



**IM-TWIN: from Intrinsic Motivations
to Transitional Wearable INTelligent
companions for autism spectrum disorder**
a European funded project

***Open day for Families 1
Deliverable 6.10***



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Acronyms of partners

CNR-ISTC	Consiglio Nazionale delle Ricerche, Istituto di Scienze e Tecnologie della Cognizione (Italy)
UU	Universiteit Utrecht (The Netherlands)
CRI	Centre de Recherches Interdisciplinaires (France)
LA SAPIENZA	Università degli Studi di Roma La Sapienza (Italy)
PLUX	Plux - Wireless Biosignals S.A. (Portugal)

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1. Overview of the deliverable

Deliverable 6.10 presents the Open day for families organised by CRI in France, scheduled to take place on Tuesday, November 14, 2023, as part of a day focused on autism for families. This event is being coordinated in collaboration with the Autism Resource Center Nord-Pas-de-Calais.

2. Open day for families

2.1 The event

The event on November 14, 2023, will be organised by the “Autisme Ressources Hauts-de-France” association, which reached out to the CRI team for us to participate and present the IM-Twin project. We chose to host the Open day for families within this framework to reach a broader audience than we could have reached by organising an independent event.



Figure 1: Affiche de la journée organisée par le CRA le mardi 14 novembre 2023

The “*Autisme Ressources Hauts-de-France*” association serves as the regional hub for all those seeking to improve the identification, diagnosis, and support of people with Autistic Spectrum Disorder (ASD). It brings together most of the stakeholders involved in autism in the Hauts-de-France region. In 2005, the “*Autisme Ressources Hauts-de-France*” association received accreditation from the National Health Agency (ARS) to establish the “*Centre Ressources Autisme Nord-Pas-de-Calais*.” A Resource Center is a medico-social establishment dedicated to individuals with autism spectrum disorders, their families, and professionals in the

field of support. Autism resource centres carry out their missions for children, adolescents, and adults with autism spectrum disorders, their families, the professionals who provide support, and anyone concerned. In France, Autism Resource Centers are among the few facilities authorised to diagnose autism. (Source, in French: <https://cra-npdc.fr/le-cra/>)

The event on November 14 is open to professionals working with ASD people, but primarily to families of ASD children and ASD people themselves. The day is scheduled in two parts:

- Understanding: During the morning, presentations will be given by parents and therapists on understanding ASD.
- Supporting: In the afternoon, the sessions will focus on supportive programs, presented directly by therapists.

Throughout the day, research teams, including ours (CRI), will host scientific mediation booths to showcase their research projects to visitors, primarily families.

2.2 Presentation of the IM-Twin project by the CRI team

The scientific mediation booth for the IM-Twin project will be hosted by Lisa Jacquey.

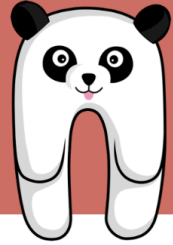
The booth will include, firstly, a poster summarising the main results of the IM-Twin project in a format accessible to the general public (see next page). This poster will serve as a basis for discussions with families.

Secondly, a demonstration of PlusMe and the T-shirts will be offered to families (including children) so they can interact with the developed devices.

During this event, Lisa Jacquey had the opportunity to interact with about ten families regarding the IM-Twin project. The participating families showed interest in the project. They expressed particular interest in the fact that PlusMe could serve as a potential screening tool/support tool for therapy and also as a plush toy, an item considered familiar to children, which seemed very suitable. Most families believed that their child would feel comfortable interacting with PlusMe. While the T-shirt initially raised concerns for some families, they seemed reassured after a brief demonstration. Concerns raised focused on the potential difficulty of using the Im-Twin system by professionals or families, as well as the cost, making it less accessible.

3. Conclusions

The Open day for families will provide an opportunity to introduce the IM-Twin project to numerous parents of ASD children. The objectives are twofold: firstly, to disseminate information about the IM-Twin project, and secondly, to gather families' feedback and impressions regarding the developed devices (PlusMe and the t-shirts).



Projet européen Im-Twin

Lisa Jacquey (PSITEC, Université de Lille - LPI)



Le projet Im-Twin

Ce projet de recherche a pour objectif de **développer de nouvelles technologies interactives** pour faciliter la prise en charge et le dépistage précoce des enfants avec un Trouble du Spectre de l'Autisme (TSA). Il réunit 5 équipes à travers l'Union Européenne.



PlusMe

PlusMe est une **peluche interactive et multisensorielle**, proposant à des jeunes enfants (< 5 ans) différentes activités contrôlées par l'adulte via une tablette connectée en Bluetooth.



PlusMe propose **6 activités mettant en jeu des compétences sensibles dans le cadre du TSA** : intérêt pour la nouveauté, imitation, jeu symbolique, tour de rôle, pointage et attention conjointe.

Les principaux résultats

PlusMe peut-il être employé dans le cadre du dépistage précoce du TSA ?

Deux études menées auprès de 32 et 21 enfants suggèrent que PlusMe pourrait être un outil approprié pour accompagner le repérage des signes précoces du TSA. Nous avons observé des différences significatives dans la réalisation des activités entre des enfants avec TSA, TSL* et DT**.

Les t-shirts connectés

Les t-shirts connectés sont portés par l'enfant et permettent de mesurer en temps réel **des données physiologiques qui pourraient être des indices de l'état émotionnel de l'enfant**, sans passer par le langage : la fréquence cardiaque, l'activité électrodermale, la température et les mouvements.



Les t-shirts connectés permettent-ils de rendre compte de l'état émotionnel des enfants ?

Les premiers résultats issus des données de 23 enfants confirment que les t-shirts sont efficaces pour récolter des données physiologiques de haute qualité. L'étude est toujours en cours pour déterminer si ces données sont un bon indicateur de l'état émotionnel des enfants, sans passer par le langage ou d'autres signes comportementaux.

* TSL : Trouble Spécifique du Langage

** DT : Développement Typique

Figure 2: Poster for the Open day for families

History of changes

No.	Description
1	Version updated from 1 to 2 (February 2024)
2	<p>At the end of section 2.2 “<i>Presentation of the IM-Twin project by the CRI team</i>”, page 5, a new paragraph reporting the feedback from attendees was added:</p> <p><i>“During this event, Lisa Jacquey had the opportunity to interact with about ten families regarding the IM-Twin project. The participating families showed interest in the project. They expressed particular interest in the fact that PlusMe could serve as a potential screening tool/support tool for therapy and also as a plush toy, an item considered familiar to children, which seemed very suitable. Most families believed that their child would feel comfortable interacting with PlusMe. While the T-shirt initially raised concerns for some families, they seemed reassured after a brief demonstration. Concerns raised focused on the potential difficulty of using the Im-Twin system by professionals or families, as well as the cost, making it less accessible”.</i></p>