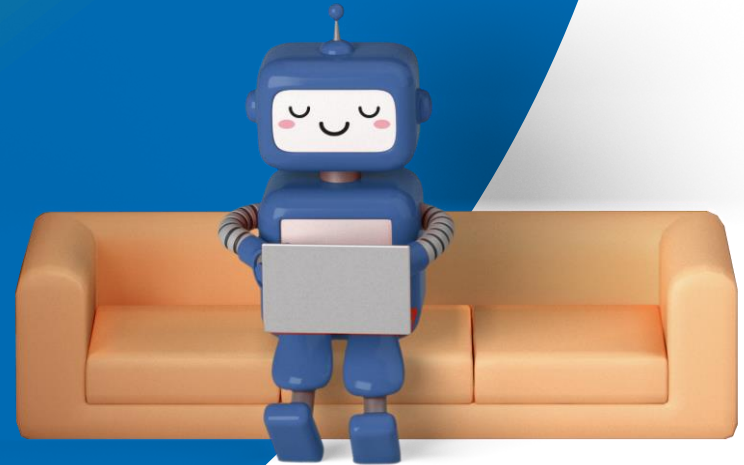


# The bot that lived:

SurveyBot's role in automated web survey pretesting

Saijal Shahania, Joshua Claassen,  
Jan Karem Höhne, & David Broneske  
Department 4: AI for Social Science  
CS3 Meeting, 24.10.2024



# DZHW

German Centre for Higher Education Research  
and Science Studies ■

# Acknowledgments

Prof. Dr. Jan Karem Höhne  
Dr. David Broneske  
Joshua Claaßen  
Jeffy Elson



# Motivation

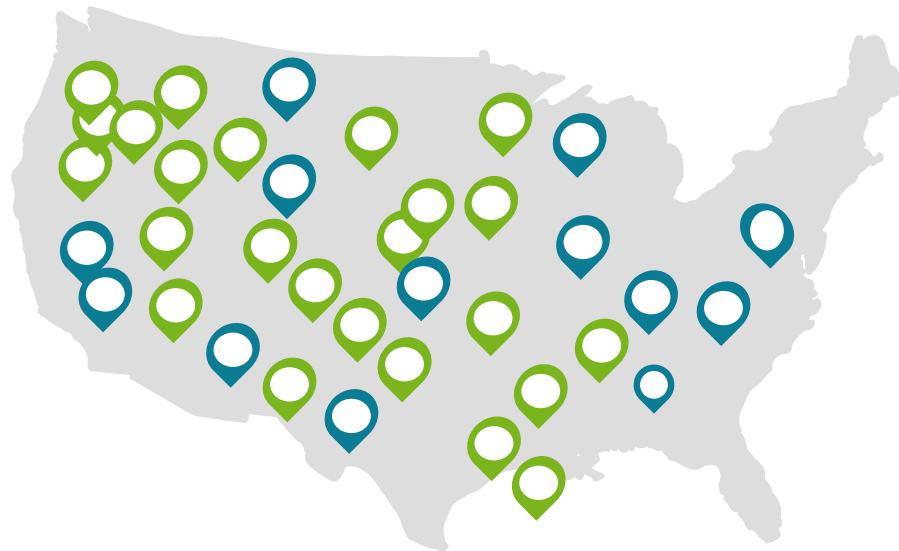
Pre 2000's

*Offline Surveys*



Post 2000's

*Emergence of Web Surveys*



● *Offline Surveys*

● *Web Surveys*

# New Tech = New Problems



*Functionality*



*Consistency*



*Answer Quality*



# Functional Pretesting



***Functionality***



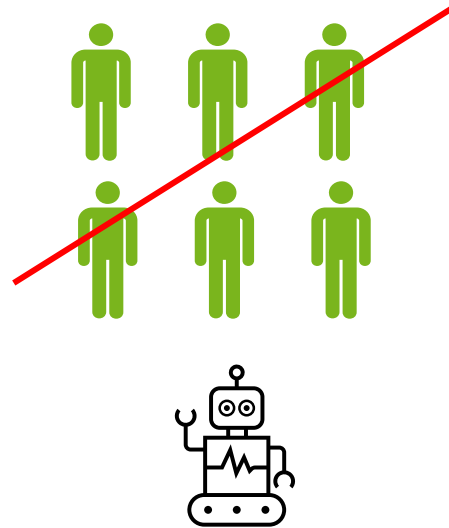
***Consistency***



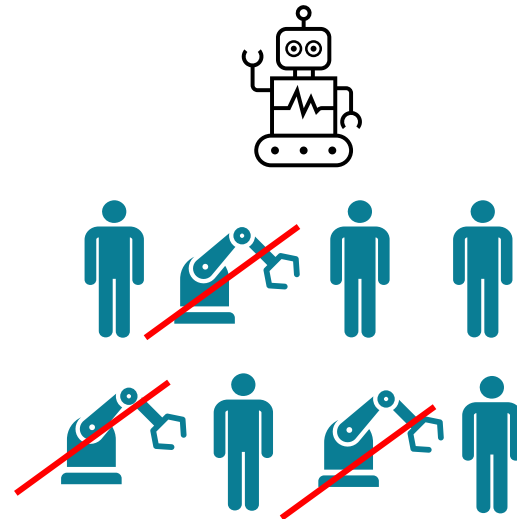
***Answer Quality***

# Where does SurveyBot fit in?

## Pre Survey Phase



## Post Survey Phase



Pre Testing

Detection

# Using our Bots for Pretesting



**01**

## **Pre-survey testing**

*Participation links testing*

**02**

## **Main survey testing**

*Core components such as  
different question types*

**03**

## **Post-survey testing**

*Collection and storage of  
paradata*

# Online Survey –LGBTQ

Advertised via FB 



Umfrageforschung - DZHW & Uni Hannover

Anzeige · Finanziert von Deutsches Zentrum für Hochsc...Wissenschafts...

Umfrage zu gleichgeschlechtlichen Partnerschaften - Nehmen Sie jetzt teil und gewinnen Sie 5€ in 5 Minuten!



ww3.unipark.de  
Jetzt teilnehmen!

Mehr dazu

## Statistics



2 Groups



1512 Total



5 €  
(150) Incentive



ECSP Paradata

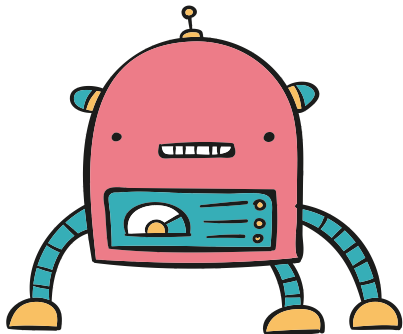
**Funded by: DGOF**



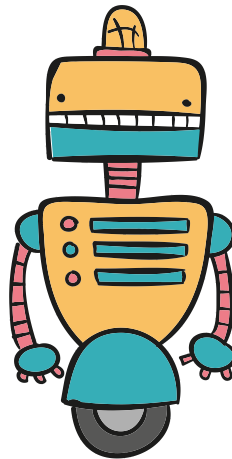
# Our Team - SurveyBot

**Rule-based Bots**

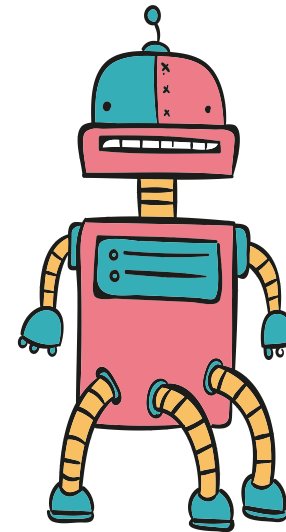
**AI-based Bots**  
*(Powered by LLM - Gemini)*



