



D5.12 – Independent Report on the performance of AQUARIUM on North American population



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1. EXECUTIVE SUMMARY

VRMIND-AQUARIUM (Nesplora Aquarium from now on) is a neuropsychological test for attention in people from 16 to 90 years old. It is a Continuous Performance Test (CPT) designed to evaluate mainly attentional processes and working memory and support the diagnosis of attention disorders, as well as the assessment of any adult with a clinical condition where attention is impaired. This assessment is carried out through the performance of the person within a virtual aquarium. Therefore, it is also valuable in disorders where attentional processes are essential like different dementias, acquired brain injury, affective and anxiety disorders and multiple sclerosis, among others. Nesplora Aquarium offers scores about: sustained attention, selective attention; working memory, inhibitory control; processing speed and its deviation, switching capacity and perseveration. Both visual and auditory stimuli are presented, so that both sensory channels are working at the same time.

This product was launched to the market on 2018 and from the development of the tool up to now both the professionals from Nesplora and also our collaborators have made different investigations with this tool and we continue researching with Nesplora Aquarium since these studies increase the visibility of the tool and its clinical value.

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

2. RELATION WITH OTHER WPS AND DELIVERABLES

This deliverable is closely related with D5.10 (Independent report on the performance of AQUARIUM on European population) and D5.11 (Independent report on the performance of AQUARIUM on Latam population).

3. COLLABORATOR'S STUDIES

Since the moment the tool Nesplora Aquarium was developed and ready for its use in the research field, we started looking for North American 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 were already using Nesplora Aula but also have access to adult population and that have previously expressed interest in carrying out studies with

Nesplora Aquarium. Unfortunately, our pool of current clients in USA it is not so big. The unsuccessful contacts are shown in table 1.

Despite having tried to contact different reference professionals in the field of neuropsychology, we were only able to establish contact with three potential collaborators. The fact of having a person in the U.S. who helped us by doing market prospecting was helpful to us in starting some contacts with potential collaborators, but it was not enough to be able to carry them forward. Finally, we have managed to carry out collaboration with a single collaborator.

3.1 Attention Disorders Clinic

Collaborator's description: Attention Disorders Clinic, provides evaluation, treatment, and ongoing management and support for children and adults with ADD, ADHD, Asperger's and Autistic Spectrum Disorders, learning and memory difficulties, and other related neuropsychological disorders such as anxiety and depression. It is a team comprised of a physician, nurse practitioners, and psychologists working together, in order to provide a comprehensive service.

Location: Utha (USA)

Sample: 100 people over 16 years old. Half of the sample is diagnosed of ADHD or ADD and the other half of the sample is a control group without any mental condition diagnosed.

Measurements:

- **Nesplora Aquarium:** Nesplora Aquarium (Climent, 2018) is a continuous performance test that takes place in a virtual scenario, very similar to a real aquarium. During 20 minutes, the person 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 person in one seat of the mail hall, facing the principal fish tank, 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 Aquarium is composed by two main exercises: (a) Dual Xno paradigm-based exercise (i.e., "Press the button with every stimuli EXCEPT when you see the clownfish or you hear the word surgeon") and (b) Dual Xno paradigm-based exercise with interference (i.e.,

“Press the button with every stimuli EXCEPT when you see the surgeon or you hear the word clown”).

Objective of the study:

The aim of this study is double. On the one hand, to carry out a sensitivity study in order to analyze the discrimination capacity of Nesplora Aquarium to detect ADHD and/or ADD. On the other hand, to analyze the validity of the neuropsychological test Nesplora Aquarium for the monitoring of pharmacological treatment with amphetamines in patients with ADHD. As a secondary objective, we aim to quantify and characterize the effect of the administered drug.

Hypothesis:

- 1) Nesplora Aquarium will have a good discrimination capacity to differentiate between people with ADHD or ADD and healthy people.
- 2) Nesplora Aquarium will be a valid test for the monitoring of pharmacological treatment with amphetamines in ADHD patients. Pharmacological treatment has quantitative and qualitative effects on the attentional processes impaired in these subjects, making them improve.

Results and conclusions:

The deliverable D1.3 presents the summary of the process followed with this collaborator and the results.

4. CONCLUSIONS

The aim of this validation clinical study is to measure validity and sensibility for the detection of pathologies, of the Nesplora Aquarium test, as well of the capacity to monitor pharmacological treatment. 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 Aquarium has been deployed into the market in 2018 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.

We have encountered difficulties to establish collaborations in North America. In many cases, we did not even receive a feedback after the first contact and in the other ones, reported in the beginning of this document, we could not finally arrange collaboration, specially also for problems with the collaborators related with the ethical issues.

Even though, we have been able to close an agreement with just one collaborator. Anyway, we consider that it would be great to continue with clinical studies in North America, since it is the more difficult region for us to start the commercialization and these studies can help us a lot with this purpose. For this reason we will continue searching for new collaborators for these clinical studies during the VRMIND lifecycle and beyond.

it is important to mention that the studies carried out with Nesplora Aquarium in LATAM and in Europe have provided us with contacts with other centres there that are interested in our tools and will also make it possible for us to open more studies and more markets there in the future.



5. REFERENCES

Climont, G. (2018). Nesplora Aquarium. San Sebastián: Nesplora.