VRMIND– Virtual Reality Based Evaluation of Mental Disorders
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D5.1 – Independent Report on the performance of AULA on European population

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1. EXECUTIVE SUMMARY

VRMIND-AULA (Nesplora Aula from now on) is a neuropsychological test for attention in children from 6 to 16 years old. It is a Continuous Performance Test (CPT) designed to evaluate attentional processes and support the diagnosis of attention disorders, it analyses the child's behaviour within a classroom. It is also valuable in other kind of disorders where attentional processes are essential like generalized developmental disorders, difficulties to learn or cognitive deficiencies. Nesplora Aula offers scores about: sustained attention, divided attention (visual and auditory); impulsivity; excessive motor activity (hyperactivity); tendency to distraction, processing speed, focus on the task, attentional difference between visual and audio stimuli and between more and less stimulating tasks, sterile movement, motor activity and fatigue for tasks. Also distinguishes the tendencies to the internal or external distraction. The normative study of Nesplora Aula with general population of Spain was published in Journal of Attention Disorders (Iriarte et al., 2012), and the convergent validity with Conners' Continuous Performance Test, the market leading test, has been recently published in Child Neuropsychology journal (Díaz et al., 2014).

This product was launched to the market on 2011 and it has been sold to 350 customers in 22 countries. From 2011 up to now both the professionals from Nesplora and also our customers have made different investigations with this tool.

Even though to continue researching with Nesplora Aula it is always useful since these studies increase the visibility of the tool and its clinical value. This is the reason why it was planned to perform clinical studies with Nesplora Aula in different countries at the beginning or the VRMIND Project.

This deliverable describes the contacts with potentials collaborators made in section 3. The studies which were finally carried out are specified in section 4 while the main conclusions are drawn up in section 5.

It is important to notice that our current collaborators in Europe have not shared with us all the data and they will do it in the future. Besides, we are

currently talking and trying to reach agreements with other potential collaborators in Europe.

2. RELATION WITH OTHER WPS AND DELIVERABLES

This deliverable is closely related with D5.2 (Independent report on the performance of AULA on Latam population) and D5.3 (Independent report on the performance of AULA on N. American population).

3. COLLABORATOR'S STUDIES

Since the moment we received the approval of the VRMIND project we started looking for European collaborators. First of all we contacted with those members who signed an interest letter to collaborate with us and also with our current clients who have previously expressed interest in carrying out studies with Nesplora Aula. Most of our contacts did not want to collaborate with us mainly due to agenda constraints and difficulties to achieve the ethical issues.

So we started inviting different experts in the neuropsychological and ADHD field. At this point, we start focusing mainly on France, Germany and Italy, since they are really interesting countries for us for business reasons. These unsuccessful contacts are shown in table 1.

Table 1. Contacts done but not signed (for confidentiality reasons, the columns including the name of the centers has been deleted in this version)

CITY	REASON FOR NOT PARTICIPATING
France	No feedback after first contact
France	After first contact he suggested us to contact another colleague who did not answer
France	No guarantee of having the results on time
France	No feedback after first contact
France	No guarantee of having the results on time

France	No feedback after first contact
Switzerland	No availability of sample with the criteria requested
Belgium	No feedback after first contact
Germany	No feedback after first contact
Germany	No feedback after first contact
Germany	No feedback after first contact
Germany	No feedback after first contact
Germany	No feedback after first contact
Germany	No feedback after first contact
Germany	No feedback after first contact
Germany	No feedback after first contact
Germany	No feedback after first contact
Germany	No feedback after first contact
Germany	No feedback after first contact
Germany	No feedback after first contact
Spain	No guarantee of having the results on time.
Spain	No availability of sample with the criteria requested
Iceland	No feedback after first contact
Spain	No guarantee of having access to the sample in the time agreed
Spain	No guarantee of having access to the sample in the time agreed
Spain	No availability of sample with the criteria requested. We agreed with the collaborator to contact again in September.
France	No feedback after first contact
Spain	No guarantee of having the results on time. Lack of agreement about the conditions of the study

We also published a profile in the Enterprise Europe Network - EEN. This process has been relatively slow and started to show interesting outcomes on February. These have been the institutions interested in collaborating with us:

