
YOUTH TALKS CONSULTATION

METHODOLOGY NOTE

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# CONTENT


ABOUT YOUTH TALKS 2

**The Youth Talks consultation** **2**
- The scientific committee 2
- Target population 4
- Calendar 4

**Deliverables** **5**
- Database 5
- The global report 6
- The question boxes 7

YOUTH TALKS: WHAT METHODS WERE USED TO COLLECT CONTRIBUTIONS? 9

**Defining the methods of collecting the contributions** **9**
- Types of contribution 9
- Languages used for the consultation 10

**Defining the question protocol** **11**
- Choice of questions 11
- Testing the question protocol 14
- Ongoing adjustments and content changes 15

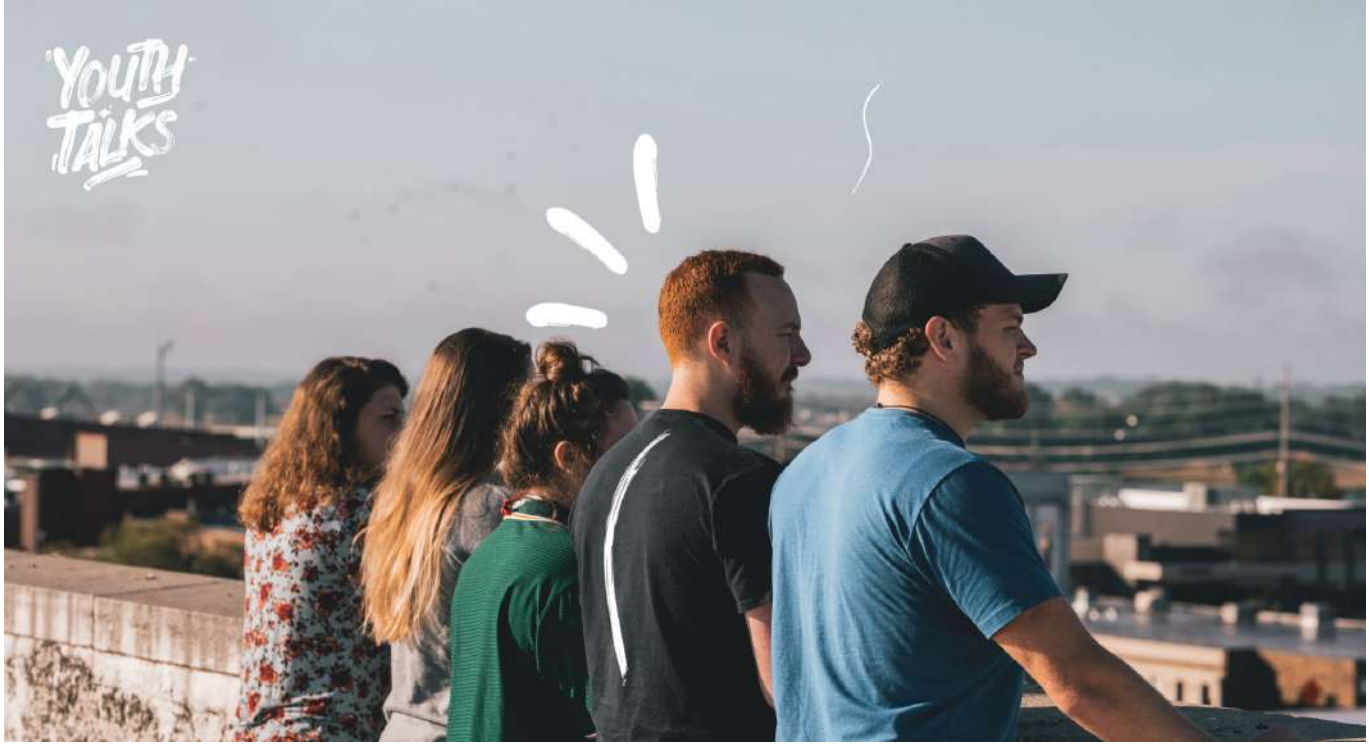
YOUTH TALKS: HOW THE CONTRIBUTIONS WERE ANALYZED 17

**Focus: sample representativeness** **17**

**Frequency analysis** **18**
- Overall process used for analyzing the contributions 18
- Deep dive on the process of translating contributions 19
- How the semantic analysis algorithm works 20
- Human supervision of semantic analysis 21
- Repository stabilization and validation process 22
- Naming convention & formulation of semantic clusters 24
- Analysis of question 11: innovation and indicators 26
- Deep dive on the multimedia contribution analysis 28

**Identifying rare and original ideas** **30**
- How the algorithm works 30
- Human review and selection 30

CASE STUDY USING DATA COLLECTED VIA THE EMPATHY QUESTIONNAIRE (RODOLPHE DESBORDES) 32




# ABOUT YOUTH TALKS

## The Youth Talks consultation

The Higher Education For Good Foundation (HE4G) was created to guide and support the world of higher education in a much needed transition towards providing young people with the skills they need to help address both current and future challenges.

"Youth Talks," HE4G's first initiative, questions young people directly about their vision of the future and the skills they feel they will need to shape it and thrive within it.

Youth Talks is a worldwide online consultation of unprecedented size that uses the very latest natural language processing technologies (NPL). During the consultation from October 2022 to May 2023, young people aged 15 to 29 from 212 different countries and territories shared nearly 1 million contributions and ideas about the future of the younger generation.

### The scientific committee

The overall mission of the Scientific Committee is **to advise the Youth Talks steering committee**.

Within the framework of our cooperation with our partner bluenove, the scientific committee is specifically responsible for the following tasks:

- Prior to the consultation, **learn about the methodological approaches** the partner plans to implement for data collection and analysis
- **Assess the scientific robustness** of these methodologies
- If appropriate, talk to the technical teams to **clarify and/or amend these methodologies**
- **Make recommendations** to the Youth Talks steering committee

## Frédérique Vidal, Director of the Scientific Committee

Frédérique Vidal is a professor in molecular biology, academic administrator, and politician who served as Minister of Higher Education, Research and Innovation in the government of Prime Ministers Édouard Philippe and Jean Castex from 2017 to 2022. She was the president of the University of Nice from 2012 to 2017. She earned a Master of Advanced Studies in molecular virology from the Pasteur Institute, and a PhD in biology from the University of Nice Sophia Antipolis. During her first term (2012-2016), Frédérique Vidal founded Université Côte d'Azur, a consortium consisting of the university, and business schools, art schools and research centers, to increase the international attractiveness of the university and obtained the label "Initiative of Excellence" for the University in 2016. She was then re-elected as president in 2016. Frédérique Vidal is now special advisor for the European Foundation of Management Development and volunteer scientific advisor for the Higher Education for Good Foundation.

## Rodrigo B. Castilhos

Rodrigo B. Castilhos is an Associate Professor of Marketing at Skema Business School. His research focuses on the interplay between market systems, space and markets, and consumption and social class. His studies seek to understand how different agents shape and are shaped by the dynamic evolution of markets, how space and markets co-constitute each other, and how market-mediated class dynamics unfold in different consumption contexts. His work has been published in peer-reviewed journals including the Journal of Marketing Research, the Journal of Business Research, Marketing Theory, Consumption Markets & Culture, and the International Journal of Consumption Studies. Rodrigo has also consulted for companies in the fields of education, retail, sports goods, packaged goods, real estate, and technology.

## Éric de la Clergerie

Éric de la Clergerie is a Research Officer working at INRIA in the field on Natural Language Processing (NLP), more specifically on Parsing and Syntax. He is the main developer of FRMG, a large coverage French grammar. FRMG has been used to parse all kinds of corpora (including French wikipedia), in particular to perform knowledge acquisition (terminology and semantic networks). It has also been used for information extraction. More recently, he has also worked on statistical/neural transition-based parsers, and on the coupling of symbolic parsers (such as FRMG) with statistical ones or neural ones. And even more recently, he got involved in neural language models (such as French CamemBert), investigating their training, capacities, potentialities, and limits.

## Rodolphe Desbordes

Rodolphe Desbordes is a professor of Economics at SKEMA Business School in France. He was previously a Reader (Associate Professor) in Economics at the University of Strathclyde, Glasgow UK. He holds a BA in political science (Sciences Po Paris) and a PhD in international economics (University of Paris I Pantheon-Sorbonne). His research interests cover the fields of foreign direct investment, economic growth, epidemics, and applied econometrics, and the student impact of internationalization.

## Marine Hadengue

Director of the Higher Education for Good Foundation (HE4G). HE4G is a Swiss-based not-for-profit organisation that helps educational institutions transform their curricula to meet the needs of the mid-21st century. As part of this, Marine leads Youth Talks, a groundbreaking initiative that marks the first-ever global youth consultation asking open-ended questions to young people worldwide and using advanced AI tools to analyze their answers.
Also a professor at SKEMA Business School, her expertise includes responsible management education, innovation, and social entrepreneurship. An engineer by training, Marine holds a Ph.D. from Polytechnique Montreal, a master's degree in political science form University of Montreal and completed her postdoctoral studies at Polytechnique Paris. Member of the International Advisory Board of the Peter Drucker Society, she is also the CEO of the Arbour Foundation, a Canadian philanthropic organization specializing in access to higher education.

## Target population

The Youth Talks consultation is intended for young people aged 15 to 29, of every geographical origin and every social background.

A review of the most recent youth surveys informed the scientific committee in their selection of an age group that would be as inclusive as possible, with the aim of gathering young people's ideas, not only as they emerge from childhood but also once they have left full-time education behind, and are able to take stock of their education and career path so far. The scientific committee thus selected the 15- to 29-year-old age group.

The period from 15 years of age to 29 is often seen as a key time in a young person's life, marked by numerous challenges, transitions, and opportunities. This age group is often the focus of international surveys and studies, owing to its importance in young people's individual and collective development, and in that of society as a whole.

Other major organizations have also selected this age group (15–29) when conducting surveys and reports focusing on the youth. Here are some examples:

The World Health Organization (WHO) has conducted surveys and studies on the health and well-being of young people around the world, frequently concentrating on the 15–29 age group, including reports on young people's mental health, disease prevention, access to health services, etc.

The United Nations Population Fund (UNFPA) puts the accent on youth-related topics, particularly with respect to issues like sexual and reproductive health. They conduct surveys and research into the needs and rights of young people aged 15–29.

Lastly, the World Bank publishes reports and conducts studies about the challenges faced by young people from all over the world. These reports address subjects like education, employment, social inclusion, and economic opportunities for young people aged 15 to 29.

## Calendar

The first edition of Youth Talks was launched on October 14, 2022, and the data analyzed in the summary report includes data collected from October 14, 2022, through May 19, 2023. However, the platform itself remained open for contributions after this date. The consultation lasted long enough for a significant number of participants to be reached and for young people from both the southern and the northern hemisphere to be included—care was taken to ensure that the consultation covered two different semesters, thus fitting in with the rhythms and calendars of our academic partners.

