## What Can We Do To Make AAC Devices Configuration Easier?

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# Topics

Problem Statement

Increasing configuration complexity

• Our Portuguese AAC Tool

– Eugénio

- Evaluation of the Configuration Interface
  - Tests, Participants, Tasks, Tools
- Results and Discussion
- Conclusions and Future Work

#### **Problem Statement**

- AAC tools are designed to meet different users' needs and capabilities
- Many options are included...
- Difficult to configure!



# Eugénio Example (1)

- Version 1
  - A very simple word predictor
  - User profiles
- 18 options only
  - Profile options
    - Interface options
    - Advanced prediction options

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Tamanho das Letras das Palavras Preditas:

 18

 Número Máximo de Palavras Preditas

 4

 Coordenadas Iniciais da Janela:

 70

 Teclas para Completar:
 F1, F2, ..., F10

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# Eugénio Example (2)

- Version 2
  - On-screen keyboard
    - Different layouts
  - Scanning access
  - New interface settings
  - User vocabulary
- 43 options
  - Profile options
    - Interface options
      - Grouping
    - Advanced prediction options
    - Dictionaries management

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# Eugénio Example (3)

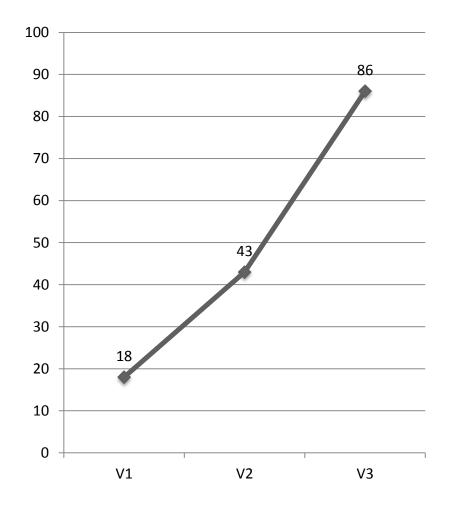
- Version 3
  - Pictograms
  - On-screen keyboard editor
  - Pictogram prediction
  - Sentence prediction
  - Co-construction
  - Context-awareness (time, location, speaking partner)
- 86 options
  - User profile options
    - Tabs
  - Import, Export, Pictogram Galleries, ...
  - Global options
    - Not user profile dependent

Eugénio with ARASAAC pictograms (designed by Sergio Palao to CATEDU)

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## **Increasing Number of Options!**

- Doubles at each version
- Dialog-based interfaces may not be enough to deal with it...
  - Many ATs use it
- May be of no use if are difficult to configure!
  - AT abandonment
- So...
  - What Can We Do To Make AAC Devices Configuration Easier?



# Method

- Ask users to configure a dialog-based interface
  - Eugénio
- Standard tasks
  - Create user profiles, create on-screen keyboards, ...
- Get configurators feedback
  - Difficulties, improvement suggestions
- Analyze and categorize feedback
  - To improve the configuration interface



### Participants

- 23 Rehabilitation Professionals
  - Cerebral Palsy Center of Beja
  - School Clusters n.º 2 of Beja
  - School Clusters n.º3 of Beja
- Speech therapists, occupational therapists, school teachers
  - Different levels of expertise



### Procedure

- Four-module training course
- In each module
  - Participants learned how to perform typical tasks
  - Later had to perform similar task on their own
    - Submit difficulties and suggestions
- At the end of each module
  - Questionnaire
- After development of real AAC solutions
  - Questionnaire



# **Training Course Modules**

- Module 1
  - User profiles management
  - Basic communication boards
- Module 2
  - Advanced communication boards
- Module 3
  - Importing and exporting data
  - Speech synthesis, vocabulary prediction and scanning access configuration
- Module 4
  - Location, time and speaking partner awareness



## Task Example

- Create a communication board with the following structure and name it *Cafeteria*.
  - a. Adjust the size of the keys.
  - b. Set the keys output to text. Test it.
  - c. Set the keys output to pictogram. Test it.
  - d. Adjust the editing area.

Coffee	Juice	Cake	Chocolate	
Toast	Soup	Water	Ice-Cream	
Candies	Pie	Sandwich	?	
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Eugénio with ARASAAC pictograms (designed by Sergio Palao to CATEDU)

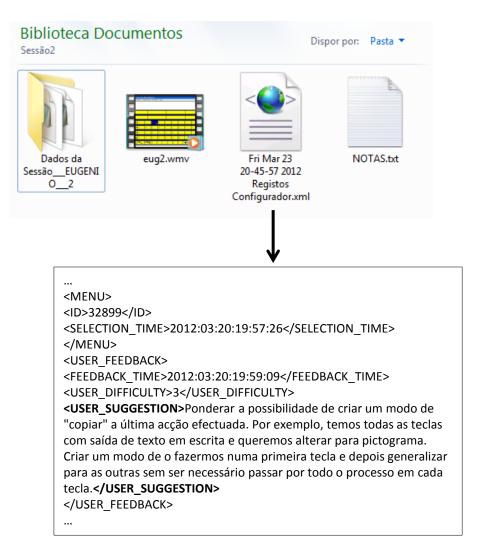
## **Configurators Feedback**

- Collect user feedback from each dialog-box
   – R button
- General feedback also possible
  - Menu option

