

Sensory issues and Disability



**Touch to learn,
touch to communicate**

17th-18th March 2016

19th March: Free day, open to all

Cité des Sciences et de l'Industrie Paris 19^e



Foreword

This conference is one in a series of science events that INS HEA has organized on the timeless theme of the five senses. Initially grounded in technical discussions related to finding teaching solutions for children with sensory disabilities, this exploration has grown into a keenly anticipated international rendezvous and a crossroads for multiple and varied scientific disciplines.

Rounding out this cycle, the sense of touch is probably the most archaic, the most complex, the most social and therefore the most human of our senses, and perhaps the one involving the greatest risk. The entire body is the organ of touch, the hand is its vanguard, the brain its laboratory.

“Sight gives the name, but the hand knows,” said Gaston Bachelard. That is exactly what we will hear in the wealth of offerings over the three days of this conference. “Touch to learn, touch to communicate” is jointly organized by INS HEA and Universcience, at the Cité des Sciences et de l’Industrie in Paris.

Studies based on phenomenology, anthropology or neurosciences will be complemented by critical reviews of the technical and pedagogical tools that are available today to extend and supplement the human body in a great many domains – education, arts, health, civic affairs, etc.

These three days will without a doubt “touch” a wide audience of researchers and practitioners.

José Puig, Director, INS HEA



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Co-Organizers

INS HEA

An institute for higher education and research Disability and special educational needs

INS HEA is the national higher institute for training and research on special needs education. It is the first institution in France dedicated entirely to people with disabilities and special educational needs. As a public institution of higher education, it is active in the areas of professional, social, and inclusive education, and its three main missions are: research, training, and resources. Regularly sharing its expertise, it advises various ministries and represents France at the European Agency for Special Needs and Inclusive Education.

Since October 2012, INS HEA has had a research team accredited by the Ministry of higher education and research: the research group on disability, accessibility and educational practices (EA 7287 Grhapes). This research team welcomes PhD students of sociology, psychology and education sciences whose research topics are based on the principles of accessibility and special educational needs (SEN).

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Universcience

Universcience was created in 2010 when the Cité des sciences et de l'industrie joined forces with the Palais de la découverte. It had one simple yet challenging goal: to inspire as many people as possible to be curious about the world around them, encouraging them both to marvel at the world of science and to engage in scientific reasoning.

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Programme

Thursday, 17th March 2016

8:15 Welcome - Coffee or Tea

9:00 Auditorium: Greetings and opening of the conference

- José Puig, head of INS HEA, Suresnes
- Dominique Botbol, vice head of exhibitions at Cité des Science and Palais de la Découverte museums, Universcience
- Nathalie Lewi-Dumont, INS HEA-Grhapes, head of the conference's scientific committee

9:50 Auditorium: lecture No1

- Vincent Hayward (UPMC Sorbonne University / Isir CNRS) : The physical basis of touch and its effects on perception

10:40 Break

11:00 Auditorium: Plenary session No1

“Understanding touch and sensory substitution“

Moderator: Vincent Hayward, Université Pierre et Marie Curie / Isir CNRS

- Gabriel Arnold and Malika Auvray (UPMC Sorbonne University / Isir CNRS): Improving the design of sensory substitution devices and their use by visually impaired people
- Aurélie Vallée and Katia Rovira (PSY.NCA EA 4700, Rouen Normandy University): Interaction and collaboration within a visuo-tactile sensory substitution system
- Christophe Jouffrais (CNRS / Toulouse University, Irit CNRS): Interactive graphs accessible to visually deficient persons

12:00 Questions from the floor and announcement of today's posters

12:30 to 3:30 Free time for lunch and visits (poster sessions and stalls)

1:30 Carrefour numérique: poster session No1

3:30 Round tables, in parallel:

Round table No1 – Auditorium

“Touch for students with disabilities, and for others (touch and inclusive practices)”

Moderator: Mélissa Arneton, INS HEA Grhapes, Suresnes

- Marie Potapushkina-Delfosse (Versailles educational district / Cren, University of Nantes): Learning English through touch in pictures and dance
- Valérie Barry (Lirtes, Paris Est University): Sensoriality and scaffolding: study of the influence of touch and handling in the construction of scientific learning in nursery school with “mainstream” pupils, and pupils with a cognitive and motor disability
- Claire Tibbetts (Visual Impairment Service, Northamptonshire, UK): Touch For All? An analysis of using active touch to enhance learning in the primary classroom
- Gabrielle Sauvillers (Paris educational district): Using a sensory approach of pictures in “whole class” settings

Round table No2 – Carrefour Numérique, Agora room

“Touch, multi-modal approaches and communication”

Moderator: Danièle Toubert-Duffort, INS HEA Grhapes, Suresnes

- David Vaidis (Université Paris Descartes, laboratoire de psychologie sociale), Séverine Halimi-Falcowicz, Nicolas Buttafoghi, Didier Courbet, Marie-Pierre Fourquet-Courbet (Institut de recherche en sciences de l’information et de la communication, Aix-Marseille University): “If I touch you, I influence you”: perception of the person asking and effect of touch
- Michèle Rouge (Royal Institute for deaf and blind people, Brussels, Belgium): The “I am” exercise: a goldmine of stimulations around the shape of the body and body surface of visually impaired children with multiple disabilities
- Mylène Hardy (Institut d’études politiques, DAIE, Paris): Mother and baby build a skill together: communication through touch
- Martine Janner Raimondi (University of Rouen, Civiic Lab): Empathy from the viewpoint of allowing oneself to be touched in the learning interrelationship

5:15 Auditorium: lecture No2

- Bertrand Verine (Paul Valéry University, Montpellier, Praxiling, FAF-LR):
Tactile vocabulary exists: I have heard it

6:00-8:00 Cocktail

Friday, 18th March 2016

8:45 Introduction and announcement of today's posters

9:00 Auditorium: lecture No3

- Édouard Gentaz (CNRS / University of Geneva, Switzerland): Multi-sensorial exploration in learning

9:45 Round tables, in parallel

Round table No3 – Auditorium

“From touch disruption to the almost exclusive use of touch in various situations“

Moderator: Jacques Souriau, University of Groningen, The Netherlands

- Dominique Le Nen (Brest regional hospital): Touching and the traumatized hand
- Anne-Cécile Mouget (University of Caen Normandy): Orgasm without genital sensitivity: compensation for sensitivity impairment following a spinal injury
- Franck Berteau (Cresam, Poitiers): Tactile communication and deafblindness: bodily and emotional impacts
- Riitta Lahtinen and Russ Palmer (University of Helsinki, Finland): Haptics, touch messages, sharing environmental information

Round table No4 – Carrefour numérique, Agora Room

“Reading tactile pictures and raised line drawings“

Moderator: Michel Bris, INS HEA, Suresnes

- Fabio Levi (University of Torino and Tactile Vision Onlus, Italy) and Rocco Rolli (Tactile Vision onlus, Turin, Italy): Raised line drawings: an essential means of communication for the visually disabled
- Florence Janin (Nantes educational district): How can exploration of tactile images be taught?
- Oriana Orlandi, Annie Vinter and Pascal Morgan (University of Burgundy, Lead CNRS): Comprehension of tactile images in visually impaired children: the role of perceptual experience
- Anne Chotin, Annie Tromeur, Guillaume Gabriel (INS HEA): Raised line drawing: implications and limitations

11:15 Carrefour numérique: poster session No2

11:15 to 1:30 Free time for lunch and visits (poster sessions and stalls)

1:30 Auditorium: Plenary session No2

“Learning and teaching Braille“

Moderator: Nathalie Lewi-Dumont, INS HEA Grhapes

- Torø Graven (University of Oxford, UK): Discrimination strategies for braille
- Mira Tzvetkova-Arsova (University of Sofia, Bulgaria): Assessment of tactile discrimination skills of blind students of primary school age admitted in special schools for visually impaired
- Natalie Martiniello (University of Montreal, Canada): The use of technology to enhance tactual learning: A study of braille teaching professionals

2:30 Questions from the floor

3:00 Break

3:15 Auditorium: Plenary session No3

“Adapting museums, and access to Art“

Moderator: Marcus Weisen, École normale supérieure, Paris

- Aldo Grassini (Omero tactile museum, Italy): In search of an aesthetics of touch
- Marie-Pierre Warnault and Anne Ruelland (Cité de l'Architecture et du Patrimoine, Paris): Appropriation of an architectural work by touch
- Laura Solaro (Louvre museum, Paris): The tactile gallery at the Louvre. A personal account of an innovative educational practice
- Delphine Demont (Acajou dance company): Self to world, and world to self: from sense of touch to dance

4:35 Questions from the floor

5:00 Closing of the conference

Saturday, 19th March 2016

Free entrance. In French only. Organized by Universcience College.

Conferences in the morning. Exhibitions in the afternoon.

Lectures at the auditorium

10 h

- Vincent Hayward (Institut des systèmes intelligents et robotiques, CNRS/Université Pierre et Marie Curie) : Les bases physiques du sens du toucher

10 h 45

- Dominique Le Nen (CRHU, Brest) : L'anatomie des mains, à la croisée des arts et des sciences

11 h 30

- Nicolas Buttafoghi, Didier Courbet, Marie-Pierre Fourquet-Courbet, Séverine Halimi-Falkowicz (Aix-Marseille Université, Institut de recherche en sciences de l'information et de la communication), David Vaidis (Sorbonne Paris Cité, Laboratoire de psychologie sociale, Institut de psychologie) : « Les médias numériques qu'on touche » : Effets des écrans tactiles et des serious games sur les apprentissages et les comportements
- Hélène Labat (Laboratoire Paragraphe, Université de Cergy-Pontoise, Institut d'éducation, Laboratoire d'étude des mécanismes cognitifs, Université Lumière Lyon 2), Jean Ecalte (Laboratoire d'étude des mécanismes cognitifs, Université Lumière Lyon 2, LabEx Cortex ANR-11-LABX-0042), Annie Magnan (Laboratoire d'étude des mécanismes cognitifs, Université Lumière Lyon 2, LabEx Cortex ANR-11-LABX-0042, Institut universitaire de France) : Approche multi-sensorielle pour apprendre à lire-écrire: de l'intuition pédagogique à la recherche en psychologie cognitive du développement

12 h 30

- François Jouen (École pratique des hautes études, Paris) : Le toucher à la naissance, une acquisition pour la vie

Demonstrations and workshops

À la Bibliothèque enfants

- Atelier BD (atelier, à 15 h 30) avec Dannyelle Valente (Chercheur au laboratoire du développement sensori-moteur, affectif et social, Université de Genève, Suisse)

Au Carrefour numérique

- Résonance fossile (présentation) avec Florence Bernard (Agrégee d'arts plastiques et artiste plasticienne)
- Laissez toucher les petits papiers (présentation) avec Christian Bessigneul (Graveur, professeur émérite à l'École Estienne)
- Paper Art (présentation) avec Anne Meier Soumille (Historienne de l'art, art-thérapeute, artiste en « paper art »)
- Les sens du Toucher (atelier, 1 heure) avec Stéphanie Kappler (Médiatrice biologiste au Palais de la découverte)
- Un sens qui trompe énormément: les illusions tactiles (atelier) avec l'équipe de Vincent Hayward

Thursday, 17th March

Oral presentations



Lecture

The physical basis of touch and its effects on perception

Vincent Hayward

Professor, UPMC Sorbonne University/ CNRS

Vincent Hayward held the “chaire internationale d’haptique de l’UMPC” in 2008 and became professor at UMPC in 2011. Before, he was a professor at McGill University, Montréal, Canada (since 1989). He was the director of the “McGill Research Center for Intelligent Machines” from 2001 to 2004. Vincent Hayward is interested in robotics, tactile perception, and haptic interfaces. Vincent Hayward is a “Fellow of the IEEE” since 2008 and received an “Advanced Grant” from the European Research Council since 2010.

Vincent Hayward will also give a lecture on the same topic to the general public in the morning on Saturday, March 19th (in French only).

Summary

The human hand is an extraordinarily developed sensorimotor organ. Touch is a sense that is based on mechanics like hearing is based on acoustics. It is therefore natural to think that the mechanical properties of the hand are of fundamental importance to touch. We will examine the surprising mechanics of the hand, of the skin and of its interactions with objects, either for manipulating, discriminating or recognising them, and what information these interactions transmit to the brain.