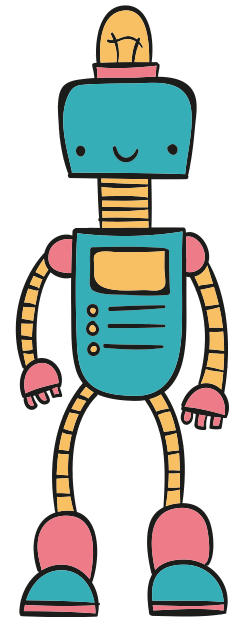
**Basic**



**Medium - I**



**Medium -II**

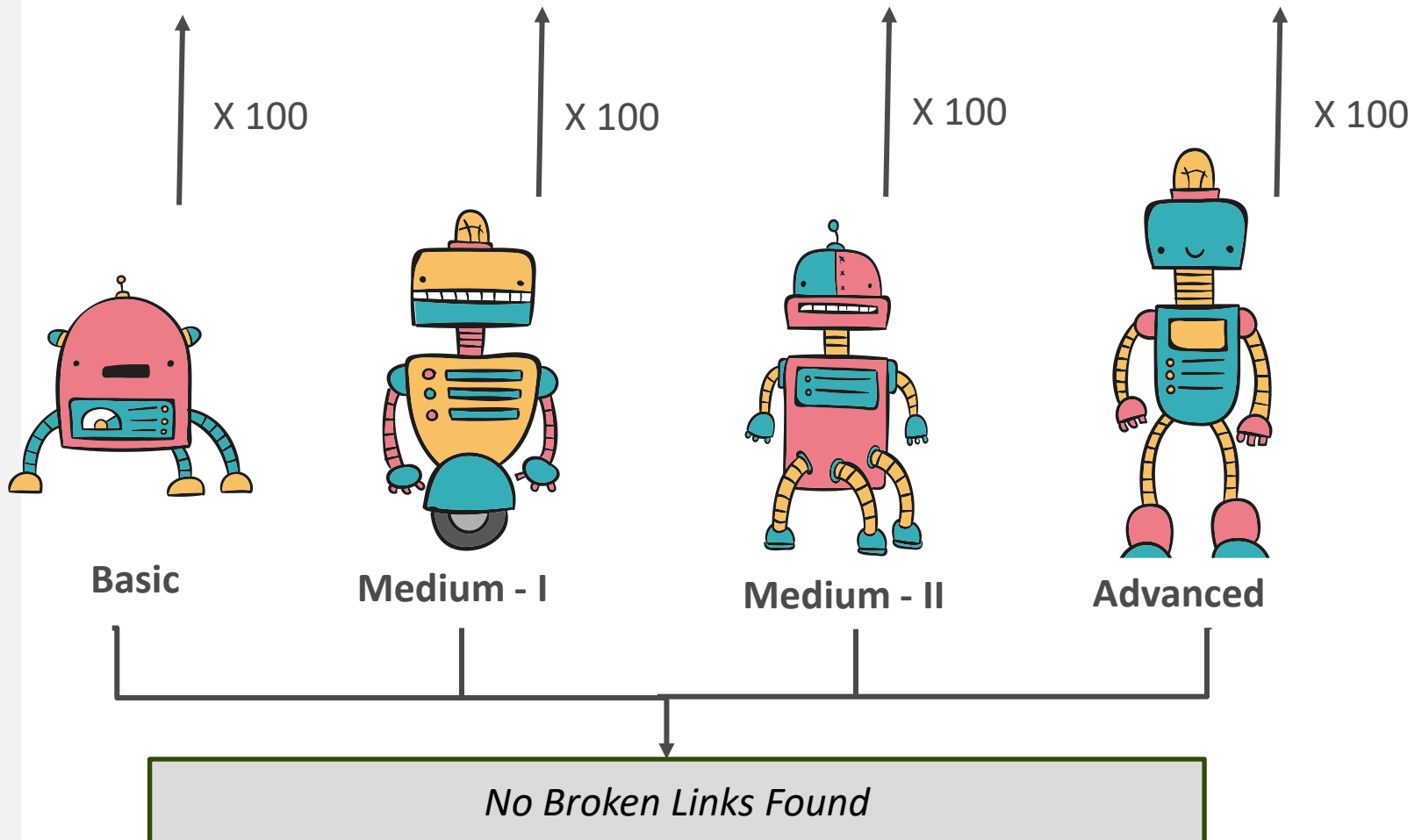


**Advanced**

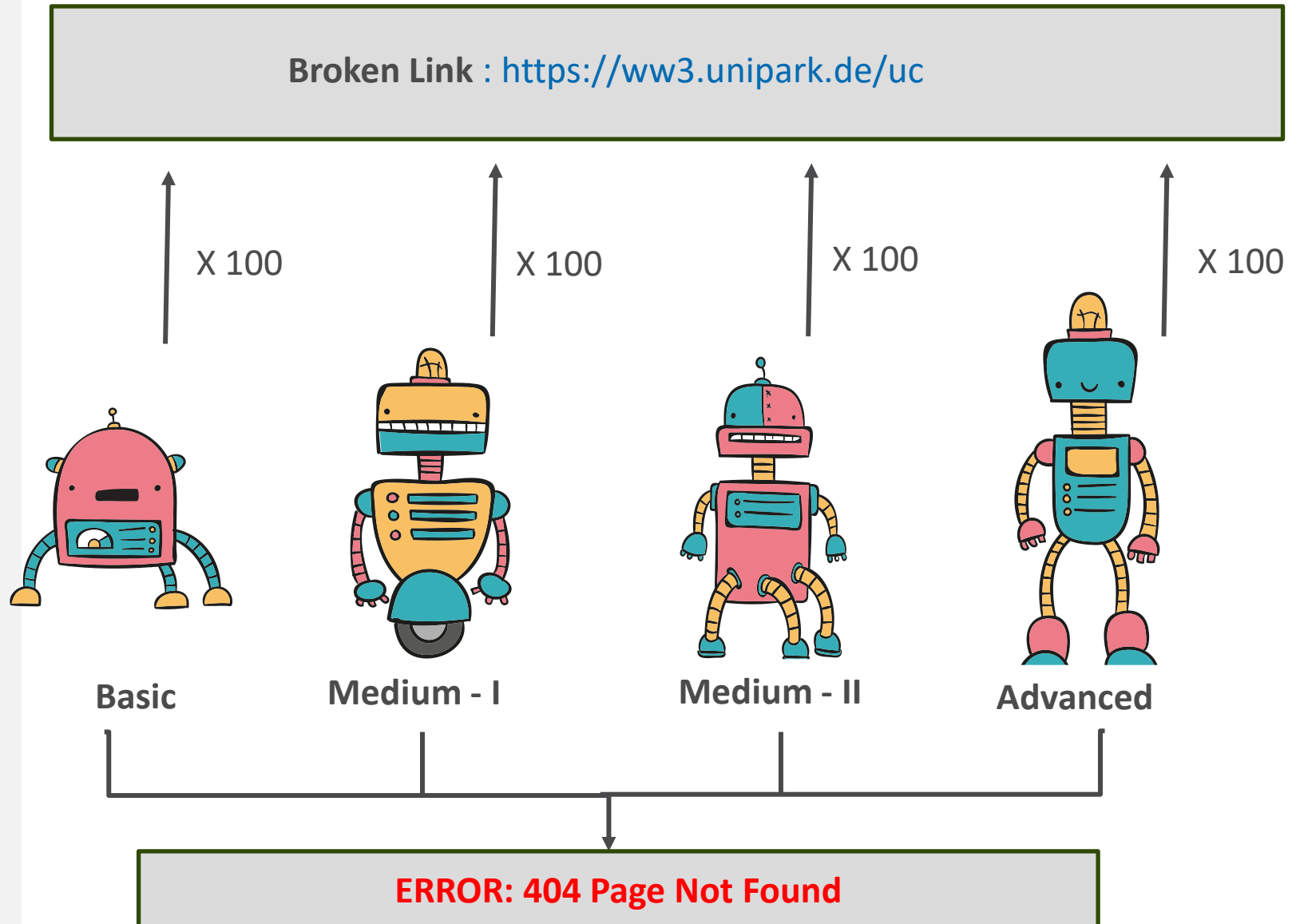
# *Pre-survey testing*

# Pre-survey testing

[https://ww3.unipark.de/uc/demo\\_survey\\_1/?a=](https://ww3.unipark.de/uc/demo_survey_1/?a=)