Prior to the official launch of the consultation, a considerable amount of preparatory work took place, mainly between February and October 2022, including, amongst others: defining the question protocol and the questionnaire design, testing the questions, building the platform, and conducting tests related to the expected load. These tests were conducted during a hackathon involving around 750 students.

**Figure 1: Calendar presented to the scientific committee on May 2, 2022**

# Deliverables

## Database

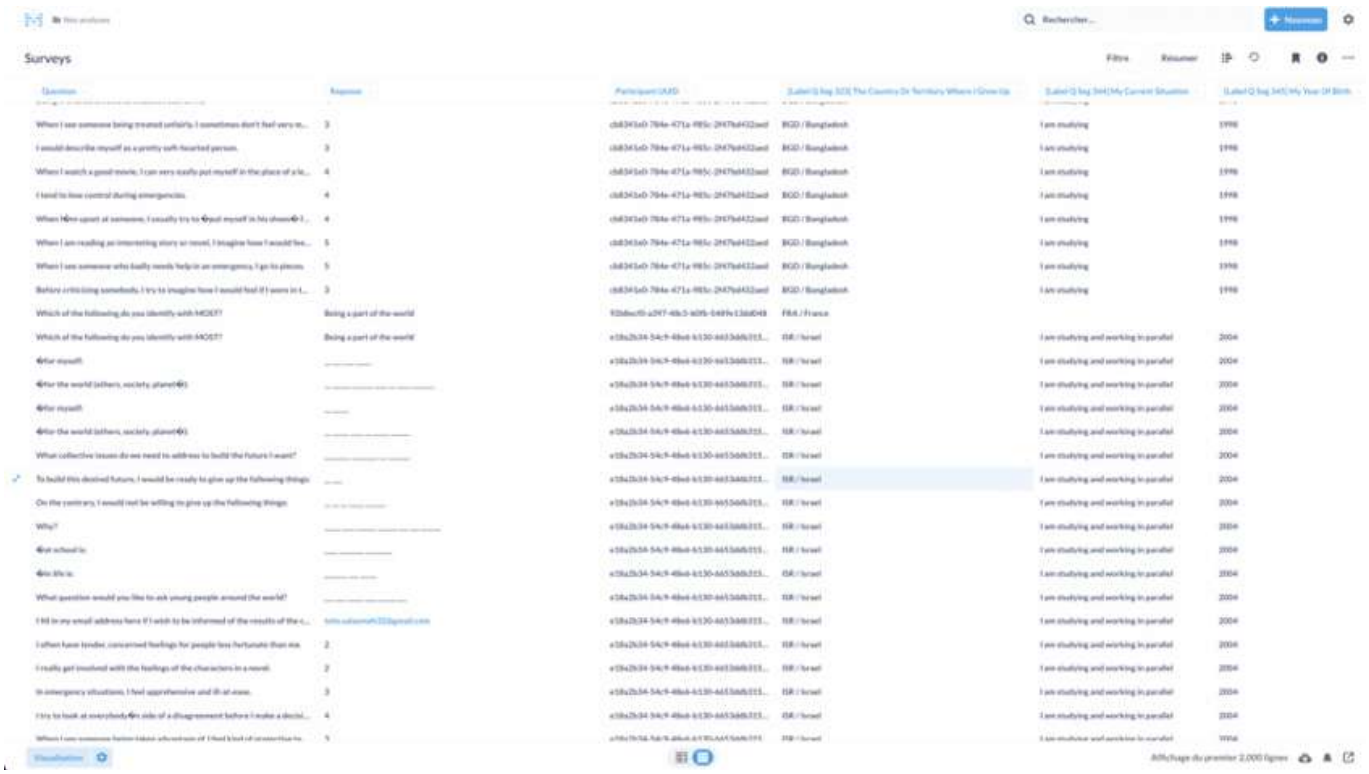
The Youth Talks database is powered by Metabase, an open source analytics software, and is available on demand, with individual logins. A policy for using this database is available, which also describes how to request access to it.

The database includes the English translation of all the data collected (this step was mandatory to be able to analyze the data), the data collected in its original language, and the multimedia files.

Using Metabase open source software both ensures transparency and also allows customization. Metabase is designed to offer an optimal user experience, with a database structured to enable intuitive navigation so that users can explore the information available effectively, which in turn makes data analysis, interpretation, and technical manipulation much easier.

The format of this practical, flexible tool demonstrates Youth Talks' commitment to promoting transparent, effective collaboration and making all key resources available to researchers and experts in order to facilitate in-depth, informed exploration of the data collected during the consultation.

**Figure 2: Screenshot of database of answers per participant**



## The global report

The summary report is another of the consultation's key deliverables.
This document, designed to be accessible to the general public, aims to tell the story of the consultation and offers an initial descriptive overview of the results obtained.

- The report covers the context of the consultation, its stakeholders, its methods of contribution, its ambassadors' program, and the methods used for scoping and analysis.
- It provides a statistical overview, including details of the number of participants and contributions, and also offers segmentation that enables deeper analysis.
- Every question is exhaustively presented and analyzed. It includes main lessons learned, lessons by region, subject repositories arising from the semantic analysis, and a "To go further..." section guiding the reader to a more in-depth analysis.
- The report also highlights "nuggets"—high quality contributions in both form and content.
- The document is available in both English and French, giving it greater reach and making it accessible to more readers.
- This comprehensive document presents an initial major analysis of the contributions, which remains faithful to the diversity and depth of the ideas collected.
- A downloadable PDF version of the report will be available online, as well as an editorialized web version, designed specifically for digital reading with the aim of reaching a wider audience.

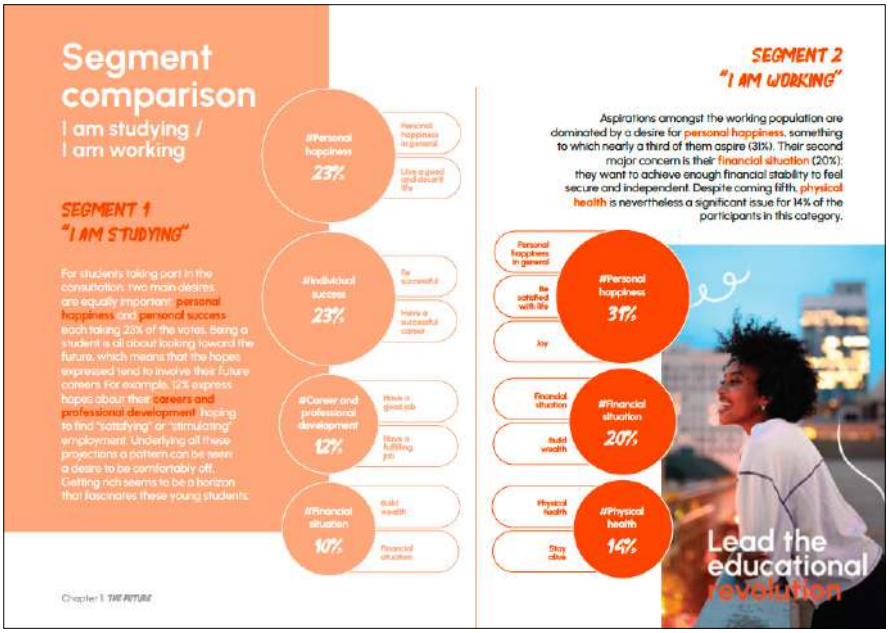



Figure 3: Example of a segment comparison of answers to one of the questions

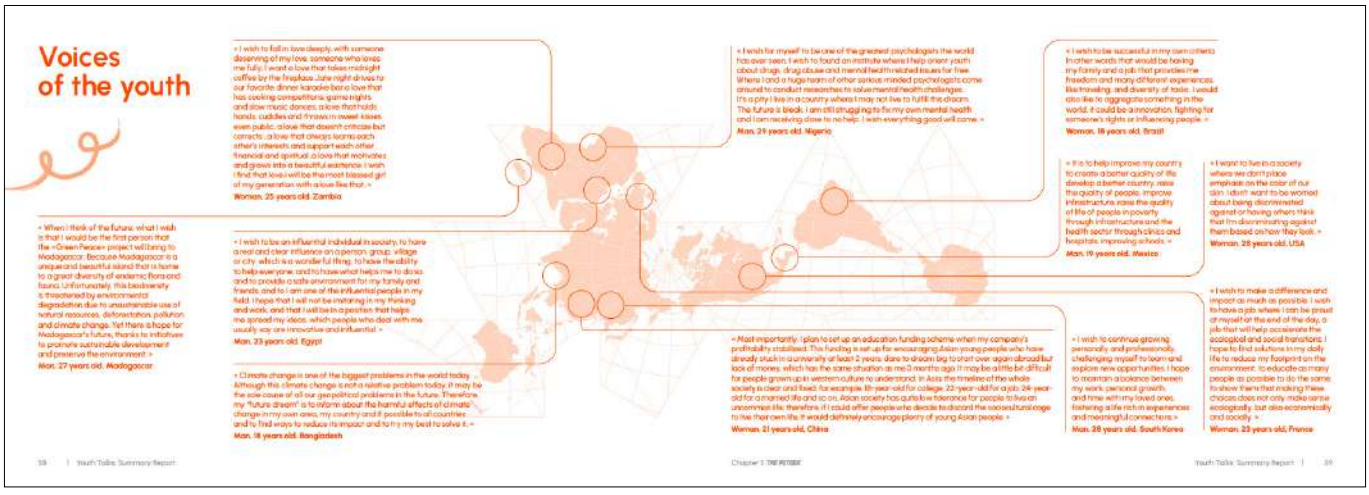



Figure 4: Example of nuggets from answers to one of the questions

## The question boxes

The question boxes are the consultation's third key deliverable. This platform features intuitive design and a way of presenting complex information that makes it accessible and engaging to the general public.

- It is designed to be both interactive and responsive, offering an interactive user experience. It also features dynamic infographics and fun ways of viewing data.
- It is a unique digital space, where users can preview the results, explore the questions, and discover the answers via well-structured repositories.
- The online platform provides clear, concise summaries of major findings, thus offering speedy understanding of the dominant topics and trends.
- Moreover, users can compare results from different geographical areas, to obtain a broader, more nuanced perspective. Excerpts from video interviews enrich the visitor experience by bringing a dash of authenticity to the data. The "nuggets" are intended to showcase some of the more unusual stories from the youth.
- While the summary report can serve as a detailed reference document, the online platform is designed to succinctly capture the overall essence of the results. It acts as an executive summary, allowing anyone and everyone to understand the main lessons learned and key trends at a glance.