SPAIN

1. Consorci Sociosanitari de Terrassa

2. Hermanas Hospitalarias, which is currently collaborating in the studies with the Nesplora Aquarium test
3. Andalusian Knowledge Agency
4. Therapeutic Community of Jaen
5. La Fé Hospital

ITALY

1. Camera di Commercio Industria Artigianato Agricoltura di Torino
2. Casa di Cura del Policlinico

GREECE

1. CSRI- Cognitive Systems Research Institute

We have talked with all of them and they are in different phases of the collaboration process. In fact, the Greek collaborator has already signed an agreement for Nesplora Aquarium. The other seven collaborators are interested in VRMIND and they want to collaborate but they still do not know in which study they want to participate.

3.1 InPaula

Collaborator's description: InPaula is an institute of children neurorehabilitation which emerged in June 2010 with the aim of becoming a referent in innovation and quality, able to offer a cognitive, sensorial and motor integral re-education. But it is, above all, the project of two parents – university professors in Psychobiology and Experimental Psychology – who wanted to offer the best neurorehabilitation system to their daughter, Paula. The multidisplinary vocation results in a professional team of neuropsychologists, speech-therapists, physiotherapists and occupational therapists that work coordinated on individualized therapies designed for each child, taking always into account the essential labour of its family and closest environment.

Location: Almería (Spain)

Sample's commitment: 50 children between 6 and 16 years old

Sociodemographic data

	Number	Age average	Years of education (average)
Male	31	9.23 ± 2.74	6.8 ± 2.56
Female	15	9.6 ± 3.56	7.2 ± 3.07
Total	46	9.35 ± 2.98	6.93 ± 2.71

The diagnostic of the children were: 11 of them have Attention Deficit Disorder (ADD); 4 Attention Deficit Hyperactivity Disorder (ADHD); 4 Asperger syndrome (NAS); 3 Down Syndrome; 3 reading disorder/dyslexia; 2 Autism Spectrum Disorder (ASD); 2 reading and writing difficulties; 2 intellectual giftedness; 2 dyslalia; 2 intellectual disability; 2 learning difficulties; 1 myelomeningocele; 1 Specific Language Impairment (SLI); 1 psychomotor retardation; 1 neurofibromatosis; 1 preterm birth; 1 cerebral palsy; 1 maturational delay; 1 moderate mental retardation; and, 1 writing and reading delay.

Measurements:

- **Nesplora Aula**: Nesplora Aula (Climent & Banterla, 2010) is a continuous performance test that takes place in a virtual scenario, very similar to a school classroom. During 20 minutes, the child is situated in a virtual context, shown through a head-mounted display with movement sensors and earphones and a single-button switch. Perspective places the child in one of the desks, facing the blackboard, where the stimuli appear. Stimuli are presented both on a visual and auditory basis, and, at the same time, previously randomized distractors of ecological nature appear progressively. The core of Nesplora Aula is composed by two main exercises: (a) a NO-X paradigm-based exercise (i.e., "Press the button when you DO NOT

perceive the target stimulus") and (b) an X paradigm-based exercise (i.e., "Press the button when you perceive the target stimulus").

- **WISC-V: Wechsler Intelligence Scale for Children®-Fifth Edition** (Wechsler et al., 2003)**:** It is the latest version of the most proven trusted cognitive ability measure ever. It has been redesigned to give you a truly comprehensive picture of a child's abilities and it includes notable improvements to make identifying the issues—and finding the solutions—faster and easier.

Descriptive data:

WISC IV	
Description	**Mean ± Standard Deviation**
TOTAL_Intelligence_Coefficient_(IQ)	95.71 ± 23.32
Verbal Comprehension Index	103.4 ± 24.91
Perceptual Reasoning Index	96.13 ± 23.28
Working Memory Index	91. 56 ± 20.92
Processing Speed Index	93.36 ± 18.38
Block Design	8.42 ± 4.07
Similarities	10.69 ± 4.98
Digit Span	8.36 ± 3.97
Concepts	10.71 ± 4.49
Vocabulary	10.51 ± 4.58
Letter-Number Sequencing	9.23 ± 3.99
Matrix Reasoning	9.27 ± 4.06
Comprehension	10.31 ± 4.5
Symbol Search	8.82 ± 3.39
Nesplora Aula	
Description	**Mean ± Standard Deviation**