Translation French/English and French sign language available



Improving the design of sensory substitution devices and their use by visually impaired people

Gabriel Arnold et Malika Auvray

Institut des systèmes intelligents et de robotique, CNRS, UMR 7222

Summary

One promising technology conceived to compensate visual deficits consists in converting visual information into stimuli accessible through another sensory modality (e.g., touch or audition). These sensory substitution devices remain however barely used by visually impaired people, either because their design is not optimal, or because their use involves too many constraints and cognitive effort. We propose that a more successful adoption of these devices by visually impaired people relies on a better design of both the device and the sensory coding that is used, on better learning protocols, and on taking into account individual specificities. First, we will show that some natural associations between dimensions of the signal across sensory modalities, used in some devices, differ between sighted and blind people. In particular, auditory frequency (high-pitched vs. low-pitched tone) and direction of tactile motion (ascending vs descending) are associated in sighted but not in blind people (Deroy *et al.*, in press). Second, we will show that spatial abilities are also subject to individual differences, and in particular regarding people's ability to mentally represent space from different perspectives. Finally, we will show that users can learn to recognize objects with a tactile device and this learning subsequently transfers to new objects and perceptual conditions (Arnold & Auvray, 2014). In conclusion, the existence of individual preferences and specificities crucially highlight the necessity to adapt sensory substitution devices to each individual user. However, an appropriate training also allows users to adapt to the device.

Keywords

Perceptive learning - Spatial cognition - Sensory interaction - New technologies - Sensory substitution.

Bibliographic references

Arnold, G., & Auvray, M. (2014). Perceptual learning: Tactile letter recognition transfers across body surfaces. *Multisensory Research*, 27, 71-90.

Deroy, O., Fasiello, I., Hayward, V., & Auvray, M. (In press). Pitch and tactile movement interfere, but not for blind individuals: Investigating audio-tactile correspondences in sighted, early, and late blind individuals. *Journal of Experimental Psychology: Human Perception and Performance*.

Translation French/English and French sign language available

Interaction and collaboration within a visuo-tactile sensory substitution system

Aurélié Vallée and Katia Rovira

PSY.NCA Laboratory, University of Rouen

Summary

The use of digital technologies by persons with a visual disability is increasingly widespread. This fact requires that we look into sensory substitution systems opening up access to digital images and communication mediated by computer. In this context the CRED team of the COSTECH laboratory created the Intertact system. This system is based on the haptic method, and enables two persons to interact tactilely within a shared digital environment. Several studies of sighted adults have shown that this environment allows interaction and collaboration among participants (Auvray, Lenay & Stewart, 2009 ; Deschamps, Lenay, Rovira & Aubert, 2015). Following upon these studies, we have observed possibilities of interaction through Intertact among visually deficient adolescents. After an initial study (Vallée, Deschamps & Rovira, 2012) showing that these participants did not succeed in interacting and collaborating, we modified our protocol and put it into a scenario allowing us to move closer to the virtual worlds experimented with by the children and adolescents. 29 pairs (58 participants) made up of sighted, partially sighted and blind children and adolescents took part in this second study. At the end of this study we observed that the majority of the participants could interact and collaborate within the digital environment through tactile exchanges.

Keywords

Adolescents - Children - Haptic perception - Mediatized communication - Sensory substitution - Visual disability.

Bibliographic references

- Auvray, M., Lenay, C. et Stewart, J. (2009). Perceptual interactions in a minimalist virtual environment, *New Ideas in Psychology*, 27, 32-47.
- Deschamps, L., Lenay, C., Rovira, K. et Aubert, D. (2015). *Croisement perceptif et monde commun : Une étude minimaliste de la perception mutuelle d'objets partagés*, Colloque Jeunes chercheurs en sciences cognitives, 3-5 juin 2015, Université de Technologie de Compiègne, Compiègne, France. <http://cjcsc.sciencesconf.org/65822/document>
- Vallée, A., Deschamps, L. et Rovira, K. (2012). *Dispositif d'aide aux jeunes aveugles : interagir au sein d'un internet tactile*. 54^e congrès national de la SFP 2012. Montpellier. France. 253-255.

Translation French/English and French sign language available



Interactive graphs accessible to visually deficient persons

Results of five years of research in cognitive sciences and technologies

Christophe Jouffrais

CNRS and University of Toulouse, IRIT, Toulouse

Summary

Much teaching is based on graphic representations, and this has repercussions on social insertion in technologically advanced countries. These graphic representations are by their very nature not very accessible to visually impaired persons. This has an impact on their education and quality of life. Embossed cards are the most widely used tools to improve access to graphs. But they have many limitations (cost, limited number of figures, knowledge of braille, etc.). In recent years several projects have sought to go beyond these limitations by offering interactive systems to access digital graphic data (Brock *et al.* 2013), and have made it possible to arrive at several principles (McGookin *et al.* 2010). Following upon these projects, we have developed a set of interactive systems based on tactile exploration allowing access to graphic data. The interactive audio-tactile map provides access to several levels of information on the basis of the same relief map. It also provides advanced interactions to access new functions like learning routes. We have shown that this map is generally more usable than a traditional relief map (Brock *et al.* 2014). It is now used, moreover, by specialized teachers, and there are plans to market it. More recently, we have also designed a system allowing visually impaired persons to build and explore tangible representations of digital graphic data. The system is based on a conception of adapted objects that symbolize the figures on the map.

A navigation system makes it possible to position these objects on the elements of the graphic representation which are being sought. It is also possible to create physical connections between these objects so as to create lines and zones. We have shown that this system can be used by visually impaired persons to build and explore graphs of varying degrees of complexity.

Keywords

Assistance technologies - Design - Man-machine interaction - Spatial cognition - Tactile exploration - Visual impairment.

Translation French/English and French sign language available

Learning English through touch in pictures and dance

Marie Potapushkina-Delfosse

Doctor in Language Sciences, CREN, University of Nantes

Teacher, School District of Versailles

Summary

Reality acts on man, and man acts on reality. Such is the essence of human life according to the anthropology of the gesture (Jousse). Every action entails touch. We perceive all actions that we undergo or perform in terms of touch, even when these actions do not involve apparent physical contact between the thing or person acting and the thing or person acted upon. For example, our speech *touches upon* the subject, a work of art that we observe *touches us*, etc. Such words are much more than figures of style -- these metaphors that we use regularly reveal very much about the tangibility of our relationship to the world. The fact that man structures his emotional and intellectual experiences in terms of his bodily nature (Johnson, Lakoff) is to be taken into account in teaching.

My action-research in language teaching in schools seeks to formalize a system of access to living languages through touch, experimented through artistic exercises, namely painting and dance, approached on the basis of the series of Kandinsky and Laban respectively. Pictorial touch (contact between the hand and the support surface with or without the intermediary of a tool), touch in dance (contact with one's body and the bodies of partners, with accessories, with the floor) enable pupils to absorb linguistic knowledge associated with movement. *Bodying (corporage)*, one of the key concepts in Jousse's theories, facilitates learning and makes it more durable.

Keywords

Anthropology of the gesture - Cognitive linguistics - Dance - Language teaching - Painting - Touch.

Bibliographic references

- Johnson, M. (1987). *The Body in the Mind*. Chicago: The University of Chicago Press.
Jousse, M. (1974/2008). *L'Anthropologie du geste*. Paris: Gallimard.
Kandinsky, W. (1989). *Du Spirituel dans l'art, et dans la peinture en particulier*. Paris: Denoël.
Laban, R. (1994). *La maîtrise du mouvement*. Arles: Actes Sud.

Translation French/English and French sign language available



Sensoriality and scaffolding: study of the influence of touch and handling in the construction of scientific learning in nursery school with “mainstream” pupils, and pupils with a cognitive and motor disability

Valérie Barry

Associate Professor in Education Sciences,
LIRTES, ESPE of the University of Paris-Est Créteil

Summary

This paper examines the influence of touch and handling in the construction of scientific learning about living things with “mainstream” children as well as children with a disability attending a nursery school or in a specialized environment.

This paper focuses on contextualized research conducted over two years:

- in all three classes of a nursery school;
- in the nursery school class of an educational unit of CRFI (nursery school reeducation center).

In each class research covered 16 learning sessions (about one per month during two school years). The sessions included material to be touched and handled.

The purpose of this paper is to present some results of the research:

- so that a scientific experiment constitutes both revelation and an acquisition, *i.e.* that it helps turn a discovery made in a given situation into an acquisition (knowledge acquired through personal experience). Combining scientific experiment (formulation of a hypothesis, action, discussion, validation) with creation of experience is a catalyst. In other words, the creation of a scenario including oneself or a test of oneself involving touch, language (of the child or the adult), and symbolic thought.
- The systems created to encourage pupils to focus their attention on certain parts of the scientific material studied (magnifying glasses, cards for masking, etc.), before showing them fully, can have the following effects: development of targeted attention, greater mobilization of the children, and new interactions among peers.
- The two above results emerged from observations of “mainstream” pupils and pupils with a disability (cognitive, motor), in a mainstream as well as a specialized environment.

Keywords

Disability - Experience - Learning sciences - Sensoriality.

Translation French/English and French sign language available

Touch For All? An analysis of using active touch to enhance learning in the primary classroom

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Summary

Presentation Focus

Identifying the value of using touch as a tool for universal learning in a Primary Mainstream setting.

Identifying and exploring how the use of tactile exploration, interacting with other senses and with language, may foster learning processes, autonomy and access to culture, not only for the Student with Visual Impairment but for all students within the immediate mainstream setting.

Experimental Research

- Primary age classes including pupils with a Severe Visual Impairment.
- Working with class teachers to plan learning opportunities, using touch as a stimulus, aid or accompaniment for learning.
- Identifying and measuring the impact upon cognition, learning, creativity and memory.
- Using tactile modality, such as Braille, raised drawings, tactile pictures and real-life objects.
- Tactile elements utilized in lessons, striving for true inclusion. Being mindful of all learning styles and enhancing learning with tactile opportunities in a discreet and appropriate way.
- Identifying true make up of class demographic with regard to learning styles
- Using qualitative data, assessment and reflective practice.

A presented analysis of findings from Experimental Research.

- Identifying the impact of tactile resources used.
- Conclusions drawn from data in relation to learning style, age and ability of children.

Participants will;

- Gain a greater insight into the value of inclusive touch in education and a chance to consider the definition of true inclusion.
- Reflect on own practice and identify potential opportunities to introduce the use of tactile stimulus and learning aids.
- Gain a greater awareness of conflicting theories; 'reasonable adjustment' Vs 'true inclusion'.

Keywords

Learning - Inclusion - Tactile

Bibliographic references

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Translation French/English and French sign language available



Using a sensory approach of pictures in “whole class” settings

Gabrielle Sauvillers

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Summary

As French literature teacher and coordinator of a unit for visually impaired students, Gabrielle Sauvillers analyses the experiments she has conducted at the Buffon middle school (Paris). As she is fond of teaching art history, for a long time she wondered how she could convey the aesthetical emotions from paintings to her blind pupils.

Far from considering teaching image analysis to partially sighted and blind pupils as a paradox, she noticed that art lessons were embarrassing and that VI pupils were staying apart together. Therefore, she chose to make art history classes a place of sharing and integration, of mutual enrichment of viewpoints and perception, through federating projects. She gives great importance to creating various adjustments, which do not deprive visual works of art from their richness. She ensures that image analysis does not make sighted people force their own perception on the blind.

Assuming that students in an inclusive setting work every day with around 20 sighted schoolmates, she has chosen to make the whole class group setting a main advantage and proposes multisensory experiences to all the students through ephemeral experiences : *accessible visits of museums, theatre-image sessions or discovery under blindfold of tactile interpretations of paintings.*

These experiences play a part in sensorial enrichment for all.

Keywords

Art history - Blind - Inclusion - Adaptation - Multisensory.

Bibliographic references

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Hatwell, Y., (2000). *Toucher pour connaître, Psychologie cognitive de la perception tactile manuelle*. PUF.

Hervé, J., (1990). *Comment voient les aveugles ?* Ramsay, Enquête.

<https://www.facebook.com/interpretationstactiles>

Translation French/English and French sign language available

“If I touch you, I influence you”: perception of the person asking and effect of touch

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Summary

In the context of interpersonal communication, touching your interlocutor increases the probability that he will meet your request (Kleinke, 1977). There are many theoretical explanations for this, but none cover all of the effects observed (for a review, Guéguen, 2002).