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User Feedback		-		×
How do you rate th	ne difficulty level o	f the dialog box you are	working in?	
Comments and imp	rovements?			
				*
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## **Collected** Data

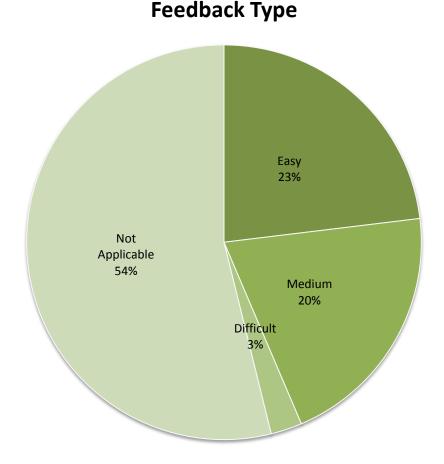
- Session Data
  - user profiles, on-screen keyboards, ...
- Session screencast
  - Screen recording
- Configurators feedback and navigation
  - Log file
    - menus and dialog-boxes opened
    - user feedback
- Questionnaires
  - Post-Task and Post-AAC Solutions Development



#### FEEDBACK DURING TASK EXECUTION

## **Configurators Feedback**

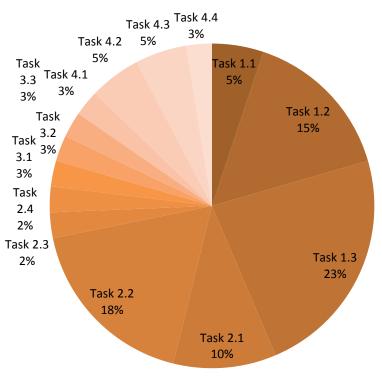
- 39 suggestions or difficulties
- Most of the times dialog boxes were not scored
  - Not Applicable (21)
- Dialog scores
  - Easy (9)
  - Medium (8)
  - Difficult (1)



# Feedback During Task Execution

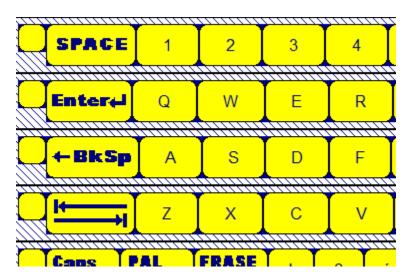
- More feedback in first modules
  - New tool, most obvious problems, task familiarity
- Top 5
  - Task 1.3 (9)
    - Basic on-screen keyboard management
  - Task 2.2 (7)
    - Advanced on-screen keyboard management
  - Task 1.2 (6)
    - Basic user profile configuration
  - Task 2.1 (4)
    - Prediction keys management

#### Reported Suggestions or Difficulties Per Task



# What Did Configurators Say! (1)

- Small bugs and insufficient or missing functionality
  - Possibility to change the on-screen keyboard's name (2)
  - Correct the min and max values for vocabulary prediction (1)
  - Possibility to center text in keys (1)
  - Correct adaptation of labels' size to the width of keys (1)
  - Make access to keys' properties faster (2)
  - Improve navigation in the message editing area (1)
- Would be better to manipulate objects directly
  - Drag and drop keys (2)
  - Drag and drop user profiles (1)

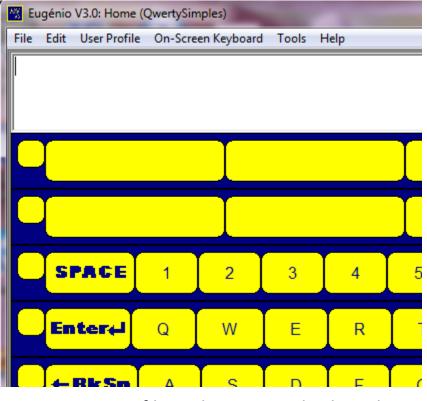


Drag -and-drop keys not available

# What Did Configurators Say! (2)

#### • Some language corrections

- Correct the name of a key's property (6)
- Correct the name of a onscreen keyboard's property (1)
- Difficulties identifying available options and active elements
  - Hide and show available options according to context (1)
  - More feedback about which is the active on-screen keyboard (1)
  - More feedback about which is the active user profile (1)



Active profile and on-screen keyboard

# What Did Configurators Say! (3)

#### Perform automatic operations

- Whenever possible fill keys' options automatically (1)
- Applying the same action to several keys (7)
- Applying the same action to several days of the week (6)
- Interactive help
  - Assistance configuring keys' properties (1)