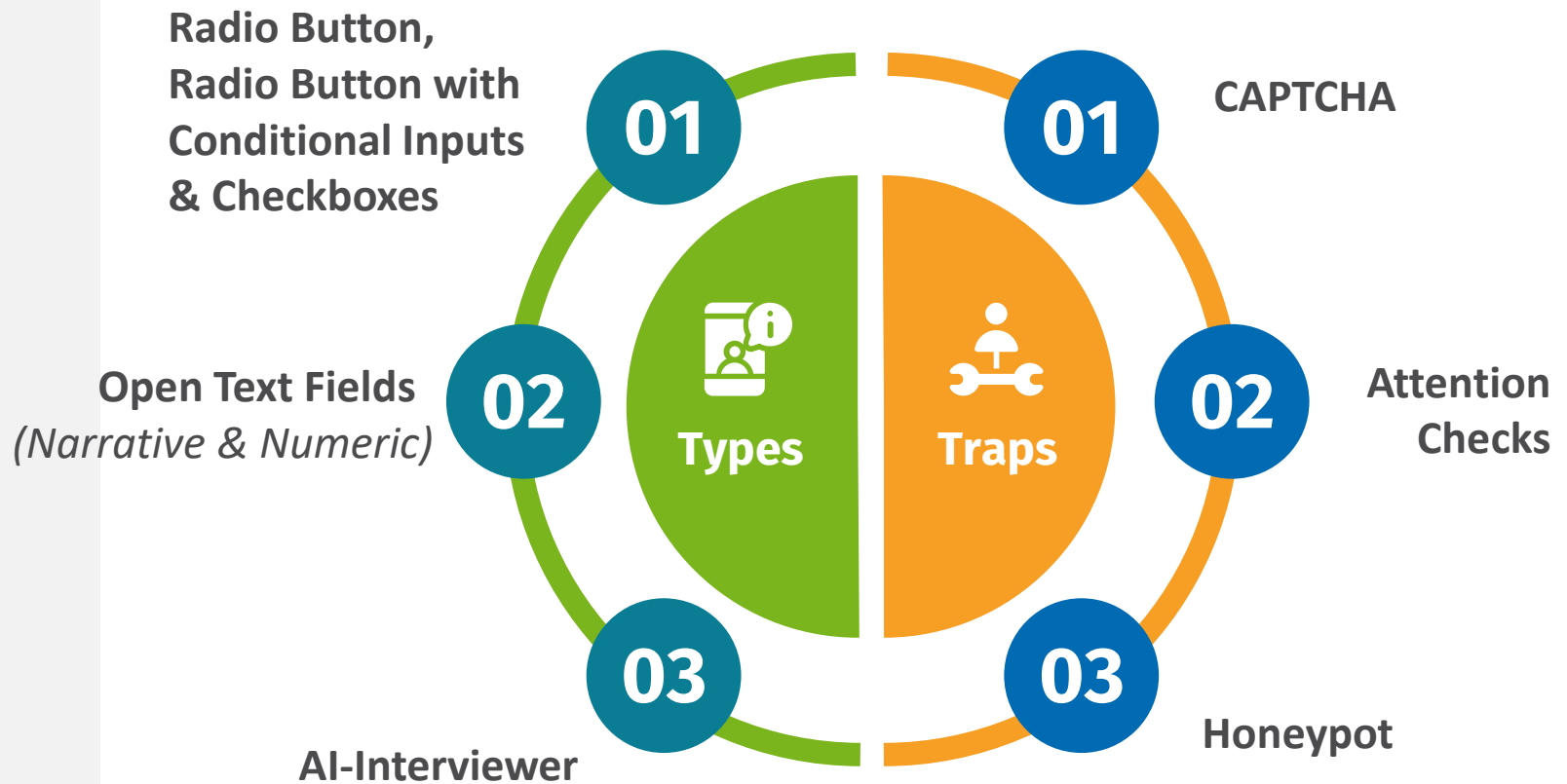


# What happens with broken links?

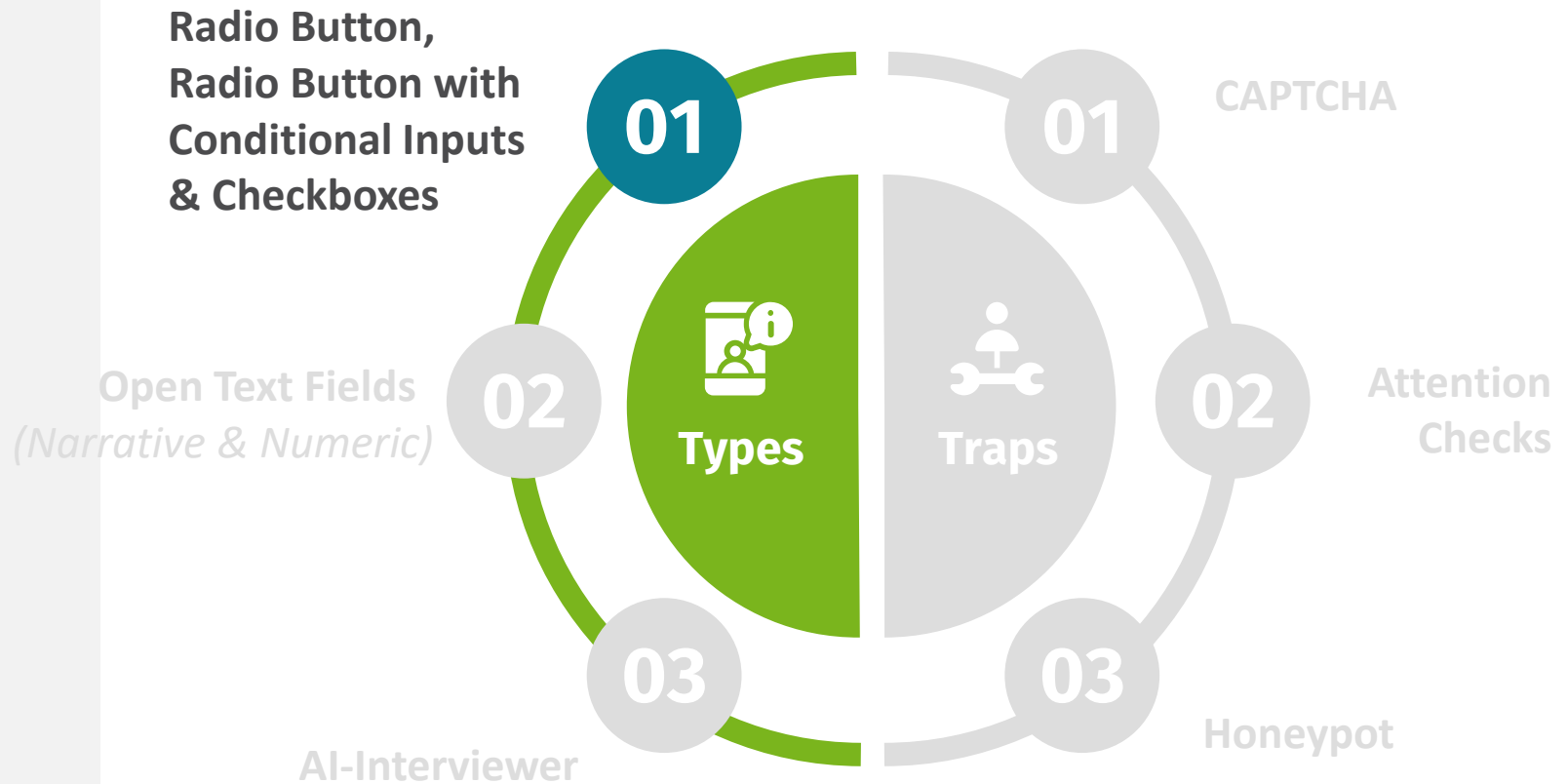


# *Main-survey testing*

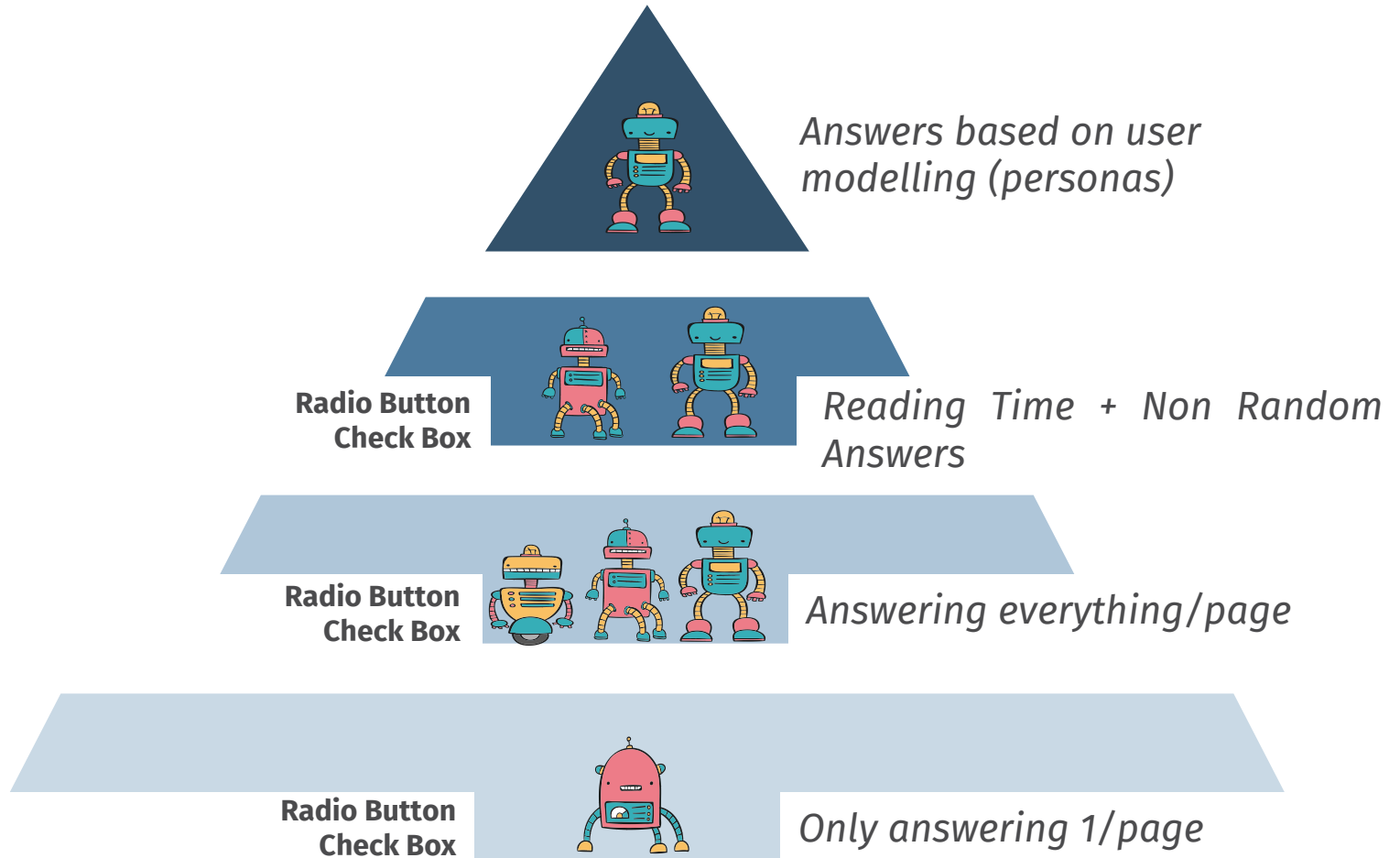
# Question types in our survey



# Question types in our survey

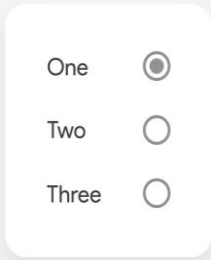


# Radio Buttons & Checkboxes





# Radio Buttons & Checkboxes



One

Two

Three

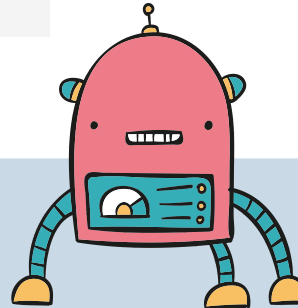
**Accessible Checkboxes**

Checkbox

CSS Only

A disabled checkbox

Fourth Option



**Radio Button  
Check Box**

*Only answering 1/page*

**Basic**

# Radio Buttons & Checkboxes

One

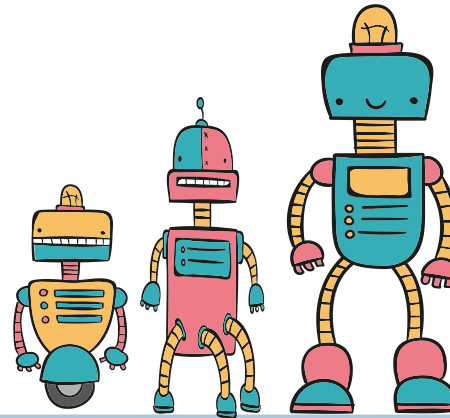
Two

Three

One

Two

Three



- Button 1
- Button 2
- Button 3
- Button 4
- Button 5
- Button 6

**Radio Button  
Check Box**

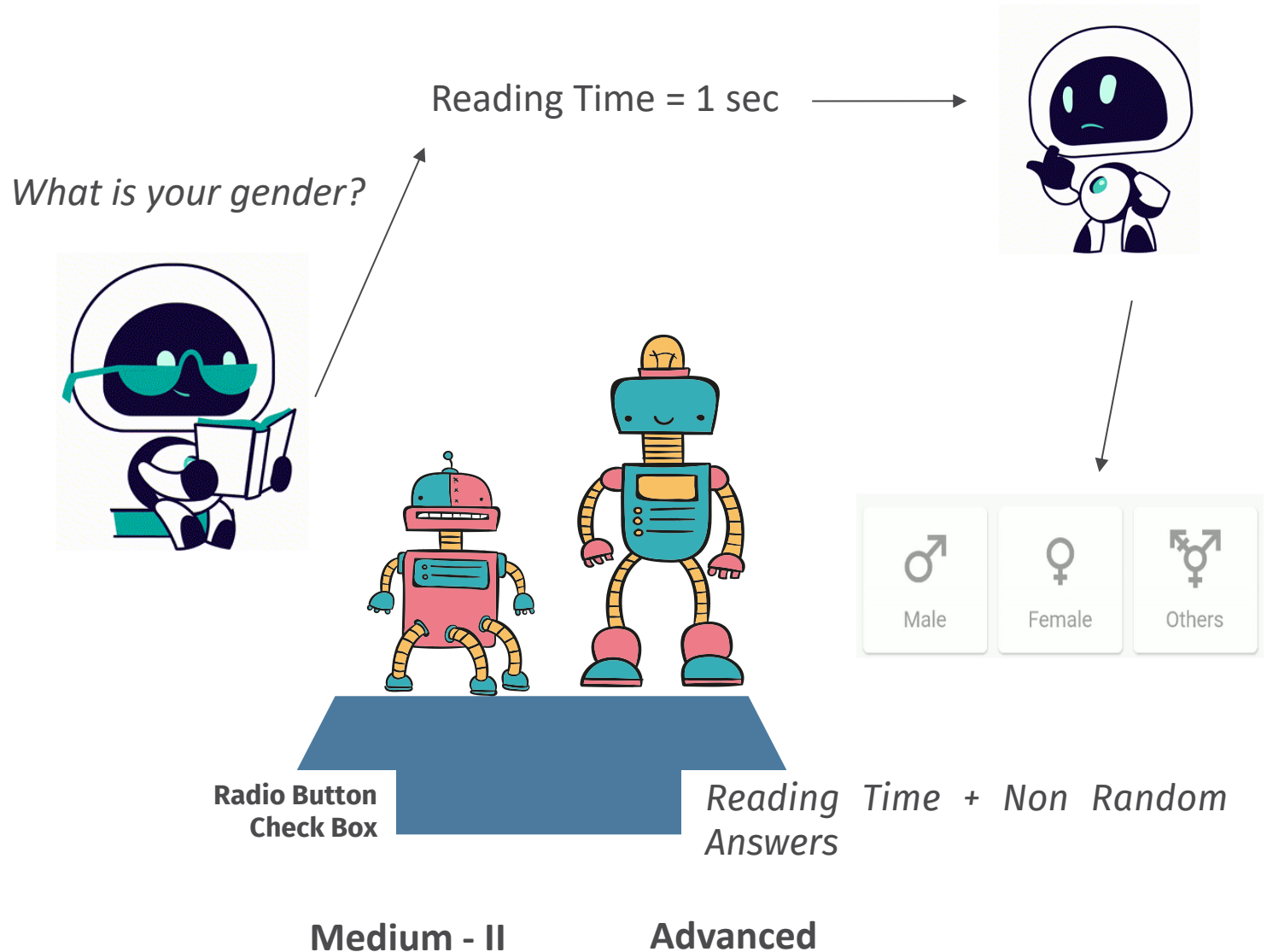
*Answering everything/page*

**Medium - I**

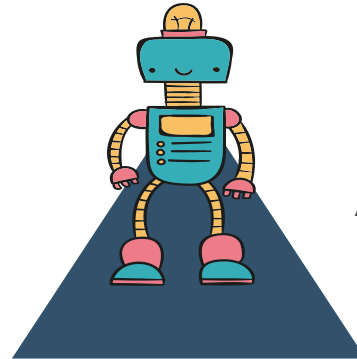
**Medium - II**

**Advanced**

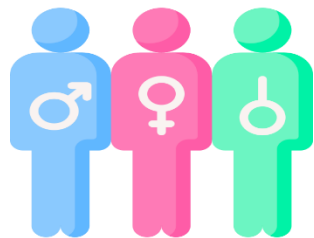
# Radio Buttons & Checkboxes



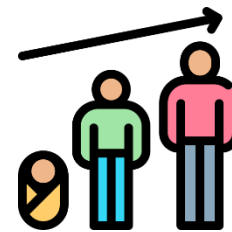
# Radio Buttons & Checkboxes



Answers based on user modelling (gender, age and personas)



Gender



Age



Liberal



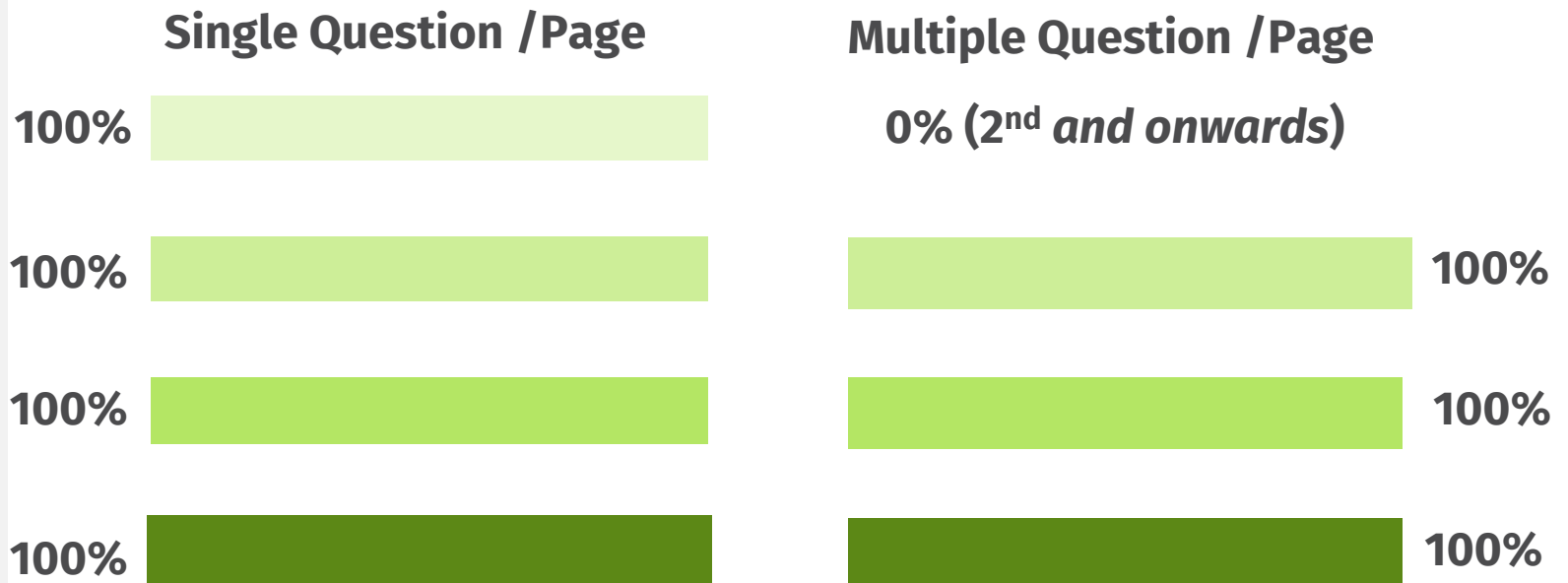
Neutral



Conservative &  
Very Conservative

# Completion Rate and Item Non Response

**~100 % Completion Rate – All Bot Models**



Basic Medium -I  
Medium-II Advanced

# Main survey testing – Radio Buttons

There are different opinions on same-sex partnerships in Germany. How about you: To what extent do you agree or disagree with the following statements?