McElroy, Morrow & Eroglu (1990) posit a mediation of the perception of the person asking of the acceptance of the request: the behavior of the person making the request is believed to cause any emotional awakening in the person to whom the request is addressed.

This awakening can be assessed, depending on the circumstances, either positively or negatively, and the result of the request (acceptance vs. refusal) is in the end determined by this process of evaluation. The effects of touch could thus be mediated by the way the person touching is perceived by the person touched. To our knowledge, this hypothesis has been the subject of only one study (Halimi-Falkowicz, Vaidis & Joule, 2005): a positive perception of the person touching is believed to increase the probability of acceptance of the request, whereas a negative perception is believed to diminish it. In classical studies, which have never shown a negative effect of touch, the positive effects observed could thus be due to the benevolent character of the experimenter. The two studies that we will present tended toward a mediation of the perception of the person touching by the person touched of the acceptance of the request.

Keywords

Acceptance of a request - Facial expression - Perception of the person touching - Social interaction.

Bibliographic references

Guéguen, N. (2002). *L'effet du contact tactile sur l'acceptation de requêtes. Recherches expérimentales dans le paradigme de la soumission librement consentie*. Thèse pour le doctorat d'État des lettres et sciences humaines. Université de Provence.

Halimi-Falkowicz, S., Vaidis, D., et Joule, R.-V. (2005). *Effet de la perception du « toucheur » par le « touché », et de la distance séparant le « toucheur » du « touché », sur l'acceptation d'une requête*. VII^e colloque de psychologie sociale appliquée, Rennes (France), 20-22 octobre.

Kleinke, C. (1977). Compliance to requests made by gazing and touching experimenters in field settings. *Journal of Experimental Social Psychology*, 13, 218-223.

McElroy, J. C., Morrow, P. C., & Eroglu, S. (1990). The atmospherics of personal selling. *Journal of Personal Selling and Sales Management*, 10, 31-41.

In French only



The “I am” exercise: a goldmine of stimulations around the shape of the body and body surface of visually impaired children with multiple disabilities

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Summary

This “essential” massage exercise is the result of much thought, and it was often corrected, adapted, and adjusted to the needs of children and adolescents with multiple disabilities. It is to them that this exercise is offered.

The pleasure of meeting, of experiencing a pleasant sensation, is for everybody, and is something we want to repeat!

The “I am” aims at several priority objectives. The first one is to try to tame this pleasure! And also to learn to discover, to give sensations and information to the child, in a moment of shared tranquility, to all of the child’s body surface, in a language immersion relating to the entire shape of the child’s body.

The “I am” takes place in a situation of true contact, authentic awareness, focused on our presence, and can be followed by more functional movements.

Depending on the profiles, behaviors, and pathologies of the children and each child’s motor possibilities, the methodology chosen for each session will remain similar, whereas the setting and pace can vary.

Among the sources of the inspiration for this exercise are the following: the “Shantala” massage for babies of Dr F. Leboyer; the Robins and Veronica Sherborne methods, the basic principles of conductive education of Dr A. Pêto, and the imagination and experience of the members of the team over the years! The effects of these moments which are regularly offered to children are impressive. Throughout these years the “I am” has enabled many children to discover or recover a certain bodily pleasure in their wounded bodies and minds.

Keywords

Blindness - Body shape - Entire body - Massage - Visual impairment.

Bibliographic references

Leboyer, F. (2004). *Shantala*. Paris: Seuil.

Sherborne, V. (2001). *Developmental Movement for Children*, Worth Publishers.

In French only

Mother and baby build a skill together: communication through touch

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Summary

The multimodal character of the interaction between mother and baby raises the question of the skill of verbal and nonverbal communication, especially in a 15-month old baby with severe mental retardation. Communicational exchange is made contractually possible because the interacting persons put a meaning in the message that they produce, a meaning that they believe to be comprehensible by the other as long as appropriate rules are observed. The approach of this paper is ethnomethodological. Our expectations as parents have been based on the intrinsic capacities and social norms of the parent -baby relationship, which include the predominance of visual communication and fluidity in the interaction influencing the way we communicate with our child. This paper seeks to show how daily performance of interaction leads us to call into question these representations, and privileges touch as a means of communication, in combination with other modes, visual and auditive. Although our baby cannot express communicational expectations of the same level as ours, our interactions have led us to reconstruct our own representations of the baby's communication skill. Thus, there was a true joint construction with the baby of this skill, as well as a construction of the norms defining our contract of communication, for example the recognition and definition of the role of the mother in this contract linked to haptic spatial exploration in a given cultural context (Gentaz, 2005; Guégen & de Gail, 2000).

Keywords

Communication skill - Emotional and cognitive scaffolding - Haptic - Mother-baby interaction.

Bibliographic references

Gentaz, É. (2005). Explorer pour percevoir l'espace avec la main. In C. Thinus-Blanc (Ed), *Agir dans l'espace* (pp. 33-56). Paris: MSH

Guéguen, N., & de Gail, M.-A. (2000). Le toucher: un indicateur culturel implicite du statut et du rôle. *Communication et organisation*, 18, 135-154

In French only



Empathy from the viewpoint of *allowing oneself to be touched* in the learning interrelationship

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Summary

Even though the capacity for empathy is inherent in human kind (Tisseron, 2010), the inhibition of empathy is also one of the relational challenges in which learned social roles interfere. The teacher, engaged in an educational relationship, cannot avoid this “*force which allows oneself to be touched by another person*” (2010, 83). Believing that the teacher allows himself to be touched by learners as well as by the contextual information of the situation in which the interaction is taking place requires defining this comprehensive experience of the experience of the other person (Husserl, 1929). It is this that makes it possible to recognize the other person as an *analogon* of oneself.

The *empathetic agreement* defined by Brunel et Cosnier (2012) makes it possible to pursue the conversation on the basis of the principle of cooperation, presupposing clear, relevant and sufficient information, without excess. This agreement, *via a coming to awareness* and *an emotional becoming* (Depraz, 2014, 206), is made up of a passive receptive expectation favoring openness to the present, and of the emotion of surprise realizing the potential of the feeling. Thus, the adaptive capacity of the subject, the objective ownership of the intensity of the sensation as well as the psychic disposition linked to the internal experience of the subject interfere in the act of allowing oneself to be touched and of touching someone else. These elements are expressed through the language, tone, rhythm, attitudes, and gestures used. We take into account these parameters in order to identify the agreement or lack of agreement between a teacher’s assistant (“*auxiliaire de vie scolaire*”), a teacher, the pupils of a nursery school class and a child with a disability, all together for a half day per week throughout the year.

Keywords

Empathy - Learning relationship - Nursery school - Touch.

Bibliographic references

Brunel, M.-L. et Cosnier, J. (2012). *L'empathie. Un sixième sens*. Lyon: PUL.

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Husserl, E. (1929/1980). *Méditations cartésiennes. Introduction à la phénoménologie*. Trad. G. Pfeiffer et E. Levinas. Paris: Vrin,

Tisseron, S. (2010). *L'empathie au cœur du jeu social*. Paris: Albin Michel.

In French only

Lecture

Tactile vocabulary exists: I have heard it

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Summary

The study, teaching and use of sensorial vocabulary faces the stubborn prejudice that “there is no word to express it, you have to feel it” (quoted by Sola, 2015). I will show that this common belief is groundless, providing examples of verbalization of properties of consistency and texture taken from three sources:

- Beressi, J. (2011, 30 juillet). *Les cinq sens. Le toucher*. France Culture.
- Verine, B., Chauvey, V., Hatwell, Y. et Gentaz, É. (2012). *Description verbale et perception haptique*. Montpellier: Praxiling.
- Verine B. (dir.) (2014). *Dire le non-visuel*. Montpellier: Praxiling, Liège: PULG.

I will advocate systematic training in the verbalization of touch in teaching in school classrooms and in re-adaptive activities for persons who have lost their sense of sight. Indeed, it is not because we cannot find the words for these perceptions that we are usually silent about them. On the contrary, much of reality remains unnoticed by us because we are guided by the ready-made words of a society which is blinded by the visual dimension.

Keywords

Discourse analysis - Sense - Touch - Vocabulary.

Bibliographic references

Digonet, R. (dir.) (2016). *Pour une linguistique sensorielle*. Paris: Champion.
Sola, C., (2015). Toucher et savoir. Une anthropologie des happerceptions professionnelles. *Ethnographiques.org*, 31 (La Part de la main),
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Translation French/English and French sign language available

Personal notes

Personal notes

Thursday, 17th March

Posters



Multisensory integration of letters: the benefits of motor exploration of letters for children in the last year of preschool

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Rémy Versace

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Summary

In the field of acquisition of reading skills, work by several research teams has revealed that exercises involving motor activity support integration of grapho-phonological correspondences (GPC), an indispensable step for the identification of written words (see Labat, *et al.*, 2015, for a review). Our study had two aims. The first objective was to test the effect of incidental learning of GPC using digital technology with five-year-old children. The second aim was to investigate the role of motor skills (multisensory learning). The study consisted of pretesting, learning (4 sessions * 2 GPC per day) and post-testing of 36 children in the last year of preschool ("grande section école maternelle" in France, average age 5-6 years). The children were divided into two groups, and followed a computer programme designed to teach eight GPC units. The first group learned the shape of the letters visually, *i.e.* by looking at the letters; the second group's learning experience was visual and motor, *i.e.* tracing the letters with a finger on a screen. Statistical analysis of variance and of signal detection showed that incidental learning is effective, as attested by progress in completing tasks (assessing GPC and decoding pseudowords). Variance analysis showed that visual plus motor learning was the most effective: adding haptic exploration stimulates the learning of connections between graphemes and phonemes. These findings are interpreted using the Act-In memory model (Versace, *et al.*, 2014).

Keywords

Incidental learning - Knowledge of letters - Haptics - Act-In model - Multisensory learning/training.

Bibliographic references

Labat, H., Ecalle, J., Baldy, R., & Magnan, A. (2014). How can low-skilled 5-year-old children benefit from multisensory training on the acquisition of the alphabetic principle? *Learning and Individual Differences*, 29, 106-113. doi: 10.1016/j.lindif.2013.09.016

Versace, R., Vallet, G. T., Riou, B., Lesourd, M., Labeye, É., & Brunel, L. (2014). Act-In: An integrated view of memory mechanisms. *Journal of Cognitive Psychology*, 26(3), 280–306. doi: 10.1080/20445911.2014.892113

Poster in French



Influence of baby massage on mother-infant vocal interaction

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Summary

Skin-to-skin contact between mother and infant is known to have positive effects on affective bonding (Feldman *et al.*, 2002, Field, 2014). Previous studies have shown that infants are highly sensitive to the timing and rhythmic qualities of the human voice (Trevvarthen & Aitken, 2003). So far, no study has analyzed how baby massage could influence vocal interaction between healthy full-term infants and their mothers.

In this study, we filmed and compared the social contingencies (mutual responsiveness) between maternal speech and infant vocalization in a group of 10 3- to 6-month-old massaged babies to those in a control group of 10 babies not receiving massage.

Results show no significant difference between the 2 groups regarding the number of infant vocalizations and the degree of mothers' verbalization. However there are significant differences on average duration of simultaneous vocalizations, higher for the massage group. Regarding the degree of vocal contingency (defined as responding to the partner within a 3 second temporal window), results show that the no massage group has higher vocal contingency than the massage group.

Lower vocal contingency in the massage group may be due to competition with other communication modes that massage practice could support such as touch and mutual gaze. Further studies should investigate how massage influences mother-infant communication in a multimodal context.

Bibliographic references

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Field, T. (2014). *Massage therapy research review. Complementary Therapies in Clinical Practice* (Elsevier). 1-6.

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Poster in French

Shaping Shapes: A science-meets-art exhibition

Torø Graven

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Summary

Shaping Shapes invited visitors to use their curiosity and imagination – to shape shapes from, e.g. curves, dots and straight lines; first visually then tactually. Indeed, Shaping Shapes asked: What stimulates curiosity and imagination in vision and touch? What do eyes and hands agree on, and what do they disagree on?

