between power and advice taking critically depends on people's stability of their power position.

Results of two experimental studies suggest that when their position is unstable, the powerful show decreased advice taking (Study1). This adverse tendency emerged even when the

adviser's level of expertise was made salient (Study 2). Interestingly, while those with unstable power positions disregarded advice from both expert and non-expert advisers equally, powerholders with stable power position took significantly more advice from the expert advisers, than they did from the non-expert ones.

Our findings provide critical theoretical insight as to when social power might increase or decrease advice taking. Importantly, these findings challenge the predictions of the Approach-Inhibition theory of power (Keltner, Gruenfeld, & Anderson, 2003), the most dominant theory in social psychology of power, that implicitly proposes increased advice taking by people in unstable power positions. Finally, our findings provide important practical implications regarding when powerholders are more receptive towards advice.

Key words: decision making, advice, power instability

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THE EFFECT OF LANGUAGE AND ETHNIC ORIGIN ON PROSOCIAL BEHAVIOR IN PRESCHOOLERS

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Humans appear exceptional in their ability to respond to the needs of their conspecifics, very early in development. Although the prosocial behaviors that children can produce are well documented, we still have much to learn about the mechanisms that underlie and modulate these fundamental behaviors. It is known that children's social preferences are guided by social categories determined by gender, race, age or the language spoken by the partner. Much less is known, however, about how these categories or their combination influence children's

prosocial behavior. The current study seeks to clarify how language and ethnic origin interact and affect the prosocial behaviors of 4-, 5- and 6-year-old children. We hypothesized that language will override ethnic origin because unlike the latter, language conveys more information about an individual's life and culture. Children were tested in five cooperation and helping tasks with four different conditions by crossing language and ethnic origin. The results show that children are faster to help and cooperate with an experimenter who speaks their native language regardless of her ethnic origin. In conclusion, as we expected language modulates prosocial behavior more than ethnic origin and is probably hierarchically higher than other social in preschoolers.

Key words: social categorization, preschoolers, language, ethnic origin, prosocial behavior

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GIVING IS A CUE OF EQUALITY-MATCHING RELATIONS FOR 12-MONTH-OLD INFANTS

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Recent studies showed that infants interpret interactions based on resource distribution (e.g., granting priority of access) as cues to specific relational models (e.g., authority ranking). Since humans are the only primate species to have evolved relations among nonkin based on asynchronous and reciprocal exchange via active sharing (giving), we hypothesize that infants may be prepared to treat this sharing behavior as cue of a relational model based on even balance (equality-matching). We explored this hypothesis across seven looking-time studies by familiarizing 12-month-olds (N = 16 per study) with two partly overlapping transfer-based interactions (S1-S3: A gives to B and takes from C; S4-S7: A gives to B, C takes from B), and exposing them at test to two reciprocation events (consistent vs. inconsistent) for each dyadic interaction. Results showed that, while infants correctly re-identified the familiarized interaction in the consistent reciprocation event for giving and taking alike, they encoded the direction of transfer (i.e., who shared with whom) selectively in the giving case. Despite able to

track both types of interactions over time, only in the giving case infants registered information functional to the bookkeeping of welfare imbalances, thus corroborating our hypothesis that giving is a cue to equality-matching relations.

Key words: social relations, sharing, reciprocity

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PERSPECTIVE TAKING DURING JOINT ATTENTIONAL TASKS

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The goal of the present study was to investigate whether selective, level-2 perspective taking occurs while participants are focusing on the same stimuli but have to perform independent tasks. The stimuli consisted of different sentences that either contained a target word from the animal, plant or object category. The task of the participants was to decide whether the sentences were semantically correct, while the partner (co-actor) had to count the items of a target category. Then, participants had to recall all seen items from the three categories. An eye-tracker device was used to measure the reading speed of sentences. In the Paired condition both the participant and the co-actor were present. In the Control condition the co-actor was absent, but the participant knew her task. Results show that participants recalled more items from their partner's target category than from the two non-target categories when the co-actor was present, additionally, looked longer to those sentences which contained their partner's target-items.

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WITHOUT ILLUSIONS ABOUT DELUSIONS – SOCIAL REPRESENTATIONS OF SCHIZOPHRENIA: AN
EXPLORATORY STUDY

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Schizophrenia can be a severe and chronic illness characterised by lack of insight and poor compliance with treatment and also surrounded by the most common myths and misconceptions spread in the society. As social representations are concerned with social knowledge, the social representation of mental illnesses, particularly that of schizophrenia may influence how this psychiatric diagnosis is accepted, whether treatment will be adhered to and how people with schizophrenia function in the world. The purpose of our exploratory study is to provide a foundation for understanding people's social knowledge about schizophrenia. As an initial step, we employ social representations theory and methods to understand how schizophrenic patients, their relatives and healthy controls make sense of and assign meanings to schizophrenia today. It is anticipated that our results will explore the differences in the nature of stereotypes and people's attitudes towards schizophrenia and help clarify the perceptions of the illness in order to develop better psychoeducational intervention programs, to correct misinformation about schizophrenia and to promote an informed understanding of those with schizophrenia for their more successful reintegration to normal living.

Key words: schizophrenia, social representations, psychoeducational programs, compliance

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IS EMPATHY ALWAYS BENEFICIAL? VALIDITY AND RELIABILITY OF THE HUNGARIAN VERSION OF THE SELF-COMPASSION SCALE SHORT FORM AND COMPASSION FOR OTHERS SCALE

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AIM: Recent research data indicates that empathy for pain is underpinned by neural structures that are also involved in the direct experience of pain therefore it generates negative affects and may cause the early burnout of the clinicians. The buddhist conception of compassion for others and the self may help sustaining mental health as its neural correlates differ from the ones for empathy. The Self Compassion Scale and Compassion for Other scale originally developed by Neff and Pommier respectively were conceptualized for empirical research of the constructs. The aim of this study was the validation of the Self-Compassion Scale short form (SCS SF) and the Compassion for Others Scale (CS) in Hungary.

METHOD: University students (N=306) entered the research to assess psychometric properties of the scales. Participants were asked to complete SCS-SF, CS, Rosenberg Self Esteem Scale, Depression Anxiety and Stress Scale, Subjective Well Being Scale, the Five Facet Mindfulness Questionnaire and Interpersonal Reactivity Index

RESULTS: Statistical analyses confirmed the factor structure of the scales. Their construct and criterion validity was acceptable and showed significant positive correlation with SWSL and significant negative correlation with the negative psychological indicators.

