

Characteristics of main research directions investigated at the institute and the achievements 2010–2014

Institute	Institute of Psychology of the CAS, v. v. i.
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The recent evaluation process marks an excellent opportunity to look into the past as well as to the future and to assess what the Institute of Psychology (IPS) of the Czech Academy of Sciences has achieved and how it should proceed from here on. This document aims to offer such an assessment and to make suggestions regarding the Institute's future strategy and organization.

Outline:

- 1) The IPS's mission and main activities
- 2) Outcomes of the Evaluations of the Research and Professional Activities of the Institutes of the CAS for 2005 – 2009 and their impact on the structure of topics being studied
- 3) Characteristics of main research directions investigated at the Institute and their achievements in 2010 – 2014
- 4) Additional information: quantitative data about international cooperation and published works

1) The IPS's mission and main activities

The Institute was established on 1 April 1967, under the name the Institute of Psychology of the Czechoslovak Academy of Sciences. Under section 18 (2) of Act No. 283/1992 Coll., the Institute became an entity of the Academy of Sciences of the Czech Republic as of 31 December 1992. Under Act No. 341/2005 Coll., the legal status of the Institute of Psychology of the CAS has been transformed from a state contributory organisation into a public research institution (abbreviated as v. v. i.) from 1 January 2007.

The purpose for which the Institute of Psychology has been established is to carry out scientific research in the field of psychology, to contribute to the utilisation of its research results, and to provide a research infrastructure. The principal activity of the institute is scientific research focused on selected key problems in the field of psychology, particularly in personality and social psychology, cognitive psychology and research methodology. The IPS acquires, processes and disseminates scientific information, issues scientific publications (journal with IF *Ceskoslovenska psychologie*, monographs, proceedings, etc.). It also provides scientific assessments, professional opinions and recommendations, consulting and advisory services. In cooperation with universities, the IPS carries out doctoral study programmes and provides training for young scientists. Within the scope of its activity, the institute promotes international cooperation, including the organisation of joint research projects with foreign partners, participation in exchange programmes for scientists and the exchange of scientific information, as well as the preparation of joint publications. The institute organises scientific meetings, conferences and seminars at the national and international levels and provides the infrastructure for research.

The Institute initially comprised four departments. However, on 1 January 2013 the Department of Personality and Social Psychology and the Department of Health Psychology were merged, as their projects were based on closely related topics and their members cooperated extensively.

The Institute has its seat in Brno and a branch office in Prague.

2) Outcomes of the Evaluations of the Research and Professional Activities of the Institutes of the CAS for 2005 – 2009 and their impact on the structure of topics being investigated

The basic profile of the IPS's activities includes research in the field of personality and social psychology, cognitive psychology and research methodology. The results of international evaluation of the Institute's activities for 2005 – 2009 showed that the Institute's members only undertook viable and significant projects. This basic structure of research topics was used also in 2010 – 2014. Major updates of the Institute's activities were instigated in the following two areas:

1) To reinforce experimental research. Today, experimental studies of cognitive processes and communication and their ontogenesis are realized in a fully equipped laboratory that has been opened in the new location of our Prague branch office in Hybernská Street, where it was moved from the facilities provisionally provided by the Economics Institute of the CAS.

2) To modify existing topics and open new topics in the above-mentioned areas, to reflect developments in the field and engagement of the IPS in international projects among others in the following areas: personality – to explore spirituality as a factor of the general structure of personality; social psychology – to investigate intergroup contacts and handling stressful situations using a spaceflight crew model or to include the perspective of tertiary education in the research of bullying; cognitive psychology – to deal with visual attention and spatial imagination; research methodology – to focus on mixed research plans (interconnection of quantitative and qualitative methodology).

The evaluations also pointed out the balanced quality of individual departments. The identified development areas or weaknesses concern the Institute as a whole. They include (1) insufficient ability to sell scientific results at the international level and (2) poorer ability to concentrate a larger number of researchers around key scientific problems. The Institute management has taken the following measures:

1) Approval of the directive on Expected Scientific Performance that stipulates criteria of publishing performance of researchers and experts as per relevant qualification degree. The basic criterion is the article published in international journals with impact factor. The Board of IPS discussed the directive on 30 November 2009. The directive came into force on 1 January 2010. Later it was extended to include the definition of the reward system that acknowledges publishing in foreign countries.

2) Enhancement in the area of project management. From 2012 several work groups have been working within the Institute. Today, these groups do not represent a formalized entity within the IPS organizational structure, instead they gradually crystallize around the projects listed below (most often within our major grant projects). An example of an emerging group of high significance is the Brno Lab of Intergroup Processes or the IPS's Laboratory of Experimental Psychology.