“One of my newly blinded pupils claimed that she had no idea what to direct her attention towards when she was tactually exploring objects. Tactile information was overwhelming to her, thus she had, gradually, become tactually inactive. Other newly blinded pupils claimed to, visually, imagine their tactually explored objects: [...] one of my adventitiously blinded pupils claimed that [...] he could perfectly well, visually, imagine a painting hanging over his living-room sofa, but could no longer, visually, imagine his wife’s, his daughter’s, or even his own face: these had now become tactually familiar.” [Graven, T. (2009, p. 1). Seeing Through Touch: When Touch Replaces Vision as the Dominant Sense Modality. Saarbrücken: VDM Verlag Dr. Müller AG & Co.]

Shaping Shapes included two autonomous series of pictures, one visual for the eyes and one tactile for the hands, framed by previous research. “Try-it” tasks challenged the hands to recognise tactile figures. In fact, Shaping Shapes could be perceived in five autonomous parts or in a path including five stops:

- Stop 1: Presentation of research: The link between vision and touch. “Try-it” task.
- Stop 2: Series of visual pictures.
- Stop 3: Presentation of research: How attention to objects’ visual shape improves recognition
- Proficiency by touch. “Try-it” task.
- Stop 4: Series of tactile pictures.
- Stop 5: Presentation of research: How attention to objects’ tactile shape improves recognition proficiency by touch. “Try-it” task.

Keywords

Art - Attention - Haptic touch - Recognition proficiency - Vision-touch link.

Poster in English



The Perception of Object with Flexible Shape by Visually Impaired Persons

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Summary

There is a special type of objects for blind and visually impaired people. These are objects with a soft surface (skin, ball, bread, and umbrella).

If the shape of the object is hard and constant, to understand its physical properties simply touching is enough. But when it comes to observing objects with a soft surface or objects with variable shape, there also a need to observe it visually in addition to the touch experience.

In this case, the subject must perform strong perception actions on the object by hand. The object changes its shape. Subjects observe this change, its amplitude and direction (J.Piaget, Dg.Gibson, V.Zaparojec).

We studied this process with visually impaired persons and came to the following conclusion: There is *special analyzer* perception of the soft object. It has no special receptors, but it has a special process and algorithm:

- a) the subject must perform strong perception actions on the object by hand. 2) the object changes its shape. 3) a subject observes these changes, its amplitude and direction.
- b) This analyzer has a special *cerebral* chapter in the brain (E. Sokolov, G.Losik).
- c) Not only *touch* but *vision* plays crucial role in perception of an object with flexible surface.

We need to find other ways to provide partially sighted and blind people with the ability to perceive objects with dynamic shapes. In particular, for blind people there is a difficulty to see and to touch the degrees of freedom of a human body, animal body, fish, bird, insect (Knut Brandsborg). The same problem appears when visually impaired people want to experience acting (theatre) or active children playing.

Poster in English

Improving touch perception at the right index makes adjacent fingers on the left hand feel better

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Summary

Tactile acuity is fundamentally important for everyday life. Recent research in healthy participants has shown that repetitive somatosensory stimulation (RSS) of the finger pads is able to improve tactile sensitivity at the stimulated site (Godde *et al.*, 2000), demonstrating both practice and training-independent stimulation can induce brain plasticity. In recent experiments we investigated whether RSS on the right index fingertip is able to affect sensitivity on other body parts. We found improved performance at the stimulated right index finger and also at the face but not on the left index finger (Muret *et al.*, 2014). To better understand how plastic changes can transfer to the face but not to the homologous index, here we investigated whether RSS-induced changes transfer towards other fingers on both hands. We applied RSS to the right index and examined tactile acuity at six sites before and after by measuring two-point discrimination thresholds (2PDT). We first assessed 2PDT at the left and right index, upper-lip and thumb (n=15), and then at the left and right index, middle and thumb (n=15). In addition to replicating our previous finding of an improvement at the face and no change at the left index, we found improvement at the left thumb and middle fingers but no change at these fingers on the right hand. This spread of improved acuity from the right index towards the lips, left thumb and left middle fingers testifies to a complex pattern of RSS-induced plasticity, that are potentially mediated by transcallosal connections and lateral inhibition. These results could open up new possibilities for rehabilitation of sensorimotor deficits in patients.

Bibliographic references

Godde, B. *et al.*, (2000). *J. Neurosci.* 20, 1597-1604.
Muret, D. *et al.*, (2014). *Curr. Biol.* 24, R736-R737.

Poster in English

Author speaks English and French



Psychometric assessment and haptic perception: a new 2D haptic tests battery for use with children and adolescents with and without visual impairment

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Summary

To fill an important gap in the psychometric assessment of individuals with impaired vision, we designed a new battery of haptic tests, called Haptic-2D, for visually impaired and sighted children and adolescents aged from 5 to 25 years. Unlike previous existing tools, our battery of tests included only 2D raised materials that participants explored using active touch. It was composed of 11 haptic tests, organized in five categories assumed to measure scanning skills, haptic discrimination, spatial understanding, short-term memory, and picture comprehension. A total of 138 participants took part in the study, half of whom were sighted ($n = 69$), and half visually impaired (legally blind, $n = 16$; low vision, $n = 53$). Results showed significant age effects on scores. By contrast, we failed to find any interaction effects between age and vision. The reliability of test items was good (Cronbach's alphas between .51 and .84). Convergent validity was satisfactory, as indicated by a significant correlation (age partialled out) between total haptic scores and scores obtained at the B101 test ($r_p = .51$, $n = 47$). Divergent validity was also good, as attested by significant but lower partial correlations between total haptic scores and raw scores on verbal tests of the WISC ($r_p = 0.43$, $n = 62$). Finally, the test-retest reliability was satisfactory ($r_s = .93$, $n = 12$, one or two month delay). This new psychometric tool should be guide and support professionals of visual impairment in their practice.

Keywords

Haptics - Psychometric assessment - Visual impairment - Development.

Bibliographic references

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- Wechsler, D. (2005). *WISC-IV, Echelle d'Intelligence de Wechsler pour Enfants et Adolescents*. Paris: ECPA.

Poster in English. Author speaks English and French

Improving touch perception at the index finger also modifies its motor control

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and Université Claude Bernard Lyon I

Summary

Touch plays a fundamental role in our everyday life, and is particularly important because of its strong interaction with the motor system. In addition, the somatosensory and motor cortices are both known to be highly plastic. But while sensorimotor plastic changes have been widely studied following motor training or sensorimotor deprivation, little is known about the impact on the motor system of somatosensory plastic changes induced by a pure manipulation of tactile inputs. Such somatosensory plastic changes can be induced using repetitive somatosensory stimulation (RSS), which was found to improve tactile acuity at the stimulated fingertip but also at the face. Considering this large spread of perceptual changes and the interconnected nature of the somatosensory and motor cortices, here we investigated whether the purely somatosensory plastic changes induced by RSS had repercussions on the motor control of the fingers. An original motor tracking task was combined with kinematic recordings to measure movement independence and tracking accuracy of the right fingers. Finger movement kinematics of a first group of participants ($n = 15$) were recorded before and after three hours of RSS of the right index fingertip, but also from a matched control group ($n = 15$). Preliminary results show that RSS at right-D2 prevented the decrease in movement amplitude observed for that finger in the control group. In addition, the ability of that finger to remain stationary while the other fingers were performing the tracking task tended to decrease after RSS. While further analyses are in progress, these preliminary results suggest that RSS-induced somatosensory plasticity, in addition to improving the tactile acuity of the stimulated finger, can also affect its motor capabilities. These results open up a new window of investigation regarding the use of tactile stimulation and somatosensory plasticity to improve haptic and sensorimotor functions, especially for rehabilitative purposes.

Keywords

Tactile acuity - Passive learning - Somatosensory plasticity - Kinematics - Sensorimotor.

Poster in English

Author speaks English and French



Cross-syndrome and developmental variation of communication and language skills in young children when playing games involving fine and global motor skills

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Summary

In typical development, manipulation of objects increases visual attentiveness, as very young children react to modification of the objects' characteristics: very early on the tactile and visual modalities cross-communicate in babies (Ruff, 1984, 1986; Hatwell, 1986, Streri, 1991, Gentaz, 2009). Interdiscursive contexts in which the first conventional productions appear were thought to arise in the course of interactive routines segmented into gestural and vocal behaviours (Bates, 1976; Bates et al. 1979, Bruner, 1983, Guidetti, 1998, 1999, 2003, Tomasello, 1988). The discovery of so-called "mirror" neurones that have the property of acting in the same way when an individual perceives a movement or executes it has upended this conception. The sensory and motor system has become an integral part of cognition.

In the course of this longitudinal (12 months) and transversal empirical study, 10 young children with autism were studied, matched by developmental age with 10 young children with Downs' syndrome and 10 typically developing children. The groups were matched using a methodology integrating psychomotor, cognitive, language and social skills (Brunet-Lézine, BECS). The study analysed gestural and verbal communication by the three groups of children in game situations involving fine and global motor skills. The impact of an individual intervention programme focusing on heteroregulation of joint attention was also studied (Pérès-Al Halaby and Adrien, 2011; Pérès-Al Halaby, 2012).

Comparative analysis of the findings shows that: i) language development is strongly correlated with eye-hand coordination; ii) at equivalent language levels the children with autism and the children with Downs' syndrome present highly contrasting socio-communicative profiles; iii) the socio-communicative profile of the children with Downs' syndrome is close to that of typically developing children. These findings are discussed in relation to gestural and verbal communication development models.

Keywords

Pragmatic development - Autism - Downs' Syndrome - Typically developing children - Sensory - Motor system.

Poster in French



Tactilo-kinaesthetic exploration procedures for apprehending the Rorschach test

Odile Raguin

Clinical psychologist, Doctor of Psychology, Lyon 2 University

Summary

This research follows a study already begun in my first year of Master's Degree. It deals with the haptic process adapted to 3-dimensional Rorschach plates.

Is the haptic process sufficiently discriminating to validate the reliability of this test under this mode? Does differentiated calibration respect the values given to this test by H. Rorschach?

After loss of sight, a subject is going to have to mobilize or find new physical and psychic resources to become autonomous and go on living.

Everything in that person is broken: their narcissistic construction, his representation of the world and his differences in the eye of others.

The Rorschach test allows us to approach a subject's psychic wealth. It shows us the psychic potential of a subject in relation to himself and to others. Yet the Rorschach test calls on visual activity to organize an informal material. It is an activity based on images which leads one from the perceptive to the projective, from perceived to experienced.

In certain situations, touch can be an intermediary for perception, for projection and it can show how the subject is represented.

Through this research, we can consider calibrating this test in another way in order to measure quantity and quality by changing "colour" for 'texture', for example.

In this study, it is essential to verify that this does not remove the value given by H. Rorschach to this item in this test, but on the contrary opens it to other clinical dimensions, that specific of the blind or partially-sighted.

Moreover, this study could open up new approaches to 3-dimensional drawings and allow a great part of the ageing population to use this method in daily life, to find new bearings.

For instance, using certain textures to find one's way around the flat by 3-dimensional pictograms.

Keywords

Haptic - Projective test - Texture - Blindness - Discriminating.

Bibliographic references

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Poster in French

Addressing user experience in developing a web interface

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Summary

User experience (a term used by Donald Norman at the end of the 20th century) refers to the individual behaviour of a person, and the attitudes and feelings associated with using a specific product, system or service. Today this experience has given rise to the field of UX Design.

In the context of a project on the emerging trend to address user experience when designing platforms based on human-machine interaction, this paper focuses on the introduction of a survey of visually impaired users of a university website and the implications for interface design.

Two groups took part in this study; a first group of four students with no vision problems, and a second group of four visually impaired students. The sociological and biographical characteristics of the two groups were equivalent (age, sex, education, etc.). The members of the first group were distinguished only by their mastery of the Internet, while the visually impaired students were further distinguished by their level of mastery of screen reading software.

As a reminder, according to Nielsen tests conducted with five users suffice to resolve at least 80% of usability problems.

Keywords

Accessibility - Usage - User behaviour - User experience - Visual impairment.