# YOUTH TALKS: WHAT METHODS WERE USED TO COLLECT CONTRIBUTIONS?

## Defining the methods of collecting the contributions

### Types of contribution

Participants were offered several different ways of making their contribution, the aim being to offer an inclusive choice of experiences to suit each participant's desires and possibilities.

#### Individual contributions: the online consultation

The consultation questionnaire has been accessible online at https://youth-talks.org since late October 2022. This is an open access platform (no identification required) available in six languages: English, French, Spanish, Arabic, Chinese, and Portuguese. The questionnaire is provided via bluenove's Assembl Survey platform.

Assembl Survey collects and analyzes personal opinions contributed by participants (expectations, needs, concerns, etc.) via questionnaires, always guided by the following criteria:

- Every participant answers on an individual basis, without being influenced by the answers of other participants. The user experience is deliberately anonymous, so that people feel able to speak freely.
- The module can be used with open-ended, semi-open-ended or closed questions.
- For increased accessibility and inclusion, participants can also contribute by sharing their answers using text, voice recordings or images.
- The module has been specially designed to allow open questions to be used, ensuring that participants can express themselves using richer, more varied language, and are not limited by binary responses or influenced by predefined multiple-choice answers.

The online consultation consisted of a common core of open questions plus some segmentation questions intended to characterize participants in order to perform comparative analyses (See the ***Defining the question protocol*** chapter).

At the end of the questionnaire, participants were invited to continue their experience by answering a series of 16 closed questions on the subject of empathy to be used for research purposes.

### Collective contributions: activities organized by our ambassadors

In addition to the consultation itself, young people were also invited to take part in activities, either by simply participating or by organizing and coordinating them, after becoming Youth Talks ambassadors. These activities meant that participants could be offered a more collective experience (unlike the online consultation, where personal answers were given entirely independently), and could also answer the questions in person, if they had no or little access to the internet.

Four types of activity were offered, with the aim of finding something to suit participants' different contexts, constraints, and preferences.

- **Street interviews:** ambassadors could interview passers-by or people they know, asking them the questions from the consultation
- **Stands:** ambassadors could have a stand at an event or on a street corner to tell people about the project, give them information, and encourage young people to take part
- **Conversation workshops:** ambassadors could get participants together and ask them to discuss one or more issues connected with the questions in the consultation
- **Creative workshops:** ambassadors could get participants together and have them create works of art (writing, fresco, etc.) based on themes from the consultation

These last two activities could take place in person or remotely.

Activities were designed to collect similar data to that collected via the online consultation. Ambassadors were sent activity kits and reporting templates, so that they could report (via the platform) the contributions collected during these activities. These contributions were then analyzed in the same way as the individual contributions (See ***How the contributions were analyzed*** chapter).

## Languages used for the consultation

The Youth Talks consultation was conducted in six different languages to ensure maximum reach and accessibility throughout the world: English, Arabic, Chinese, French, Spanish and Portuguese. These languages were strategically selected as covering wide-ranging geographical and linguistic diversity.

# Defining the question protocol

## Choice of questions

The questions used in the consultation are available on the Youth Talks platform: https://youth-talks.org/en/ by clicking on "I give my opinion."

### Information and preliminary questions

Before the main questions, participants are welcomed by an introductory text that reads:

> WELCOME
>
> **Congratulations! By joining us here, you are already having a positive impact on the world!**
>
> You can take a step further by participating in the largest global youth consultation, the first initiative of its kind. Youth Talks gives you the floor!
>
> **3 good reasons to participate:**
>
> - You ask yourself the right questions to better understand who you are and how you want to help change the world: What are you ready to do?
> - You influence tomorrow's youth policies: a White Paper with the results of the consultation will be sent to the OECD, the European Commission and other major youth organizations.
> - You tell universities and other higher education institutions what you want to learn to change the world.
>
> Bonus: one tree is planted for every 10 participants!
>
> ***Feel free to express yourself: there is no right or wrong answer, your contributions will remain anonymous, and no question is mandatory.***
>
> We're counting on you.
> We're ready to learn from you!

Next, participants were asked two preliminary questions to find out where they grew up and whether they identified most with the town they were living in, the country they were living in, the world, or "don't know."

> **The country or territory where I grew up:** *(drop-down menu)*
>
> Which of the following do you identify with MOST?
> Being part of the city or area where you live
> Being a part of the world
> Being a part of this country
> Don't know

Asking about the country where they grew up at the very beginning of the questionnaire was intended to ensure that at least this much segmentation data was obtained. Participants tended not to respond to segmentation questions asked at the end of the questionnaire.

The aim of the second question was to assess, after the consultation, the representativeness of the resulting samples. This strategy will be discussed in more detail in a subsequent chapter of this methodology note.

## Body of the consultation

**The main questionnaire consisted of 11 open-ended questions:**

1. When I think about the future, what I wish… for myself
2. When I think about the future, what I wish… for the world (others, society, planet…)
3. When I think about the future, what worries me… for myself
4. When I think about the future, what worries me… for the world (others, society, planet…)
5. What collective issues do we need to address to build the future I want?
6. To build this desired future, I would be ready to give up:
7. On the contrary, I would not be willing to give up (habits, lifestyles, values…):
8. Why?
9. To build this desired future, what we must all learn (knowledge, skills, behaviors)… at school is:
10. To build this desired future, what we must all learn (knowledge, skills, behaviors)… in life is:
11. What question would you like to ask young people around the world?

The scientific committee advocated an open-ended question protocol based on young people's aspirations and concerns regarding their future. The scientific committee conducted four workshops to define the questions, with the aim of addressing two interconnected aspects of the relationship between young people and their futures:

- The personal dimension, which is about young people's hopes and concerns in respect of their personal and private lives, for example their career or their emotional life.
- The global dimension, which is about the hopes and concerns young people have about the world and its problems, such as global warming and geopolitical conflicts.

It was then decided that each dimension should be addressed in terms of the desires and concerns of the youth, which led to the emergence of the first four open-ended questions about their aspirations and worries, both for themselves and for the world as a whole (questions 1, 2, 3 and 4). A question about the challenges that must be overcome was then added to complete this first set of questions (question 5).

Once the first questions had led respondents to think about their future, the work of French philosopher Bruno Latour[1] inspired the next set of questions, which focused on what participants would be prepared to give up. The idea was to find out more about the extent to which participants might help to achieve the future they sought, which had been described in their earlier answers. More specifically, they were asked what they would or would not be prepared to give up, and why (questions 6, 7 and 8).

The last set of questions looked at what participants ought to learn, both at school and in life, if the future they seek is to be achieved (questions 9 and 10).

Lastly, the final question reversed the roles of questioner and participant, inviting the young people to imagine a question they would like to ask the world themselves (question 11).


1. http://www.bruno-latour.fr/sites/default/files/downloads/P-202-QUESTIONS.pdf

### Segmentation questions

Following these open-ended questions, the young people were asked a series of segmentation questions:

> My current situation
> My year of birth
> My gender
> My level of education (completed or in progress)
> My parents' highest level of education
> Here is an income scale in which 1 indicates the lowest income group and 10 indicates the highest income group in your country. In which group do you consider your family to be?
> I learned about the initiative from a partner organization:

### Follow-on questions: validated research questionnaire on empathy

In addition to the Youth Talks consultation based on open-ended questions, we also provided a questionnaire on empathy to be completed by anyone who wanted to take things a step further. Empathy is a fundamental need in our interconnected society, facilitating mutual understanding and supporting conflict resolution. Faced with global challenges like climate change, social inequalities, and political polarization, empathy can elicit a sense of shared responsibility.

We chose to use a validated research questionnaire, the "Interpersonal Reactivity Index," in order to guarantee the rigor of our survey. This standardized tool means that our results can be compared with those of other studies, making the results easier to interpret as their dimensions are well defined and encouraging other researchers to use our data for their own quantitative work.

> **The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate letter on the scale at the top of the page: 1, 2, 3, 4, or 5. READ EACH ITEM CAREFULLY BEFORE RESPONDING. Answer as honestly as you can. Thank you.**
>
> *ANSWER SCALE: 1. Does not describe me well / 2 / 3 / 4 / 5. Describes me very well*
>
> - I often have tender, concerned feelings for people less fortunate than me.
> - I really get involved with the feelings of the characters in a novel.
> - In emergency situations, I feel apprehensive and ill-at-ease.
> - I try to look at everybody's side of a disagreement before I make a decision.
> - When I see someone being taken advantage of, I feel kind of protective toward them.
> - I sometimes try to understand my friends better by imagining how things look from their perspective.
> - After seeing a play or movie, I have felt as though I were one of the characters.
> - Being in a tense emotional situation scares me.
> - When I see someone being treated unfairly, I sometimes don't feel very much pity for them.
> - I would describe myself as a pretty soft-hearted person.
> - When I watch a good movie, I can very easily put myself in the place of a leading character.
> - I tend to lose control during emergencies.
> - When I'm upset at someone, I usually try to "put myself in his shoes" for a while.
> - When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me.
> - When I see someone who badly needs help in an emergency, I go to pieces.
> - Before criticizing somebody, I try to imagine how I would feel if I were in their place.

## Testing the question protocol

In July 2022, 49 young people took part in a questionnaire testing session to validate the formulation, quality of translation, and clarity of the questions.

**They were offered two ways of taking part:**

- 36 freely made their contributions online
- 13 took part in special test sessions (some remotely via videoconferencing, others in person on bluenove premises)


**The questionnaire's six languages were tested to check the quality of the translations. The people performing the tests came from different countries, so as to detect any potential cultural bias:**

- English: 10 testers (India, Canada, Indonesia, United Kingdom, Nigeria, Lebanon)
- French: 26 testers (France, Canada, Tunisia)
- Portuguese: 5 testers (Brazil)
- Arabic: 5 testers (Morocco, Tunisia, Algeria, Syria)
- Mandarin: 1 tester (China)
- Spanish: 2 testers (Columbia, Spain)

The tests were conducted under real conditions, with the questionnaire just as it was intended to be used with the consultation's target population. At the end there were additional questions about the test itself. Only the common core and segmentation questions were asked.

For each question (open-ended and closed, segmentation), the test participants were asked to say if they understood the question properly and add any comments or suggestions when appropriate.

**These tests made it possible to check:**

- that the amount of time taken to answer all the questions was reasonable
- that in all languages the questions were properly understood: one way of checking this was to make sure that the same kinds of answers were given across all languages, as any differences might have suggested subtle changes in the translated questions
- the relevance of the answers in terms of our initial objectives
- whether more detailed instructions or contextualization were needed
- how interested young people were in the project

As a result, some additional details were introduced in order to clarify the questions and make them easier to understand. These adjustments were guided by observations made during the initial tests.