CONCLUSIONS: The SCS SF and CS demonstrated acceptable psychometric properties in Hungary.

Key words: self-compassion, compassion for others, burnout, empathy, mental health

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NEURAL ENTRAINMENT TO RHYTHMIC TONE SEQUENCES IN 6-7 YEAR OLD CHILDREN

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Neural oscillations have been shown to synchronize to external periodic stimuli, and this entrainment may affect the allocation of attention in time. Neural entrainment is proposed to be the underlying mechanism when moving to the beat of the music, as it requires predictive action at regular time intervals. Previous research found neural markers for entrainment in the beta and gamma band oscillations and steady-state evoked potentials (SS-EPs), and neural entrainment was shown to be different for children and adults. However, it is not known to what extent these neural responses in different frequency bands characterize neural entrainment, and how they manifest in early childhood. To address these questions, we measured electroencephalography (EEG) of first-year primary school children (N=25) while they were either listening passively, or tapping to isochronous tone sequences. Based on previous research, we expected that markers of entrainment will appear in the induced power of the high beta band (20-25 Hz), in short latency gamma activity (20-60 Hz) and in SS-EPs at frequencies corresponding to the rate of our rhythmic stimuli. We will present spatio-temporal dynamics of evoked and induced oscillations in the 20-60 Hz frequency range and SSEPs, the relationship between these EEG markers and how are they affected by stimulus tempo.

Key words: entrainment, children, EEG, synchronization, rhythm

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THE BDNF VAL66MET POLYMORPHISM MODULATES THE NEURAL CORRELATES OF AUTOBIOGRAPHICAL MEMORY

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Despite the relatively large body of literature on the effect of the Val66Met polymorphism on memory functions, its effect on autobiographical memory has not been investigated so far. Here, we studied event-related potential correlates of autobiographical memory by testing old/new ERP components described in the episodic memory literature and assessed the impact of the BDNF Val66Met polymorphism on these components. We recorded ERPs during an autobiographical memory task in which the participants had to decide whether the presented photographs depicted unfamiliar places or familiar places in their hometown, and in the latter case whether or not the photographs had been taken by themselves. Regardless of the presence of the Met allele, we observed a mid-frontal (300-500 ms) effect, a parietal late positive component (500-800 ms), and a late frontal effect (800-1200 ms). In Met carriers, however, the late frontal effect for autobiographical stimuli was found to be significantly reduced when compared to Val homozygotes. Our results hint at a differential post-retrieval processing of self-referential memory in Met carriers.

Key words: autobiographical memory, brain-derived neurotrophic factor, event related potentials, late frontal effect

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FOUR-MONTH-OLD INFANTS' EXPECTATIONS ABOUT FAIRNESS AND INGROUP LOYALTY

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Prior research indicates that by 1.5 years of age, infants (a) show sensitivity to fairness and ingroup loyalty and (b) expect ingroup loyalty to trump fairness when the two are in conflict. Here we asked whether infants as young as 4 months of age would already hold similar expectations. In Experiment 1, infants saw a distributor divide two items either equally (fair event) or unequally (unfair event) between two identical animated puppets. Infants looked significantly longer if shown the unfair as opposed to the fair event, thus showing sensitivity to fairness (this effect was eliminated if the puppets were inanimate). In Experiment 2, infants were familiarized to two groups of puppets, cats and foxes, and then one of the puppets distributed two items between an ingroup and an outgroup recipient. The distributor gave one item to each recipient (equal event), gave both items to the ingroup recipient (favors-ingroup event), or gave both items to the outgroup recipient (favors-outgroup event). Infants looked significantly longer if shown the equal or favors-outgroup event as opposed to the favors-ingroup event, suggesting that they expected ingroup loyalty to trump fairness in the distributor's actions (this effect was eliminated if group affiliations were made less salient).

Key words: social cognition, infancy, morality, ingroup loyalty, social group membership

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HOW CAN NOVEL METAPHORS BE MORE CONCRETE THAN CONCRETE EXPRESSIONS?

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Figures of speech permeate everyday, scientific and literary language, and metaphors have been proposed to do the heavy lifting in embodied cognition by mapping sensorimotor activations, well observed for concrete (and literal) expressions, onto abstract language. In this study, we used event-related potentials (ERPs) to test whether novel metaphors evoke the electrophysiological concreteness effect, i.e., a sustained late frontal negativity, hinting at imagery-driven processes, in a divided-visual-field paradigm. Participants read French adjective-noun expressions, where adjectives follow nouns, and where all adjectives were concrete, but the combined meaning was either metaphorical ("history scarred") or concrete ("customer scarred"). Nouns were presented centrally, and adjectives either in the left or right visual field. By measuring ERPs we tested whether the concreteness effect is driven by lexical units

("scarred") or by meaning combinations, and is absent for metaphors, which were rated less concrete than literal expressions in a prior norming study. Preliminary analyses revealed, rather unexpectedly, that metaphors evoked a concreteness effect relative to concrete literal expressions during right hemisphere presentation, and also an N400 during left hemisphere presentation ($p < .05$). Further analyses are necessary to explore the effect, but it could indicate strong imagistic processes for metaphors, contrary to subjective ratings.

Key words: metaphor, concreteness effect, right hemisphere, ERPs, N400

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WHO IS THE LEADER? HOW 18-MONTH-OLD INFANTS LINK SUCCESS WITH LEADERSHIP

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Recent research has demonstrated the infants' capacity to understand the different roles in a leadership relation (the leader, the non-leader and the followers). However, it is not clear what makes one the leader. Considering that infants are sensitive to hierarchical relationships arising from competitive contexts, here we study if the winner is perceived as the leader. Using an eye-tracker (method), we recorded 18-month-olds' eye gaze behaviour while watching short animations where one agent (observer) observes two other agents trying to catch a ball, either alone or both at the same time. In this second case, only one of the agents can prevail (always is the same one). After this familiarization, both agents offer to the observer to follow different paths: to go with the "winner" or with the "loser". We measured the anticipation and total looking time for both options. The results indicate that infants expect the observer to follow the winner rather than the loser (mean-winner= 12,81 sec.; mean-loser= 17,02 sec.; $p = 0,04$). These results confirm that infants consider the success as a feature of leaders. We will further discuss the implications of this assumption taking into account the way the winner achieved his goals.