Total omissions	62.39 ± 10.60
Total commissions	55.21 ± 9.76
Average reaction time on correct answers	59.02 ± 14.55
Variability of reaction time on correct answers	64.61 ± 12.61
Motor activity	68.41 ± 11.57
Deviation from attentional focus	63.3 ± 9.97

Objectives of the study:

The aim of this study was to provide better understanding of the cognitive profile of children, mainly with ADHD, exploring the correlations between Nesplora Aula and WISC IV intelligence scale. However, in the total sample just 11 had a diagnosis of ADD and another 4 were diagnosed with ADHD. So, it is a small sample to analyse and the results obtained with this sample would not be good enough to reach solid conclusions. For this reason, we have thought that it would be better to split this sample in different sub-samples, according to their diagnosis, and the different sub-samples can be merged with data from other studies. Besides in Nesplora we carry out our own evaluations in our clinic with researching purposes, so part of this sample can be merged with other sub-samples. In this way we can assure that we get a better and more representative sample for the study.

At this moment, we are merging the InPaula's sample with the samples of INECO and Randall Institute. In total we have a sample of 156 people that can be divided in three different groups: (1) those with a diagnosis of ADHD (with or without hyperactivity); (2) those with a language disorders diagnosis; (3) those with autism spectrum disorders. According to the results of a preliminary study, it seems that each one of these groups have a different attentional profile that can be appreciated in Nesplora Aula. We are still analysing the data that will be published in an open source journal and it will also be part of the doctoral dissertation of an alumn from the University of Almería.

3.2 Proyecto3

Collaborator's description: Proyecto 3 Psicólogos is a network of clinical centres specialized in providing multidisciplinary care from the neuropsychology, psychology, speech treatment, psychiatry, occupational therapy and educational psychology perspectives. They are specialist on neurodevelopment.

Location: 3 different clinics in Spain at: Madrid, Vitoria and Miranda de Ebro.

Sample's commitment: 200 children between 6 and 16 years old.

This collaborator has shared the data with us in two different moments. As each time the data shared have been different (for instance, the first time he shared with us data from Nesplora Aula but the last time has not shared with us these data yet) we present the results in two different sub-sections.

Sociodemographic data of the evaluations shared the first time

		Number	Age average (SD)
Gender	Male	54	9.81 ± 2.37
	Female	13	10.92 ± 0.59
Grade	1º P.E.	4	6.75 ± 0.95
	2º P.E.	7	7.14 ± 0.37
	3º P.E.	23	8.48 ± 0.73
	4º P.E.	5	9.40 ± 0.54
	5º P.E.	6	10 ± 0
	6º P.E.	4	11 ± 0
	1º C.S.E.	4	12.75 ± 0.5
	2º C.S.E.	9	13.56 ± 1.01
	3º C.S.E.	5	15.20 ± 0.84
Total		67	10.03 ± 2.66

P.E.: Primary Education; C.S.E.; Compulsory Secondary Education

The participants were located in 2 school centres in Madrid and they had not previous diagnosis.

Measurements of the evaluations shared the first time:

- **Nesplora Aula**: Nesplora Aula (Climent & Banterla, 2010) is a continuous performance test that takes place in a virtual scenario, very similar to a school classroom. During 20 minutes, the child is situated in a virtual context, shown through a head-mounted display with movement sensors and earphones and a single-button switch. Perspective places the child in one of the desks, facing the blackboard, where the stimuli appear. Stimuli are presented both on a visual and auditory basis, and, at the same time, previously randomized distractors of ecological nature appear progressively. The core of Nesplora Aula is composed by two main exercises: (a) a NO-X paradigm-based exercise (i.e., "Press the button when you DO NOT perceive the target stimulus") and (b) an X paradigm-based exercise (i.e., "Press the button when you perceive the target stimulus").
- **Conners CPT 3**: The Conners Continuous Performance Test 3rd Edition is a task-oriented computerized assessment of attention-related problems in individuals aged 8 years and older. By indexing the respondent's performance in areas of inattentiveness, impulsivity, sustained attention, and vigilance, the Conners CPT 3 can be useful to the process of diagnosing Attention-Deficit/Hyperactive Disorder (ADHD) and other neurological conditions. During the 14-minute, 360-trial administration, respondents are required to push the spacebar when any letter, except "X", appears.