1. *Gay, lesbian and bisexual people should be allowed to lead their lives the way they want.*
2. *It is disgusting when gay and lesbian people kiss in public.*
3. *Gay, lesbian and bisexual people should have the same rights as heterosexual people.*
4. *In Germany, many overdo it with their tolerance towards gay, lesbian and bisexual people.*
5. *There is nothing bad about a sexual relationship between two people of the same sex.*
6. *Gay, lesbian and bisexual people should stop making such a fuss about their sexuality.*

Completely  
agree

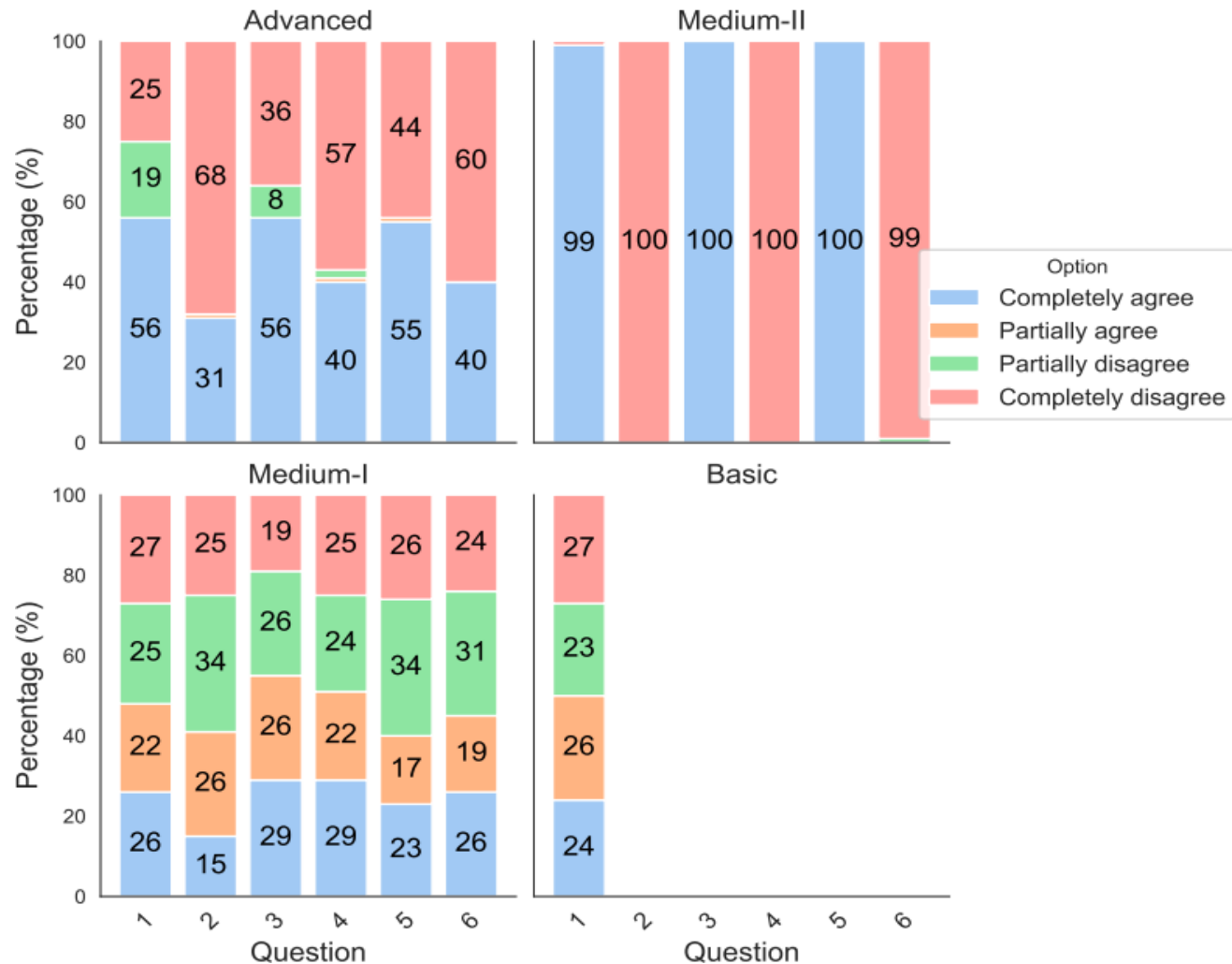
Partially  
agree

Partially  
disagree

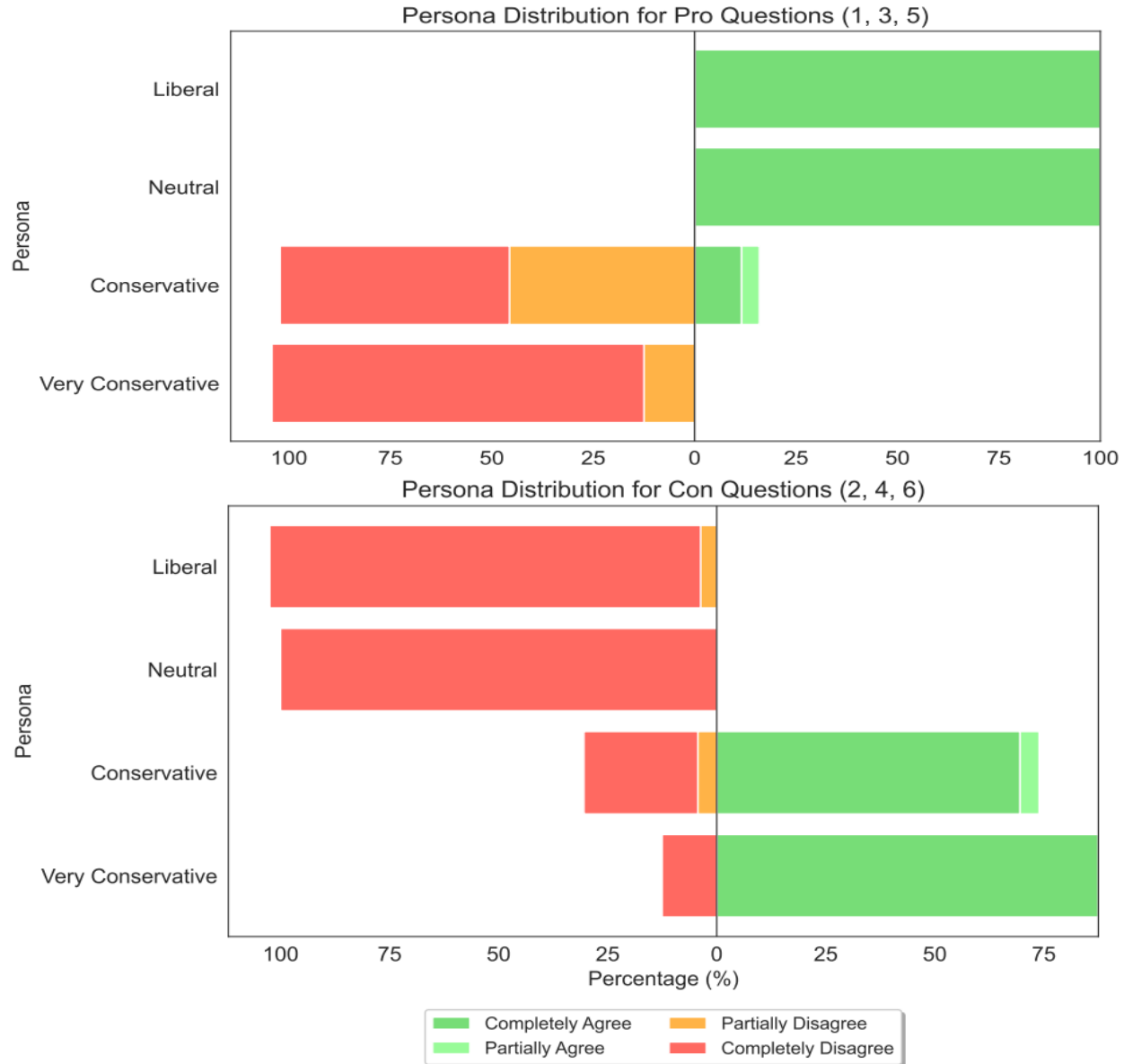
Completely  
disagree

# Main survey testing – Radio Buttons

Distribution of response options selected per question by bot models



# Main survey testing – Radio Buttons

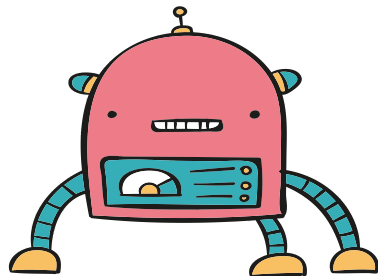




# Main survey testing – Checkboxes

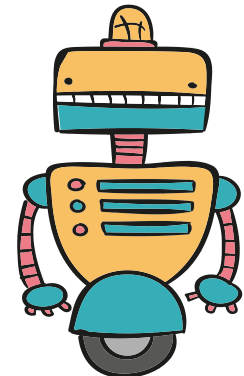
*Where did you complete this survey?*

- *From home (including home office)*
- *At work (e.g. in the office)*
- *At school, university or library*
- *In the café, restaurant or bar*
- *Public transport (e.g. bus or train)*
- *In a public place (e.g. park or shopping centre)*
- *In another place*



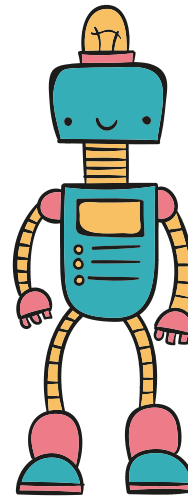
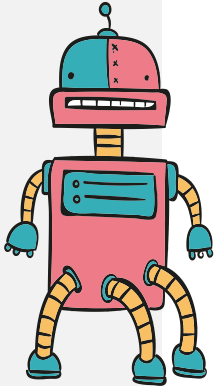
Basic

*Non sensical random selection*



Medium - I

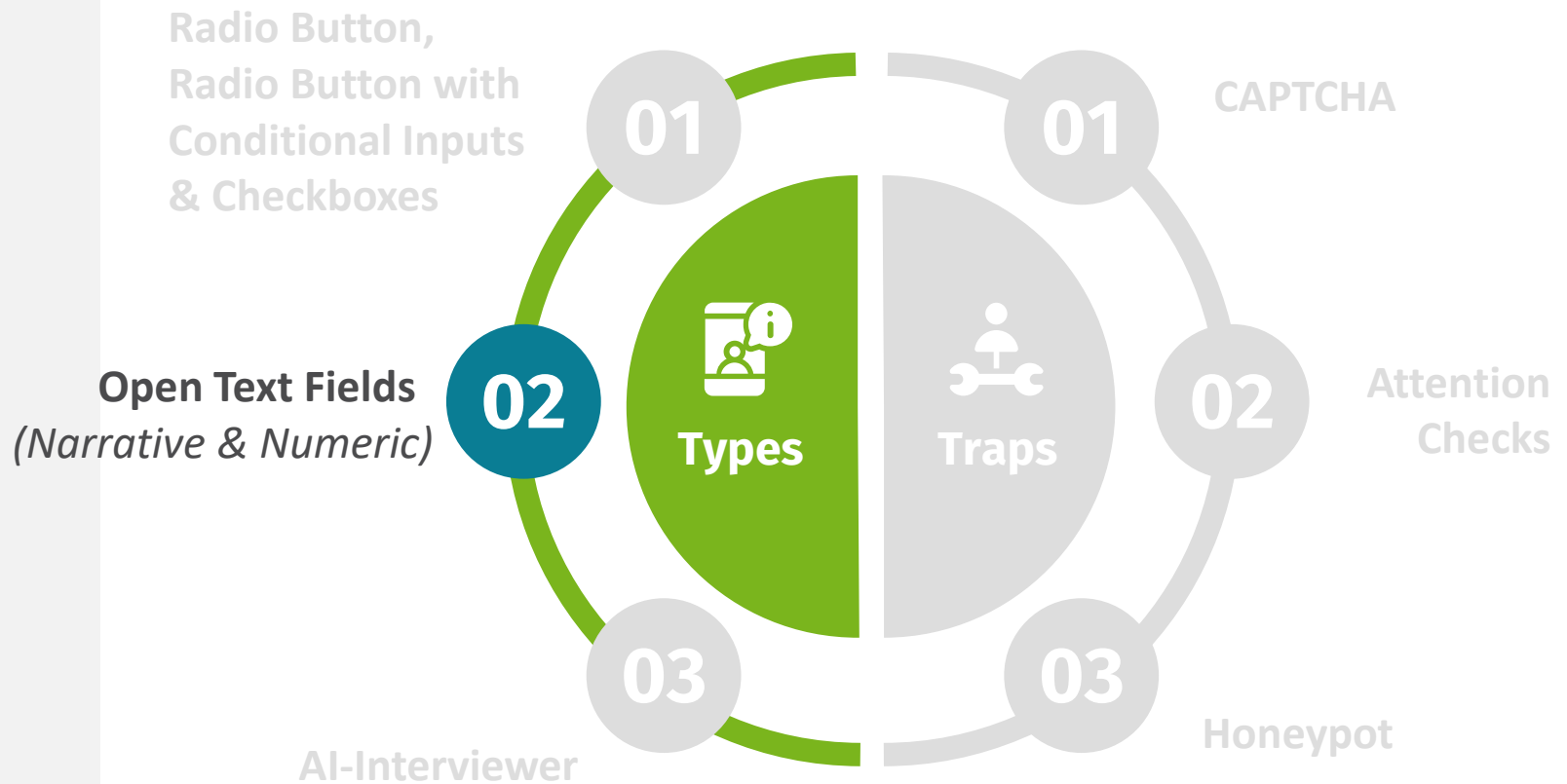
# Main survey testing – Checkboxes



*Where did you complete this survey?*

	Medium - II	Advanced
From house (including Home office)	96%	96%
From house + At work (e.g., in the office)	2%	1%
From house + In a public place (e.g., park or shopping center)	1%	0%
From house + At a different place	1%	3%