**Example of a modification:**

Possible misunderstandings arose in some of the open-ended questions, which had not been detected during the test phases. For example, some participants thought that the questions "To build this desired future, I would be ready to give up:" and "On the contrary, I would not be willing to give up:" were closed questions requiring a binary answer, such as "yes" or "no." To solve this problem, details like "(habits, lifestyles, values, etc.)" were added to clearly illustrate the kind of answer respondents were expected to provide.

## Ongoing adjustments and content changes

During the consultation, changes were gradually made to optimize the targeting and quality of responses. For example, the addition of bracketed comments to some of the questions, such as "(habits, lifestyles, values…)" influenced how the respondents approached the question, leading them towards specific answers.

As a result, one month after the consultation began, the brackets were repositioned and added to the instructions, to avoid over-directing the answers.

Also, in November 2022, during the first analysis tests, it was noticed that the English version of the question about what young people would be prepared to give up was not always well understood. This led to a review of its content, and the question was changed from "To build this desired future, I would be ready to give up…" to "To build this desired future, I would be ready to give up the following things:".

These carefully considered, ongoing changes are testimony to an attentive, flexible approach to designing and implementing the questions, which in turn guarantees increased consistency and relevance in the answers elicited.

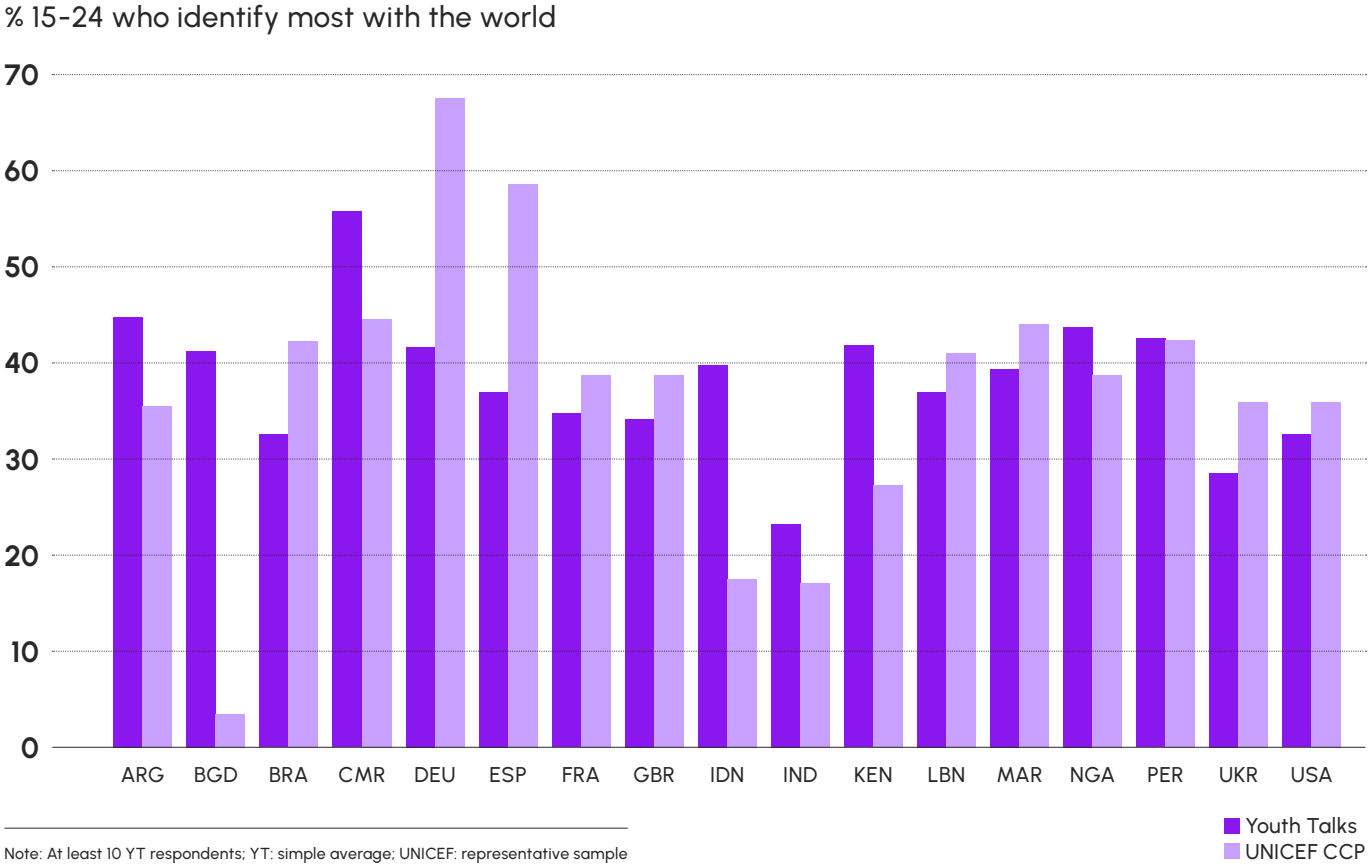
# YOUTH TALKS: HOW THE CONTRIBUTIONS WERE ANALYZED

## Focus: sample representativeness

A sample is said to be representative if it proportionally reflects the attributes of a population (e.g., gender, age, location, education, income). Individual responses are likely to be a function of these attributes and therefore, when studying opinions, out-of-sample generalizations can only be made from a representative sample. Youth Talks (YT) is a convenience sample: participants have been included based on their accessibility and their willingness to participate. It may therefore not be fully representative of the 15-29 population.

To assess this possibility, we compare in Figure 1 below the share of (possible to identify) 15-24 people who identify the most with ***"being a part of the world"*** in YT with the counterpart share in the probability-based and nationally representative samples provided by the Changing Childhood Project (CCP) for 21 countries.

**Figure 1: Answers from YT convenience sample with UNICEF CCP nationally representative sample**




Note: At least 10 YT respondents; YT: simple average; UNICEF: representative sample

For most countries, the results are very similar, keeping in mind that the margin of error is +/- 4% (at the 95% confidence level) for CCP answers. We nevertheless observe a large difference for Bangladesh (BGD), Germany (DEU), Spain (ESP), Indonesia (IDN) and Kenya (KEN). These differences may be due to over- or under-sampling of some categories related to attributes such as gender, age, education, income, or location. Generalization from sample to population could still be achieved ***ex post***, for example through multilevel regression with poststratification.

In addition, when the interest is in a treatment effect (e.g., the effect of an attribute on social and political attitudes), online convenience samples often provide similar results to those obtained from nationally representative samples.

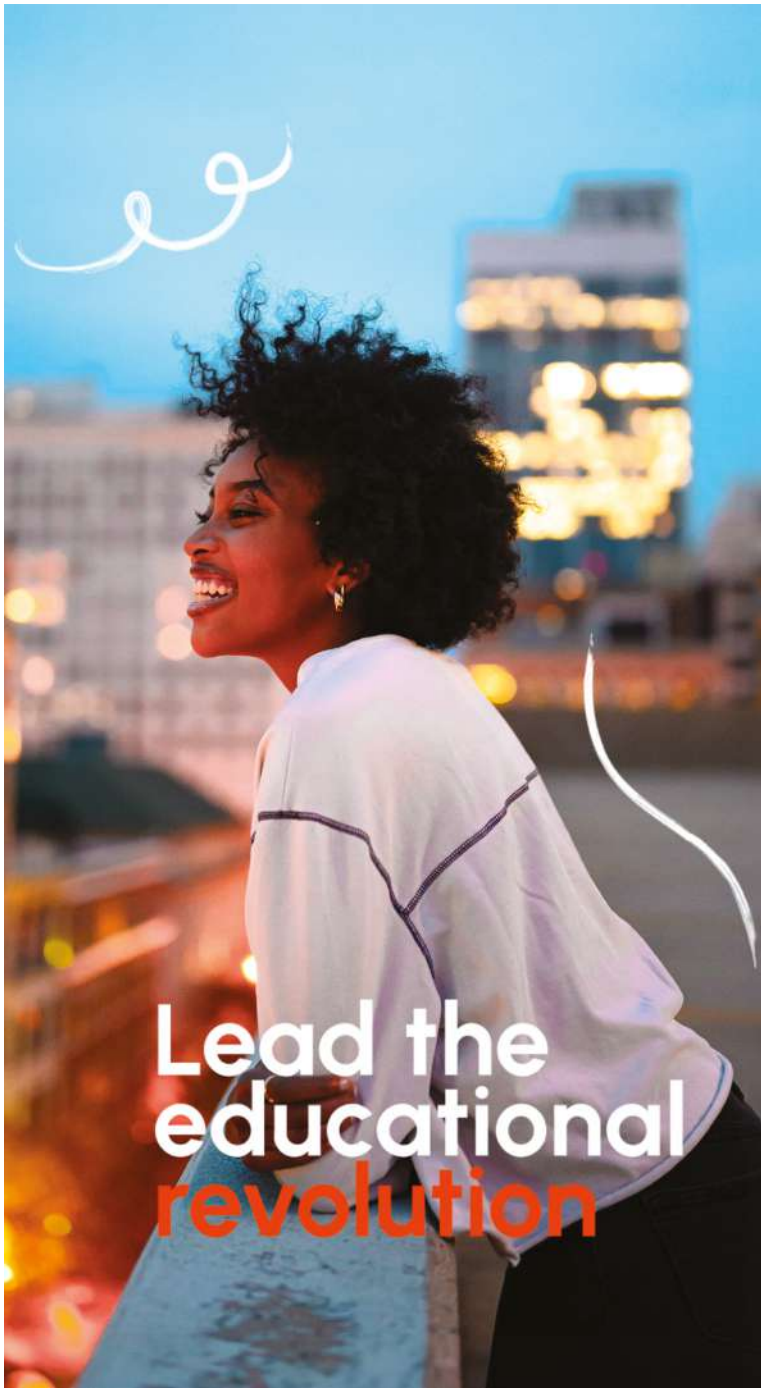
**Overall, these results suggest that YT is a valuable tool not only to estimate treatment effects but also to get a rough idea of the prevalence of an opinion in a given population.**

# Frequency analysis

## Overall process used for analyzing the contributions

Analysis began a few weeks after the consultation was launched and continued throughout the consultation, in a series of iterations. The following steps were repeated for each iteration:

1. Extraction of verbatims
2. Translation into English (details of this process provided below)
3. Translated verbatims injected into analysis platform
4. Analysis (clustering)
5. First results of analysis reviewed by project committee
6. Adjustments made to analyses and repositories
7. Review by editorial committee
8. Summaries written
9. First proofreading and corrections
10. Final proofreading



## Deep dive on the process of translating contributions

Contributions were collected by means of six questionnaires, one in each of the languages used for the consultation (French, English, Spanish, Portuguese, Arabic, Chinese). Some contributions were made in other languages, as some participants answered the questions in the English questionnaire in their mother tongue, after translating it using one of the online machine translation services available via a number of web browsers.