Descriptive data of the evaluations shared the first time:

Conners CPT 3 (T-Score)	
Name of the Variable	**Mean ± Standard Deviation**
Omissions	61.69 ± 17.707
Commissions	48.31 ± 8.459
Perseveration	50.69 ± 9.947

HRT-Hit Reaction Time	55.51 ± 10.355
HRTSD-Hit Reaction Time Standard Deviation	53.04 ± 10.076
Nesplora Aula (T-Score)	
Name of the Variable	**Mean ± Standard Deviation**
Total omissions	50.54 ± 9.75
Total commissions	53.30 ± 13.07
Total Reaction Time (RT)	58.42 ± 9.74
Total RT Standard deviation	59.03 ± 11.08
Visual omissions	49.61 ± 8.71
Visual commissions	53.55 ± 12.31
Visual Reaction Time (RT)	53.64 ± 9.45
Visual RT Standard deviation	53.25 ± 9.80
Auditory omissions	54.54 ± 9.51
Auditory commissions	54.10 ± 12.63
Auditory Reaction Time (RT)	63.57 ± 12.29
Auditory RT Standard deviation	55.28 ± 12.10
With distractors omissions	51.42 ± 9.53
With distractors commissions	51.46 ± 11.32
With distractors Reaction Time (RT)	60.30 ± 10.41
With distractors RT Standard deviation	59.21 ± 11.52
Without distractors omissions	50.76 ± 9.68
Without distractors commissions	54.90 ± 13.14
Without distractors Reaction Time (RT)	56.84 ± 9.40
Without distractors RT Standard deviation	57.75 ± 10.81
No-X task omissions	50.22 ± 9.74
No-X task commissions	52.78 ± 11.14
No-X task Reaction Time (RT)	57.57 ± 9.58
No-X task RT Standard deviation	58.30 ± 10.58
No-X task omissions	53.27 ± 9.96

No-X task commissions	54.19 ± 11.28
No-X task Reaction Time (RT)	59.46 ± 11.02
No-X task RT Standard deviation	57.69 ± 10.57

Objectives of the study: The objective is to test the convergent validity between Nesplora Aula and the Conners CPT 3, a golden standard in the clinical field for the evaluation of attention.

Hypotheses: The hypothesis is that the Nesplora Aula and Conners' CPT 3 will show an adequate convergent validity in those measures that are comparable between both tests. It is also expected that additional measures contained in the Nesplora Aula but not in the CPT 3 will add value to the clinical work.

Results: To assess the relationship between scores on the Nesplora Aula and the scores on the CPT 3, Spearman correlation coefficients were calculated, with statistical significance set at $p < .05$.

Results show convergence between some scores of the Conners CPT 3 and Nesplora Aula. Correlations between both test measures can be observed in the following table:

		CONNERS CPT 3rd Edition			
		Omissions	**Commissions**	**Reaction Time**	**RT Standard deviation**
NESPLORA AULA	**Variables AULA**	**Omissions AULA**	**Commissions AULA**	**Reaction Time AULA**	**RT Standard deviation AULA**
	Total	.110	.635**	.405**	.228

	Visual	.155	.644**	.489**	.224
	Auditory	.080	.519**	.314**	.250*
	With distractors	.153	.657**	.292*	.177
	Without distractor	.086	.555**	.461**	.269*
	No-X task	.091	.661**	.368**	.146
	X-task	.190	.475**	.434**	.300*

*p<.05; **p<.01

In the table, correlations between some scores of both tests can be observed. Commission errors and reaction time scores of the Conners CPT 3 correlate with commission errors and reaction time in Nesplora Aula in all the situations of the test (Total score, with and without distractors, visual and auditory and task 1 and 2). Regarding the standard deviation of reaction time, the score in the CPT 3 correlates with the same measure of Nesplora Aula for auditory stimuli, without distractors and in the second task (X-task).