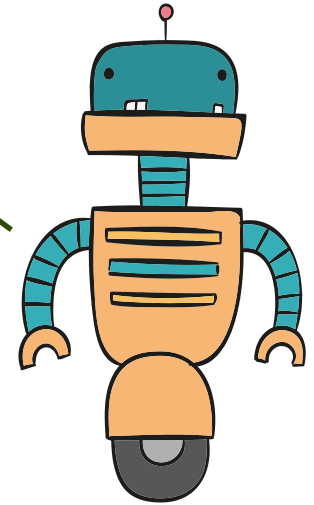
# Question types in our survey



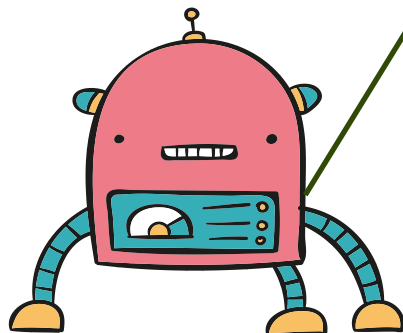
# Open Questions – Basic & Medium -1

- Ich möchte diese Frage nicht beantworten
- Ich weiß es nicht
- Ich bin mir nicht sicher
- Es ist mir unangenehm, diese Frage zu beantworten
- Ich bin mir nicht sicher, wie ich diese Frage beantworten soll
- Ich verstehe nicht ganz, was diese Frage bedeutet
- Das kann ich nicht beantworten

..... & Many More.....



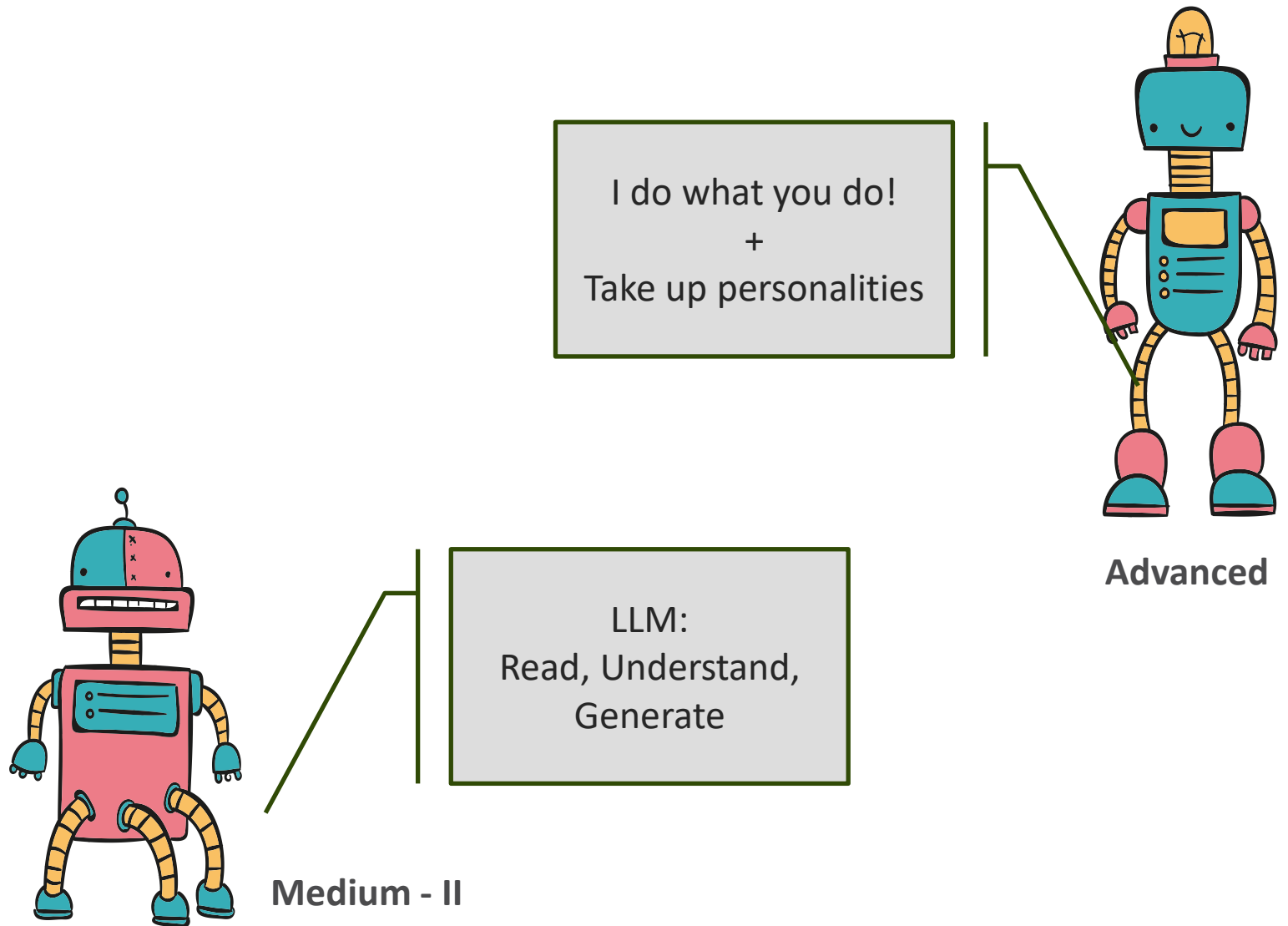
Medium - I



- *Ich weiß es nicht*
- *Ich bin mir nicht sicher*
- *Ich bin mir nicht sicher, wie ich diese Frage beantworten soll*

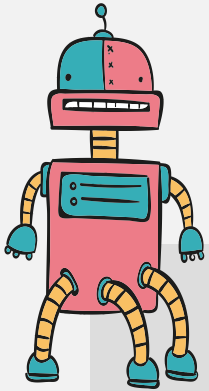
Basic

# Open Questions – Medium 2 & Advanced



# Sample Answers

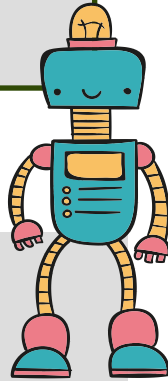
***To what extent do you think discrimination against gay, lesbian and bisexual people is a problem or not a problem in Germany?***



Medium - II

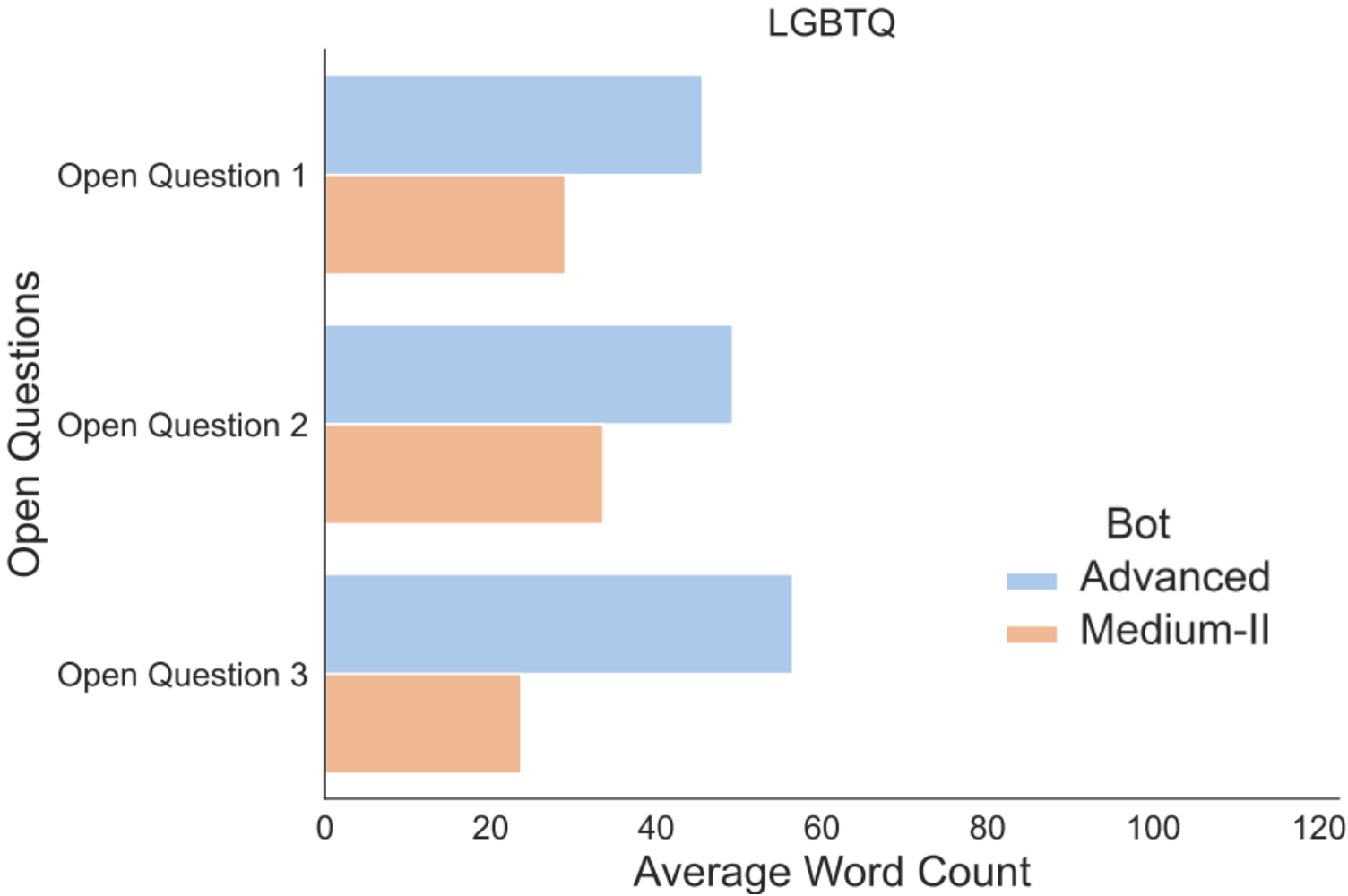
*I consider discrimination against gay, lesbian and bisexual people in Germany to be a problem because it can lead to exclusion, prejudice and violence.*