Time Adaptat	tion 🔽					
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
00:00-23:59	00:00-08:50 16:00-23:59	00:00-08:50 16:00-23:59	00:00-08:50 16:00-23:59	00:00-08:50 16:00-23:59	00:00-08:50 16:00-23:59	00:00-23:59
Add	Add	Add	Add	Add	Add	Add
Remove	Remove	Remove	Remove	Remove	Remove	Remove

Copy the same time to several days of the week

#### **POST-TASK QUESTIONNAIRES**

# What Did Configurators Say! (4)

- Small bugs and insufficient or missing functionality
  - Recover deleted user profiles (1)
  - Correct adaptation of labels' size to the width of keys (1)

#### • Difficulties making associations between solution's elements

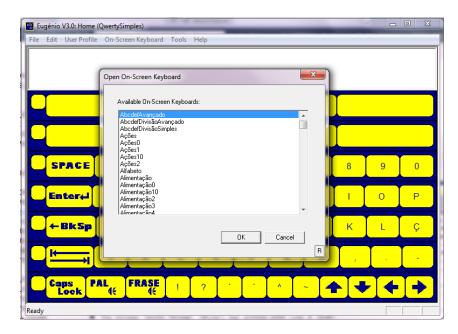
- Difficulties associating a user profile to speaking partners mobile phones (1)
- Difficulties associating a user profile to the indoor location devices (1)
- Associating a user profile to a certain time/day of week is easier because there are no external devices involved (1)

le Edit Use	er Profile Options			
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Associating a profile to a speaking partner mobile phone

# What Did Configurators Say! (5)

- Stronger visual representation of solution's elements
  - Visual presentation of user profiles' options and configuration (1)
  - Visual presentation of onscreen keyboard's options and configuration (1)
  - Associate images to user profiles and on-screen keyboards (1)
- Perform automatic operations
  - Whenever possible fill keys' options automatically (1)



Opening an on-screen keyboard

# What Did Configurators Say! (6)

- Difficulties importing resources from third-party applications
  - Incorporate pictogram
     resources to avoid working
     with two different programs
     (1)
- Long task sequences
  - Needs a long sequence to assign a user profile to a specific indoor location (1)
  - Needs a too long sequence to assign a user profile to a specific speaking partner (1)

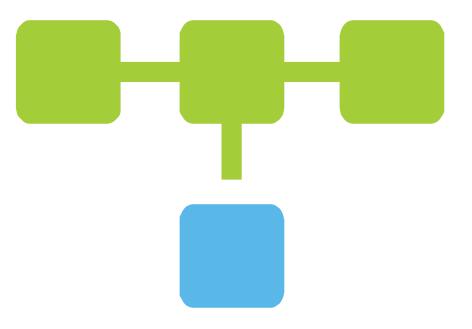


Eugénio & Picto Selector (Martijn van der Kooij)

#### POST-AAC SOLUTIONS DEVELOPMENT

# What Did Configurators Say! (7)

- Small bugs and insufficient or missing functionality
  - Decrease adaptation time in indoor settings (2)
  - Turn speech synthesis faster (1)
  - Better adjustment of images inside the keys (1)
- Links to external resources
  - Link to other programs (1)
  - Connection to Internet resources (1)
- Visual representation of elements and aesthetics
  - Turn the configuration interface more visual (1)
  - Turn the interface more attractive (1)
- Configuration issues
  - Difficult to configure due to the quantity of options (1)
  - Create a configuration manual (1)



# What Configurators May Want...

- Elements presented visually
- Relations between elements
  - Users, profiles, components
- Configurators say which components to configure



## Conclusions

- Evaluated the dialogbased interface of Eugénio
- Identified difficulties configuring a dialogbased interface for AAC
- Identified principles to construct better configuration interfaces

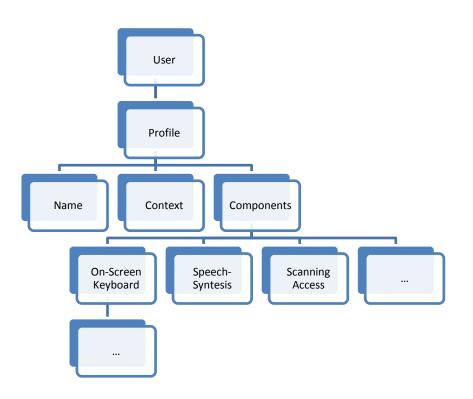


#### Future Work

- Design a configuration interface that follows identified principles
  - New tests with the support of SUPERA (AT Portuguese Association)

Sociedade Portuguesa

- Deeper analysis of other system's configuration interfaces
- Taxonomy that groups and presents configuration properties for AAC
  - Collaboration with other research groups



#### Thank You!

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