3) Characteristics of main research directions investigated at the institute and their achievements in 2010 – 2014

Personality and social psychology

The members of the Department of Personality and Social Psychology focus on state-of-the-art scientific advancement in the field of personality and social psychology. We research successful human development across life span and the management of difficult situations. The conditions of successful life development were examined in different life periods (early childhood, childhood, adolescence, adulthood and old age). In 2010 – 2014 we dealt with communication of mothers with infants. In children and adolescents, we strive to determine behaviours that can endanger future successful development (e.g., antisocial behavior, bullying at school, etc.). Our research reflects contemporary social relevant topics such as intergroup relations and attitudes towards members of different countries and social minorities. In 2010 – 2014 we published outcomes of research that have long dominated the department, pertaining to personality structure and the five factor model.

In the investigation of predictors of adaptive functioning in middle adulthood, we focused particularly on temperament and personality characteristics in childhood and adolescence. We found that the child's temperament and personality in adolescence predicted not only adaptive psychological functioning (well-being, life satisfaction, self-esteem, self-efficacy and resilience), but also adaptive social functioning (career stability). We also focused on successful ageing in the elderly. We examined the relationship between generativity and well-being among elderly people in highly diverse cultural contexts. We also studied factors of positive development in adolescence and young adulthood on a specific population of childhood cancer survivors.

The research on risk and protective factors of development in adolescence was carried out in collaboration with the Child Study Center of Yale University). We found out in a representative sample of Czech adolescents, that among non-delinquent adolescents the quality of parenting is a more important factor for development of adolescent antisocial behavior than demographic and socio-economic characteristics of the family. In the 2012 – 2014 period, we proceeded with our previous research on school bullying and we demonstrated links between facets of moral evaluation and being a bully, a victim, a defender or uninvolved, thereby underscoring the relevance of morality for understanding bullying.

In the assessed period, one of the central research topics in the department was also resources of resilience and regulation of emotions during long-term isolation within the international project, Mars-500. The project brought interesting findings published in international journals.

Within the research projects dealing with intergroup attitudes and contact in Central Europe we have determined several important results that have enriched the state-of-the-art theories and shown that national stereotypes, rated either from ingroup or outgroup perspective, are not based on reality. We enriched the current intergroup contact theory, showing that it is important to consider not only the magnitude of effect of positive and negative intergroup contact on prejudice but also the relative frequencies of positive and negative contact in real life settings. In 2014, the Brno Lab of Intergroup Processes was established.

For a long time, the main research topic at the Department of Personality and Social Psychology was personality structure and the five-factor model of personality traits. This topic is well represented in publications from the period 2010 - 2014.

Cognitive psychology

The members of the Department of Cognitive Psychology focused their research on selected topics of visual perception, visual attention, psycholinguistics and on categorization of historical experimental instruments.

Experimental psychophysical research on visual perception was directed towards visual space perception and visual perception during and after long-term sensory deprivation. The research on visual space perception concerned mainly methodological topics. We found an inherent relationship between perceived size and perceived direction, seemingly independent descriptors of visual space. As a part of an isolation experiment Mars-500, we investigated the changes in perception and memory during the long-term spatial confinement. Despite the participants' very specific life experience, only a small effect of the confinement on perceptual performance was observed. The specifics of visual perception on formerly blind patients who underwent a successful sight-restoring operation were examined. We found that the patients' post-treatment development was negatively affected by underlying problems with holistic processing of visual stimuli and by the decreased robustness of their perceptual representation.

As a part of the visual attention research, we studied the allocation of attention and eye movements during multiple object tracking task. We observed surprisingly low intra-individual variability of eye movements patterns. Within the international project Mars-500, the effect of prolonged isolation on the participants' scene memory was tested. Our findings suggest that perception of distant scenes was more prone to memory illusions (boundary extension).

The core topic of the psycholinguistic research stream was the acquisition of grammatical knowledge and its relations with other aspects of linguistic and social development. One topic was the relation between sentence imitation and linguistic, especially grammatical knowledge. The sentence imitation task is a known marker of impaired language development in English and other languages. The research on this topic examined the role of linguistic knowledge and short-term memory in adult sentence imitation, aiming to clarify how working memory depends on long-term linguistic representations. Another research topic was the relation between the acquisition of pronouns, or person reference in general, and the development of social understanding. We have shown that the emergence of personal pronouns in children is related both to grammatical development and to the development of social understanding and theory of mind.

Finally, we focused on research in the field of historical experimental instruments used at the beginning of scientific psychology. We categorized basic instruments regarding their original purpose and functioning and investigated their technological design. Our results were published in the monograph *Psychological Machinery: Experimental Devices in Early Psychological Laboratories* (Peter Lang Publishing). We took a deeper look in a specific area of instruments that are tachistoscopes. We performed an experimental study in which we compared four tachistoscopes with different technical designs from different eras of technical development.