To translate everything into English, the pivot language, we set out a process that was repeated with each iteration:

1. Extraction of all verbatims
2. Creation of a common question repository and translation of closed questions by means of an Excel correlation table
3. Selection of verbatims for translation
4. Creation of six documents for translation for each source language and documents sent to Google Translate[2] ***(NB: the English document was also translated to make it easier to process contributions in languages other than those used for the questionnaire)***
5. Translation quality checked using formulas that allowed targeted verification (IF type formulas) and a reference vocabulary to detect possible translation errors (for example, "clothes" instead of "habits"). If any mistakes were picked up, a second wave of translation was performed on a case-by-case basis
6. Translated and corrected verbatims added to overall repository
7. Data imported to analysis platform

Following this procedure reduced the number of mistakes and incorrectly translated contributions. Owing to the size of the files involved in each iteration (with tens to hundreds of thousands of lines), a few marginal errors remained that were set aside during analysis and corrected at the end of the process.

2. https://www.researchgate.net/publication/362987687_THE_ANALYSIS_OF_GOOGLE_TRANSLATE_ACCURACY_IN_TRANSLATING_PROCEDURAL_AND_NARRATIVE_TEXT ; https://pubsonline.informs.org/doi/abs/10.1287/mnsc.2019.3388 ;https://arxiv.org/abs/1910.02688

## How the semantic analysis algorithm works

Contributions made in response to open-ended questions were analyzed via bluenove's Assembl platform, which uses an algorithm to automatically group semantically similar ideas. This clustering algorithm produces a frequency analysis of terms and term co-occurrences within the corpus.

This takes place in a number of stages, guided by the following methodological approach, which guarantees that is it both highly effective and extremely accurate (verbatim indexation quality 90–95%).

### Iteration 1

For each open-ended question, an answers repository, suggested by the clustering algorithm, was created and then refined by human input. The process was as follows: The first 1,000 verbatims were injected into the algorithm and 600 of them were checked by the analyst (300 with the highest confidence score and 300 with the lowest). This task was performed for each of the open-ended questions and required several hours of human verification per question.

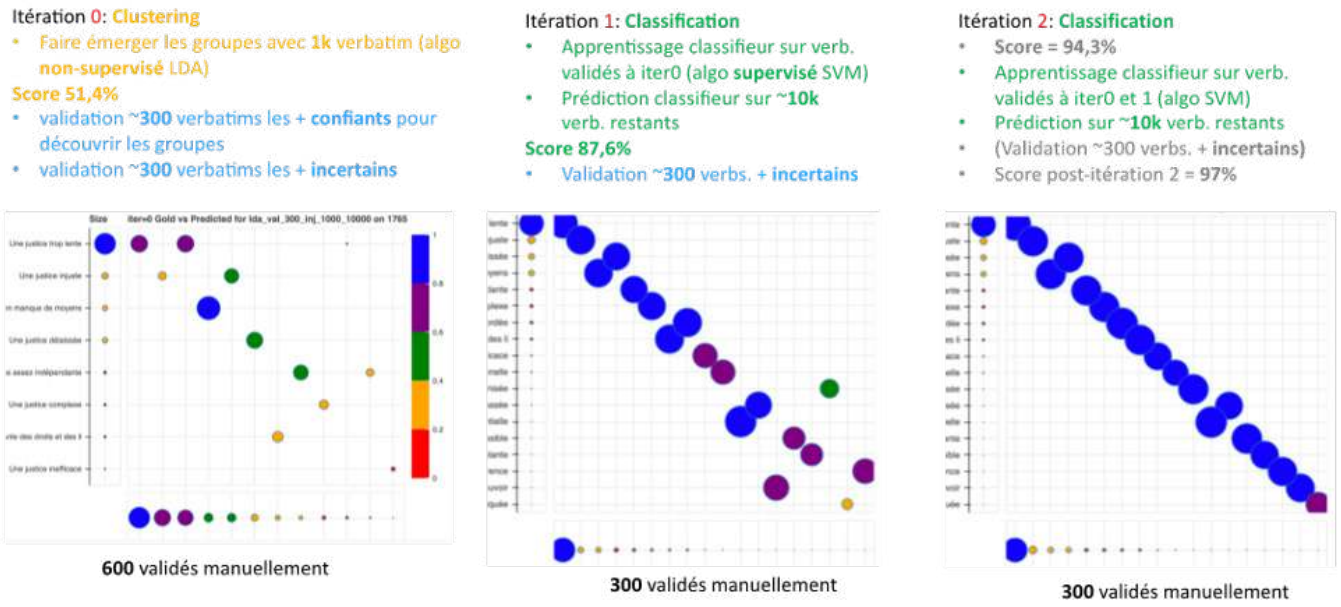
### Iteration 2

Based on this initial repository for each question, all additional data was ***automatically*** classified by a semantic classifier. This classifier, trained on ultra-massive data from the internet (several billion web pages), induces semantic proximities learned in other data corpuses, which makes it particularly high performing. Thus, for an additional batch of data with 10,000 verbatims, the human analyst was able to concentrate on the 300 verbatims with the lowest confidence score.

### Iteration 3

A new batch of 10,000 more verbatims was classified automatically, and, as before, only the least certain ones were checked by human analysts. This new iteration resulted in an ***average*** indexation score of over 95%, which is considered the optimum possible outcome (above this threshold, two humans are not necessarily in agreement about the appropriate classification). All further data was then injected into the analysis ***without any need for human supervision***.

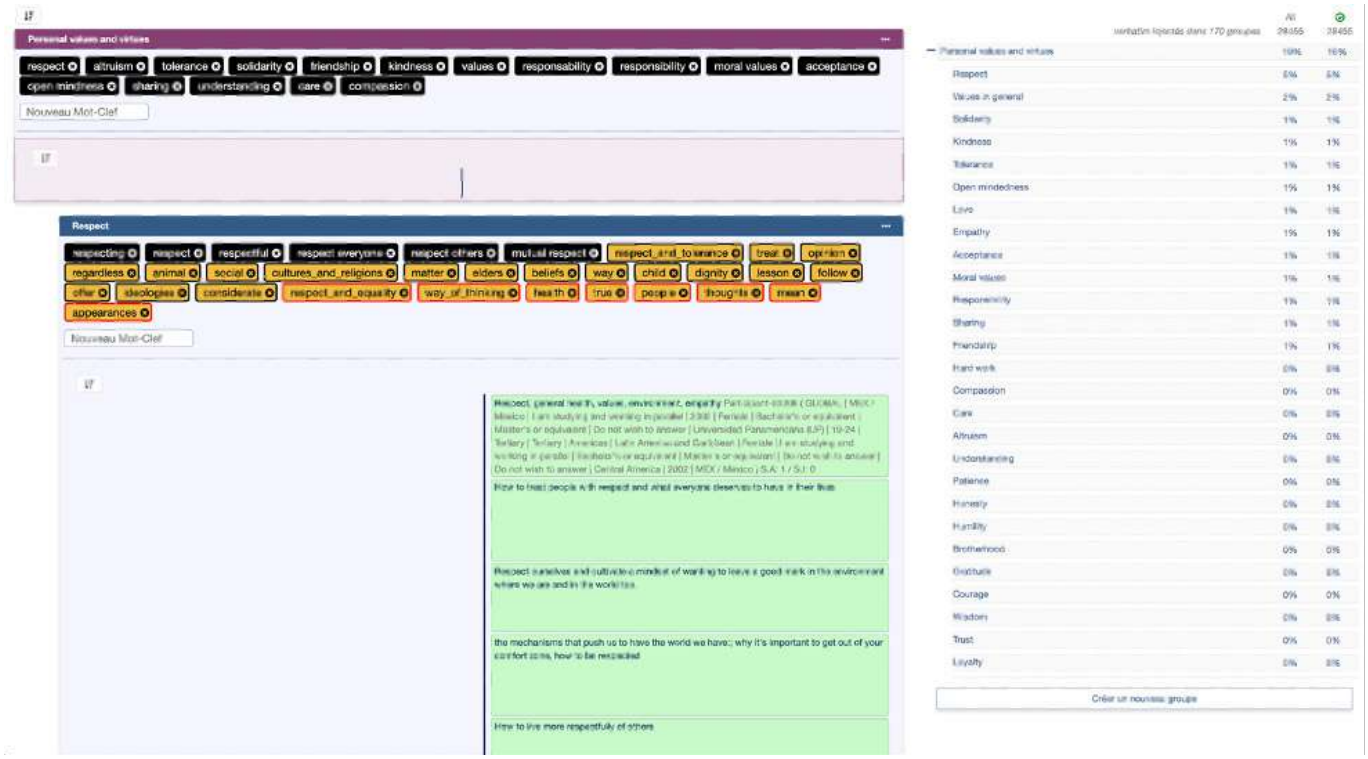
The following diagram summarizes the three-stage analysis (one clustering cycle + two classification cycles):




3. confidence score is related to the belonging score of the sentence in terms of semantic group.

To improve classification accuracy, new keywords were added during intermediate iterations, so that the algorithm could identify the correct cluster for each contribution with optimum accuracy.

**Figure 8: Example of supervision interface for classification using keywords**




## Human supervision of semantic analysis

During project scoping, the strategic decision was made to conduct a finely detailed semantic analysis of the answers.

### Hierarchical classification and multiscale analysis

To minimize any interpretative bias and facilitate analyses at different scales, each verbatim was carefully assigned to the cluster that was most closely aligned with the intrinsic meaning of the response.

For example, the verbatim "I want to have a fulfilling job" was allocated to the "Have a fulfilling job" cluster, whereas "I want to have a good job" was assigned to the "Have a good job" cluster. This may appear to be a subtle difference, but it is a crucial one, reflecting different kinds of aspiration that may potentially come from young people with a variety of socioeconomic profiles.

For a more integrative analysis, these different clusters were both put into the "Career and Professional Development" cluster. This provides researchers who may want to use the data for future studies with vital analytical flexibility.

### Limitations and use of "priority" approach

Note that the algorithm used for this study does not allow multi-indexation—in other words, a verbatim cannot be assigned to more than one cluster, even if it contains several different ideas.

In such cases, it was decided that priority would be given to the first idea expressed by the participant to classify the verbatim. Thus, in the example verbatim "Peace and love," the idea of peace comes first and was therefore used rather than that of love.

This method of hierarchical, fine-toothed analysis, despite having its limitations, underlines the importance of meticulous human supervision. It promotes deeper, more nuanced understanding of the data while delivering a structure that enables flexible, multidimensional analysis.