Key words: social hierarchy, leadership, dominance, prestige

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IDIOSYNCRATIC SWITCHING PATTERNS IN MULTI-STABLE AUDITORY PERCEPTION ARE RELATED TO
FUNCTIONAL BRAIN NETWORKS

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Multi-stability is perceptual phenomenon in which perception stochastically switches between alternative interpretations of the stimulus. This allows the examination of perceptual experience independent of stimulus parameters. Previous studies found that listeners show temporally stable idiosyncratic switching patterns when listening to multi-stable auditory stimulus, such as the auditory streaming paradigm. This inter-individual variability has been described along two dimensions, “Exploration” and “Segregation”. In the current study, we explored the functional brain networks associated with these dimensions and their constituents using electroencephalography and near-infrared spectroscopy. Through a data-driven approach, current results replicated previous findings on idiosyncratic switching patterns and the two dimensions explaining inter-individual variance. Further, “Segregation” and its constituents were found to be related to brain networks operating in the theta EEG band, whereas “Exploration” and its constituents were found to be related to networks in the lower and upper alpha and beta bands, as well as networks extracted from deoxygenated hemoglobin concentration changes. Thus, the dimensions on which individuals’ perception differ from each other in the auditory streaming paradigm probably reflect separate perceptual processes in the human brain.

Key words: perceptual multi-stability, auditory streaming, individual differences, functional networks

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GENERIC INFORMATION SUPPORTS THE FAST-MAPPING OF NOVEL LABELS

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Multiple studies have shown that children are capable of fast mapping words and facts onto objects. In three studies, we assessed how labels and (generic or specific) facts presented together or separately influence their short and long-term retention. During an object-matching game, 4-year-old children were incidentally presented with novel labels and facts about novel objects. We tested recall immediately, and at a 1-week delay, in cases when the labels and facts were presented separately for different objects (Study 1), when labels and facts were presented together at the same time for an object (Study 2), and when labels and facts were presented for the same object but with a time interval in between (Study 3).

The results revealed that 1 week after presentation, only generic facts were remembered if labels and facts had been presented separately or with a gap in between (Studies 1 and 3). When labels and generic facts were presented together (Study 2), 4-year-olds displayed better long-term retention of both novel names and generic facts. Taken together, these studies show that kind labels and kind-generic facts support each other in children's long-term memory.

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21-MONTH-OLDS DISTINGUISH BETWEEN LEADERS AND BULLIES

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Can infants distinguish between rule by a leader and coercion by a bully? To find out, we asked whether 21-month-olds would expect subordinates to comply with an instruction given by a leader (leader condition), but not with an instruction given by a bully (bully condition). Infants watched computer-animated events involving geometric characters. In the familiarization trials of the leader condition, three subordinates bowed to the leader and gave her their ball. In the test trials, the leader instructed the subordinates to go to bed; the subordinates either complied while the leader watched but disobeyed after she left (disobedience event) or

continued to comply after she left (obedience event). In the bully condition, the leader was replaced by a bully who in the familiarization trials hit the subordinates and stole their ball. Infants looked significantly longer at the disobedience than at the obedience event in the leader condition, but looked equally at the two events in the bully condition. These and additional findings from control conditions indicate that 21-month-olds expect subordinates to obey a leader, but not a bully. Thus, by the second year of life, infants are already sensitive to the complex dynamics of authority and power.

Key words: infancy, social cognition, dominance relations, leadership, coercion

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THE ROLE OF MEMORY FOR PAST EVENTS IN DIACHRONIC COOPERATION, COMMITMENT AND THE DISSEMINATION OF REPUTATION

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Mahr & Csibra (2017) have argued that episodic memory is the capacity that allows us to regulate our claims to epistemic authority about the past. One question, which is only briefly addressed in their article, however, is why this capacity applies to this specific kind of content: reconstructions of specific, past events. Here we extend the arguments by Mahr & Csibra (2017) through an analysis of the role of specific past events in the effectiveness of diachronic cooperation/commitments. We argue that the evolution of sophisticated forms of diachronic cooperation requires the development of corresponding social pressure for the prevention of defection either through direct punishment or reputation. We propose that both punishment and the dissemination of reputation (albeit in different ways) favor the selection of the capacity to communicatively refer back to specific past events since this allows one to effectively influence others' interpretations of these events.

More generally, our understanding of how of commitments and entitlements are distributed in the present essentially depends on our ability to communicate information about specific events in the past. This view has consequences for our understanding of the role of emotions and narrative in episodic memory.

Key words: episodic memory, event memory, evolution of cooperation, reputation

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VISUAL FIXATION PATTERNS DURING VIEWING OF HALF-FACE STIMULI IN ADULT HUMANS: AN EYE-
TRACKING STUDY

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Human faces play a special role in social cognition, since as a core signal of interpersonal communication, they convey various kinds of information (sex, age, race, emotions, intentions etc.). Our study aimed to explore how this specialization manifests itself in eye movements when looking at faces. We monitored the gaze pattern of 23 adult participants applying eye-tracking method. To test if model-driven processes are involved in face perception, and to see how inversion affects fixations on special facial stimuli, we used vertically cut half-faces in upright and inverted positions (so half of each stimulus represented a half-face, whereas the other half was left blank). Our results corroborate prior findings consistently demonstrating the dominance of the triangular area marked by the eyes and the mouth, measured by number and duration of fixations. In addition, we found evidence (and our study is the first to do so, to our knowledge) for so-called complementary fixations, targeted at the non-informative parts of the pictures, suggesting that other than purely stimulus-driven mechanisms might drive looking behavior when scanning faces.

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2-YEAR-OLD CHILDREN SHOW FLEXIBILITY IN IMMEDIATE RE-ENACTMENT BUT NOT IN MEMORY RETRIEVAL IN A DELAYED IMITATION PARADIGM

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The study investigated 2 year-old children's event memory. To explore whether children remember general, goal-directed parts of an event or episodic aspects as well, we created a delayed imitation paradigm involving two occasions 1 week apart. Between occasions the situational constraints changed, which demanded either to retrieve a previously irrelevant unique step (use of a tool) in order to achieve a goal; or the omission of a previously relevant step. Participants (n = 32) were presented with objects, and a model demonstrated how to achieve them. The model always used a tool to achieve objects regardless of its necessity (object close/far). Demonstration was followed by immediate reenactment under the same

constraints, and one week later the constraints changed and children were allowed to obtain the goal with no additional demonstration. In close-first condition children were more likely to use their hands, however in far-first condition children were more likely to use the tool. After constraint changing children in close-first condition continued to use their hands. Children in far-first condition used the tool less than before. Based on these results we propose that early event memory shows mainly characteristics of general, semantic memory and episodic irrelevant information gets omitted with time.