Research methodology

In 2011, two books were published by the members of the department that both relate to the construction and evaluation of psychological tests. The first is "Psychometrics" and the second is "Testing in Psychology: Item Response Theory and Computerized Adaptive Testing" The first book settles the general framework of the field which has been missing in the Czech psychological literature for decades and the second deals with more sophisticated models. Some

of them were implemented into the CATo software framework – a versatile instrument for computerized adaptive testing suitable for practitioners as well as for research purposes in the field of the most up-to-date psychometric trends.

Project through Czech Scientific Foundation “Analysis of the stories evoked by the Thematic Apperception Test: quantitative and qualitative approaches” was focused on the series of the approaches to the scoring of the text data – both qualitative and quantitative. In an international collaboration we published a book “Thematic Apperception Test: Interpretative Perspectives”. All the chapters could be used as an instruction for scoring TAT stories by different scoring system. Another paper based on the applications of qualitative methods was published by Kateřina Zábrowská – “Bullying as intra-active process in neoliberal universities” that uses the discourse analysis methods.

Another papers concerning the workplace bullying but with the use of the mixed, both qualitative and quantitative methods, were published – e.g. “Workplace bullying as sensemaking: An analysis of target and actor perspectives on initial hostile interactions” by Kateřina Zábrowská et al. and “Prevalence and forms of workplace bullying among university employees” by Kateřina Zábrowská and Petr Květon.

There is a series of chapters and papers using narrative psychology concepts and methods, and psychosemantic approaches. From a number of publications we could highlight the book “Conceptions of Meaning” (edited by Shulamith Kreitler and by Tomáš Urbánek) published in the Nova Science Publishers in New York. It is worth mentioning that some psychosemantic methods were implemented as a text-based indices used in the research in neuroscience and published in a journal with high IF.

4) Additional information (quantitative data about international cooperation and works published)

Most importantly, the number of foreign publications significantly increased in the evaluated period. As far as the most important category of results is concerned, i.e. papers published in international IF journals, members of the IPS published 26 studies in international journals between 2005 and 2009 as compared with 69 studies in 2010 – 2014. The number of studies whose lead authors (or second or third authors) were IPS members (2005 – 2009: 12, 2010 – 2014: 47) also increased. The papers were published largely in journals with an impact factor above the median of our field (med = 1.269 for all 10 categories of psychology on the Web of Knowledge). These results were achieved with an almost constant number of researchers, as the IPS’s budget (and the budget of the CAS as a whole) stopped growing in 2010 due to the world economic and financial crisis. This made it impossible to hire new employees; several part-time researchers even had to leave. The Institute’s achievements were supported by its long-term ability to obtain special-purpose funds/grants from national grant agencies (62 % of applications were successful, which makes one third of the IPS budget).

The Institute intensified international cooperation, both at the personal (international contacts of individual employees) and inter-institutional level (via agreements with institutes such as University of Helsinki, Finland; Institute for Biomedical Problems, Russia; Institute of Psychology of the Polish Academy of Sciences, Poland; University of Kentucky, USA; University of Newcastle, Australia). Our members sit on steering and professional committees of international scientific associations (European Federation of Psychologists’ Associations, International Union of Psychological Science, European Science Foundation, European Association of Personality Psychology), work as reviewers for professional journals, prepare

expert opinions on foreign scientific projects and are asked to organize invited symposia or take part in them. Thanks to all the above the IPS has become a sought-after international partner. This is demonstrated by the fact that it has been entrusted with the organization of major international events (15th European Conference on Personality, 2010; 12th Biennial Conference of European Personal Construct Association, 2014).

Research Report of the team in the period 2010–2014

Institute	Institute of Psychology of the CAS, v. v. i.
Scientific team	Department of personality and social psychology

The members of the Department of Personality and Social Psychology focus on state-of-the-art scientific advancements in the field of personality and social psychology. In 2013, the Department of Health Psychology was merged with the Department of Personality and Social Psychology, leading to an extension of research topics at the department. We research successful human development across life span and the management of difficult situations. In children and adolescents, we strive to determine behaviours that can endanger future successful development (e.g., antisocial behaviour, bullying at school, etc.). Our research reflects contemporary, social relevant topics such as intergroup relations and attitudes towards members of different countries and social minorities. In 2010 – 2014 we published outcomes of research that have long dominated the department, pertaining to personality structure and the five factor model.

In 2010 - 2014 we mainly examined:

- conditions of successful development in childhood, adolescence, adulthood and old age
- resilience resources and regulation of emotions during long term isolation
- antisocial behaviour and bullying
- intergroup relations and citizenship
- personality structure, spirituality and the five-factor model

We examined conditions of successful development based on data from two longitudinal projects: Brno Longitudinal Study of Life-Span Human Development (BLS, launched in 1961) and Brno Quality of Life Longitudinal Study of Pediatric Oncology Patients (QOLOP, launched in 2006). We collaborated on international projects related to the European Union's 6th Framework Programme, international project Mars-500 lead by the Russian Federal Space Agency (RFSA) and coordinated by the Institute for Biomedical Problems RFSA, the National section of the International SAHA project coordinated by the Child Study Center of Yale University, *Personality Profiles of Ages across Cultures project*, coordinated by the University of Ghent and NIA, Baltimore. Our research was funded by 13 grant projects awarded by the Czech Science Foundation.