Advanced

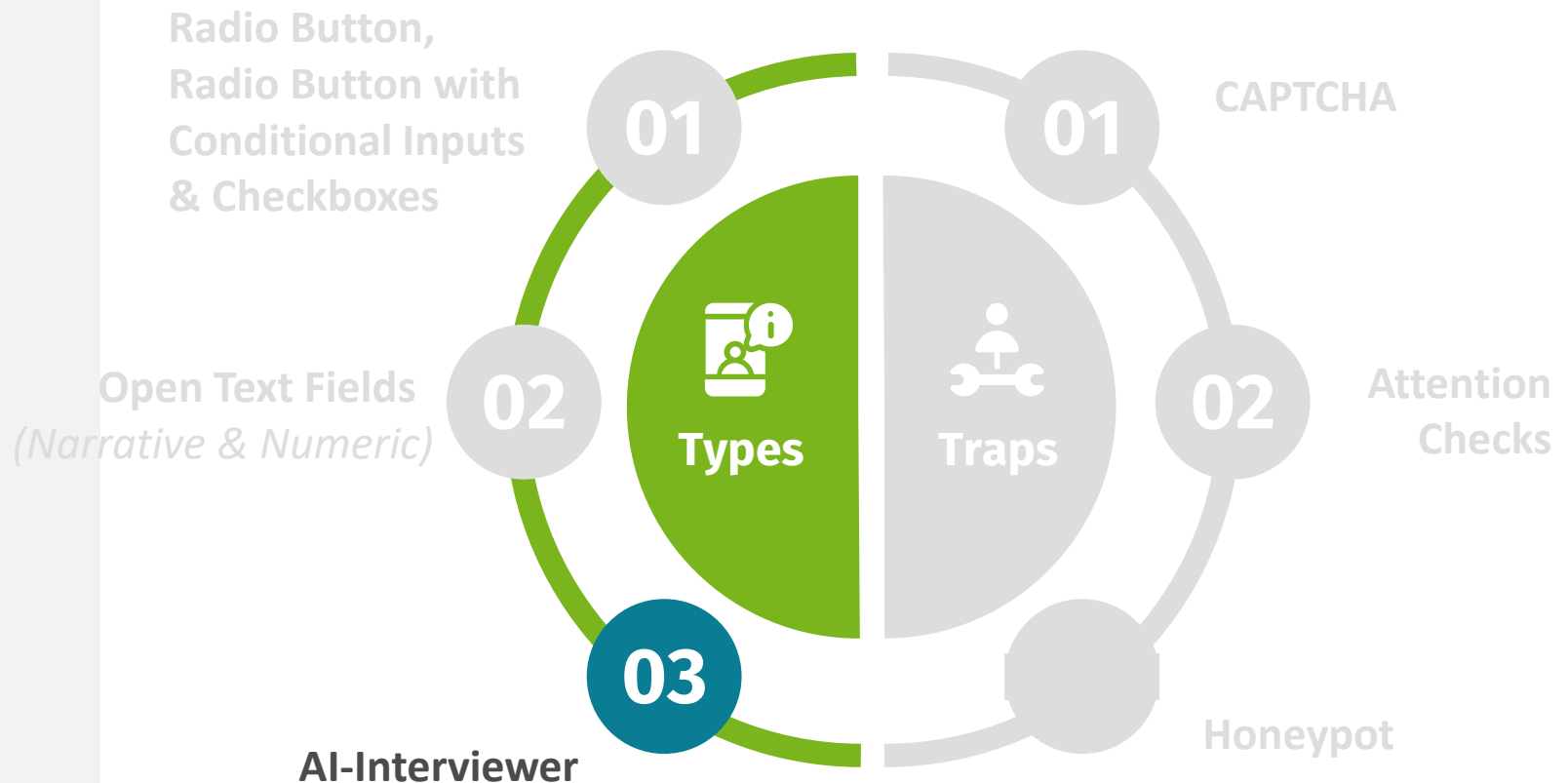


*Discrimination based on sexual orientation is a serious problem for our country. These minorities should not be excluded and treated badly just because they are different. We are all equal before the law. I believe in traditional values and family, but that includes acceptance and respect for people of all sexual orientations.*

# Average Word Count – Medium II & Advanced

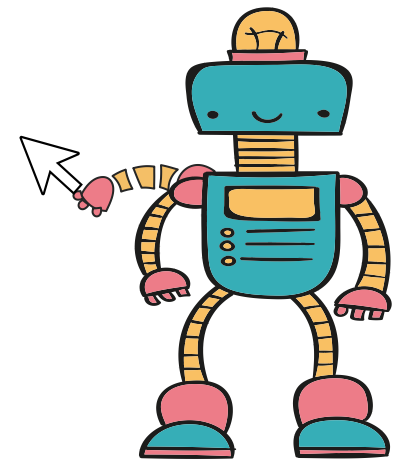
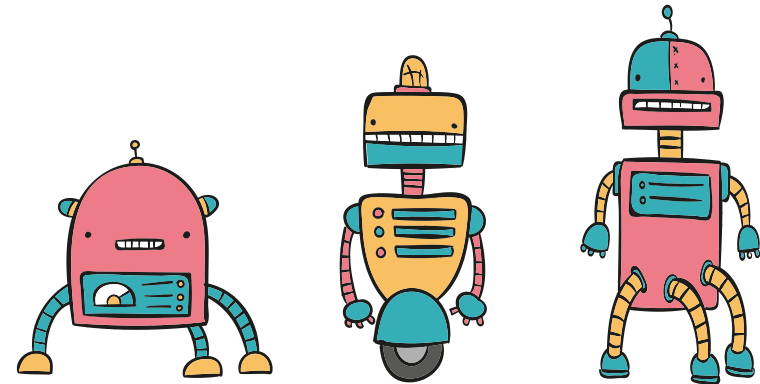
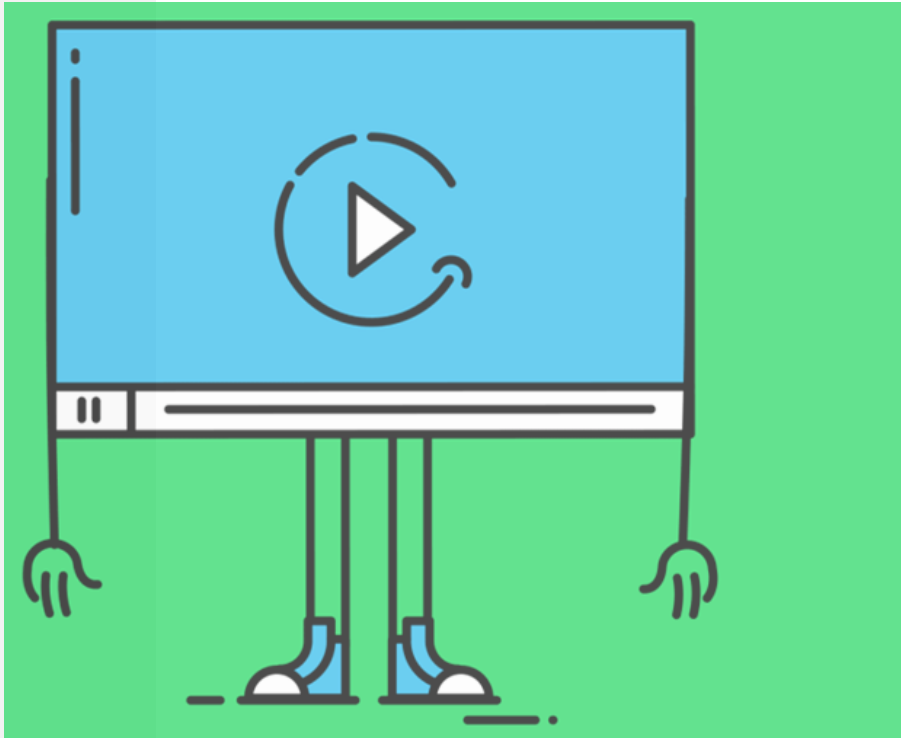


# Question types in our survey





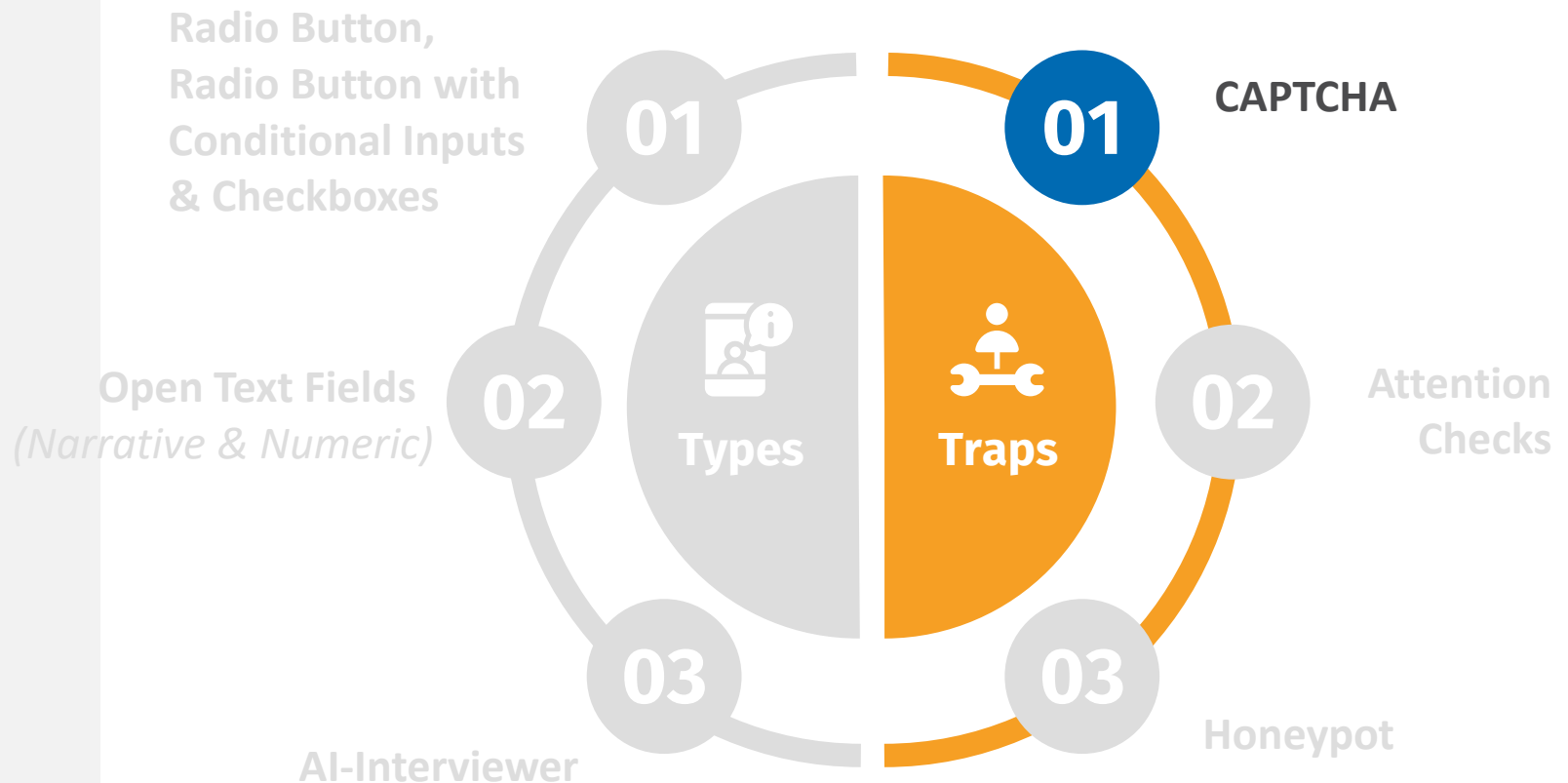
# Video Click and Transcribe



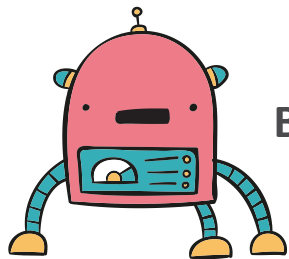
Transcription via Open AI's **Whisper**

**100 % success rate by Advanced Bot**

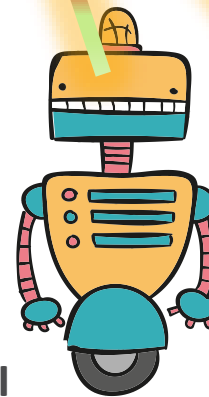
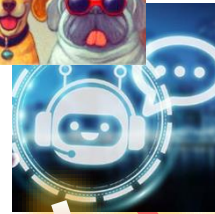
# Question types in our survey