Key words: episodic memory, delayed imitation, memory development

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SHARED CULTURAL KNOWLEDGE AS THE BASIS OF SOCIAL CATEGORIZATION IN ADULTS

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The present study investigated whether adults rely on cues of shared cultural knowledge when forming category representations of fellow humans. The study used a modified version of the memory confusion paradigm, where participants are presented with photographs of people differing along a certain social category distinction while listening to utterances associated with the pictures. In the test phase, the task is to match each utterance to the person whose picture it was associated with. When category representations are formed along a certain distinction, more within-group than between-groups errors are expected. Experiment 1 contrasted the use of two possible cues in social category representations: race and shared cultural knowledge. Participants were presented with pictures depicting six people belonging to two different

ethnicities based on skin color, while the utterances included statements that showed whether the person was familiar with cultural practices specific to the participants' society. In Experiment 2, race as a potential basis for social categorization was removed and the only distinction available was based on the content of the utterances. The results indicate that people incorporate information about shared cultural knowledge in their representations of social categories, but this effect may be less robust than those elicited by visual cues.

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SENSITIVITY TO THE PRINCIPLE OF RATIONALITY GUIDES INFANTS' SOCIAL PREFERENCES

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Based on the principle of rationality, pre-verbal infants expect individuals to act using the most efficient way to achieve their goals (Gergely et al. 2002; Skerry et al. 2013).

All the studies that addressed this principle used non-social contexts. However, people's actions usually take place in a social environment, where their behaviours influence the way other individuals interact with them (Singer et al. 2006).

Taking into account that infants are sensitive to the link between people's behaviours and social affiliations (Liberman et al. 2014; Powell & Spelke, 2013), here we addressed whether the rationality of others' behaviours was used to generate expectations about third party affiliations.

By using an eye-tracker we recorded 22 15 old-months infants' eye gaze behaviour while watching short animations, where an agent observed two other agents jumping a constraint to get a reward. At some point, the constraint was removed and one agent adapted his trajectory to a shorter one to get the reward (rational agent), while the other agent kept doing his old long-path trajectory (irrational agent). Finally, both agents went to call the observer simultaneously and he had to choose to affiliate with the rational agent (congruent affiliation) or with the irrational one (incongruent affiliation).

As expected, results show that infants were surprised when seeing the incongruent affiliation as compared to the congruent one.

Key words: rationality, social selectivity, third-party affiliation, agency, infants' social cognition

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FROM HARM TO UNFAIRNESS: TWO-YEAR-OLD TODDLERS ATTRIBUTE BROAD DEFICIENCIES IN MORAL CHARACTER

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Toddlers attribute a deficient moral character to individuals who harm others. How broad is this moral deficiency? After seeing a wrongdoer harm a victim, would toddlers still expect the wrongdoer to act fairly? Our research addressed this question and also manipulated whether the wrongdoer committed one vs. three harmful actions and whether these actions were directed at an outgroup (Experiment 1) or ingroup (Experiment 2) victim.

Two-year-old toddlers watched interactions among puppets. In Experiment 1, A1 first harmed outgroup B1 either once or three times (broke a puzzle, drawing, and/or tower). Next, A1 divided toys between ingroup A2 and A3, either equally (fair event) or unequally (unfair event). When A1 harmed B1 once, toddlers looked significantly longer at the unfair than the fair event, suggesting that they still expected A1 to act fairly. When A1 harmed B1 three times, however, toddlers looked equally at the two events, suggesting that they no longer expected A1 to be fair. In Experiment 2, A1 harmed ingroup A4 instead of outgroup B1, and toddlers looked equally at the two events whether A1 harmed A4 once or three times. Toddlers thus attribute broad deficiencies in moral character, modulated by both harm severity and group affiliation.

Key words: morality, moral development, fairness, harm, moral character

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MEASURING THE IMMEASURABLE: DEVELOPING BEHAVIORAL TESTS FOR MEASURING MINDFULNESS AND COMPASSION

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Mindfulness practice of present moment awareness promises many benefits, but has eluded rigorous behavioral measurement. John Kabat-Zinn (1990) describes mindfulness as bringing attention to moment-to-moment experience, with an intention to be present and with a compassionate attitude toward experiences. To date, research has relied on self-reported mindfulness or heterogeneous mindfulness trainings to infer skillful mindfulness practice and its effects. This study investigated the link between self-reported mindfulness (nonjudgmental attention to present-moment experience) and three different behavioral measures of mindfulness and compassion: breath-counting, Necker-cube illusion, Compassion-Empathy task.

Method: In four independent studies with over 300 total participants, we present the validation of three different behavioral measures of different aspect of mindfulness and compassion: breath counting, Necker-cube illusion and compassion-empathy test.

Results: Overall, we found that these tasks were reliable, correlated with self-reported mindfulness, differentiated long-term meditators from age-matched controls, and was distinct from executive function measures. In addition, we employed breath counting to test the nomological network of mindfulness. As theorized, we found skill in breath counting associated with more meta-awareness, less mind wandering, better mood, and greater non-attachment (i.e., less attentional capture by distractors). We also found in a randomized training study that 8 weeks of mindfulness based compassion training increased performance in breath-counting and compassion tasks, and decreased mind wandering relative to working memory training controls.

Conclusions: Together, these findings provide evidence for breath counting, Necker-cube illusion and Compassion-Empathy tests as a valid and useful behavioral measures of mindfulness and compassion. Mindfulness is more related with compassion, a concept and ability somehow different from empathy, being related with distinct brain activations. The relevance of these findings for mental balance and well-being are discussed.

Key words: mindfulness, meta-awareness, compassion, behavioral measurements

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HOW DOES KNOWLEDGE OF MULTIRACIAL, TRANSGENDER, AND BILINGUAL IDENTITIES AFFECT ESSENTIALIST INTUITIONS?