Conditions and risk factors of successful development

The conditions of successful life development were examined in different life periods (early childhood, childhood, adolescence, adulthood and old age). In 2010 – 2014 we dealt with communication of mothers with infants within a grant project supported by the Czech Science Foundation "*Communication: Physiological correlates of sharing emotions with others during the first year of life*." Traditional studies of the action understanding set infants up as observers of actions directed elsewhere. In contrast, in *PLoS ONE* (ASEP 0397016) article we published the first study examining anticipatory postural adjustments made by infants to an action directed to *them* – picking them up. We studied social pretence with mothers and peers at 15

months (*European Journal of Developmental Psychology*, ASEP 0384443) as well as the use of personal pronouns in children (*Social Development*, ASEP 0425141). This study was conducted with Filip Smolik, a member of the Department of Research Methodology. A member of the Department of Personality and Social Psychology published the first neural model of jealousy in "*Handbook of jealousy: Theories, principles and multidisciplinary approaches*", Wiley-Blackwell (ASEP 0350589).

In the investigation of predictors of adaptive functioning in middle adulthood, we focused particularly on temperament and personality characteristics in childhood and adolescence (grant project "*Studying optimal development longitudinally: Potential of Prague and Brno studies on life-span development*", 2010 – 2014). We found that the child's temperament and personality in adolescence predicted not only adaptive psychological functioning (well-being, life satisfaction, self-esteem, self-efficacy, resilience), but also adaptive social functioning (career stability). The main results of the project were presented within the invited symposium at the 13th European Congress of Psychology "Well-Being in a Life-Span Perspective" (Stockholm, Sweden, 2013). The results of the research will be published in *PLoS ONE* (accepted for publication). We also focused on successful ageing in the elderly. A study published in *Psychology and Aging* (ASEP 0434692) examined the relationship between generativity and well-being among elderly people in highly diverse cultural contexts.

We also studied factors of positive development in adolescence and young adulthood on a specific population of childhood cancer survivors (grant projects "*Quality of life in children surviving cancer: A developmental approach*," 2007 – 2010; "*Psychosocial needs and quality of life of healthy siblings of pediatric cancer patients*," 2009 – 2012; "*Quality of life in children surviving cancer: longitudinal study*," 2011 - 2015). In *SageOpen* (ASEP 0425481) we published a central finding that the overall quality of life of former cancer patients was not significantly reduced in comparison with control populations, although childhood cancer survivors were special populations at risk (brain tumor survivors and recipients of autologous bone marrow transplantation). The only significant predictors of emotional well-being – as in the general population of adolescents – were demographic variables (boys stated a higher level of emotional well-being) and parenting variables. Moreover, the impact of childhood cancer on adolescents and young adults' daily life was related to their current age. The lower the age, the less was the impact of the illness on their current daily life.

The research on risk and protective factors of development in adolescence (carried out in the framework of the Social and Health Assessment project coordinated by the Child Study Center of Yale University) resulted in the publication in the *Journal of Early Adolescence* (ASEP 0397329). The research on a representative national sample comprising 5,000 adolescents, brought a finding that in the general population of non-delinquent adolescents the quality of parenting is a more important factor for development of adolescent antisocial behaviour than the demographic and socio-economic characteristics of the family.

In conclusion, predictors of later successful development were: active child temperament, outgoing personality characteristics, quality of parenting (warmth, involvement and consistency of parenting) and socio-economic status of the family.

In the 2012 – 2014 period, we proceeded with our previous research on school bullying – a specific form of aggressive behaviour that is characterized by repetitiveness, imbalance of power and intentionality. The research was supported by the grant project "*School bullying as a process - a social-cognitive analysis of classroom bullying*", 2012 - 2014 by the Czech Science Foundation. The findings published in the *Journal of Moral Education* (ASEP

0427599) revealed that adolescents condemn bullying but appreciate defending, not only in terms of good or bad behaviour as suggested by past research, but also through rich varieties of explicit moral meanings. The article demonstrated links between facets of moral evaluation and being a bully, a victim, a defender or uninvolved, thereby underscoring the relevance of morality for understanding bullying. This publication was the most read article of 2014 in the *Journal of Moral Education*.