However, we cannot draw conclusions yet, since we need the other missing data (more than 100 children's evaluations) and carry out again the statistical analysis.

Data from the evaluations shared the second time

Data of more participants have been collected in the last months. Until now, evaluations have been carried out with the tools Nesplora Aula and Conner CPT 3 of. Data of 10 more participants have been collected with these two tools, but they have not transferred us and it has not been possible to add them in the data analysed previously.

As the tool Nesplora Aula includes auditory and visual stimuli, and the Conners CPT 3 only presents visual stimuli, an evaluation has been carried out with the CATA test, Conners Continuous Auditory Test of Attention,

which only includes auditory stimuli, to compare also its relation with the results of Nesplora Aula.

Our collaborator has sending us a part of the data collected with CATA test, which are presented below. Nevertheless, it has not transferred us all data of CATA neither the data collected with Nesplora Aula. 50 participants have been evaluated with these two tools, but we only have data from 42 of the CATA tool.

Measurements the evaluations shared the second time:

The Conners Continuous Auditory Test of Attention (Conners CATA) measures a respondent's performance in areas of inattentiveness, impulsivity, and sustained attention, making it a useful tool in evaluating attention disorders and neurological functioning. The Conners CATA provides objective information about an individual's performance in attention tasks, complementing information obtained from CPT Conners 3.

Sample the evaluations shared the second time: 42 children between 6 and 16 years old.

Sociodemographic data the evaluations shared the second time

		Number	Age average (SD)
Gender	Male	25	9.44 ± 1.66
	Female	17	10.24 ± 2.95
Age	6 years	1	
	7 years	4	
	8 years	10	
	9 years	10	
	10 years	1	
	11 years	6	
	12 years	5	

	13 years	2	
	14 years	2	
	16 years	1	
Total		42	9.76 ± 2.27

CATA (T-Score)	
Name of the Variable	**Mean ± Standard Deviation**
Omissions	56.74 ± 14.43
Commissions	51.60 ± 12.15
Perseveration	49.52 ± 10.05
HRT-Hit Reaction Time	51.12 ± 11.07
HRTSD-Hit Reaction Time Standard Deviation	54.64 ± 11.45

Objectives of the study: The objective is to test the convergent validity between Nesplora Aula and the Conners Continuous Auditory Test of Attention (Conners CATA).

Hypotheses: The hypothesis is that the Nesplora Aula and Conners CATA will show an adequate convergent validity in those measures that are comparable between both tests. It is also expected that additional measures contained in the Nesplora Aula but not in the CATA will add value to the clinical work.

Results: The data that we have are insufficient to extract conclusions. It is necessary to have the Nesplora Aula data in order to verify the convergent validity between both tests. It is expected that our collaborators will send the data to us over the next few weeks.

To assess the relationship between scores on the Nesplora Aula and the scores on the Conners CATA, Spearman correlation coefficients will be calculated, with statistical significance set at $p < .05$.

Dissemination: Once the sample is completed and all the data analysed, we plan to publish a scientific article in a journal related with this area.

The data of the relationship between the Conners CPT3 and Nesplora Aula test have already been presented at the II Latin American Congress of Neuropsychology and XIV congress of the Andalusian Society of Neuropsychology, but will be held in May 2018, as oral communication, and it has been accepted.

In addition, when the data are completed, it is expected to publish it in a journal of the psychology area such as:

- Psicothema: Edited jointly by the Faculty of Psychology of the University of Oviedo and the Official College of Psychologists of Asturias. They admit works like basic or applied research, belonging to any field of psychology. It has an impact factor of 1.344.
- Spanish Journal of Psychology: Edited by the Complutense University of Madrid. The Spanish Journal of Psychology is published with the aim of promoting the international dissemination of relevant empirical research and theoretical and methodological proposals in the various areas of specialization within psychology. It has an impact factor of 0.502

3.3 ALCAGI

Collaborator's description: Alcagi is a non-profit association devoted to the promotion of activities focused on achieving the proper protection and support for talents and high intellectual capacities in kids and young people from the territory of Gipuzkoa.

Alcagi aims to support the full development of the personality of these kids, and the promotion of support classrooms in school centres as an appropriate treatment for their needs.

