Journal of Experimental Child Psychology 249 (2025) 106064

Contents lists available at ScienceDirect

Journal of Experimental Child Psychology

journal homepage: www.elsevier.com/locate/jecp

The development of children's and adults' use of kinematic cues for visual anticipation and verbal prediction of action

Saskia Melzel [a,*], Nicole Altvater-Mackensen [b], Kerstin Ganglmayer [a], Fabian Müller [c], Konstantin Steinmassl [a], Petra Hauf [d,e], Markus Paulus [a]

[a] Department of Psychology, Ludwig Maximilians Universität München, 80802 Munich, Germany
[b] Chair of Psycholinguistics, University of Mannheim, 68161 Mannheim, Germany
[c] Laboratoire de Psychologie Sociale, Université Paris Cité, 92100 Boulogne-Billancourt, France
[d] Interdisciplinary Health Program, St. Francis Xavier University, Antigonish, Nova Scotia B2G 2W5, Canada
[e] Department of Psychology, University of New Brunswick, Saint John, New Brunswick E2K 5E2, Canada

ARTICLE INFO

Article history:
Received 4 April 2024
Revised 12 July 2024

Keywords:
Action anticipation
Action prediction
Simulation theory
Low-level mechanisms
Implicit
Explicit

ABSTRACT

Expectations about how others' actions unfold in the future are crucial for our everyday social interactions. The current study examined the development of the use of kinematic cues for action anticipation and prediction in 3-year-olds, 4-year-olds, 10-year-olds, and adults in two experiments. Participants observed a hand repeatedly reaching for either a close or far object. The motor kinematics of the hand varied depending on whether the hand reached for the close or far object. We assessed whether participants would use kinematic cues to visually anticipate (Experiment 1; *N*=98) and verbally predict (Experiment 2; *N*=80) which object the hand was going to grasp. We found that only adults, but not 3- to 10-year-olds, based their visual anticipations on kinematic cues (Experiment 1). This speaks against claims that action anticipations are based on simulating others' motor processes and instead provides evidence that anticipations are based on perceptual mechanisms. Interestingly, 10-year-olds used kinematic cues to correctly verbally predict the target object, and 4-year-olds learned to do so over the trials (Experiment 2). Thus, kinematic cues are

* Corresponding author.
E-mail address: saskia.melzel@psy.lmu.de (S. Melzel).

https://doi.org/10.1016/j.jecp.2024.106064

INTERNATIONAL REVIEW OF SOCIAL PSYCHOLOGY

Social-Class Inequalities in Distance Learning During the COVID-19 Pandemic: Digital Divide, Cultural Mismatch, and Psychological Barriers

RESEARCH ARTICLE

ubiquity press

FABIAN MÜLLER
SÉBASTIEN GOUDEAU
NICOLE M. STEPHENS
CRISTINA AELENEI
RASYID BO SANITIOSO

*Author affiliations can be found in the back matter of this article

ABSTRACT

The COVID-19 pandemic forced universities to move towards distance learning, requiring increased use of digital tools and more independent learning from students. In this context, the present study examined two previously documented barriers that contribute to social-class disparities in universities: the digital divide and the experience of cultural mismatch. *Cultural mismatch* refers to the disconnect between the highly independent cultural norms of universities and the interdependent cultural norms common among working-class students. Our goals are to (1) replicate the findings related to these barriers in a European context (2) provide pandemic-specific data related to these barriers, and (3) examine how the digital divide and cultural mismatch relate to psychological factors and learning behaviors necessary for academic success. Two thousand two hundred and seventy-five students in France answered questions about their digital access/use, self-construal, psychological factors (i.e., sense of belonging, self-efficacy, intentions to drop-out from the university), and learning behaviors (e.g., attending class, asking questions). Results showed that working-class students have less digital access and value interdependence more than their middle/upper-class peers, suggesting they are more likely to experience a cultural mismatch. Structural equation modeling revealed that both the digital divide and the experience of cultural mismatch undermines working-class students' psychological experience (e.g., belonging), which, in turn, hinders their learning behavior. The distance learning required by the pandemic led to increased needs for digital access and independence, and therefore more negatively affected working-class students, which could fuel and widen the social-class achievement gap.

CORRESPONDING AUTHOR:

Fabian Müller

Laboratoire de Psychologie Sociale, Université Paris Cité, 71 avenue Édouard Vaillant, 92100 Boulogne-Billancourt, France

Fabian.Muller.PhD@icloud.com

KEYWORDS:

higher education; social-class; digital divide; cultural mismatch; COVID-19

TO CITE THIS ARTICLE:

Müller, F., Goudeau, S., Stephens, N. M., Aelenei, C., & Sanitioso, R. B. (2023). Social-Class Inequalities in Distance Learning During the COVID-19 Pandemic: Digital Divide, Cultural Mismatch, and Psychological Barriers. *International Review of Social Psychology,* 36(1): 3, 1–17. DOI: https://doi.org/10.5334/irsp.716