In the assessed period, one of the central research topics in the department was also resources of resilience and regulation of emotions during long-term isolation. Members of the department were involved in the international project, Mars-500. Their research was supported by the grant "*Dynamics of resilience and its resources in crew members during extended spaceflight simulation*", 2011 – 2013 from the Czech Science Foundation. Researchers primarily addressed the role of resilience resources and their dynamics on the level of expression and regulation of emotions in the crew of a simulated flight to Mars. The project brought interesting findings published in international journals: (1) Experience of extended space flight simulation could lead to positive gains (*Aviakosmicheskaja i ekologicheskaja meditsina*, ASEP 0393942); (2) solidarity experiences led to gradually increasing levels of emotional energy, and (3) work self-efficacy gradually increased in the course of simulation (*Aviation Space and Environmental Medicine**, ASEP 0397980); (4) crew members experienced predominantly positive emotions and moods, so it is more important to monitor the dynamics of positive emotions; (5) regulation of emotions differed from regulation of emotions usual in everyday life (*Acta Astronautica*, ASEP 0428349). The results were summarized in a monograph "Mars-500" published in Academia (the publishing house of Academy of Sciences of the Czech Republic, ASEP 0434661). The study marked by * was conducted with Jiří Lukavský, a member of the Department of Cognitive Psychology who designed statistical methodology and analyzed data.

Intergroup attitudes and citizenship

Within the research projects dealing with intergroup attitudes and contact in Central Europe ("*Intergroup attitudes and contact in five Central European countries*", 2010 – 2013; "*Determinants of intergroup relations: An integrated model of intergroup attitudes, contact, personality-, and socially-anchored factors*", 2013 – 2016 awarded by the Czech Science Foundation) we have determined several important results that have enriched the state-of-the art theories. The comparison of national stereotypes of five central European countries with personality characteristics of real people showed that national stereotypes rated either from ingroup or outgroup perspectives are not based on reality (*European Journal of Personality*, ASEP 0425106). Results of the project were presented within invited symposia at the 15th European Conference on Personality 2010 Brno and the 17th European Conference on Personality 2014 Lausanne. We also joined an international project Adolescent Personality Profiles across Cultures, which is compatible with the topic of our previous project on stereotype accuracy. This international team found that age and gender stereotypes were accurate across cultures (*Journal of Personality and Social Psychology*, ASEP 0387787; *Journal of Cross-Cultural Psychology*, ASEP 0428772) whereas national stereotypes did not correspond with self-report or observer rating (*Journal of Research in Personality*, ASEP 0397727).

The study published in the *European Journal of Social Psychology* (ASEP 0434970) resolved a contradiction in the current intergroup contact theory, showing that it is important to consider not only the magnitude of effect of positive and negative intergroup contact on prejudice but also the relative frequencies of positive and negative contact in real life settings.

A research on the role of linguistic categories for labelling group membership was published in the *Journal of Language and Social Psychology* (ASEP 0382393) and received the biannual Best Paper Award by the International Association for Language and Social Psychology. The article published in the journal *Memory* (ASEP 0366213) illustrated the impact of social categorization on memory performance in younger and older adults. In 2014, the Brno Lab of Intergroup Processes was established. The Lab was founded by two members of the department and their MA and PhD students, focusing on intergroup processes, particularly on factors influencing majority-minority relations such as intergroup contact, intergroup attitudes and acculturation.

Intergroup attitudes were also approached from the perspective of political psychology. A member of the Department of Personality and Social Psychology served as a principal investigator of the Czech team for the European project *Europshere: Diversity and the European Public Sphere* (European Union's 6th Framework Programme, 2007 - 2012).

Personality Structure and Five-Factor Model

For a long time, the main research topic at the Department of Personality and Social Psychology was personality structure and the five-factor model of personality traits. This topic is well represented in publications from the period 2010 – 2014. In 2010, results of an original Czech psycholexical project were first published in an international context. Data from 13 trait taxonomies replicated only three factors of personality description across languages (*Journal of Personality and Social Psychology*, ASEP 0349172). Another study within the five-factor model found a cross-culturally replicable pattern of difference between internal and external perspectives for the Big Five personality traits. People see themselves as more neurotic and open to experience compared to how they are seen by other people (*Journal of Personality and Social Psychology*, ASEP 0349768). An innovative approach to the analysis of variability of personality traits in men and women was applied in four countries. Results showed higher variability of personality traits in men (*Journal of Personality*, ASEP 0387778). Following past spirituality research, we demonstrated that spirituality can be understood as a general independent factor of personality (*Journal for the Psychology of Religion*, ASEP 0341215, and a chapter in *Psychology of Religion*, ASEP 0383829, Springer).