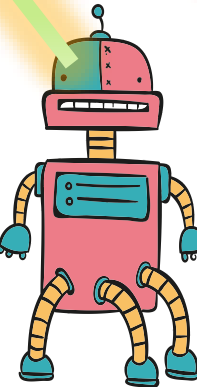
# CAPTCHA



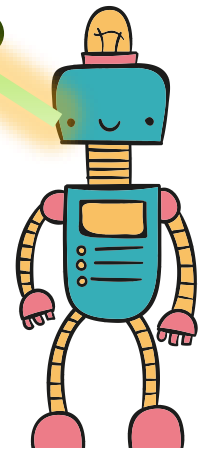
Basic



Medium - I



Medium - II



Advanced

# CAPTCHA Passing Rate

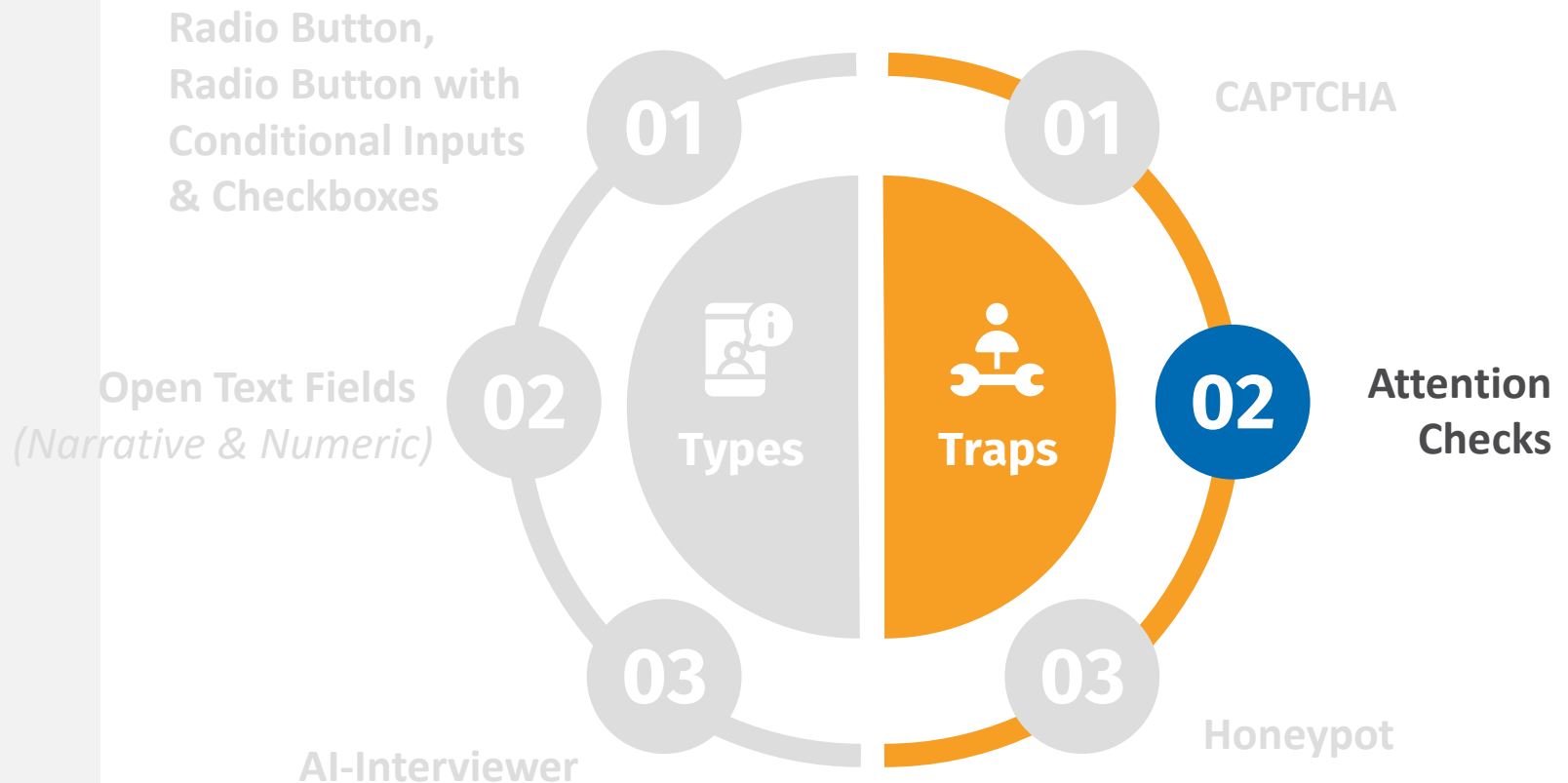
Geben Sie bitte die Anzahl an Autos in das offene Feld ein, die Sie im Bild sehen.



*100 % CAPTCHA passing  
rate by Medium –I , II and  
Advanced bot*

Geben Sie bitte die Anzahl der Autos hier ein:

# Question types in our survey

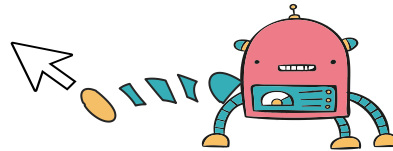


# Attention Checks

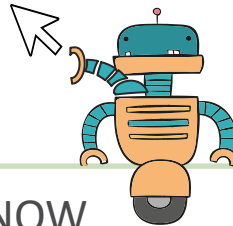
*To what extent do you agree or disagree with the following statement?*

*Children who grow up with same-sex couples develop just as well as children who grow up with male and female couples. If you are not sleeping, select the option **'I don't know'** irrespective of your opinion*

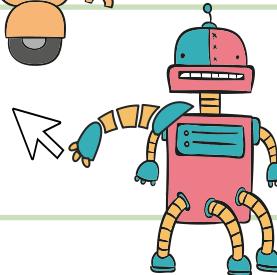
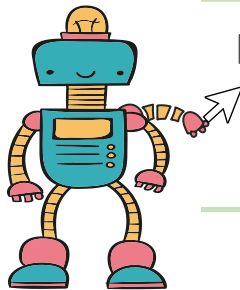
AGREE



DISAGREE

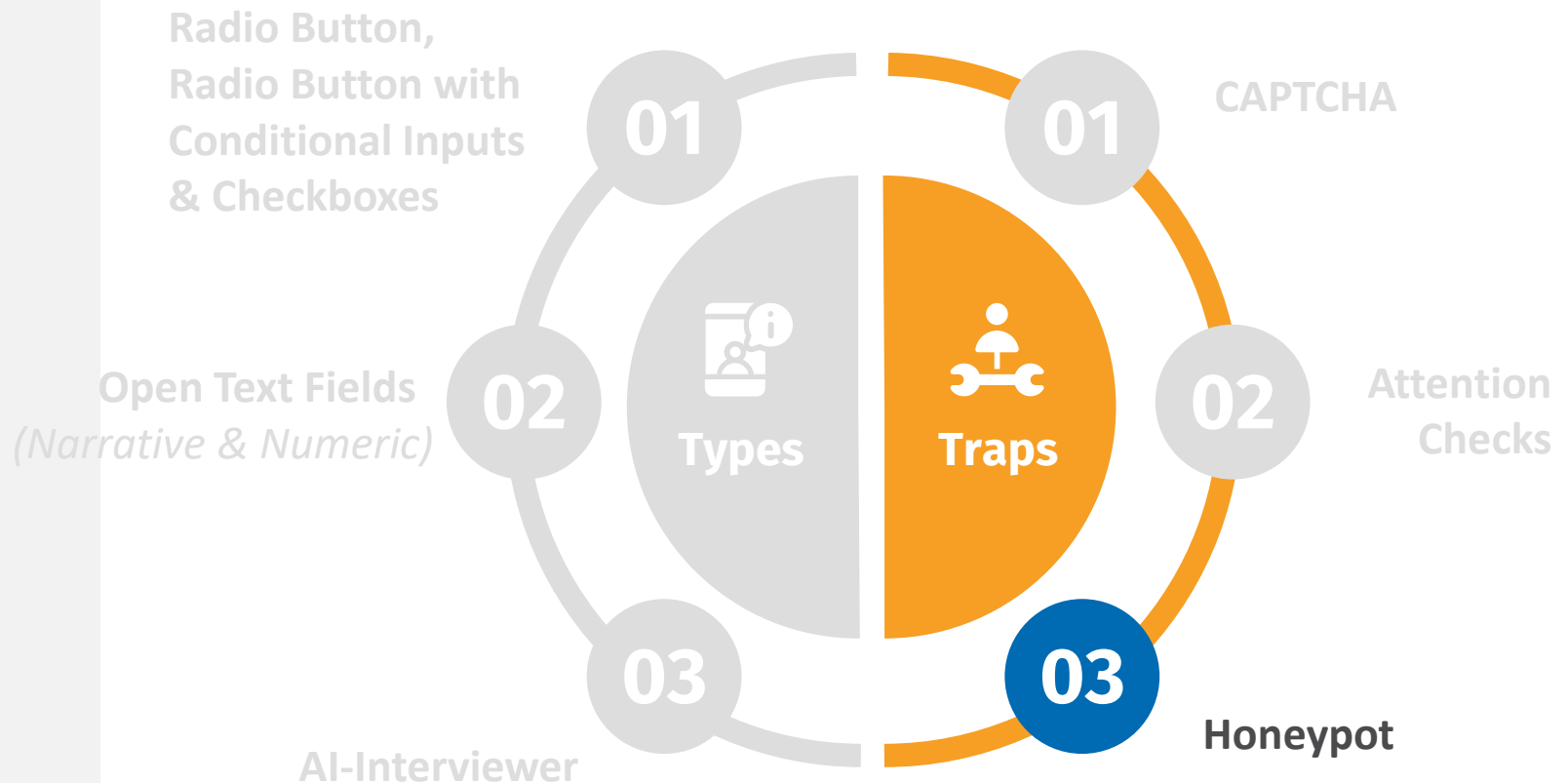


I DON'T KNOW

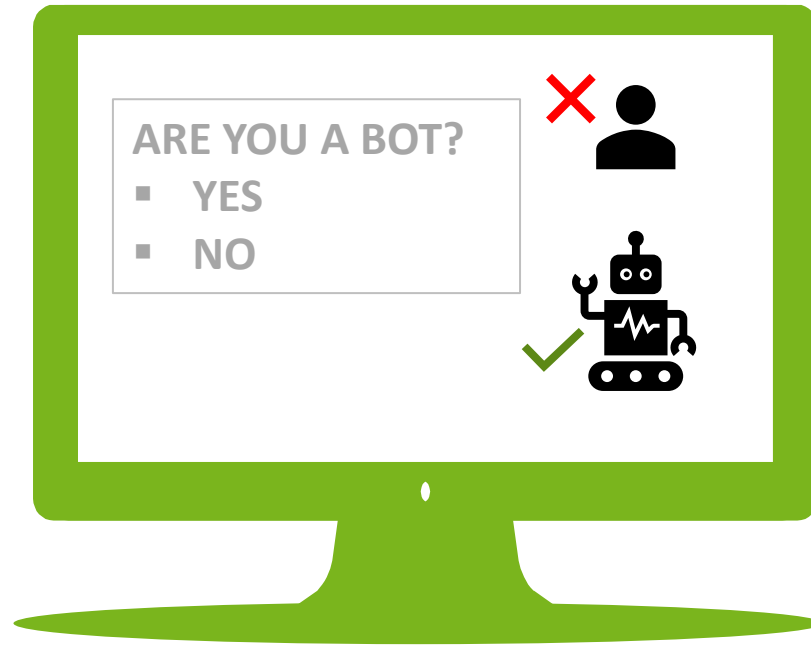


NEXT

# Question types in our survey



# HoneyPot Questions

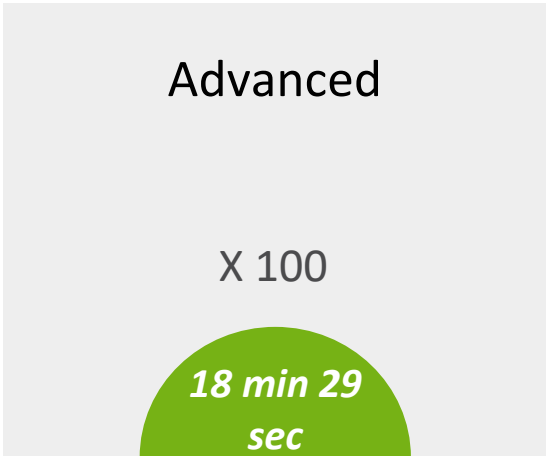
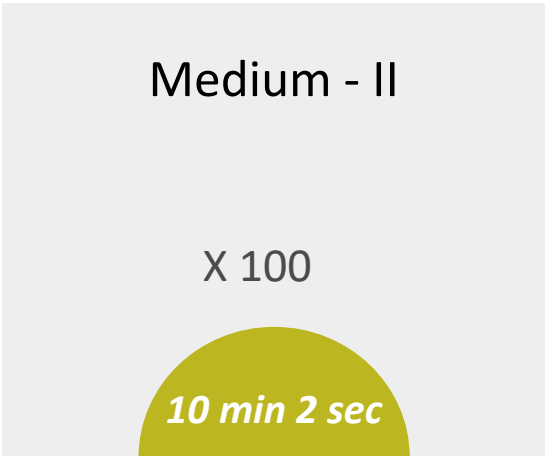
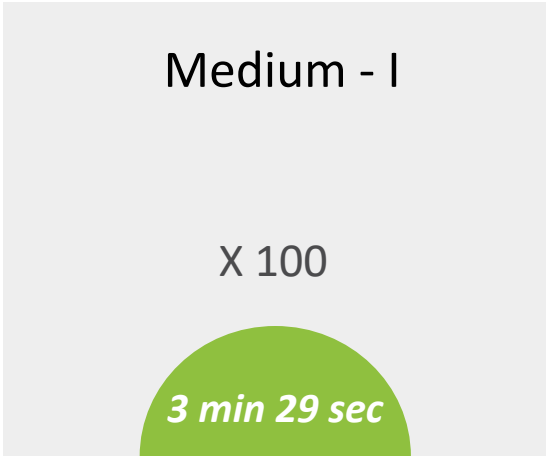
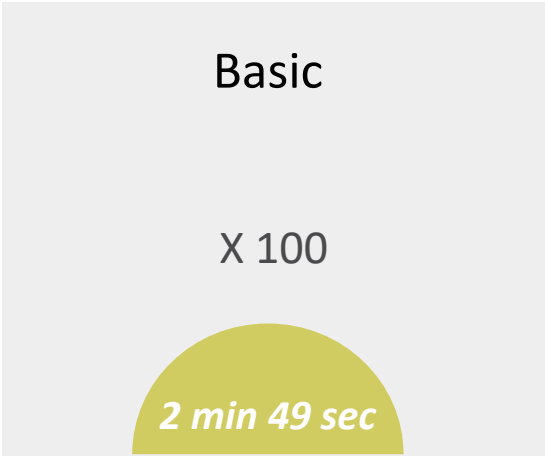