Bibliographic references

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Poster in French



Design and assessment of nonvisual interaction techniques for digital tablets: the impact on haptic exploration and memorization

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Télécom Bretagne, Lussi, Brest

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Summary

With the spread of digital tablets, it is important to design interaction techniques that are adapted to the needs of visually impaired users and enable them to apprehend graphic content with their fingers, without a raised surface. Working from research on tactile perception by the visually impaired [1] and appropriate interaction techniques [2], we have designed three such techniques using vibration and voice output for the exploration of spatial configurations on tablets. With the Direct Guidance (DG) technique, voice messages guide the user's finger toward relevant points of interests (POI). With Edge Projection (EP), the POI are listed on the left-hand side according to their y axis and along the bottom edge according to their x axis. In the Grid Layout (GL) technique the screen is divided into nine rectangular zones. We hypothesized that DG would help with research, and GL with memorization of configurations. An experiment involving four spatial tasks was set up with 12 users, some normally sighted and some visually impaired. The results demonstrated that DG was the preferred technique for localization tasks. At the same time, less distance has to be covered when using GL, and fewer strategies are needed to memorize a configuration. GL thus appears to be more efficient. These findings contribute to understanding the links between strategies, techniques and tasks.

Keywords

Assistance technology - Digital tablet - Haptic exploration - Spatial cognition - Visual impairment.

Bibliographic references

Simonnet, M. and Vieilledent, S. (2012). Accuracy and Coordination of Spatial Frames of Reference during the Exploration of Virtual Maps: Interest for Orientation and Mobility of Blind People? *Adv. Human-Computer Interact.*, 19.

Kane, S. *et al.* (2011). Access Overlays: Improving Non-Visual Access to Large Touch Screens for Blind Users. In *UIST '11*, 273-282.

Poster in French

Touch, cross-linked views: philosophy, psychoanalysis and speech therapy

Marion Simonin

PhD, Université Paris 3, speech therapist

Summary

This article proposes first of all to address the sense of touch in the framework of phenomenology. As seen by Merleau-Ponty, the subject's body is linked to other bodies. Their union forms the "flesh of the world" (Merleau-Ponty, 1993). Jean-Luc Nancy conceives of the subject and the world as articulated. "The touch" is a deferred touch (Nancy, 2013). Michel Henry affirms the immanent power of the subject (Henry, 2011). Secondly we address the sense of touch in a subject with a disability: how can touch and desire be rearticulated when senses are defective? In this case perception and movement can be disturbed (Céleste and Lauras, 2000), altering both the subject's experience and the emotions related to this experience (Dolto, 1984). A therapeutic approach combining muscular stimulation and stimulation of emotions could foster unity. Our most recent analyses look at the sense of touch in the context of speech therapy. We studied the case of an infant with Down's syndrome, treated using the Padovan® method that stimulates the patient with holistic and multimodal touch intervention. The patient in turn invests in an orderly fashion a world that is found to be accessible. Body, hand and world become elements that the subject can integrate into a now unified reality (Gentaz, 2009).

Keywords

Haptics - Phenomenology - Psychoanalysis - Speech therapy.

Bibliographic references

- Céleste, B. & Lauras, B. (2000). *Le jeune enfant porteur de trisomie 21*. Paris : Nathan université.
- Dolto, F. (1984). *L'image inconsciente du corps*. Paris : Seuil.
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- Henry, M. (2011). *Philosophie et phénoménologie du corps*. Paris : PUF.
- Nancy, J.-L (2013). *Noli me tangere*. Paris : Bayard.
- Merleau-Ponty, M. (1993). *Le visible et l'invisible*. Paris : Gallimard.

Poster in French



Your words touch me: how tactile input contributes to perception of speech

Avril Treille, Coriandre Vilain

CNRS, GIPSA-Lab, Grenoble, France

Marc Sato

Laboratoire Parole et Langage, CNRS and Aix-Marseille Université, France

Summary

It is often said that speech is auditory and visual, but it is forgotten that these are movements that can also be felt. Thanks to this property deafblind persons can communicate, by placing a hand on the speaker's face to feel the movement of the sounds that are produced (Tadoma method). While the fusion mechanisms of the auditory and visual modalities have been widely studied in unimpaired individuals, no study has been made of the fusing of information from hearing and touch, one of the senses most often used on a daily basis, but rarely to perceive speech. Are the mechanisms used to integrate these two sensory sources similar to those used in audio-visual perception of speech? To answer this question we took inspiration from the Tadoma method to carry out two experiments using electroencephalography to explore audio-tactile perception of the syllables /pa/, /ta/, and/or /ka/ by a group of unimpaired subjects. In this case the naive subjects were able to identify by touch the syllables pronounced by the tester, suggesting use of our motor knowledge linked to speech production to make it easier to interpret the tactile information from the perceived movements. We also demonstrated the existence of integration mechanisms similar to those used to fuse auditory and visual information, by highlighting the presence of electrophysiological markers that are specific to the fusion process. These findings underscore the extraordinary capacity of our brain to draw upon our sensory and motor knowledge to optimally process unfamiliar information, such as that derived by touch, in order to achieve a form of communication.

Keywords

Electroencephalography - Speech perception - Tactile.

Poster in French

Personal notes

Friday, 18th March

Oral presentations



Lecture

Multi-sensorial exploration in learning

Édouard Gentaz

Professor of Psychology of Development at the University of Geneva
and research director at the CNRS (LPNC - Grenoble)

Summary

The objective of this conference is to show that multi-sensorial exploration, in particular through touch, encourages learning in babies as well as children. We shall present research on babies born prematurely that reveal elementary forms of learning. We shall then see how multisensory methods favor learning in school, like reading, writing and mathematics for young children.

Keywords

Baby - Child - Learning - Multisensoriality - Schooling.

Bibliographic references

Heller, M. et Gentaz, É. (2015). *Psychologie du toucher et de la cécité*. Talant-Dijon : Éditions les Doigts qui Rêvent.

Heller, M. and Gentaz, É. (2003). *Psychology of Touch and Blindness*. Hove : Psychology Press.

Translation French/English available



Touching and the traumatized hand

Dominique Le Nen

University professor - hospital surgeon, Regional University Hospital of Brest

Summary

The mutilation of the hand inflicts a twofold penalty on the victim: he must undergo the perception of other persons and live with the obsessive idea that the other person sees only his deformity. In addition, he is deprived of the normal use of his hand.

The hand has five specific characteristics: the **capacity to grasp**, which requires the mobility of the digital chains; the **strength** of the fist, necessary to hold objects; **dexterity**, needed for accurate movements; **touch**, the sophisticated result of the combination of sensitivity and touch; lastly, the **aesthetic dimension**.

As the cerebral "plasticity" of the individual must deal with a sensitivity impairment and thus with a touch impairment, it adapts to the functional capacities of the hand. When the impairment is severe, sight replaces sensation...*touch is the eye of the hand*.

A child with a mutilated hand grows up with that hand and uses it. He adapts his movements so as to be able to perform practically all movements needed in life. Serious traumas raise true ethical questions: should the mutilated hand be kept? Should the hand be reconstructed, keeping in mind the fact that the result might be mediocre? We are now dealing with situations that have to be evaluated case-by-case, as with the story of woman who underwent an operation on a deformed hand. Her hand was neither functional nor aesthetic, but it was a hand and she wanted to keep it. There were major sequels, but she built a new life for herself. Or there is the story of the child whose arm was amputated, and his other arm mutilated with a hand deprived of sensations, which forced him to use his feet. The sole of his feet became deeper, his toes became flexible, the sensitivity of his soles changed, his feet became organs capable of grasping. This capacity of the body and of the senses to adapt thus created all the necessary conditions to allow a function to change an organ and adapt to new tasks.

Professor Le Nen will give a lecture "Anatomie des mains, à la croisée des arts et des sciences", open to the public, on Saturday March 19th (in French only)

Keywords

Adaptation - Case studies - Hand - Mutilation.

Translation French/English and French sign language available

Orgasm without genital sensitivity: compensation for sensitivity impairment following a spinal injury

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Summary

In our society male sexuality is mainly shown (the media, pornography, etc.) as the physical performance of *sexual scripts* based on the erection and ejaculation. In these visual representations everything that can be felt or sensed usually remains implicit. This is perhaps why medicine (medical research, treatments, reeducation) focuses mainly on the restoration of erections and ejaculations in cases of alteration of the sexual function by spinal injury. Although sensitivity disorders are known, the sensorial aspects of sexuality are usually not taken into account. Is this perhaps because these impairments are considered as stemming "naturally" from physical acts? The men interviewed in the course of the research that I am conducting on the love-life and sex life of men with spinal injuries had been offered erection inducers. None of them, however, had been given explanations about possibilities to recover sexual sensations, even though they described the loss of pleasure in sexual relations as being considerable. The absence of genital sensations even led some of them to give up sexuality. It is on the basis of similar observations that the American sexologist M. Tepper, himself quadriplegic, wrote *Regain That Feeling*.

During their reeducation process men with spinal injuries must struggle against overall *impotence* confining them to a genital-centered model of sexuality, constituting an epistemological obstacle to the necessary adjustment to their new bodily capacities. Some men, however, go beyond this, and rebuild a satisfying sex life for themselves by deeply challenging sexual norms. On the basis of the testimonials of these men, their descriptions of their practices and sensations, it is possible to define and summarize possibilities for pleasure and orgasm even when genital sensitivity is absent.

Keywords

Eroticization - Orgasm - Sexuality - Spinal injury.

Bibliographic references

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Translation French/English and French sign language available



Tactile communication and deafblindness: bodily and emotional impacts

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Summary

The objective of this approach is to show the relevance of the notion of “bodily and emotional impacts” in the development of communication through dialogue and narrative with persons with multiple sensorial disabilities. In order to show this process we use video clips from manuals on *Communication and Congenital Deafblindness*. Indeed, the DbI Communication Network suggests that children reproduce gestures deriving from bodily and emotional images left in their memory by an actual experience. Their partners can facilitate this communication if they know how to identify which aspects of experience are most relevant, and observe how emotional and bodily impressions are formed in their bodies. These impacts do not resemble the image of the object or event that we form as adults. These impacts reveal the bodily, emotional and cognitive impression rooted and formed in the mind of a child during these shared interactions.

Analysis of the video allows us to observe how the partners co-construct these impacts during shared experiences generating in the subject (whether or not deafblind) more or less visible expressions evoking an experience that can be shared and developed in a dialogue and/or narration, including a “nonverbal” one.

Keywords

Bodily and emotional impacts - Congenital deafblindness - Dialogicality - Narrativity - Tactile communication.

Bibliographic references

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Janssen, M. *et al.* (2007). *Contact et interaction sociale*.

Souriau, J. *et al.* (2008). *Construction du sens*.

Souriau, J. *et al.* (2009). *Transition vers un langage culturel*.

Translation French/English and French sign language available

Haptices, touch messages, sharing environmental information

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ISE research group, University of Helsinki, Finland

Russ Palmer

ISE research group, University of Helsinki, Finland

Summary

Haptices are touch messages produced onto the body allowing people to experience emotions, face expressions, social quick messages and confirmation elements. Environmental visual and auditive information can be experienced and drawn onto a person's body.

Visually impaired person's perception of space are based on auditive and haptic information and may differ to those who are sighted. To enable the experience of environmental forms and social behaviour, can be defined as environmental description using haptices. (Lahtinen, Palmer & Lahtinen, 2010). The portrayal of visual and auditive images through haptices originates from social-haptic communication using verbal or signing interaction between two people (Lahtinen, 2008).

This approach consists of either drawing or mapping out the core elements of the particular space onto a person's arm or back by hand(s). The presentation will enable the participants to experience on how shapes, space and non verbal expressions can be applied and interpreted through touch. This allows the visually impaired person to gain a unique insight and to map out a mental image of the environment (Lahtinen, Palmer & Ojala, 2012). These approaches can be used with different client groups including sensory impaired, learning disabilities, elderly and terminal ill people.

Keywords

Environmental description - Haptic - Haptice - Sensory impaired - Social-haptic communication - Touch.

Bibliographic references

Lahtinen, R. (2008). *Haptices and Haptemes – a case study of developmental process in social-haptic communication of acquired deafblind people. Academic Dissertation*. University of Helsinki. Tampere: Cityoffset Oy.

Lahtinen, R. , Palmer. R & Ojala, S. (2012). Visual art experiences through touch using haptices. *Procedia Social and Behavioral Sciences*, 45, 268-276.

Lahtinen, R., Palmer, R. & Lahtinen, M. (2010). *Environmental Description for visually and dual sensory impaired people*. Helsinki: Art-Print Oy.