Summary

Members of the department participated in several international projects including the European Union's 6th Framework Programme. Their research projects, that focused on selected principal and current topics of personality and social psychology, succeeded in obtaining financial support offered by the Czech Science Foundation. We research the development and successful functioning of personality as well as factors that can endanger its successful functioning across the lifespan. We do not study only individuals, but also social groups and associated phenomena. We interconnect the two partial psychological disciplines by incorporating social factors into our research on the successful functioning of personality. Our research is largely based on the longitudinal study design that helps us find causal connections between the investigated phenomena. However, in our social psychological research of language abstractness we also used experimental study design. We successfully present the results of our studies abroad. Between 2005 and 2009 the department members published 35 papers in English (journal studies, monographs and chapters in monographs). In 2010 – 2014 the number of works written in English increased to fifty. Whereas between 2005 and 2009 the department members published, as lead authors or authors in second or

third position, 11 papers in journals with IF (six of them were published in Slovak journal *Studia Psychologica*), in 2010 – 2014 this number doubled to 22 (4 in *Studia Psychologica*). A similar number of papers were published in foreign IF journals, where the department members were part of a wider international team (nine in 2005 – 2009, ten in 2010 – 2014). It follows that the department members have compared very favourably with the international competition and successfully published the results of their research projects in foreign journals. They cooperate with universities in Prague and Brno and other universities in the Czech Republic where they teach students and work as advisers of bachelor, master and doctoral theses. They sit on the editorial boards of international journals and lecture at invited symposiums during international conferences. From this it is clear that they are becoming internationally respected professionals. The members of our department also engage with the scientific community by working in committees of many European psychological associations and organizations. Department members popularize the results of their work in the media, give lectures and write texts for the public.

Two department members were honoured by the Academy of Sciences of the Czech Republic. In 2011 Gabriela Marková was awarded The Otto Wichterle Award (an honour given by the Czech Academy of Sciences to stimulate and encourage selected, exceptionally outstanding, promising young scientists at the Czech Academy of Sciences for their remarkable contributions to the advancement of scientific knowledge in a given area of science). The same year, Pavel Říčan was awarded The Karel Engliš Medal in the field of social and economic sciences for his life work.

Research Report of the team in the period 2010–2014

Institute	Institute of Psychology of the CAS, v. v. i.
Scientific team	Department of Cognitive Psychology

The members of the Department of Cognitive Psychology focused their research on the following selected topics:

- visual perception
- visual attention
- psycholinguistics
- historical experimental instruments

In the period of 2010 – 2014, there were altogether more than 30 papers and chapters published and 8 projects were supported by the Czech Science Foundation grants. In addition to the research activity, the members of the department also organize the annual Winter School of Cognitive Psychology and the Summer School of Linguistics and, in 2011, the interdisciplinary conference Cognition. In 2012, the Laboratory of Behavioral and Linguistic Studies (Labels) was established to provide the technology, expertise, space and subject pool necessary to execute experimental studies in cognitive and behavioral sciences.

Visual perception

Experimental psychophysical research was directed towards visual space perception, visual perception after long-term sensory deprivation and the effect of confinement on visual perception.

As a part of visual space perception research, several, primarily methodological, topics were elaborated. One topic was the notion of the “multi-dimensionality” of visual space, i.e., how particular descriptors (size, orientation) are combined to form a single representation of visual space. In the psychophysical experiment, we found an inherent relationship between seemingly independent descriptors which was interpreted as a consequence of unequal precision in retinal scaling. This finding is at odds with the results of the vast majority of depth perception experiments. In another line of research, we compared perceptual performance in different tasks with different metrics of the requested response (judgments of ordinal, ratio and absolute depth) and investigated whether, with an increased level of description of depth, performance is decreases accordingly. The project was supported by Czech Science Foundation grant (2007 – 2009, 406/07/1676) and the results were published in *Perception* (Šikl & Šimeček, 2011, ASEP 0366234) and *Attention, Perception & Psychophysics* (Šikl & Šimeček, accepted).

Three members of the department (RŠ, MŠ, JL) participated on the Mars-500 isolation study that simulated a flight to Mars and investigated changes in perception and memory during the long-term spatial confinement. Radovan Šikl and Michal Šimeček studied, in a series of experiments, changes in crewmembers’ 3-D perception and in the flexibility of perceptual representations. In general, only a small effect from the confinement was observed. The project was supported by Czech Science Foundation grant (2009 – 2012, 406/09/2003) and the results

were published in *Attention, Perception & Psychophysics* (Šikl & Šimeček, 2014, ASEP 0427685).

The specifics of visual perception on patients who, after a long period of blindness, underwent a successful sight-restoring operation were examined. For those patients, the perceptual domains that were found to be particularly afflicted are object and face recognition, visual space perception and the lower levels of visual processing (i.e., perceptual organization). In a series of experiments, we tested the hypothesis that patients' perceptual performance is negatively affected by underlying problems with holistic processing of visual stimuli and by the decreased flexibility and robustness of perceptual representation. The project was supported by Czech Science Foundation grant (2012 – 2013, P407/12/2528) and the results were published in *i-Perception* (Šikl et al., 2013, ASEP 0397984) and *Vision Research* (Kremláček et al., 2013, ASEP 0391871).