**Figure 9: Table showing number of clusters per question**

| # | QUESTION | CLUSTERS NUMBER |
|---|---|---|
| 1 | When I think about the future, what I wish… for myself | 163 |
| 2 | When I think about the future, what I wish… for the world (others, society, planet…) | 170 |
| 3 | When I think about the future, what worries me… for myself | 66 |
| 4 | When I think about the future, what worries me… for the world (others, society, planet…) | 80 |
| 5 | What collective issues do we need to address to build the future I want? | 191 |
| 6 | To build this desired future, I would be ready to give up: | 171 |
| 7 | On the contrary, I would not be willing to give up (habits, lifestyles, values…): | 148 |
| 8 | Why? | 78 |
| 9 | To build this desired future, what we must all learn (knowledge, skills, behaviors)… at school is: | 125 |
| 10 | To build this desired future, what we must all learn (knowledge, skills, behaviors)… in life is: | 131 |
| 11 | What question would you like to ask young people around the world? | 100 |

## Repository stabilization and validation process

Following the automatic extraction and naming of the first version of all the clusters and macro-clusters, bluenove and the scientific committee formed a task force to proofread all the clusters. The aim of this exercise was to determine a single criterion for naming the clusters and apply it to all of them. To name the clusters, the group opted for simplicity and proximity of verbatims, while still maintaining fine granularity. All the clusters and macro-clusters for each question are available in the appendix.

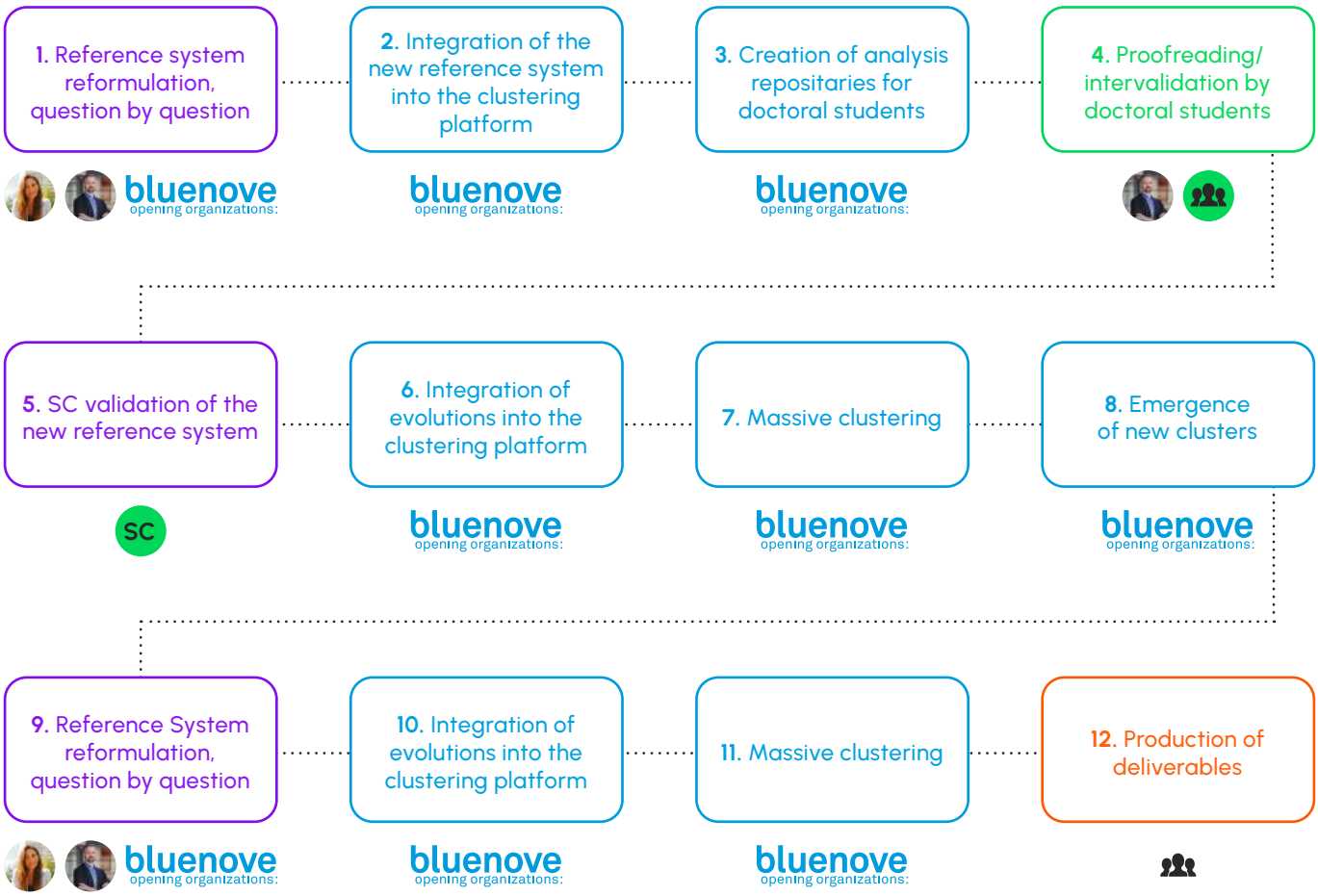
Once proofreading of each question's clusters was complete, the new convention for naming them was incorporated into the clustering platform, before extracting a second version of the database in order to perform cross-validation.

The different stages of the process for stabilizing and validating the repositories were as follows:

1. The repositories (meta-clusters and clusters) generated by bluenove were proofread and revised by the foundation's scientific committee, one question at a time. **As far as possible, during this crucial process, the researchers involved worked separately as they assessed the names given to the meta-clusters and clusters**, in order to ensure that their interpretations were entirely independent.
2. **They then worked as a group to standardize the formulation of the clusters** and match up mirrored questions (for me/for the world, at school/in real life), so that they would be sure to have comparable repositories.
3. **The modifications thus made to the repositories were incorporated into the Assembl analysis platform** as the process went on, to ensure that they would be taken into account during subsequent injections of verbatims.
4. An export of the contributions, including the new repositories, was then made available to some doctoral students who were unconnected with the project. These researchers performed **a cross-validation** (see "cross-validation" paragraph below).
5. The modifications suggested by these research students were **validated by members of the Scientific Committee, including the senior researchers involved in stage 1**.
6. Once they had been validated, **the modifications were incorporated into the platform**.
7. **New data was injected** into the platform, which resulted in new waves of clustering.
8. The new data **gave rise to new clusters**: these were tagged to make them easy to identify. By this stage, 60–70% of the contributions to each question had been analyzed.
9. These **new clusters were proofread, reformulated, and validated** by the Scientific Committee, including the senior researchers involved in stage 1.
10. Any modifications made were incorporated into the platform.
11. The final wave of clustering was based on the final version of the repositories.

## Stabilization and validation of the reference system

*A new process that mixes machines and humans, borrowing best practices from the qualitative scientific literature.*




## Naming convention & formulation of semantic clusters

One aspect of the semantic analysis and the method described in the previous section was the establishment of a naming convention to ensure data consistency, accuracy, and transferability, thus making it easier for readers and researchers to use it. This convention, which guided the individual and collective work of both the researchers and bluenove's analysts, was based on the following key principles:

### Arbitration methodology

- **Generic formulation of clusters:** rather than formulating cluster names as subject-verb-object, preference was given to generic terms. For example, "I wish for success" became "Individual success."
- **Use of verbs in the infinitive:** in some cases, infinitives of verbs were used to express the essence of a cluster, e.g., "To have a job" or "To become a doctor."
- **Definition of macro-clusters:** the methodology note includes a clear definition of the macro-clusters, which enables better understanding of both their content and their reach.
- **Organization of verbatims:** the verbatims were moved from their macro-clusters to sub-clusters, making it easier for them to be used in scientific research.

### Cluster label format

- **Conciseness:** cluster labels were kept to one or two words rather than whole sentences.
- **Use of umbrella words:** such terms, which refer to broader concepts, are more easily transferable and make the data easier to read and interpret.

### Structure and classification

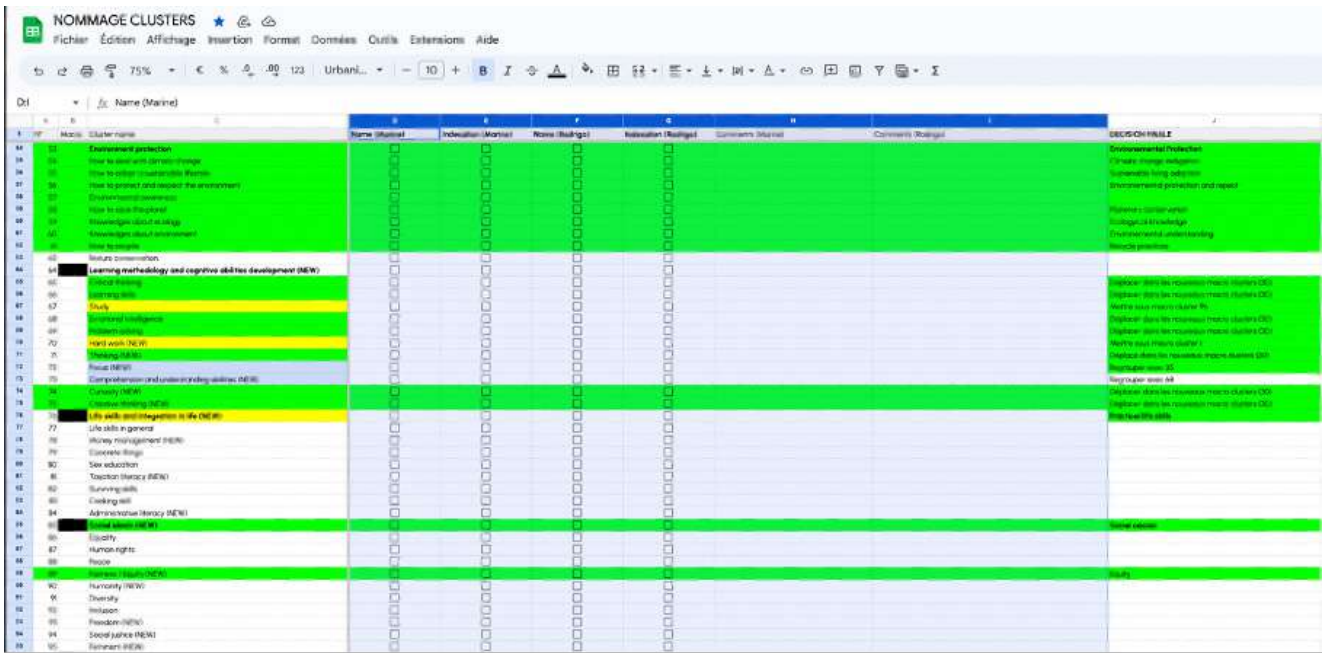
- **Meta-cluster:** e.g., "Individual success/ Life accomplishment."
  - Definition: "success" refers to an actual, goal-oriented achievement.
  - Specificity: "individual success" means achieving a desired, planned or attempted goal.
- **Classification rule:** generic verbatims were classified at meta-cluster level.
- **Merging and reorganization:** e.g., "To have a job I love" was merged with "To do the job of my dreams."