Educational Research Review 29 (2020) 100304

Contents lists available at ScienceDirect

Educational Research Review

journal homepage: www.elsevier.com/locate/edurev

Assessing social, emotional, and intercultural competences of students and school staff: A systematic literature review☆

Fabian Müller[a,1], Albert Denk[b,*,1], Emily Lubaway[b,1], Christine Sälzer[c], Ana Kozina[d], Tina Vršnik Perše[d,e], Maria Rasmusson[f], Ivana Jugović[g], Birgitte Lund Nielsen[h], Mojca Rozman[i], Aleš Ojsteršek[j], Svetlana Jurko[k]

[a] Social Psychology Laboratory: Contexts and Regulation – EA4471, Institute of Psychology, Université de Paris, Paris, France
[b] TUM School of Education, Technical University of Munich, Munich, Germany
[c] Department of Education, University of Stuttgart, Stuttgart, Germany
[d] Center of Evaluation Studies, Educational Research Institute, Ljubljana, Slovenia
[e] Faculty of Education, University of Maribor, Maribor, Slovenia
[f] Department of Education, Mid Sweden University, Sundsvall, Sweden
[g] Centre for Educational Research and Development, Institute for Social Research in Zagreb, Zagreb, Croatia
[h] Faculty of Education and Social Studies, Via University College, Aarhus, Denmark
[i] Department for Educational Quality and Evaluation, German Institute for International Educational Research, Frankfurt, Germany
[j] Education Development Office, Ministry of Education, Science and Sport, Ljubljana, Slovenia
[k] Network of Education Policy Centres, Zagreb, Croatia

ARTICLE INFO

Keywords:
Social and emotional competences
Intercultural competence
Assessment
Systematic literature review

ABSTRACT

The inclusion of social, emotional, and intercultural competences (SEI) in academic contexts has been supported by international organizations, such as the European Union, the United Nations, and the OECD, since the early 2000s. However, little information is yet available regarding the assessment of these competences. This paper shares the findings of a systematic literature review that produced an inventory of existing tools for the assessment of SEI competences of students and school staff. This is the first time assessment tools for these three competences have been concurrently reviewed. An interdisciplinary and international research team conducted this systematic literature review in the databases of ERIC, PsycInfo, PSYNDEX, Scopus, and Web of Science. Out of 13,963 articles, 149 assessment tools were examined and processed. In addition to the instrument analysis and a detailed description of the procedure, this article shows the basic theoretical concepts, as well as the limitations, of such a review. It was found that 1) the majority of the discovered instruments rely on self-reported survey and inventory data, 2) of the three competences, intercultural competence had the fewest relevant instruments, and 3) very few tools have been created to assess all three competences together. From this review, it is apparent that a wider variety of assessment tools (other than self-reports), as well as more comprehensive tools (e.g. qualitative analysis of vignettes) for the assessment of all three SEI competences, should be developed to meet international demand. The results of the literature review are available and freely accessible in the form of an assessment catalogue.

☆ This project is co-funded by the Erasmus + Programme Key Action 3 of the European Union.
* Corresponding author. Technical University of Munich, TUM School of Education, Arcisstraße 21, DE 80333, Munich, Germany.
E-mail address: albert.denk@tum.de (A. Denk).
[1] F. Müller, A. Denk, and E. Lubaway contributed equally to this work.

https://doi.org/10.1016/j.edurev.2019.100304
Received 30 January 2019; Received in revised form 26 September 2019; Accepted 20 November 2019
Available online 26 November 2019
1747-938X/

ZDM
https://doi.org/10.1007/s11858-019-01080-6

ORIGINAL ARTICLE

Comparing eye movements during mathematical word problem solving in Chinese and German

Anselm R. Strohmaier[1] · Anja Schiepe-Tiska[1] · Yu-Ping Chang[2] · Fabian Müller[1] · Fou-Lai Lin[2] · Kristina M. Reiss[1]

Accepted: 31 July 2019

Abstract

Language plays an important role in word problem solving. Accordingly, the language in which a word problem is presented could affect its solution process. In particular, East-Asian, non-alphabetic languages are assumed to provide specific benefits for mathematics compared to Indo-European, alphabetic languages. By analyzing students' eye movements in a cross-linguistic comparative study, we analyzed word problem solving processes in Chinese and German. 72 German and 67 Taiwanese undergraduate students solved PISA word problems in their own language. Results showed differences in eye movements of students, between the two languages. Moreover, independent cluster analyses revealed three clusters of reading patterns based on eye movements in both languages. Corresponding reading patterns emerged in both languages that were similarly and significantly associated with performance and motivational-affective variables. They explained more variance among students in these variables than between the languages alone. Our analyses show that eye movements of students during reading differ between the two languages, but very similar reading patterns exist in both languages. This result supports the assumption that the language alone is not a sufficient explanation for differences in students' mathematical achievement, but that reading patterns are more strongly related to performance.