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What happens to our intuitions about social categories when we encounter more fluid identities? One social intuition, essentialism, dictates that one can be either black or white, male or female, English- or Spanish-speaking, with no overlap or movement between these categories. We learn, however, that multiracial, transgender, and bilingual individuals exist. What happens to our intuitions about social categories when we learn this new information? Research shows that our intuitions about the physical world are simply suppressed, not replaced, when we learn otherwise. Does this also happen to our social intuitions? Thirty-eight undergraduates rated statements whose truth value was either the same across both intuitive and learned theories about social categories (“A little girl can grow up to be a woman”) or whose truth value differed across those theories (“A little girl can't grow up to be a man”). Participants were slower and less accurate in their ratings of the latter, suggesting that essentialist intuitions linger and affect our judgments even after we may think we know otherwise.

Key words: essentialism, social categories, transgender, multiracial, bilingual

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CAN CHILDREN INTEGRATE INFORMATION ABOUT EFFICIENCY IN FALSE BELIEF REASONING?

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Recent studies revealed that infants can track an agent's false belief already in their first years of life. However, the evidence provided by earlier studies is constrained to a few distinct domains, like attribution of beliefs regarding objects at a location or an object's identity. These narrow down the possibilities concerning the contents over which early theory of mind operates. Thus, it is still a question whether young children are able to attribute belief contents capturing more complex relations. Our study explores 3-year-olds' ability to reason about causal schemas in a belief attribution context (e.g. DzX believes that if p then qdz, where Dzpdz and Dzqdz represent the relation of an intervention to a possible effect).

In the experiment 3-year-olds were familiarized with a set of inefficient and efficient tools operated by a character, such that the different tools had different causal contributions in obtaining a reward. During the false-belief condition, in the absence of the character the efficient tool was replaced by an inefficient one, while in the true-belief condition this exchange took place in his presence. We tested whether children could represent false belief about the efficiency of the tools and integrate them in behavioral predictions.

We collected both implicit and explicit measures of false belief reasoning. Preliminary results (N=40) suggest that while 3-year-olds tended to act congruently with the agent's belief in response to the explicit question, the pattern from implicit measures was in the same direction, but less strong.

Key words: theory of mind, causal reasoning, efficiency, naïve physics

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COMPARING EVIDENCE FOR SOCIAL GENERALIZATION: DIVERSE VS. NARROW

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Generalizations about social groups (prejudices, stereotypes) are based on limited sets of data. But not all data are equal: rationally, we should generalize more readily from diverse evidence than from narrow evidence. We asked whether children and adults employ this rationale when generalizing about an unknown group—students from “the Jiffy school.” We presented one diverse [black and white children who like toy X] and one narrow set of evidence [two white

children who like toy Y] and asked which toy is liked by most Jiffy students. The toys were hidden; the only clue was the diversity of evidence. Adults generalized more from the diverse evidence (most students will like what children of different races liked) but five-year-olds generalized predominantly from the narrow set. Because all our participants were white, we hypothesized that they assumed the Jiffy students to be all white, too. To test this as an explanation for their choice, in Study 2 we prefaced the experiment with showing a mixed-race picture of Jiffy students. Now five-year-olds generalized predominantly from the diverse group. Our results show that already at age five children can apply systematic rationales when making social generalizations in ways that depend on their social environment.

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PRESCHOOL METACOGNITIVE DEVELOPMENTS ALLOW LEARNING AND USE OF
CO-REFERENTIAL WORDS

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A possible effect of the hypothetical mutual exclusivity bias is that children avoid using two labels for the same referent; for recently learned labels, one may be rejected or applied to a distractor object. We present two experiments examining this phenomenon, sometimes referred to as the correction effect. Our hypothesis is that metacognitive developments around the age of 4 allow children to overcome this behaviour. In Experiment 1 (N = 66), over half of 3- to 5-year olds did not accept both names for the referent. Success was strongly associated with their ability to understand perspective, measured by false belief understanding. In Experiment 2 (N = 60) we replicated these findings and also compared performance on a version of the disambiguation task, modified such that a novel word is most appropriately applied to a familiar rather than a novel object (Gollek & Doherty, 2016). Performance on this Pragmatic Cue task, was related both to performance in the current Correction task and False Belief Tasks. Findings indicate that perspectival understanding is required to use co-referential names correctly within a particular conversation. Relations to lexical principle and socio-pragmatic accounts of apparent word learning biases are discussed.

Key words: word learning, correction effect, theory of mind, disambiguation effect

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We studied how 2, 4, and 6 month-old infants progressed in knowledge of their body structure and their ability to independently control their limbs.

The babies wore movement-detecting bracelets that allowed us to create a contingency such that when an infant moved one particular limb, a sound occurred in the room. We expected that, in order to cause the sound to occur, younger infants would be unable to separate out the particular limb that created the sound and would move their whole body. On the other hand we expected that as infants grew older they would progressively be able to narrow down their actions to the particular limb causing the sound.

We confirmed that when motion of an arm causes the sound, as expected, 2 month old infants move their whole body, and 4 month old babies move their upper body. Curiously however, 6 month old infants' behavior is more similar to 2 month olds'.

We suspect our failure to find the expected narrowing of control to the contingent limb at six months may be because six month-old infants were not interested in the sound we used.

Key words: body knowledge, contingency, infants, goal-directed actions

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HOW LEARNING CAN CHANGE SOCIAL CATEGORIZATION INTO EFFICIENT INDIVIDUATION?

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Social categorization helps us to organize our social world and to make inferences about unknown people on the basis of our knowledge of their social categories. In contrast, individuation allows us to acquire specific knowledge about particular individuals. Research in social psychology has shown that social categorization is the default process to perceive and organize social stimuli. Across two experiments, we aimed at investigating whether categorization processes can be flexibly adjusted to individuation in trust decision-making. We adapted the multi-round version of the trust game paradigm and differentially manipulated the reciprocation rates of participants' game partners. Our results showed that at first, participants

used social categories to guide their decision (not) to trust their game partners, even though social category was not a relevant dimension for performing the task, thus showing a categorization strategy. However, repeated interactions resulted in an efficient individual learning of the reciprocation trend of their game partners. Individuation was clear when interacting with in-group game partners, but trust decisions were also affected by categorical thinking when interacting with out-group game partners. We discuss the motivational variables that influenced participants' performance in our task, and turned the by-default categorization processes into efficient individuation.