Translation French/English and French sign language available



Raised line drawings: an essential means of communication for the visually disabled

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University of Torino, President of Tactile Vision onlus Torino

Rocco Rolli

Architect, Vice-president of Tactile Vision onlus, Torino

Summary

How do the forms and means of communication develop in contemporary society? What are the effects on the situation of visually impaired persons, and how can they deal with these developments? How is their approach to reality modified from the perceptive point of view? What is the specific function attributed to speech? And to touch? What is the social composition today of the population affected by serious problems of sight, and what is the function that educational structures can fill in the process of integration? What elements must characterize the tools useful in fostering these processes, and which subjects must take charge of them?

From the point of view of visually disabled persons, what are the mechanisms to approach reality, which in everyday life constitute the context in which propositions useful in guaranteeing better communication practices with the environment and others can be rooted? Raised line drawings can represent the natural development of these practices. They also provide an opportunity to finetune the capacity of visually impaired persons to understand and produce effective messages.

Our presentation seeks to offer several initial responses to the questions indicated here. The purpose is to place the discussion about the function of touch in communication within a context that takes into account the social dimension as well as problems of concrete living which visually deficient persons must solve in their daily experience.

Keywords

Autonomy - Communication - Raised line drawings

In French only

How can exploration of tactile images be taught?

Florence Janin

Special teacher, Nantes

Summary

Exploration of tactile images mobilizes many skills (Hatwell, 2000), and must be learned (Bris, Morice, 1995). How does a specialized teacher of visually impaired schoolchildren (Teacher B) provide a pupil with tools to facilitate access to tactile information? We will highlight the ways in which certain of the teacher's representations are renewed in the course of the implemented sequence, and have an effect on the learning goals targeted by the teacher when guiding the pupil. We thoroughly studied the origin and nature of the determinations that weigh on the teacher's action, and we have built up a practical epistemological handbook (Sensevy, 2007, Toullec-Théry and Marlot, 2013, 2014). In parallel we studied in a similar fashion the practices of a specialized teacher for pupils with learning difficulties (Teacher E). These findings are presented by way of comparison.

Our findings show that Teacher B and Teacher E used very different types of guidance, and that in both cases practical epistemological factors had an impact on the teacher's action.

In this respect training of specialized teachers, and that of mainstream classroom teachers as well, should be reviewed in the light of inclusive education policy.

Keywords

Epistemology - Specialized education - Tactile guidance.

Bibliographic references

Bris, M., Morice, J.-C. (1995). Conception du dessin en relief pour les personnes non voyantes. *Le courrier de Suresnes*, 63, 5-16.

Janin, F. (2013). *Analyse croisée des interactions entre deux enseignants spécialisés et un élève lors de la guidance de lecture d'images tactiles*. Mémoire de Master 2 (non publié), Université de Nantes.

Sensevy, G., Mercier, A., (2007). *Agir ensemble, l'action didactique conjointe du professeur et des élèves*. Rennes : PU

Toullec-Théry, M., Janin, F. (2014). Lecture d'image tactiles et guidance par une enseignante spécialisée E, effets d'une situation inédite d'aide sur ses pratiques. In *La nouvelle revue de l'adaptation et de la scolarisation*, 66, 93-111.

Hatwell, Y. (2000). *Toucher pour connaître*. PUF.

In French only



Comprehension of tactile images in visually impaired children: the role of perceptual experience

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Summary

The objective of our work was to better understand how visually impaired children apprehend the tactile images illustrating the books that are meant for them, and to further our knowledge of the constraints imposed by their haptic perceptual system, in order to address their difficulties when they encounter these images (D'Anguilli, Kennedy and Heller, 1998; D'Anguilli and Kennedy, 2000). The question put in our study was: in what ways does the perceptive experience, determined by the degree of visual impairment, have an impact on the exploration and comprehension of tactile images?

We met with 70 children, aged 3 to 12, with differing degrees of visual impairment and no associated disabilities, and 72 sighted children in the same age group. The children were asked to manually explore and recognize tactile images. We observed the movement of their hands as they explored the images, and their performance in terms of recognition. Our findings show differences of approach in exploring and recognizing images between visually impaired and sighted children, and between blind children and partially sighted children.

It appears that comprehension of tactile images is linked to cognitive and motor-perception mechanisms that are strongly influenced by the children's perceptual experience. Their experience has an impact of the ways in which haptic information is gathered and processed, and also plays a role in the representation of content.

Keywords

Children - Haptic exploration - Haptic perception - Tactile image - Visual impairment.

Bibliographic references

D'Anguilli, A., and Kennedy, J. M. (2000). Guided exploration enhances tactual picture recognition in blindfolded sighted children: Implication for blind children. *International Journal of Rehabilitation Research*, 23, 319-320.

D'Anguilli, A., Kennedy J. M., and Heller, M. A. (1998). Blind children recognizing tactile pictures respond like sighted children given guidance in exploration. *Scandinavian Journal of Psychology*, 39, 187-190.

In French only

Raised line drawing: implications and limitations

Anne Chotin, Annie Tromeur, Guillaume Gabriel

INS HEA, Suresnes, office in charge of documents adapted for visually impaired persons

Summary

For a person blind from birth, drawing in relief and the reading of tactile images are not spontaneous aptitudes. They are not immediate sources of pleasures, rather they necessitate use of a code that must be learned, at the expense of intense intellectual effort. This is totally unlike the ways in which sighted people experience images and illustrations. The problems encountered are not only the challenge of tactile decoding, but lie also in differences of experience and representations. Raised images do, however, bring a number of things to blind persons.

By giving blind children images to touch they acquire precise knowledge of the real world that surrounds them, and of the ways in which others represent this reality: a spider has legs, a fish has scales. Images provide access to knowledge and durably imprint it. Reality takes on greater meaning, and with training and “guidance” a child can construct the world with greater accuracy.

Raised line drawings are set in the tactile memory, like an imprint, by structuring exercises and components. An octopus has eight tentacles: a drawing enables a child to count them, to feel their contours and study their configuration.

This knowledge, hypotheses and acquisitions of reading are verified by questioning the reader and asking him/her to reproduce certain elements in raised line drawing. The drawing technique is progressively appropriated and assimilated. Furthermore, the image is flexible and practical, compared to a 3D object.

Exploitation of illustration is a moment of sharing and exchange. Tactile images often include a textual or human guide, also an element of inclusion. Illustration, omnipresent in educational materials and practices, must also be included in the training of visually impaired children. This training cannot be exhaustive, however. Reading tactile images requires much time, energy and concentration, that are also needed in other areas. Furthermore, tactile illustration is necessary, but not sufficient, and to be fully effective must be prepared, supplemented and enriched by other activities.

Bibliographic references

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In French only



Discrimination strategies for braille

Torø Graven, PhD

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Summary

The figure identity strategy recognises each character, and performs preliminary analyses of dots; it ranks a feature conjunction (of dot location and dot quantity) as the most important discriminator. Then, it performs a specific analysis of dots, e.g. '*R's dot 5 equals V's dot 6*' (Graven, 2015, p. 85). The global characteristics strategy notices global braille letter shapes, e.g. '*An N and some L's, or something like that*' (*ibid.*, p. 87); it ranks one separate feature (either dot location or shape property) as the most important discriminator. If found necessary, it then performs a specific analysis of shape features, e.g. (N amongst Ls) '*One is a curve, while the other ones are a straight line*' (*ibid.*, p. 87). The touch vision strategy notices characters or shapes of dots, and performs preliminary analyses of dots/gaps or shape features. Next, it recognises the characters by associating them with visual experiences, e.g. braille '*V equals regular print, capital, L.*' (*ibid.*, p. 88). The figure identity strategy and the global characteristics strategy are equally fast, accurate, and used with equal amounts of after-decision certainty; for the touch vision strategy this varies according to visual experience. When the discrimination strategy fails, either because of attentional load or because of not focussing attention sufficiently, braille readers lack a repertoire of alternative discrimination strategies, and/or the experience of using this repertoire (Graven, in press).

Keywords

Attention - Braille - Discrimination strategy - Haptic touch - Recognition proficiency.

Bibliographic references

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Translation French/English and French sign language available

Assessment of tactile discrimination skills of blind students of primary school age admitted in special schools for visually impaired

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Summary

For blind people, touch is the most appropriate sense to achieve spatial information (Hatwell, 2003). Many tactile tests were developed throughout the years to measure the tactual skills (Mazella, Albaret, Picard, 2014).

Procedure:

60 blind students admitted in preparatory class (24) and first grade (36) of the two special schools for visually impaired in Bulgaria participated in this research. They were never taught any tactile skills in a structured way. The pupils were tested with 3 tactile tests:

- 1) The Nolan-Morris roughness test (short version of Mommers of 1974);
- 2) The Crandell & Hammill test for tactile discrimination of shapes of 1968;
- 3) Test for tactile discrimination of size (Mommers, 1974).

Results:

A classical item analysis by Cronbach's Alpha for reliability and internal consistency was used. It showed that all three tests were highly internally consistent.

The level of recognized items of the 3 tactile tests showed that:

- In the roughness discrimination tests items 4, 14, 7, 5 were the easiest ones (recognized by 53% of the pupils and up). The most difficult were items 30 and 31.
- In the Crandell & Hammill test for tactile discrimination of shapes the easiest items were 5, 4, 15, 20, 6 (recognized by 52% of the pupils and up). The most difficult were items 13, 10, 12, 25.
- In the Mommers test for tactile discrimination of size items 7, 8, 11, 4, 9, 18 were the easiest ones (recognized by 50% of the pupils and up). The most difficult items were 30, 29, 27.

Conclusion:

The level of performance of the majority of the blind students in Bulgaria (above 50%) with the 3 tests was low. Most of them did not have developed tactile discrimination skills. These skills are highly important for learning Braille, for reading relief materials and tactile maps.

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Translation French/English and French sign language available



The use of technology to enhance tactual learning: A study of braille teaching professionals

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Summary

The development of braille instigated an historic shift in the social participation of blind citizens in the western world by permitting the acquisition of written and linguistic proficiencies (Dodd & Conn 2000, p. 2; Argyropoulos & Martos 2006, p. 682). Despite the benefits (which include demonstrably improved employment outcomes), the adventitiously blind are less likely to learn braille (Goudiras *et al.*, 2009). The research in this presentation explores the premise that new technologies might appropriately be used to enhance and reinforce braille literacy. Findings are based on a survey of braille instructors across North America aimed at better understanding their views on the relationship between braille and technology, and the extent to which they use technology to enhance braille learning. Results demonstrate that braille instructors are less likely to use technology with seniors; rehabilitation instructors feel less capable of teaching braille using technology than school-based educators; blind or low vision instructors are less concerned that new technologies will displace braille literacy; and school-based educators find technology to be more beneficial to learning than rehabilitation instructors. These findings and their implications will be discussed, as will questions they raise regarding the future teaching and learning of braille.

Keywords

Braille - Rehabilitation - Teaching - Tactual perception - Technology.

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Translation French/English and French sign language available

In search of an aesthetics of touch

Aldo Grassini

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Summary

Touch is a way of learning, touch is a way of communicating, and touch is also a path providing access to the aesthetic experience of art. Up to now we have sought to understand the cognitive capacity of touch, without paying much attention to its aesthetic potential. This issue has become essential, however, for thinking about genuine cultural integration of blind people; social integration is not possible without cultural integration, and art is a prime component of culture.

Can a blind person have a truly aesthetic experience of art?

Touch provides knowledge of certain specific properties that cannot be perceived by other senses: weight, temperature, solidity are exclusively tactile characteristics. Other properties can be perceived by other senses, but can only be materially apprehended by touch: volume in three dimensions, smoothness, a raised line, fullness and void, etc. And touch also gives its own pleasurable sensation that is different from that procured by sight.

A tactile image is not formed in the same way as a visual image, but they can both be experienced in an authentically aesthetic manner. There is a pathway to art that calls upon the sense of touch, and uses emotional components and not just cognitive elements. In visual experience the subject and the object remain distinct, separated by a space; tactile contact eliminates this space. Touch includes a participation of the affect that is not found in visual perception.

If this is true for blind people, why wouldn't it be valid for sighted people as well? Adding the pleasure of touch to the pleasure of sight offers a new approach to the enjoyment of art. It is time to develop a theory of the aesthetics of touch, a domain not yet explored.

Keywords

Access to art - Aesthetics of touch.

Bibliographic references

Grassini, A. (2015). *Per un'estetica della tattilità. Ma esistono davvero arti visive?* Rome: Armando Editore.