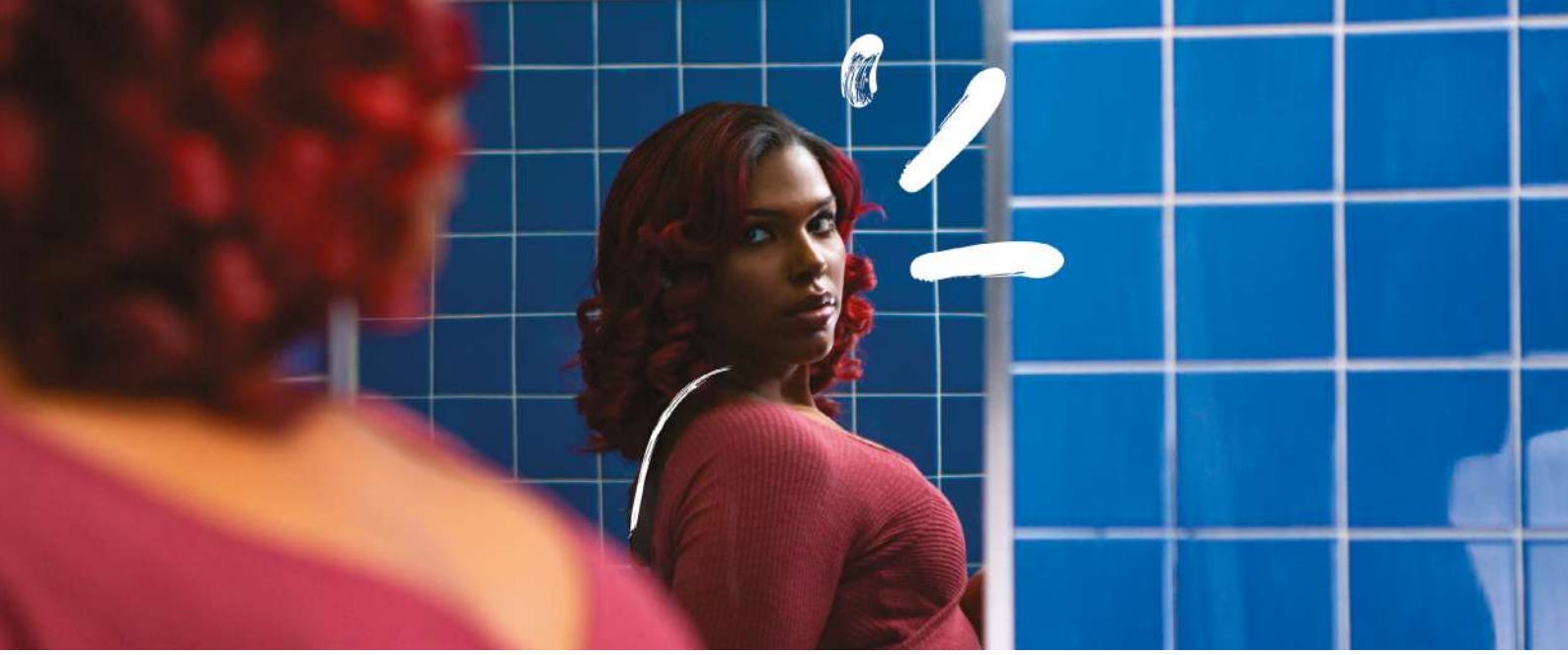
### Concrete examples

- **Meta-cluster**
  "Personal and social relationships"
- **Sub-cluster:** "To have a family" (ok), "To love and be loved" (revised from "To be loved"), "To have friends" (ok).

Great care was taken in establishing the naming convention and forming the semantic clusters, to ensure that they were clear, concise, and pertinent. As a result of following these methodological principles, the analysis offers a solid, transferable base for future studies, yet still maintains the nuances and specificities of the verbatims collected.

### Figure 10: Extract from the naming convention for question 9





## Cross-validation

To improve the methodological robustness, the process of cross-validation followed common guidelines in the field of qualitative studies using automated text analysis methods[6]. Once naming of the clusters and macro-clusters had been stabilized, an initial database containing 13,632 contributions (or 4% of the total number of contributions) was extracted for independent validation by three researchers, including one senior researcher. The primary purpose of this stage was to correct any potential errors made by the algorithm when allocating an answer to a cluster and inform future iterations of the ***clustering*** process. The cross-validation procedure followed the protocol below:

- Independent analysis of each verbatim to check which clusters and macro-clusters it belonged to. If a verbatim was considered to have been allocated to the right cluster, the reviewer marked it as "YES" using a special tool. If this was not the case, the verbatim was marked as "NO." For example, if the verbatim "I wish to have a job in which I thrive" had been put in the "have a job" cluster, it would have been marked "NO." Next, the researcher would have suggested another, more suitable cluster, e.g., "have a fulfilling job."
- Consolidation of the three independent analyses using a common set of data.
- Decision made by senior researcher on a 2:1 basis. Two YESes meant the verbatim was validated. Two NOs meant the verbatim was invalidated and a new cluster suggested.

The validation rate for the verbatims (YES) varied from 80% to 97%, which demonstrates the robustness of the algorithm used.

### Figure 11: Extract from cross-validation tool

| D | E | F | G | H | I | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|
| MACRO-CLUSTER | SOUS-CLUS | VERBATIM | Poon | Faria | Cast | Comments_PO( | Comments_FARIAS | Comments_CAS | Result | Reccomendation |
| Career and professional devel | Be a doctor | Want to be doctor and serve the poor. | Yes | Yes | Yes | | | double/be useful | Yes | |
| Career and professional devel | Be a doctor | As a Child specialist (doctor) | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be a doctor | I want to become a doctor | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be a doctor | To become a doctor | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be a doctor | I want to be a doctor and buy lots of chocolates | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be a doctor | I want to be a doctor | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be a doctor | to be a doctor | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be a doctor | doctor | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be a doctor | Have a doctorate | Yes | No | No | | Succeed academically | succed academically | No | succed academically |
| Career and professional devel | Be a doctor | Want to be a Doctor | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be a doctor | Be good doctor | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be a doctor | Being a doctor | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be a doctor | To become a good person and doctor | Yes | Yes | Yes | Help others | | | Yes | |
| Career and professional devel | Be a doctor | Be a Doctor | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be a doctor | I wish I have be a doctor | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be a doctor | I want and wished to become a doctor | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be a doctor | I wish I would be a doctor someday, and keep doing nice de | No | Yes | Yes | Help others | | | Yes | |
| Career and professional devel | Be a doctor | I wish I will be a good doctor for the future | No | Yes | Yes | Have a good future | | | Yes | |
| Career and professional devel | Be a doctor | I wish I become a good doctor for the future | No | Yes | Yes | Have a good future | | | Yes | |
| Career and professional devel | Be a doctor | to be a vet | Yes | No | No | | new sous-cluster: be a veterina | be a veterinarian | No | New SC: be a veterinarian |
| Career and professional devel | Be a doctor | I want to be a doctor. | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be a doctor | I wish to become a leader and doctor | No | Yes | Yes | Achieve my goals | | | Yes | |
| Career and professional devel | Be a doctor | Do what I want with the remaining time of my life. To be at | No | Yes | Yes | Be fulfilled | | double/be fulfullfilled | Yes | double |
| Career and professional devel | Be an engineer | I want to be a CSE engineer | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be an engineer | Engineering | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be an engineer | be a software enginer | Yes | Yes | Yes | | | | Yes | |
| Career and professional devel | Be an engineer | I just want be a good man | No | No | No | Ambiguous, alt: to be k | Become a better person | be good | No | New SC: be a good person |

4. Humphreys, Ashlee, and Rebecca Jen-Hui Wang. 2018. "Automated Text Analysis for Consumer Research." Journal of Consumer Research, no. April. https://doi.org/10.1093/jcr/ucx104.

## Analysis of question 11: innovation and indicators

Question 11 was different from all the others in that it elicited questions that the young people wished to ask other young people around the world. Unlike the other questions, which primarily gathered statements or personal experiences, analyzing question 11 required a specific, innovative methodological approach.

### Method of analysis

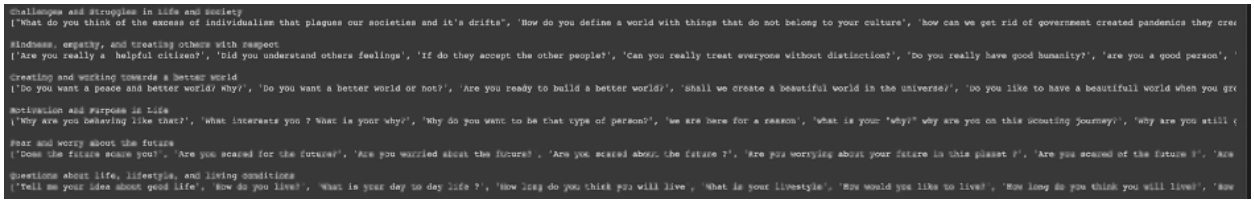
The chosen method of analysis combined various technologies, including:

- **calculating embeddings:** the "text-embedding-ada-002"[7] model was used to calculate ***embeddings*** in all contributions, thus capturing any semantic nuances.
- ***K-means* clustering:** data was segmented into 100 distinct clusters using the ***K-means*** algorithm to organize the contributions into coherent groups.

### Figure 12: Backend clustering

- **cluster naming:** the GPT-4[8] model was tried as a way of labeling clusters by primarily examining the first 50 verbatims from each cluster, thus bypassing constraints related to the number of ***tokens***.

### Figure 13: Backend cluster labeling



- **identifying meta-clusters and nano-clusters:** detection of major transversal themes (mutually exclusive and collectively exhaustive meta-clusters) and identification of finer trends and groupings within a cluster (three nano-clusters per cluster).

### Figure 14: Backend identification of nano-clusters

```
        "Social Issues and Human Behavior": [
          "Human Behavior and Social Issues",
          "Kindness, empathy, and treating others with respect",
          "Human negativity, hatred, and violence",
          "Personal Values, Choices, and Impact on Society and the World",
          "Perceptions and opinions on the current state of the world and society.",
          "Biggest issues and challenges facing society and individuals today"
        ],
        "Future Concerns and Visions": [
          "Perceptions and visions of the future",
          "Concerns and questions about the future of our generation and the world.",
          "Fear and worry about the future",
          "Concerns and responsibilities of the current generation for a better future and sustainable world.",
          "Predictions and visions of the world in the future",
          "Perceptions and expectations of the world and oneself in 10 years",
          "Concerns and fears about the future"
        ],
        "Unity, Collaboration, and Empowerment": [
          "Respect and Communication",
          "Unity and Collaboration Across Differences",
          "Willingness to sacrifice and take action for a better future",
          "Taking Action for a Better World and Sustainable Future",
          "Promoting peace and unity in the world"
```

5. https://platform.openai.com/docs/guides/embeddings/what-are-embeddings
6. https://platform.openai.com/docs/models/gpt-4

- **3D visualization:** a dynamic infographic was created using the Plotly 3D graphs module, showing the distances between the contributions and clusters.