Visual attention

We studied the allocation of attention and eye movements during a dynamic task, when people are asked to track several moving dots simultaneously for approx. 10 seconds. This task is particularly interesting because people usually fail to recognise trial repetitions, which allowed us to study the intra-individual and inter-individual variability of eye movements. In vision science, researchers often design models of eye movements for some tasks. It is usually overlooked that eye movements of the same person in identical visual tasks can differ and the data on eye movements' variability within the same task are rare, because in different tasks people spot the repetition and act accordingly (visual search, memorising photograph, etc.). The project was supported by Czech Science Foundation grant (2010 – 2012, P407/10/P607) and the results were published in *Journal of Vision* (Lukavský, 2013, ASEP 0396628). We are working on two related papers: Děchtěrenko et al. (in prep.) studied how eye movements are affected when the stimuli undergo a geometrical transformation (mirroring); Lukavský and Děchtěrenko (in prep.) found that eye movements are delayed relative to the focus of attention by approx. 100 ms.

As a part of the Mars-500 isolation project, Jiří Lukavský studied the perception of proximal/distant scenes and found that after living in confinement, the participants' perception of distant scenes was affected and it was more prone to memory illusions (boundary extension). The results were published in *Visual Cognition* (Lukavský, 2014, ASEP 0433881).

In memory studies, presenting more exemplars of the same category leads to performance decrease (exemplar effect). Lukavský and Děchtěrenko investigated the interplay between visual similarity and memory categorisation. They tested whether showing scenes that are visually similar but belong to different categories will decrease the memory performance, but found no difference. These results show that the assigned category is a stronger cue than the overall resemblance of the photographs.

Psycholinguistics

The core topic of the psycholinguistic research stream was the acquisition of grammatical knowledge and its relations with other aspects of linguistic and social development. Three or four topics were elaborated and the research in these topics continues and will continue further. One topic is the relation between the acquisition of grammatical phenomena and the semantic properties of words, especially their imageability. One report on this was published in the *Journal of Psycholinguistic Research* (ASEP 0433866), two additional papers are under review

in international journals (one with minor revisions requested). Another topic is the relation between sentence imitation and linguistic, especially grammatical knowledge. The sentence imitation task is a known marker of impaired language development in English and other languages and we showed, in a report published in the *Journal of Speech, Language and Hearing Research* (ASEP 0433849), that this is true for Czech as well. Subsequent research on this topic examines the role of linguistic knowledge and short-term memory in adult sentence imitation, aiming to clarify how working memory depends on long-term linguistic representations. A further research topic is the relation between the acquisition of pronouns, or person reference in general and the development of social understanding. We have shown that the emergence of personal pronouns in children is related both to grammatical development and to the development of social understanding and theory of mind (published in *Social Development*, ASEP 0425141). The work to replicate these findings using language transcripts and experimental data is ongoing. Finally, a separate stream of work examined the knowledge of grammatical categories such as number and gender in young children; this resulted in publications in the proceedings of the annual Boston University Conference on Language Development (ASEP 0441171). Besides the basic research topics, the psycholinguistic work resulted in the preparation of two psychometric tools for assessing child language, one published by the local medical publishing house Grada, the other (Czech adaptation of Communicative Development Inventories) ready for publication.

Historical experimental instruments

In the years 2010-14 we focused on research in the field of historical experimental instruments used at the beginning of scientific psychology. We categorized basic instruments regarding their original purpose and functioning and investigated their technological design. Our results were published in the monograph "Psychological Machinery: Experimental Devices in Early Psychological Laboratories" (Peter Lang Publishing, ASEP 0425975). We took a deeper look into a specific area of instruments called tachistoscopes. We performed an experimental study in which we compared four tachistoscopes with different technical designs from different eras of technical development. This study entitled "Experimental Evaluation of Tachistoscopic Measurement: A Step Beyond Wundt's Criticism" is published in the *American Journal of Psychology* (ASEP 0438243).

Research Report of the team in the period 2010–2014

Institute	Institute of Psychology of the CAS, v. v. i.
Scientific team	Department of research methodology

Researchers from the Department of Methodology of Psychological Research published in the period 2010-2014 almost one hundred papers or chapters, participated in three monographs in Czech and two monographs in English. They dealt with several long-term broader topics:

1. Development of quantitative methods.
2. Development of qualitative methods.
3. Cooperation of qualitative and quantitative methods.
4. Narrative psychology methods and psychosemantics.

Most of the published books and papers can be subsumed under one of the above mentioned topics, in some cases the topics overlap. For the sake of clarity, we will briefly present some of the results connected with the four methodological topics.