Translation French/English and French sign language available



Appropriation of an architectural work by touch

Marie-Pierre Warnault, Project manager

Anne Ruelland, Director

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Summary

For mediation, interpretation and the creation of hands-on pedagogical tools, the team at the visitor programmes office of the Cité de l'Architecture & du Patrimoine draws upon the principle of universal design. This approach posits that components designed for people with disabilities can be used by all. In this context we will present two workshops that we have designed, exploiting the sense of touch for all categories of visitors.

In the first of these workshops, visitors use touch to discover architectural fragments that are hidden from view. This workshop, accompanied by a human guide, is used during cultural events.

The second workshop, called "Touch to draw!", follows on the first workshop; having explored a raised line drawing by touch visitors are given an opportunity to reproduce this drawing in a suitable medium. In this workshop, created for a temporary exhibit, visitors followed the activity on their own, without guidance.

In our paper we will present the objectives and principles of these workshops, and analyse the feedback gathered from different types of visitors. Then we will open a discussion on the benefits that sighted visitors can draw from this tactile experience, in terms of memory, mental representation, appropriation and more generally apprehension of the world through touch, an often neglected sense.

Translation French/English and French sign language available

The tactile gallery at the Louvre

A personal account of an innovative educational practice

Laura Solaro

Musée du Louvre

Summary

The Louvre museum has a space dedicated to tactile apprehension located in its sculpture collection.

This tactile gallery has attracted ever increasing numbers of visitors since its inception in 1995. The space, initially created specifically for blind and visually impaired visitors, now welcomes visitors with disabilities, school and after-school activity groups, and visitors unfamiliar with museum culture. Access is unrestricted and all museum-goers can visit the gallery.

While the sense of touch is crucial for the apprehension of a work of sculpture by the visually impaired, ideally this sense is a requisite for all visitors who want to fully appreciate a sculpture. Touch is intrinsic to the sculptor's creative act, and implicates us in the material nature of the work. Tactile discovery addresses fundamental issues of sculpture – volume, relief, surface – and enables us to directly and concretely apprehend them.

This approach has since brought new life to the conception of interpretive exhibits and tools in other areas of the museum: tactile interpretation of works in the Islamic Arts section, samples of materials in the new Petite Galerie.

As of 2011, the Education and Training department sought to design a training module aimed at actors in education. This module is entitled "Touching and seeing, for a greater appreciation of sculpture", and is regularly offered in the catalogue of the museum's training courses. Adopting a universal approach, this course is designed as much for educators, teachers at all levels of schooling, group activity leaders and social workers, as for people working with the blind and the visually impaired.

Keywords

Museum - Touch - Universal accessibility.

Bibliographic references

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Senett, R. (2010). *Ce que sait la main; la culture de l'Artisanat*. Paris: Albin Michel.

Translation French/English and French sign language available



Self to world, and world to self: from sense of touch to dance

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Summary

Since 2005 the Acajou company has offered contemporary dance workshops accessible to the visually impaired, and pursues artistic research in this area.

In particular our work involves different ways of soliciting the bodily sensations in a global fashion. By introducing an awareness of and/or actions on and with the skin, muscles, tendons, joints, nervous system, etc., we stimulate the somesthetic system as a whole. Our exercises include self massage and manipulations to build an awareness of the body's envelope of flesh, of the architecture of the human body, and of the continual internal restructuring that takes places whenever there is movement. We also offer tactile teaching tools that incite the dancer to better construct his or her corporal or choreographic imagination, using an expedient contact with an outside object, but with a movement of appropriation that involves a reflexive focus on self and a transcription via the dancer's own body. These specific approaches developed by our company nourish the dancer's sense of touch, challenge it, and may even push back its boundaries, depth and impact. They also open up new spaces for research to explore the movement of appropriation and the specific investment that are engendered by touch – active somesthetics can reveal the imagination and personality of each individual.

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Translation French/English and French sign language available

Personal notes

Friday, 18th March

Posters



Blind friendly maps – hapticke.mapy.cz

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Petr Červenka

Masaryk University, Support Centre for Students with Special Needs

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Radek Seifert, Czech Technical University (Université technique tchèque), Support Centre ELSA

Petr Hofman, Seznam.cz

Summary

Space concept of the surrounding area is one of the most important preconditions of the independent mobility and orientation of the blind people. Tactile maps are considered to be the most appropriate source of spatial information. One of the main problems of the tactile maps usage is their problematic accessibility for the blind users since they are not available in time and with up-to-date content. The map production is a matter of tedious manual work and a result of expensive and time-consuming technical methods.

After several years of joint effort of the support centers at Czech Technical University in Prague and Masaryk University in Brno, and in cooperation with Seznam.cz company (an operator of the Mapy.cz map portal), the blind people have opportunity to use free available tactile maps of the entire Czech Republic (see <http://hapticke.mapy.cz> with the highest possible zoom).

Using the Mapnik toolkit, source vector map data are automatically converted to special maps, which can be downloaded and printed on a microcapsule paper so they become readable by touch. The whole country is displayed on map sheets in a single scale (approximately 1:1500, which corresponds to the area of 300 × 425 meters per sheet), with a single map key and with an integrated system of the description. Street names are abbreviated and displayed in the Braille code. Technology of the microcapsule (swell) paper was selected as the most accessible technology for tactile graphics in Czech Republic (at schools and support centers for the visually impaired).

Our method opens new perspectives of tactile maps usage because detailed tactile maps of a selected territory are available in a few minutes and they are updated in the same mode and from the same source data as all other web maps at the portal. Even web maps may now be “blind friendly”.

Keywords

Accessibility - Map portal - Tactile cartography - Web mapping service.

Bibliographic references

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Poster in English. English and French spoken



Early education of blind children and acquisition of skills: accompanying and structuring multisensory discoveries so that they make sense

Nathalie Caffier

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Summary

From birth blind children, with or without associated disabilities, are confronted with messages and information that they cannot process on their own. Their atypical evolution leads them to react to certain stimuli and to appear to be completely indifferent to others, sometimes creating a disharmony.

Early support and accompaniment of these children and their families can allow them to develop sensory and motor skills, and open up to their environment.

Through game playing the first acquisitions will progressively call upon a child's muscle tone, and give meaning to sitting up, make the child want to act and then interact with the immediate environment.

The child will be able to associate sensation, stimulation and new experience with meaning that can be accessed in co-action with an adult.

In this wider scope of discoveries and acquisitions, touch occupies a fundamental place. Through this sense a child will be able to explore the surrounding space, and learn to master it by calibrating gestures and force, developing fine motor skills, and will be able to dissociate and synchronize the use of hands to better master the space.

Tactile and haptic sensations, verbalized and continually adjusted according to the child's interests and skills, will serve to lead the child to understand that she can be active, and communicate, discover and learn.

Keywords

Early support - Experience - Meaning - Structuring - Touch

Bibliographic references

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Poster in French

Touch: another way of listening

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Hugues Genevois

Researcher, head of the LAM research team, *Institut Jean le Rond d'Alembert*, UPMC, CNRS

Summary

What is listening by touch? What are the modes of access, the sensory play and practices that are possible in the area of vibratory reception for persons with disabilities? Devices for listening by touch transmit sound signals through materials in such a way that the sounds can be perceived by the body.

The *Écouter Autrement* devices are made up of Tables and Stations. Unlike ordinary listening, where sound is conducted by air and transmitted by the auditory system, these “sonotactile” devices offer access to auditory information through contact. The world of listening can be explored by touch.

Using tactile interfaces (tablet, game controllers, etc.) it is possible to play on/with these devices “like a musical instrument”, alone or with others. We are developing practices that take into account the constraints and complementary characteristics tied to sensory differences. By their proprioceptive and kinaesthetic grounding, games built around vibratory and sound mediation provide an entertaining and creative pathway to new practices with sound, accessible to all types of sensory situations.

The *Écouter Autrement* devices were developed in conjunction with the accessibility event “Monuments for all” organized by the Centre des Monuments Nationaux (Panthéon, Paris, 2010), with support from the Fondation Orange. Subsequently, with further support from the Agence Nationale de la Recherche, we developed a “vibrasound” teaching approach for pupils at the Institut National de Jeunes Sourds (2012-2013) and for children (deaf and blind) at the Institut d'Education Sensorielle in Metz (Centre Pompidou-Metz, 2015).

Keywords

Bone conduction - Listening by touch - Music - Vibratory reception.

Bibliographic references

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- Les oreilles à fleur de peau*, vidéo (13'), M. Pietrzak, M. Gourdon, Labex Arts et Médiations Humaines, 2015.

Poster in French



Touch to create

Viviana Díaz

Director, Fondation Tactus, Bogota, Colombia

Summary

The Tactus Foundation is dedicated to the social, cultural and educational inclusion of children with disabilities in Colombia, focusing in particular on books, reading and publication of illustrated tactile books. Our methodology emphasizes creation of participatory community workshops. In 2013 we started the Touch to create project in five cities in Colombia, with a total of 120 participants, for the most part mothers from the local community. In the course of two artistic and experience-based workshops participants were encouraged to elaborate their thinking about disabilities, and about the ways in which the world is apprehended through the five senses. At the end of the workshop five mockups were created for illustrated tactile books recounting local stories. One of these was selected for publication in Colombia, in partnership with the Ministry of Culture. A total of 1,650 artisan-produced copies were published and distributed in the 1,492 public libraries in Colombia.

This poster presents a discussion of the project outcomes. In the community workshops the participants identified and assimilated the components of an illustrated tactile book and the characteristics of the illustrations. In the course of a three-day workshop, the participants were able to grasp concepts such as disability, tactile book and multisensory perception. These notions were materialized in practical exercises, enabling the participants to produce a mockup of an illustrated tactile book, from start to finish.

Keywords

Participation - Tactile image.

Poster in French

Audience-adapted tours and creation of mental representations: some thoughts and personal accounts

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Chantal Lécolier

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Geneviève Delwarte

Speech therapist, educational coordinator, "Les Amis des Aveugles et Malvoyants"

Summary

The Belgian national charity *Les Amis des Aveugles et Malvoyants* works to develop universal accessibility. The organization conducts cultural visits tailored to the needs of blind people, and trains staff at cultural institutions, with the active participation of visually impaired individuals, using teaching methods that consciously and purposely involve the different senses and introspection, the basis of the *Passeurs de sens* © methodology.

As practitioners of *Gestion Mentale* (cognitive pedagogy), we observe that regardless of individual profiles, multiple perceptual encoding not only favours the elaboration of rich and meaningful representations, it also convokes different aesthetic fields simultaneously, creating factors for cognitive integration leading to insight. Despite their richness, audio descriptions do not suffice to attain the deep meaning and emotion conveyed by a work of art. Metaphor, transmodal qualification and appropriate spatial vocabulary must simultaneously rely on cross-stimulation of the senses and on an active corporal approach. With reference to Hatwell, Streri and Gentaz, as well as to Rosenthal (synesthésies), we seek to refine haptic and proprioceptive perceptions in order to create multimodal evocations, and to use haptic verification so as to move towards a pseudo materialization of mental constructions. This approach is dynamic over time, grounded in the unicity of the body, and procures a form of pleasure in creation that emerges in parallel. The memory capacities that are so important for blind people are augmented as a result. Our "hyper visual" Western society neglects these types of acquisition and learning. With improved exploratory movement, greater sensitivity in touching objects, heightened perception of materials, the faculty of raising questions is developed, as is the desire for discovery, and the capacity to focus on the essential, offering an infinity of assets that predispose to an intimate experience of the creative act.

Keywords

Adapted tours - Cognitive pedagogy - Haptics - Mental management - Museum.

Bibliographic references

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Poster in French



Touch, spatial representation and learning in visually impaired students studying massage and physical therapy

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Sigolène Larivière

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Cédric Carré

Health executive, physiotherapist, teacher and practitioner,
educational coordinator IFMK-DV- Lyon

Summary

Based on ongoing research and work on touch and spatial representation aimed at visually impaired students training in massage and physical therapy, we present an exploratory survey that starts with the hypothesis that the visual status of the subjects affects the accuracy of movements when reproducing anatomical forms. This hypothesis is based on theoretical findings that show that vision plays a role in orientation (Luyat, 1997; Neimer *et al.*, 1997) and in the use of an allocentric marker (Miletic, 1994), and that touch can be used to recognize objects (Lederman *et al.*, 1993, Richard *et al.*, 2004), forms (Henriques *et al.*, 2014) and raised two-dimensional patterns (Picard *et al.*, 2010). This is related to learning anatomical objects in three dimensions, as with the bones of a skeleton. This survey shows that some severely visually impaired students have significant difficulty in constructing spatial representations of movement in relation to massage and physical therapy.