Keywords Eye tracking · Word problem solving · Reading · Self-concept · Anxiety · Flow

1 Introduction

Word problems are mathematical tasks in which relevant information is presented as text rather than in mathematical notation (Verschaffel et al. 2000). Accordingly, language plays a pivotal role in word problem solving (Boonen et al. 2016; Daroczy et al. 2015). This influence of linguistic factors has been investigated in numerous studies (see Daroczy et al. 2015, for an overview). These studies typically focus on the influence of language in general and mostly base their analyses on English. However, there exists a large variety of languages, and many fewer studies systematically investigate how different languages can influence differences in word problem solving (Daroczy et al. 2015; Galligan 2001).

✉ Anselm R. Strohmaier
anselm.strohmaier@tum.de

[1] TUM School of Education, Technical University of Munich, Arcisstr. 21, Munich 80333, Germany

[2] Department of Mathematics, National Taiwan Normal University, Taipei, Taiwan

The issue of cross-language differences has gained importance with the rise of international large-scale assessments like the *Programme for International Student Assessment* (PISA) within the last 20 years. When students' achievement is to be compared across languages, it needs to be analyzed if one language is more beneficial for mathematical word problem solving than another, be it because of its script, its structure, or the way that mathematics is expressed.

Arguably some of the most fundamental differences exists between East-Asian, non-alphabetic languages like Chinese, Korean, and Japanese, and Indo-European, alphabetic languages (Galligan 2001). However, to our knowledge there is no cross-linguistic comparative study that analyzes the process of word problem solving in alphabetic and non-alphabetic languages (Grisay et al. 2007). This question is particularly interesting since students from these East-Asian countries consistently perform above the OECD average in mathematics achievement in PISA comparisons (OECD 2016b).

The observation of eye movements has proven to be a valuable tool in analyzing the process of word problem solving (De Corte et al. 1990; Hegarty et al. 1992; Strohmaier,

Published online: 08 August 2019

OXFORD

Social Cognitive and Affective Neuroscience, 2017, 157–168

doi: 10.1093/scan/nsw163
Advance Access Publication Date: 26 October 2016
Original article

The rTPJ's overarching cognitive function in networks for attention and theory of mind

Tobias Schuwerk,[1,2] Matthias Schurz,[3] Fabian Müller,[1] Rainer Rupprecht[2] and Monika Sommer[2]

[1]Department of Psychology, Ludwig-Maximilians-University, Leopoldstr. 13, Munich 80802, Germany, [2]Department of Psychiatry and Psychotherapy, University of Regensburg, Universitätsstr. 84, Regensburg 93053, Germany and [3]Centre for Cognitive Neuroscience, University of Salzburg, Hellbrunnerstr. 34, Salzburg 5020, Austria

Correspondence should be addressed to Tobias Schuwerk, Department of Psychology, Ludwig-Maximilians-University, Leopoldstr. 13, 80802 Munich, Germany. E-mail: tobias.schuwerk@psy.lmu.de

Abstract

Cortical networks underpinning attentional control and mentalizing converge at the right temporoparietal junction (rTPJ). It is debated whether the rTPJ is fractionated in neighboring, but separate functional modules underpinning attentional control and mentalizing, or whether one overarching cognitive mechanism explains the rTPJ's role in both domains. Addressing this question, we combined attentional control and mentalizing in a factorial design within one task. We added a social context condition, in which another individual's mental states became apparently task-relevant, to a spatial cueing paradigm. This allowed for assessing cue validity- and context-dependent functional activity and effective connectivity of the rTPJ within corresponding cortical networks. We found two discriminable rTPJ subregions, an anterior and a posterior one. Yet, we did not observe a sharp functional dissociation between these two, as both regions responded to attention cueing and social context manipulation. The results suggest that the rTPJ is part of both the ventral attention and the ToM network and that its function is defined by context-dependent coupling with the respective network. We argue that the rTPJ as a functional unit underpins an overarching cognitive mechanism in attentional control and mentalizing and discuss how the present results help to further specify this mechanism.

Key words: anterior cingulate cortex; attention; dynamic causal modeling; right temporoparietal junction; Theory of Mind

Phylogenetic and ontogenetic development of the human brain forms cortical networks to serve cognitive mechanisms that are essential for survival (Bullmore and Sporns, 2012). One of these is the ventral attention network, necessary for directing the attentional focus towards unexpected salient and behaviorally relevant objects in the environment (Corbetta *et al.*, 2008). Another one is the Theory of Mind (ToM) network, which underpins mentalizing, the ability to attribute mental states to other individuals in order to explain, predict, and manipulate their behavior (Van Overwalle, 2009).

Surprisingly, although these cognitive mechanisms apparently differ substantially, evidence from almost two decades of research in both domains converged on a key role of the right temporoparietal junction (rTPJ) in both networks and associated cognitive processes. It was proposed that the rTPJ, together with the middle and inferior frontal gyrus, the frontal operculum, and the anterior insula, constitute the ventral attention network. Activity of this network disrupts the current attentional focus in situations when an unattended but relevant object is detected. This allows for disengaging from the current

Received: 27 May 2016; **Revised:** 4 October 2016; **Accepted:** 24 October 2017