Key words: social categorization, individuation, trust decision-making, learning

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GRATITUDE: THE SIGN OF A TRUSTWORTHY AGENT

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To be able to discriminate between cheaters and cooperators has posed an important selection pressure for human group living. We posit that expressed gratitude in others might be a discriminating cue between cheaters and cooperators; indeed the taking of a resource without gratitude for the gift may signal an act of domination. Here, we examine whether young children from 3 years of age use the expressed gratitude from a beneficiary as a cue for trustworthiness. We hypothesised that a benefactor will believe it to be more likely that a beneficiary expressing gratitude will reciprocate, than someone who does not express gratitude. Participants were presented with a vignette imagining they had made a drawing to each one of two new children who had just started in their kindergarten / school. One of the children expressed gratitude and the other did not. Next, participants were asked which of the two beneficiaries they thought would reciprocate altruistically in terms of sharing resources, help and information. Across domains, participants were much more likely to judge that the

grateful, rather than the ungrateful agent would act altruistically towards them in the future (N = 48, one sample t-test yielded a $p < .001$).

Key words: gratitude, trust, cooperation, alliance, judgment

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THE ROLE OF PRAGMATICS VS. NOVELTY IN A LABEL ASSIGNMENT TASK

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Children typically apply a novel label to a novel object, rather than to a familiar object; a phenomenon called Mutual Exclusivity (Markman et al., 2003). A recent explanation is that children tend to associate novel stimuli together (Horst et al., 2011). We show that pragmatic factors may override novelty. In our study two-year-old children first played with a novel object together with E1. Then E1 left the room and E2 brought another three novel objects for the child to manipulate on his/her own. Finally, E1 came back and requested the child to give her the “Bitye”. Most children chose the first object, with which they had a common history with E1, even though it was the least novel. This suggests that children understand a novel word by considering to which object the speaker is most likely to have intended to refer.

Key words: word acquisition, mutual exclusivity, pragmatics, novelty

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17-MONTH-OLD INFANTS EXPECT LEADERS TO RECTIFY TRANSGRESSIONS AMONG SUBORDINATES

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Do infants view leaders as having specific responsibilities toward their subordinates? Here we examined whether 17-month-olds would expect a leader to rectify a transgression among subordinates (leader condition), but would hold no such expectation for another subordinate who witnessed the same transgression (non-leader condition). Infants watched live interactions among bear puppets. In the leader condition, a leader (identified across experiments either by its larger size or by compliance with its instructions) brought in two toys for two subordinates. However, one subordinate (the perpetrator) quickly grabbed both toys, leaving none for the other subordinate (the victim). In the rectify event, the leader took one toy away from the perpetrator and gave it to the victim. In the ignore event, the leader approached each subordinate in turn but did not re-distribute a toy. The non-leader condition was identical except that the leader was replaced with a third subordinate. Infants looked significantly longer at the ignore than at the rectify event in the leader condition, but looked equally at the two events in the non-leader condition. These and control results indicate that 17-month-olds already ascribe role-based responsibilities to leaders: Specifically, they expect a leader who has observed wrongdoing among subordinates to rectify it.

Key words: infancy, social cognition, morality, hierarchical social relationship, authority

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ENHANCED STATISTICAL LEARNING AFTER DISRUPTION OF BILATERAL DLPFC

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The relationship between implicit learning and executive functions is still debated. Previous studies showed that manipulations reducing the engagement of frontal-lobe mediated explicit, attentional processes can lead to an improved performance in implicit statistical learning, which is assumed to be striatum/cerebellum related. To test this hypothesis, we used a between-subject design. Our subjects performed an Alternating Serial Reaction Time (ASRT) task under the influence of either rTMS stimulation or sham stimulation of both hemispheres of the dorsolateral prefrontal cortex (DLPFC), the stimulation side order was thereby counterbalanced. 1Hz inhibiting rTMS was delivered for 5 min over each hemisphere before the first learning block and in the inter-block breaks. The lasting effects of TMS on sequence learning were assessed ten minutes, two hours, and 24 hours after the learning phase. 32 healthy young adults were tested (16 in the sham group).

In line with models positing a competitive relationship between DLPFC functions and statistical learning, the DLPFC stimulation group showed a better performance compared to the sham group after the 24-hour consolidation period, whereas only the control group increased significantly from Learning Phase to the first post-measurement.

Key words: DLPFC, Statistical learning, rTMS

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TWELVE-MONTH-OLDS USE GIVING AND TAKING AS CUES FOR MUTUALLY EXCLUSIVE SOCIAL RELATIONS

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Recent findings suggest that infants interpret giving and taking actions as cues to social relations regulated onto different and mutually incompatible relational models (equality matching and communal sharing, respectively: Tatone & Csibra, 2013). If so, infants should expect a social relation to be supported by only one type of transferring action, since multiple actions would otherwise cue mutually contradictory models. Across five looking-time studies, we tested whether 12-month-olds use this “principle of relational consistency” (PRC) in determining the number of dyadic relations that an agent participates in.

In Study 1, infants were familiarized to two separate events involving an agent emerging from behind the occluder, giving or taking an object to/from a patient, and going back behind the occluder. At test, infants saw a new agent interacting twice (by giving and then taking) with a new patient. At the end of the second action, the occluder was removed to reveal one or two (identical) agents. Infants looked longer at the single-agent outcome, suggesting that they inferred two agents behind the occluder (Giver and Taker), instead of a single one (Giver/Taker), consistently with the PRC. Further studies showed that infants did not individuate agents via trait ascription (a Giver should not be a Taker: Study 2) or efficiency analysis (agents should select the shortest path to approach the patients: Study 3). We are currently exploring whether infants prioritize relational or featural information for agent individuation purposes in the present paradigm (Studies 4 & 5).

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EPISTEMIC DRIVES OF INFANTS’ SOCIAL PREFERENCES

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Infants prefer to attend to, receive toys from and imitate native compared to foreign speakers (e.g. Kinzler et al., 2007). These preferences have commonly been interpreted as early indications of humans' tendency to divide the social world into groups, preferring one's own group and disfavours others. We propose instead that infants' preferences are driven by information-seeking, leading infants to prefer people who provide them with better learning opportunities. In a previous study (Begus et al., 2016), we have shown that infants treat native speakers as superior sources of information, as indicated by heightened EEG theta oscillations, reflecting an active and selective preparation for encoding information. Given that information in one's own language enables better learning, it follows that infants' motivation to learn would result in preferences for native speakers. However, this preference should not be observed if all speakers provided equally learnable information. To test this, we ran further 2 studies, in which foreign (as well as native) speakers offered non-verbal information, while EEG theta oscillations and infants' behavioural responses were measured. We found that when infants are faced with an informative foreign speaker, they no longer show a native preference and are equally motivated to learn from and interact with both foreign and native speakers.

