Designing Wiimprovisation for Mediation in Group Music Therapy with Children Suffering from Behavioral Disorders

S. Benveniste, P. Jouvelot, R. Michel, E. Lecourt
MINES ParisTech and Université Paris Descartes

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June 3-5, Como*

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I Music, Games and Health:
- Related work
- Research Directions

II System:
- Technology
- Interaction design

III Field Tests:
- Sonorous Communication
- Population and protocol

IV Results:
- Usability
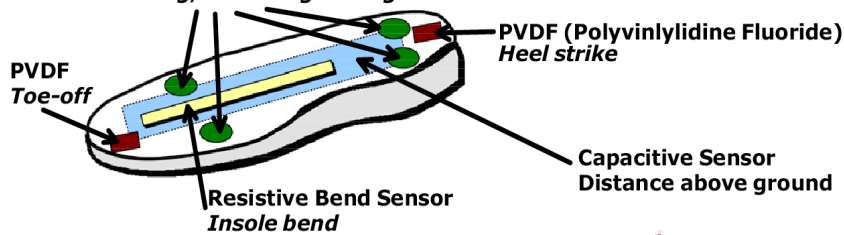- Cultural and motivational levers
- Psychodynamic aspects

V Perspectives

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Resistive Bend Sensor
Dorsiflexion / Plantarflexion

Circuit Boards, Power Supply, RF Transceiver:

- **3 Axes of Gyroscopes**
  Angular Velocity

- **3 Axes of Accelerometers**
  Linear Acceleration

- **Sonar, Board to Ground**
  Distance of foot above ground

- **Sonar, Board to Board**
  Distance, angle between feet

FSR (Force Sensitive Resistor)
Stride timing, left-to-right weight distribution

PVDF
Toe-off

PVDF (Polyvinlylidine Fluoride)
Heel strike

Capacitive Sensor
Distance above ground

Resistive Bend Sensor
Insole bend

Instrumented Footwear
MIT Media Lab

MIDICreator/Grid, MTLogbook
University of York

Marble Mania, PDWii, Remission, Ico
Serious games, Games for Health

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Therapeutic instrument design:
- Iterative process (Action Research)
- Customization

Game-like motivational strategies:
- Fun
- Cultural background

Data collection and analysis:
- Sound and movement
- Visualization and segmentation
- Logistics

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WiiMote:
- Accelerometers
- Buttons and stick

Sound generation:
- MIDI
- Battery, Kontakt

Software:
- Glovepie
- MTTB, MT Logbook
- Reaper

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Objectives:
- Instinctive
- Robust
- Rich (exploration)

Triggering:
- Percussion gesture
- Two Wiimotes per patient
- Three volumes (acceleration)

Two button groups:
- Sound choice (A,B,D)
- Instrument choice (+,H,-)

Change sound

Change instrument

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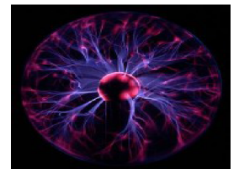
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Broad spectrum:
- 16 instruments
- Melodic and percussive

Cultural diversity:
- Traditional or mainstream
- Organic or synthetic

Bongos Shaker Derbuka Cymbale

Wood Blocks Gong Marimba Piano

Piccolo Rhodes Orgue Guitare

Tuba Robot Accord de Plage Atmo

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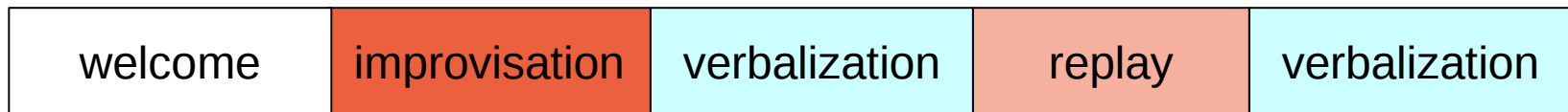
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Day care hospital:
- Children up to 12 years old
- Behavioral disorders
- "Roaming" therapeutic activities

Music therapy groups:
- Planned beforehand
- Focus on rhythm

Adapted *Sonorous Communication*:
- Playing together Vs communicating
- Specific timeline

welcome	improvisation	verbalization	replay	verbalization

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Aura of fun:
- Refered to as "the Wii"
- From excitement to motivation
- Consistently chosen
- Same status as a normal instrument

Cultural levers:
- Attraction to mainstream, melodic instruments
- Curiosity for ethnic instruments
- Social value of musicianship

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Usability/robustness:
- 5 months of testing
- Intuitive triggering
- Sound navigation increasingly mastered

Participative design (Action Research):
- Feedback integration (patients and therapists)
- Self-esteem

Positive behavioral impact:
- Increased motivation
- Planning
- Focus (system failures)

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Corporality:
- No obvious lack
- Compensation with gestures and symbols
- Mediation is possible

Identity:
- Anxiety
- Importance of individuation
- Group solutions

Sonorous history:
- Larger sound palette
- New sounds => new responses

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Viable approach:
- Feasibility proven
- Action Research efficient
- Motivation through fun and cultural levers

Promising psychodynamic observations:
- Mediation clearly possible
- Treatment acceptance (planning)
- New responses (identity, new sounds, etc.)

Permanent evolution:
- Motivation renewed via progressive empowerment
- Creation of a full-fledged treatment protocol

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Audio excerpts available at:

www.cri.ensmp.fr/mawii

Personalization:
- Choice of a new instrument
- Recording of personal samples

Data collection and analysis:
- Synchrony
- Movement (motion capture at Paris Descartes)
- Group MT Logbook

Controlled experiment:
- Closed group, Wiimotes only
- Comparison with usual instruments
- Test of a full process