Keywords

Physical therapy - Spatial representation - Touch - Visual impairment.

Bibliographic references

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Poster in French

Putting globalization in 3D perspective

Géraldine Le Roy des Barres

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Summary

This contribution presents a teaching experiment carried out on in classes in middle school and vocational high school classes in France that include pupils with disabilities (in most cases visual impairment, but not exclusively) and pupils without disabilities, with varying skill levels.

Using the teaching materials provided – this was a condition for participation in the experiment – and in keeping with the Education Ministry curricula, the objective was to construct a learning process focusing on the concept of globalization, a topic in the geography curriculum.

The experiment addressed the specific difficulties observed in this segment of the student body, i.e.:

- difficulty in mastering basic localization tasks in geography lessons,
- difficulty in grasping notions of relationships between different regions of the world in “flat” representations (plane projections, including raised line drawings as the case may be),
- difficulty in perceiving globalization as a worldwide phenomenon.

We chose the following options in our work:

- use of a three-dimensional medium, e.g. a suitable world globe,
- no ready-made workbook,
- instead, to have pupils manipulate the phenomenon, both literally and figuratively, in order to break down the multiple components and foster comprehension,
- through a specific example (in the case discussed the example is the global cotton value chain, from production and processing to sale)
- while following standard methods for construction of geographic representations (documentation, creating a legend, choice of appropriate figures and/or textures).

This activity is a variant of a classical “map creation” exercise in geography class, designed to allow a diverse class group to work together on the same physical medium.

Poster in French



Using sensory and motor exploration to appropriate a story

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Céline Chabot

Project coordinator, *Fédération des Aveugles de France* (French association of blind people)

Françoise Legoasduff

Educator – instructor, AVJ, IPIDV Brest

Christine Lyneel

Occupational therapist – instructor, AVJ, FAF Languedoc-Roussillon

Summary

In 2006 the Fédération des Aveugles de France drew up a programme entitled “Prereading/ language/representations” in collaboration with teams of professionals who work with visually impaired young children on a daily basis. Régine Michel, the initiator of this project, sought to elaborate a new and original teaching tool based on the discovery of the world of stories, by linking them to psychological and motor stimulation and the development of mental representations.

Five kits of teaching materials were designed with professionals in the field, and researchers joined in the pilot experimentation phases. The stage of pooling experience began in 2010, and was rapidly expanded to become Comenius Eveil, a three-year European programme involving six countries. The programme developed by the Fédération des Aveugles de France is currently implemented jointly by three institutions: IPIDV (Brest), FAF Languedoc Roussillon (Montpellier) and CTRDV (Lyon).

The teaching kit contains several tools: a book printed in Braille and in large type, enriched with tactile illustrations, a sound recording on CD, a teaching guide and observation grids.

The Service des Actions Médico-Sociales (Sams) and the Centre Technique Régional pour la Déficience Visuelle (CTRDV) (establishments operated by not-for-profit group PEP69) have used one of the teaching kits in workshops since 2012. With the support of the April foundation, in 2015 a multidisciplinary team of professionals created a new book with tactile illustrations enabling children to experience anew the sensory perceptions discovered in the workshops. The illustrations are enriched by sound chips that reproduce the sound emitted by the object, or an ambient auditory setting. The book stimulates tactile curiosity and haptic skills. It fosters a first step in the passage from 3D to 2D.

Keywords

Multidisciplinary work - Tactile illustration - Sensory experience.

Poster in French

Development of Three-Dimensional Models of Earth for Tactile Learning

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Summary

Blind people can recognize three-dimensional shapes through tactile sensations. Therefore, effective models are useful in tactile learning. In the special thematic session in ICCHP, we have been focusing upon three-dimensional tactile models which developed by using the most advanced technologies.

In the international conference "Touch to learn, touch to communicate", we present our three-Dimensional tactile models of Earth. We utilized exact topography data obtained by planetary explorations. Therefore, 3D models of Earth by additive manufacturing possess exact shape of relief on their spherical surfaces. Several improvements were given to models to suit tactile learning. Experimental results showed that the Earth models developed in this study by additive manufacturing were useful for tactile learning of the globe of the visually impaired.

Keywords

Additive manufacturing - Globe with exact relief - Tactile 3D model - Topography data - Visually impaired people.

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Poster in English



Tactile communication and shared experience on a daily basis

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Summary

The scientific work of Hatwell (since 1966), Fraiberg (1977), Millar (1997) and Gentaz (since 2000), has given us knowledge of the complexity of tactile and haptic perception, in terms of spatial and temporal construction, for visually impaired children. At the Institut des Jeunes Aveugles we encounter children with the rare handicap of deafblindness. These children are restricted in their verbal communication, with little motivation to spontaneously use their hands.

How can we enhance communication and construction of meaning in the daily world to guide these children towards a better understanding of their environment?

In our communication we present our observation and assessment grids, and our operational approach to communication and hereditary deafblindness, based on work by Rødbroe, Souriau and Janseen (1999). Using case studies we illustrate the work involved to create a framework for joint attention, routines, co-action, corporal memory of emotions, and storytelling (in tactile signing, oral language or other system).

This specific form of accompaniment helped these children develop new modalities of sensory and motor expression, and broadened their awareness of their surroundings. This approach requires in-depth familiarity with the child, however, in order to support construction of meaning in the context of shared daily experience. To this end we are developing collaborative interdisciplinary observation in an institutional setting and in the natural environment, for application to all nonverbal children.

Keywords

Accounts - Communication - Observation - Shared experience.

Bibliographic references

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Poster in French

Communication and mediation via touch in science exhibits: limitations and constraints to visitor experience

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Summary

This communication deals with the “general public” of visitors to a number of interactive exhibits that accord a direct or indirect role to the sense of touch in knowledge mediation and interpretation. The role of touch is discussed in terms of its limitations and constraints in communication situations. The social mobilizations of touch are not immediately evident; what are the conditions under which visitors actually use touch in experiencing an exhibit? What connections with other signifiers are the most conducive to reception? This qualitative research relies on observation and interviews. Apprehension of interactive objects appears to be dependent on the surrounding setting of sociability – sharing and exchange with other visitors, or with a docent/interpreter/mediator. Previous familiarity with museum configurations is also a decisive factor. Different degrees of participation can be identified, from visual imagining of “vicarious” touching, to direct engagement, enabling us to interpret the dynamics of the visitors’ experiences.

Keywords

Cultural mediation and interpretation - Exhibit - Reception - Scientific communication - Touch.

Bibliographic references

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Poster in French



A multisensory toolbox about comic strip for visually impaired children: A participatory design approach

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Summary

We are presenting the results of a research conducted within the publishing house *Les Doigts Qui Rêvent* (Fingers That Dream) to develop an educational toolbox about comic strips for children with visual disabilities. This device was created in a participatory design process. The research approach we adopted stems from 2 observations: 1) Tactile pictures in accessible media (picture books, mediation tools, etc.) are often merely tactile reproductions of the original visual content. Although accessible to touch, this content is seldom in line with the semiotic and perceptual context of blind children (Valente, 2015; Heller & Gentaz, 2014), and 2) In most cases, these pictures are made by sighted people trying to be “blind”. User participation is thus limited to the passive role of “test subjects” rather to validate a finished product than to actually be involved in its development (Darras, in press).

The aim of this project was to develop a toolbox to enable young people with visual disabilities to discover some codes of comic strips, in a playful way adapted to their perceptual reality. As part of a Design for All approach, we also wanted to offer a rich educational experience for both blind and sighted children. The toolbox has been designed as part of mediation workshops with visual impaired teenagers at the public library José Cabanis in Toulouse (France). We will detail the different stages of this project and in particular the co-creative process that was put in place.

Keywords

Comic strip - Participative design - Visual impairment.

Bibliographic references

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Darras, B. (In press). Design du codesign, axiologies et méthodologies du design participatif, In C. Courtecuisse & E. Vandecastelle (Eds.). *D'un territoire à l'autre*. Presses universitaires de Saint-Étienne.

Poster in French. English and French spoken

Personal notes

Saturday, 19th March
Oral presentations



“Digital media that we are touching”: Effects of touch screen and serious game in learning and behaviour

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Summary

With the boom in interactive media and social digital devices (mobile phone, interactive tablet, connected objects...) touch has become essential in the new media usage and ICT (Information and Communications Technology) (Sundar et al., 2015). To communicate with people, work, learn, play, buy on the internet... touching screens or interacting with communication through « tactile-kinesthetic acts » has become usual for most of us. A multidisciplinary team of researchers is trying to better understand the roles and cognitive/behavioral effects of touch and interactivity of digital media. In our opinion, thanks to interactivity, touch screen interactions could totally change the cognitive, emotional and behavioral effects of exposure and media uses. We will show you the results of two experiments carried out in two different fields of activity: serious game and point of sale display.

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In French only



Multisensory approach to learning to read and write: from pedagogical intuition to research in developmental cognitive psychology

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Summary

Montessori (1915) initiated a multisensory approach to school learning that called not only on the visual and auditory modes but also on the kinesthetic mode. The impact of this approach on learning to read and write has recently been reassessed. Here, we will present a set of research undertakings that demonstrate the effectiveness of multisensory training, including that of kinesthetic exploration (whether haptic or graphomotor), on the process of learning to read and write.

Studies of the haptic exploration of letters have revealed an improvement in reading at the age of 5 (Bara *et al.*, 2004), as well as in the alphabetical and phonological knowledge of 5-year-old-children at risk of learning difficulties (Bara *et al.*, 2007). Visuo-haptic exploration improves handwriting quality among 5-year-old children (Bara *et al.*, 2010), and also enhances written production (Labat, *et al.*, 2011; Labat *et al.*, 2015) and fluency (Palluel-Germain *et al.* 2007).

Another set of works has examined the effect of graphomotor exploration (highlighting or copying) on learning letters. Longcamp *et al.* (2005) compared two types of learning (typing at a keyboard vs handwriting) among children aged 3, 4 and 5 years and showed that handwriting encourages the recognition of letters and symbols (orientation). Vinter and Chartrel (2010) showed that visuo-motor training (observation of letter-writing and copying) modifies the dynamic parameters of handwriting by improving the automation of the graphical movements (increasing handwriting speed and reducing the number of velocity peaks).

This multisensory approach could constitute an additional tool to help reduce reading difficulties among disabled children. Recent results concerning this issue will be reported (Labat *et al.*, 2013; Labat *et al.*, in preparation).

The conclusion will involve an interpretation of these works within the theoretical framework of embodied cognition (Barsalou, 2008) and the need to validate them under ecological conditions (Lilliard, 2012).

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In French only



Stalls - Carrefour Numérique area

Publications de l'INS HEA

INS HEA flyers, books, journal (mostly in French)

Éditions de la Cité des Sciences - Éditions du patrimoine

Raised line and audio books.

Mutuelle générale de l'Éducation nationale (MGEN)

MGEN health insurance's action plans for disabled people.

Mutuelle d'assurance des instituteurs de France (MAIF)

The insurance company's actions for disabled people and students with special needs.

Mes mains en Or

Tactile books for children, tactile pedagogical books.

Les Doigts qui Rêvent

Tactile illustrated books for V. Imp children: children's literature, educational, academic, art; essays & research on blindness and visual impairment for parents & professional.

English spoken.

Imprimerie Laville Braille

Tactilo-visual documents with print and Braille, as well as drawings, pictures or maps on the same medium, both in visible and tactile print.

English spoken.

Association Percevoir

Movie about the discovery of an object from the collections of the musée du Quai Branly, through sound and touch.

English spoken.

Résonance fossile

Visual and tactile exhibition inspired by scientific museography

Créations en papiers d'Anne Meier Soumille

Paper creations by artist Anne Meier Soumille. Friday only.

Interprétations tactiles de Gabrielle Sauvillers

Models : « tactile interpretations » . Friday only.

English, Spanish and Italian spoken.

DeafBlind international (DBI) et International Council for Education of People with Visual Impairment (ICEVI)

These two organizations work in favor of deafblind and visually impaired people. Both organise an international conference in 2017.

English spoken.

Inside Vision

Digital innovation : a new Touch Pad for the visually impaired, Inside One

Thursday only. English spoken



Organization

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