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**GROUP MEMBERSHIP MODULATES TODDLERS' EXPECTATIONS ABOUT PUNISHMENT AND
AFFILIATIVE PREFERENCES FOLLOWING MORAL TRANSGRESSIONS**

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Two experiments examined 2.5-year-old toddlers' expectations about punishment and affiliative preferences following moral transgressions. In the punishment experiment, toddlers first saw a wrongdoer steal a toy from a victim, while a bystander watched; this bystander belonged either to the same group as the wrongdoer and the victim (ingroup condition) or to a different group (outgroup condition). In test, the bystander either punished or helped the wrongdoer. Results indicated that toddlers expected the bystander to punish the wrongdoer in the ingroup condition, but not the outgroup condition.

The affiliative-preference experiment was identical except that in test the bystander approached and played with either the wrongdoer or the victim. In the ingroup condition, toddlers expected the bystander to approach the victim, reflecting a consistent concern for the ingroup victim across both experiments. In the outgroup condition, toddlers expected the bystander to approach the wrongdoer, and additional results indicated that toddlers attributed to the bystander a desire to avoid the (unfortunate) victim.

Together, these results (a) indicate that early expectations about punishment and affiliative preferences following moral transgressions do not always mirror each other, and (b) help shed light on the functional roles of punishment and affiliative preferences in social interactions.

Key words: punishment, moral development, social cognition, affiliative preference

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THE NUMERICAL SIZE EFFECT IN SYMBOLIC NUMBERS AND EVERYDAY NUMBER FREQUENCY

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The numerical size effect means that when comparing two numbers, the larger their value is, the more difficult it is to differentiate between them. Previous results show that in the case of

artificial new symbolic numbers this effect is due to their frequency: when the frequencies of the new symbols were manipulated, the size effect followed the distribution of the symbol frequencies.

In the present experiment we manipulate the frequency of the already well-known and over-learned Indo-Arabic numbers to induce a change in the size effect. In a similar test it has been shown that the distance effect can change within a session not only for new artificial symbols, but also for Indo-Arabic numbers. Participants compare Indo-Arabic numbers from 1 to 9 in a number comparison task in three conditions in which the numbers are presented with either (a) equal frequency, (b) their everyday frequency, or (c) reverse everyday frequency.

The results suggest that the size effect does not change radically with the change in number frequency. Everyday frequency seems to be a stable feature of symbolic numbers, in contrast to the numerical distance effect which changes relatively quickly within a single session.

Key words: numerical cognition, size effect, symbolic numbers

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IT'S NOT WHAT YOU SAY, BUT HOW YOU SAY IT: CHILDREN PREDICT OTHERS' SOCIAL RELATIONSHIPS
BASED ON ACCENT

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Children express social preferences for native speakers of their language, yet little is known about how linguistic information may serve as a marker of social categorization to guide inferences about other's social relationships. Across six experiments, 5-6-year-old monolingual English-speaking children were presented with a target individual, and two potential friends of the target, whose language varied. In an initial experiment, children predicted that a French-accented English speaker would be friends with an individual who spoke French, rather than an individual who spoke English with an American accent. Additional experiments revealed that children predicted positive social relationships between individuals who spoke with a common accent, even if one of those individuals did not communicate with conventional semantic meaning or grammatical structures. A final set of experiments demonstrated that children

attended to information about conventional semantics and grammar when predicting understanding between individuals, yet their inferences about social relationships nonetheless hinged more reliably on individuals' shared accent.

Taken together, we find a robust pattern for children's friendship predictions based on a common accent, even if there is little to no potential for communication between individuals. Thus, accent serves as a marker of social categorization that guides individuals' expectations about third-party social relationships.

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STATISTICAL PATTERNS IN VOCABULARY DEVELOPMENT

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Having developed a sufficiently rich repertoire of lexical items, speakers face the problem of lexical retrieval, the process by which items are selected from semantically related ones in the lexicon. As the presence of multiple strong competitors for a given position makes it more costly to select a winner, most models of lexical access assume some form of competitive selection resolution via lateral inhibition or differential threshold. From a developmental perspective, we expect different temporal patterns of semantic competition as the function of vocabulary growth and the maturation of prefrontal inhibitory functions and working memory. To examine the properties of these dynamics in the developing production vocabulary, the present investigation employs statistical co-occurrence analyses of spontaneous speech production transcripts obtained from the CHILDES database. Based solely on distributional information, we define two types of interaction between lexical items: one is analogous to syntagmatic relations between words, and one is similar to paradigmatic relations. The measures of these interactions are conceptually transparent and suitable to find reliable

patterns of semantic competition that took place within a given time window of acquisition, thus, taken together with vocabulary norms and other developmental data, they offer novel insight into typical language production.

Key words: language production, competitive selection, vocabulary development, corpus-based statistics, distributional semantics

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INVESTIGATING EFFICIENCY AND RATIONAL DECISION-MAKING IN SEQUENTIAL JOINT ACTION

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Do we make rational decisions that maximize joint efficiency when coordinating with others (i.e. minimize the total costs of actions for a dyad instead of its constituent actors)? In joint object manipulation tasks, adults make efforts to reduce their partner's discomfort. One explanation for such behavior might be that people aim to share their efforts to minimize aggregate costs (maximizing joint efficiency). Alternatively, they may only aim to reduce their partner's effort (maximizing individual efficiency). Here, we put these two explanations to test. We used a dyadic motor coordination task in which actors transported a object to a goal area with their partner, in an environment with two potential paths. We systematically manipulated the costs of available movement options and analyzed path choices. Our results suggest that the tendency to choose the individually efficient or inefficient option in neutral trials (with no differences in related joint costs) varied widely across participants. However, in trials where an action could be executed in less and more joint-efficient ways, participants based motor decisions on aggregate costs and acted to maximize the dyad's efficiency, even at the expense of compromising individual efficiency. We propose that rational decision-making based on calculating joint costs might account for sequential joint action planning.