**NO BOTS FELL FOR HONEPOT QUESTIONS**

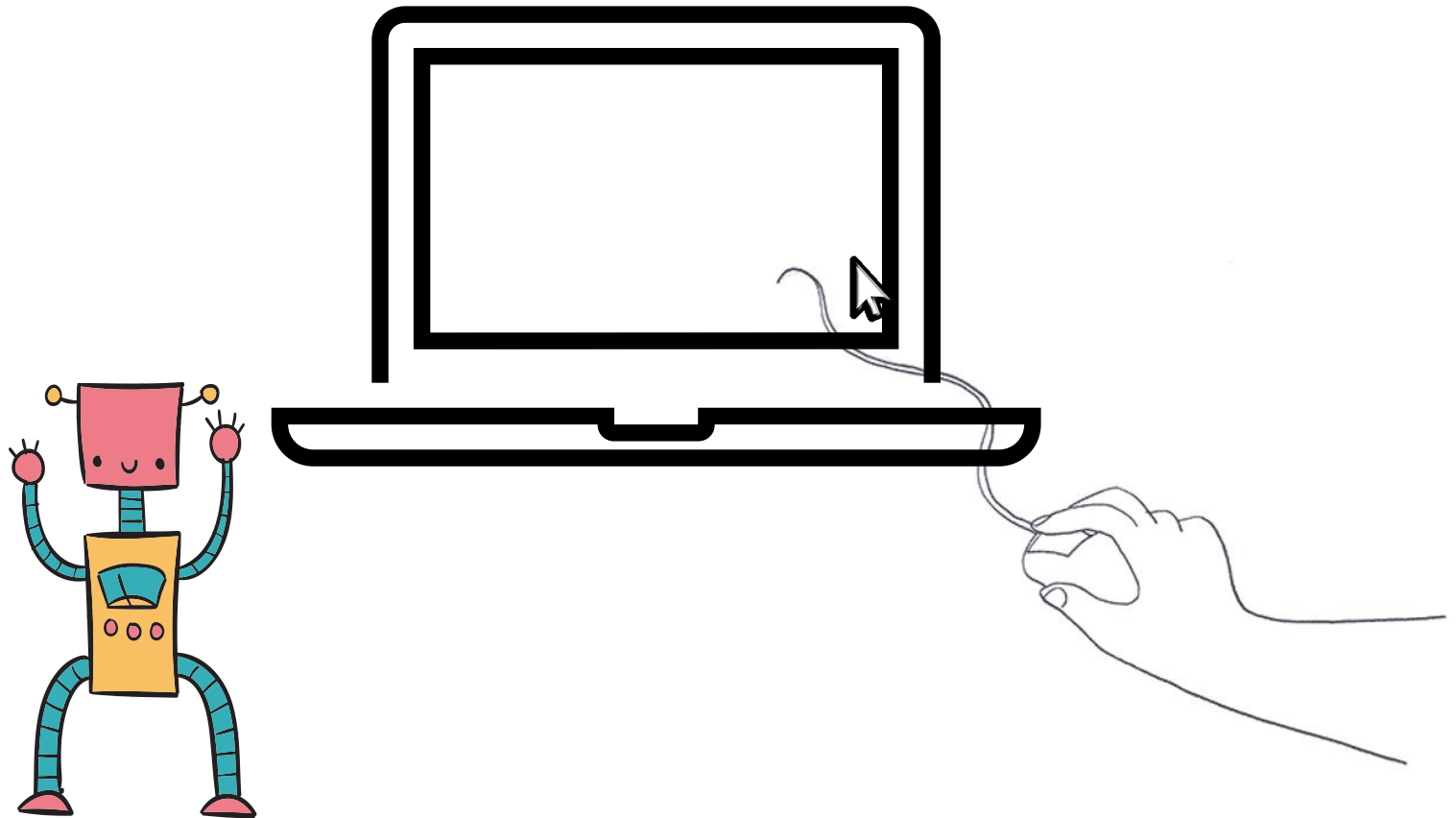


# *Post-survey testing*

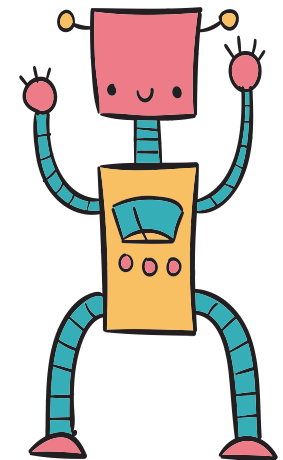
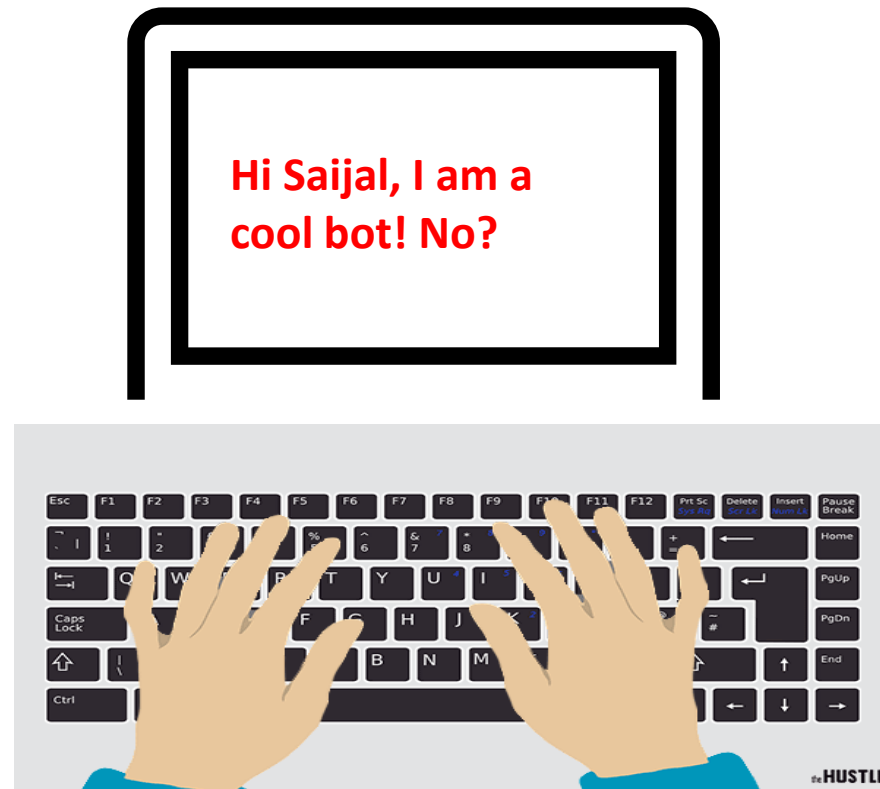
# Average Response Times



# Mouse Movements & Keystrokes



# Mouse Movements & Keystrokes



# Survey Demo

SurveyBot

## SurveyBot

Survey URL

Enter the survey URL

Number of times the bot takes the survey

Enter the number

Do you wish to save the results in a log file?

Type of Bot:

- Basic
- Medium - I
- Medium - II
- Advanced

21:46  
05.08.2024

# What Next?

- 01** Mouse Movements & Keystrokes Mapping
- 02** User Agent String
- 03** Response Times

## Para Data Analysis



## Analysing Responses

- 01** Open & Closed Separately
- 02** Decision Boundary between Humans & Bots
- 03** Effects of Personas



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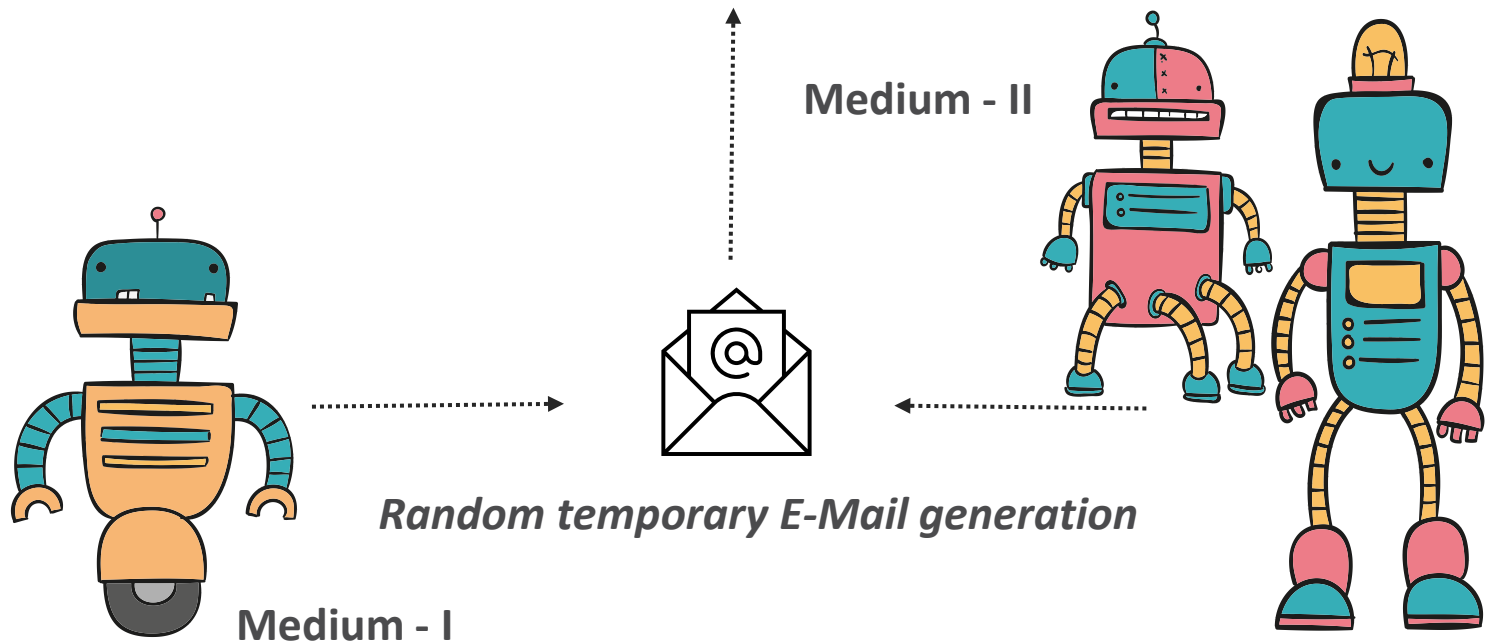


# QUESTIONS?

# Email Generation – Gmailnator Api

*Please input your E-Mail address in the text box below*

`smartbot@gmail.com`



# Main survey testing - Summary

	Basic	Medium - I	Medium - II	Advanced
<i>Randomization</i> (2)	✓	✓	✓	✓
<i>Filter Mechanisms</i> (2)	✓	✓	✓	✓
<i>Attention Check</i> (1)	✗	✗	✓	✓