1. Concerning the quantitative methodology topic, in 2011, two books were published by the members of the department that both relate to the construction and evaluation of psychological tests. The first is “Psychometrics” (ASEP 0366231) by Tomáš Urbánek (and two external co-writers: Denisa Denglerová and Jan Širůček from Masaryk University) and the second is “Testing in Psychology: Item Response Theory and Computerized Adaptive Testing” (ASEP 0366885) by Martin Jelinek, Petr Květon and Dalibor Vobořil. The first book clarifies the general framework of the field which has been missing in Czech psychological literature for decades and the second deals with more sophisticated models. Some of these research activities were supported through the project of the Czech Science Foundation “The issues of polytomous IRT models in the field of psychology of personality and its implementation in the CATo software framework” (2009 – 2011). Various polytomous IRT models were evaluated with respect to their usability in personality testing. The Graded Response Model was implemented into the CATo software framework, which is able to operate both with dichotomously and polytomously scored items. With the addition of polytomous models, CATo became a versatile instrument for computerized adaptive testing suitable for practitioners as well as for research purposes in the field of the most up-to-date psychometric trends.

2. Development of qualitative methods was supported through the project of the Scientific Foundation of the Academy of Sciences of the Czech Republic: “Dialogical behavior in the individual, group, and cultural context” (2009 – 2011) with a series of published papers – e.g. “Shapes and forms of active imagination: proposal of conceptual framework” by Vladimír Chrz (ASEP 0362867). The focus of the long term investigation were people in an experimental situation of an open, dramatic play on the subject of “public solitude”. The key moments of the dramatic play, characteristic styles of dialogical behavior and development of psychosomatic conditions pertaining to the dramatic play were studied. At the same time (2009 – 2011) we were working on another project through the Czech Scientific Foundation: “Analysis of the stories evoked by the Thematic Apperception Test: quantitative and qualitative approaches”, which was focused on the series of approaches to the scoring of the text data – some of them

were purely qualitative and some of them combined or mixed – both qualitative and quantitative. We published a book in Czech, but in an international collaboration “Thematic Apperception Test: Interpretative Perspectives” with some chapters that are exclusively qualitatively oriented – e.g. “Styles of narrative imagination in Lucie’s stories” by Vladimír Chrz (ASEP 0396527). All the chapters could be used as an instruction for scoring TAT stories by different scoring system, but all are based on the same data. Another paper based on the applications of qualitative methods was published by Kateřina Zábrodská: “Bullying as intra-active process in neoliberal universities” (ASEP 0366226) that uses the discourse analysis methods.

3. The above-mentioned book about Thematic Apperception Test also contains several chapters that could be considered as an illustration of the cooperation of qualitative and quantitative methods. For instance, the chapter: “Stories evoked by the Thematic Apperception Test from the perspective of the meaning theory by Kreitler and Kreitler” (ASEP 0396575) by Zuzana Pokorná, Tomáš Urbánek and Shulamith Kreitler (from Tel Aviv University). Combining the qualitative and quantitative methods was supported by two projects “Bullying and mobbing in tertiary education: Qualitative methodology as a research and intervention tool” (2010 – 2012) and “Work environment quality and employee well-being in public higher education” awarded by the Czech Science Foundation. Papers concerning the workplace bullying were published – e.g. “Workplace bullying as sensemaking: An analysis of target and actor perspectives on initial hostile interactions” (ASEP 0427178) by Kateřina Zábrodská et al. and “Prevalence and forms of workplace bullying among university employees” (ASEP 0383668) by Kateřina Zábrodská and Petr Květon.

4. There is a series of chapters and papers using narrative psychology concepts and methods, and psychosemantic approaches. We ran projects by the Czech Science Foundation – “Psychological diagnostics from the point of view of the personal construct theory” (2009 – 2011) and “Complexity as an expression of the psychological life of an individual” (2012 – 2014). From a number of publications we could highlight the book: “Conceptions of Meaning” (ASEP 0433603) (edited by Shulamith Kreitler from Tel Aviv University and by Tomáš Urbánek) published by Nova Science Publishers in New York. It includes chapters by Vladimír Chrz and Ivo Čermák about the narrative approach; “Narrative meaning: Dilemmas of Interpretation” (ASEP 0433418), the chapter by Miroslav Filip; “Psychological meaning from the point of view of the psychology of personal constructs” (ASEP 0433847) and “Analysis of textual data in psychology” (ASEP 0433097) by Tomáš Urbánek and Kristína Czekóová. A constructivist approach is represented by the papers authored by Miroslav Filip (et al.) “Relationships between Bannister’s intensity and consistency in verbal and non-verbal grids” (ASEP 0386823) and “Construction processes in schizophrenic patients” (ASEP 0362885). It is worth mentioning that some psychosemantic methods were implemented as text-based indices used in neuroscientific research, in which participated, Kristína Czekóová and Tomáš Urbánek – e.g. “Superior temporal sulcus and social cognition in dangerous drivers” (ASEP 0398690) published in a journal with high IF.