Key words: social cognition, joint action, efficiency, decision-making

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SELECTIVITY IN SPONTANEOUS LEVEL-2 PT: THE ROLE OF ATTENTION VERSUS SHARED GOALS

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Selectivity in visual perspective taking (PT) is indispensable, just as much as it is in first person perception. The partner's attention is a viable candidate for selection as attention modulates conscious visual experience. Indeed, previous findings indicate that the partner's attentional focus can serve as the basis of selectivity when representing how a scene appears to a fellow individual (level-2 PT). We showed spontaneous level-2 PT in the number verification task when participants knew that their partner also performed number verification (attended to perspective dependent stimulus feature, numerosity), but not when the partner was known to attend to the color of the number character and disregard the numerosity it depicted. Alternatively however, PT may have been facilitated by the experience of sharing a task in the former, but not the latter condition. The current study contrasts the affiliative and attention based explanations in adults by introducing a group where the partner's attention is directed to numerosity, but his task (indicate the number of syllables of the visually presented number character's label), nevertheless, differs from that of the participant (number verification). Attention based selectivity predicts perspective interference regardless of the partner's task, as long as it calls for processing numerosity.

Key words: level-2 perspective taking, attention, selectivity

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ACTION PREDICTION BASED ON OTHERS' BELIEFS ABOUT OBJECT IDENTITY IN 2-YEAR-OLD HUMAN INFANTS

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What are the ontogenetic foundations of humans' ability to reason about others' mental states? Two-year-old infants show sensitivity to others' false beliefs about the location of an object based on their anticipatory looking behavior (Southgate, Senju, & Csibra, 2007). Here, we investigated whether infants can compute object identity from another person's perspective. After familiarizing infants to an actor's preference of object A over B, infants saw her witness object A put in a container, and then into Box 1. Subsequently, she saw the container being taken out from Box 1, and stop midway towards Box 2. Then, the container was opened and either revealed object A, or object B; which was either seen or unseen by the actor. Then she saw the now-closed container being put into Box 2. Infants' (n=20) anticipatory looking of the actor's reach for Box 1 or 2 shows correct prediction when the content of the container (either object A or B) was revealed to the actor; but chance performance in unseen trials. This suggests infants can incorporate inferences into mental state attribution (e.g. if object B is moved, A is in its original location), but only when others receive sufficient information (on the container's identity).

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CULTURE'S CRUCIAL ROLE IN ACQUIRING ARTIFACT-SPECIFIC KNOWLEDGE

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The present study investigated the influence of attributed cultural knowledge on the process of functional learning of 4 years old children. In our experiment we principally built on the functional fixedness theory, expecting that children after having learned the function of a given tool would choose a novel one for accomplishing a novel goal. Participants (n = 39) were presented with four object sets by a model either speaking in their native or in a foreign language. During the test phase children encountered new tasks, for what they could use the

already familiar tools' color variants or other functionally equivalent but previously unseen tools. Our results confirmed our hypothesis that children preferred to use the new tool only in case of the cultural in-group (native language) condition (63,3% vs. 42,7%). These results reveal that culture is a fundamental element of artifact-specific knowledge. Furthermore, based on these findings, we propose that culture might be the incidental element in the process of assigning a certain function to a given object.

Key words: object function, functional fixedness, learning, social category, language

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UNDERSTANDING FALSE BELIEF AND PRETENSE IN STORYBOOK READING WITH ASD CHILDREN

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Understanding of false belief and pretense are important components of social-cognitive development, particularly Theory of Mind (ToM). Reading and telling storybooks with mental-state themes, and mediating conversation with children, fosters ToM development (e.g., Ziv, Smadja, & Aram, 2015).

To evaluate pretense and false belief understanding in children with Autism Spectrum Disorder (ASD), we designed a pilot study that included a short training program lasting three months. We read and mediated conversations about Bible stories with a small group of five 10-12-year-old higher-functioning boys with ASD. After each reading, the teacher tells the stories and discusses their principal theme using mental-state terms. The children are asked to explain and retell the stories. We compared children's level of understanding of pretense and false belief before and after the training (Li, Kelley, Evans, & Lee, 2011).

The main finding shows that all children performed their level in a first-order false belief task, and four of them their pretense understanding. We found also that the five children had difficulty understanding second-order false belief, in spite of the training program.

We discuss the effectiveness of short training programs in the development of ToM, and the importance of repeated storybook reading with ToM components.

Key words: theory of mind, pretense, ASD, training program, storybooks reading

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MINDFULNESS 1.0 APPLICATION: USING NECKER-CUBE ILLUSION FOR ONLINE MEASUREMENT OF MINDFULNESS

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AIM: There has been a growing interest in mindfulness among researchers. Practising mindfulness has been proven to have a positive effect on our lives. However, the tools that measure mindfulness are mostly questionnaires, and mostly conceptualize mindfulness as a dispositional and not a contextual feature. This is in contrast with the two-component model of Bishop et al. (2004), and the researches exploring the neural correlates of mindfulness. In this work we examine the Mindfulness 1.0 (MF 1.0) application as a valid and reliable measure of mindfulness. In this application the subjects complete three tasks with the Necker Cube (an optical illusion).

METHODS: Convergent validity (hypothetical correlations with the Five Facet Mindfulness Questionnaire (FFMQ), and partly with the Stroop-test), divergent validity (no correlations with test measuring executive functions) and reliability (test-retest reliability after 4 weeks) were examined analyzing 6 raw scores and 4 calculated indices of the application.

RESULTS: (a) Subjects understood the different instructions in three different conditions, moreover these three conditions can be used as indicators of different aspects of mindfulness. (b) The results of the third condition and the indices linked to response frequency weren't reliable. (c) There was evidence supporting the convergent validity of the application, such as the correlations with FFMQ (with the subscales linked to the attentional component of mindfulness) or the Stroop-test. (d) The small amount of significant correlations with executive tests might support the divergent validity of the test.

CONCLUSIONS: The MF 1.0 application can be used to measure the attentional component of mindfulness in its current form. However, because of the lack of reliability, due to the small sample (which was also not diverse enough) and the lack of random order in the conditions of MF 1.0, the application must be improved for being used in further researches.

Key words: mindfulness, FFMQ, behavioral tests

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