Location: Donostia-San Sebastián (Spain)

Sample: 15 children between 7 and 13 years old.

Sociodemographic data

	Number*	Age average
Male	8	9.63
Female	2	11
Total	10	9.90

*The sample is composed by 15 participants, 5 of them do not fit in the inclusion criteria which consist on obtaining a minimum IQ (Intellectual Coefficient) of 120 so only the data of 10 participants are showed.

Regarding the diagnosis, some of the participants were identified as high IQ before the study, other had suspicion about high IQ. WISC intelligence scale was administered in order to include the participant in the study.

Measurements:

- **Nesplora Aula**: Nesplora Aula (Climent & Banterla, 2010) is a continuous performance test that takes place in a virtual scenario, very similar to a school classroom. During 20 minutes, the child is situated in a virtual context, shown through a head-mounted display with movement sensors and earphones and a single-button switch. Perspective places the child in one of the desks, facing the blackboard, where the stimuli appear. Stimuli are presented both on a visual and auditory basis, and, at the same time, previously randomized distractors of ecological nature appear progressively. The core of Nesplora Aula is composed by two main exercises: (a) a NO-X paradigm-based exercise (i.e., “Press the button when you DO NOT perceive the target stimulus”) and (b) an X paradigm-based exercise (i.e., “Press the button when you perceive the target stimulus”).

- **WISC-V: Wechsler Intelligence Scale for Children®–Fifth Edition** (Wechsler et al., 2003)**:** It is the latest version of the most proven trusted cognitive ability measure ever. It has been redesigned to give you a truly comprehensive picture of a child's abilities and it

includes notable improvements to make identifying the issues—and finding the solutions—faster and easier.

- Descriptive data:

WISC-V	
Name of the Variable	**Mean ± Standard Deviation**
Comprensión verbal	125.80 ± 12.42
Razonamiento Perceptivo	128.10 ± 10.48
Memoria de Trabajo	127.30 ± 11.37
Velocidad de procesamiento	114.50 ± 15.48
CI Total	131.90 ± 7.99
Nesplora Aula	
Name of the Variable	**Mean ± Standard Deviation**
Total omissions	50.70 ± 11.16
Total commissions	49.60 ± 8.8
Total Reaction Time (RT)	45.6 ± 8.68
Total RT Standard deviation	52.8 ± 8.39
Motor activity	54.60 ± 16.15
Visual omissions	51.5 ± 11.02
Visual commissions	51.2 ± 5.84
Visual Reaction Time (RT)	39.1 ± 8.72
Visual RT Standard deviation	48.2 ± 10.34
Auditory omissions	53.90 ± 9.37
Auditory commissions	48.8 ± 11.99
Auditory Reaction Time (RT)	53.40 ± 11.95
Auditory RT Standard deviation	48.3 ± 9.45
With distractors omissions	51.7 ± 10.37
With distractors commissions	47.3 ± 9.09
With distractors Reaction Time (RT)	47.8 ± 7.51

With distractors RT Standard deviation	52.6 ± 8.22
With distractors motor activity	54.2 ± 15.51
Without distractors omissions	50.90 ± 10.95
Without distractors commissions	51.9 ± 9.68
Without distractors Reaction Time (RT)	44.20 ± 10.08
Without distractors RT Standard deviation	53.3 ± 8.27
Without distractors motor activity	53.80 ± 14.71
No-X task omissions	50.50 ± 10.97
No-X task commissions	51.20 ± 9.26
No-X task Reaction Time (RT)	45.1 ± 7.81
No-X task RT Standard deviation	52.8 ± 8.28
No-X task motor activity	50.0 ± 16.69
X task omissions	54.9 ± 11.79
X task commissions	50.10 ± 8.03
X task Reaction Time (RT)	48.60 ± 15.25
X task RT Standard deviation	52.80 ± 10.07
X task motor activity	56.70 ± 15.79

Objectives of the study: To verify the validity of the neuropsychological test Nesplora Aula for the diagnosis of ADHD on high I kids.

To test if kids with high IQ have certain attentional profile on the Nesplora Aula test.

Hypotheses: Nesplora Aula will be a valid test for the assessment of ADHD in kids with high IQ.

Kids with high IQ will obtain a different attentional profile than kids without high IQ.

Results: Results are not conclusive due to the small size of the sample. Qualitatively, a high motor activity and a normal amount of errors in the test

can be observed, what can point to a differential attentional profile. Data collection will continue in the following months.

Dissemination: Once the total sample is collected, the data will be published in a scientific journal or congress.

Over the last month the contact has resumed with associations, schools and clinics to try to get sample for this study. The entities contacted have been the following:

- ALCAGI (High Capacity Association of Gipuzkoa): The contact has been resumed and the proposal to participate in the study has been sent again.
- Aupatuz (High Capacity Association of the Basque Country): It has been made attempts to contact them through the Alcagi association.
- Adimac (Association of High Capabilities of Bilbao): It has been made attempts to contact them through the Alcagi association.
- San Luis La Salle College: It has been made attempts to contact them through the Alcagi association.
- Psycotaduy clinic: It is a clinic in Valencia, which treat High Capacity patients. They have been contacted with them and an agreement is being reached to carry out the data collection among the patients of the clinic who meet the inclusion criteria of the study. It is expected to sign the agreement during the month of January and that the data collection of approximately 40 participants will take place in the months of January, February and March of 2018. These data will allow us to perform the necessary analyses to verify the hypotheses of this study as well as publish them.

4. CONCLUSSIONS

The aim of these validation clinical studies is to measure the accuracy, validity, sensibility and specificity, for the detection of pathologies, of the Nesplora Aula test. From the commercial point of view, these tests are done in order to give value to the test in front of the market so the studies can open new markets in foreign countries.

Nesplora Aula was deployed into the market in 2011 and from that moment until now several studies have been carried out by the R+D department of Nesplora but also by independent experts, mainly our clients.

For this report we expected to make studies with a total sample of 300 subjects, and we have just been able to recruit 165 subjects. This reduction is due to the difficulties to find new collaborators to perform the studies in Europe. Even three collaborators were identified before the start of the project; they have not finally collaborated with us. So we have started from the beginning looking for collaborators. The ethical constraints and the deadline of the studies have been the main reasons to not collaborate with us. However, two of our current collaborators continue with the evaluations and they will give us the remaining data in the next months. With the total of their evaluations we will reach the 275-300 evaluations. The three studies carried out are very important since these studies will allow us to publish new scientific articles and to better position Nesplora Aula in the market. For instance, the study which is being carrying out in collaboration with Proyecto 3 will help us to demonstrate that Nesplora Aula has good psychometric characteristics. We have published a similar study but with a previous version of the Continuous Performance Test (CPT) of Conners (Díaz-Orueta et al., 2014). As the Conners test is the golden standard in USA for the evaluation of attentional processes, when we will finish our current study we will be able to demonstrate that Nesplora Aula has good psychometric properties in comparison with CPT3. The study with ALCAGI opens a new target population to be assessed with Nesplora Aula. To know the attentional profile of children with high capacities will allow us to position our tool not only as a tool for the diagnosis of ADHD but also for the assessment and characterization of the cognitive profile in children without problems. Finally, the study carried out with InPaula, has provided us with

more sample with different diagnoses that are being merged with those evaluations made by INECO and Universidad Autónoma de Asunción /Instituto Randall (see D5.2 for more information) since the characteristics of the sample and the evaluation protocol (Nesplora Aula and WISC-IV) are the same.

Even though, we have been able to close three agreements with three collaborators. Also we have closed another agreement with University College of London, Institute of Education (IOE). IOE is a world-leading centre for research and teaching in education and social science. Our collaborator there has an MSc in Cognitive and Clinical Neuroscience and she is PhD in Developmental Neuroscience at Goldsmiths University of London. At the IOE, she is investigating the effects of disturbed sleep on learning and behaviour in children with ADHD. Her intention is to test Nesplora Aula in a sample of ADHD children between 11 and 16 years-old together with other neuropsychological tools in order to compare their performance in these tools. However, she has not done it yet.

Finally, when we attended to the 6th ADHD World Congress (Vancouver April 2017) we made a contact of a professor from the Imperial College of London. Currently we are trying to reach an agreement with him and we hope to be able to carry out a study together very soon.

5. REFERENCES

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