**Figure 15: HTML view of extract from Plotly 3D plot**


- **analyzing weak trends and signals:** the OpenAI playground was used with the GPT-4 model to detect and interpret emerging trends and weak signals.

### Indicators and semiotic analysis grid

A special analysis grid including the following indicators was designed for this question:

- **Ego score:** measures focus on self and friends/family, to assess personal and social interest. This score is calculated by adding together the percentages of answers related directly to the participant (self) and those related to friends/family (others). For example, if 20% of the answers are about "oneself" and 15% are about "others," the Ego score is 35%.
- **Eco score:** measures holistic perspective, which addresses participant's connection with the planet, society, and the environment. This score is calculated by adding together the percentages of answers that have a holistic connection with the planet and/or society (the world), talk about a relationship with society (society), and are connected with the environment (the environment). For example, if 10% of answers are about "the world," 40% are about "society," and 15% are about "the environment," the Eco score is 65%.
- **Present and future scores:** evaluation of the percentage of answers referring to the present and to the future, to reveal the temporal focus of the contributions. This score is calculated by taking the percentage of answers that refer to something in the present, the speaker's basic situation or essential factors (everyday life, the present). For example, if 20% of answers are about life, the Present score is 20%. If 40% of answers are about the future, the Future score is 40%.
- **Growth mindset and fixed mindset scores:** this explored answers involving personal development (Growth Mindset) and fixed ideas, to reveal underlying attitudes and aspirations. The score is calculated using the percentage of answers related to self-improvement, personal development, making changes to improve one's situation (Growth Mindset), or the percentage of answers that refer to a state of mind, mindset, culture, and mental models, both individual and collective (Fixed Mindset).

These nano-clusters were analyzed using the GPT-4 model, which enabled all the scores to be provided at the first contribution grouping level. Next, the most representative questions were checked in the clustering file to ensure that the indicator was well matched with the questions.

## Figure 16: Table of indicators by meta-theme

| META-THEME TITLE | PERSONAL DEVELOPMENT & ASPIRATIONS | A BETTER WORLD | WELL-BEING | THE FUTURE OF YOUTHS |
|---|---|---|---|---|
| Total number of questions | 12 121 | 8 819 | 2 784 | 1 701 |
| Social targets | | | | |
| Oneself | 60% | 22% | 70% | 20% |
| Others | 20% | 22% | 10% | 20% |
| Society | 10% | 22% | 10% | 30% |
| The environment | 5% | 22% | 0% | 15% |
| The world | 5% | 22% | 10% | 15% |
| Egocentrism | 80% | 35% | 80% | 40% |
| Ecocentrism | 20% | 65% | 20% | 60% |
| The level of consciousness | | | | |
| Present life | 50% | 33% | 100% | 50% |
| Projection into the future | 50% | 67% | 0% | 50% |
| Fixed mindset | 30% | 38% | 70% | 70% |
| Growth mindset | 70% | 62% | 30% | 30% |
| SUB-TOTAL IN PERCENTAGE | 46% | 33% | 10% | 6% |

The semantic analysis of question 11 took a new, multidimensional approach, incorporating advanced techniques and specific indicators to fully capture the rich and complex nature of the contributions. This carefully designed methodology demonstrates the unique challenges associated with this particular question, and provides a nuanced understanding of young people's concerns, aspirations, and points of view.

## Deep dive on the multimedia contribution analysis

Analysis of the multimedia contributions, including audio files and photos, was a key component of the online consultation. There follows a detailed description of the methodology employed to analyze this type of data.

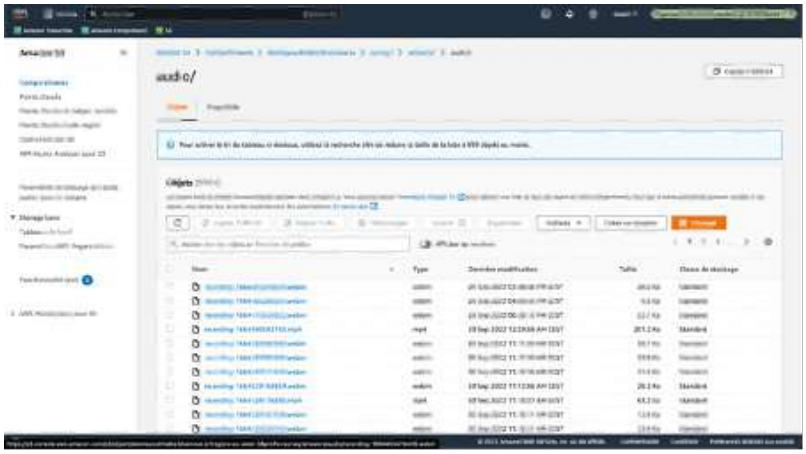
### Audio contributions

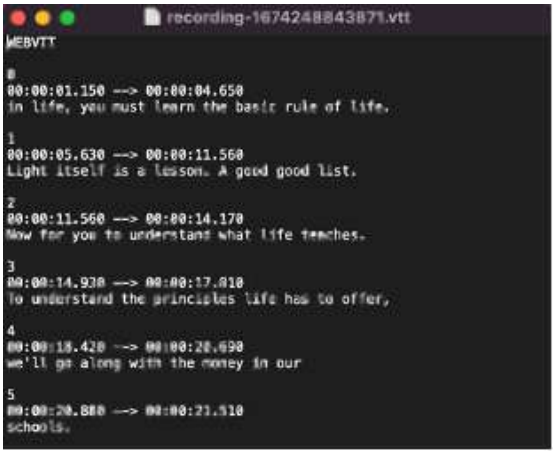
**Quantity collected:** 1,374
**Languages:** wider variety than were used in the written contributions collected, including mother tongues.

### Analysis of audio contributions

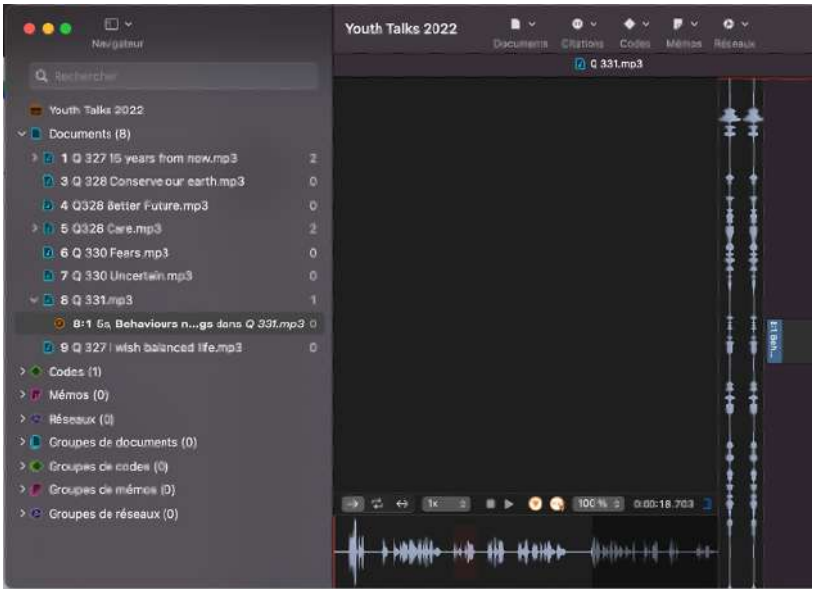
1. **Assembly:** audio contributions are assembled into one file per question.
2. **Conversion to text:** the AWS Transcribe algorithm is used to convert the recordings to text (*.vtt with time coding, *.json).
3. **Injection into clustering and classification platform:** converted texts are injected for analysis.

**NB:** an attempt was made to use Atlas.ti for the English files, but it was abandoned owing to the lack of automation or a "speech-to-text" tool.





## Figure 17: Atlas.ti interface showing attempt to code English audio files




## Analysis of photo contributions

1. **Assembly:** photo contributions are assembled into one file per question.
2. **Image recognition:** Azure AI Vision image recognition algorithm is used. API service produces one Excel file for each question, listing detected entities accompanied by a confidence score.
3. **Semiotic interpretation:** the low proportion of selfies in the contributions prevented any far-reaching semiotic interpretation. However, they are recorded along with their entity analysis for documentation and can be used in the report for illustration purposes.

**NB:** an attempt was also made to use the AWS Comprehend image recognition algorithm, but the results were too generic to be of any use.

Combining the audio and visual analyses provides an enriched view and a deeper understanding of the contributions. While the audio contributions provided more linguistic and cultural variety, the photographic contributions add a visual dimension to the consultation despite limitations to their semiotic interpretation.

The inclusion of these methods of analysis demonstrates the value of the multimedia approach, not only in terms of engagement and representation, but also in terms of exploring and interpreting a diverse range of voices and expressions.

## Photo contributions

**Quantity collected:** 761
**Diversity:** photos collected in different countries, primarily in the form of selfies.

## Figure 18: Examples of selfies collected

# Identifying rare and original ideas

## How the algorithm works

As part of bluenove's research and development activities in natural language processing (NLP), Eric de la Clergerie has developed an algorithm to describe the singularity and originality of the ideas expressed in a contribution. In practice, the algorithm captures the following points (either endorsing or penalizing them):

- Endorse long contributions (by number of words)
- Eliminate duplicate contributions (after removing words that have no intrinsic meaning, such as pronouns, determiners, etc.)
- Endorse verbatims that contain at least one rarely used word (which stands out) and generally use terms that are not frequently found in the standard vocabulary of expression. The intention is to find comments that are ***"off the beaten track."*** Rare terms are identified as such in comparison with all the other collected contributions and are those that appear in only a limited number of contributions
- Endorse verbatims containing long (and generally, therefore, somewhat rare and/or technical) words
- Endorse verbatims that include certain expressions related to suggestions/opinions/arguments, such as "we must," "we ought to," "so as to," "I think that," "in order to," etc. (300 parameters)
- Penalize the use of punctuation to indicate feelings (e.g., exclamation marks) or questions (particularly if there are a series of them)
- Penalize verbatims in which the words are mainly written in capital letters (as this usually indicates emotional content)
- Penalize contributions that are over-personal (over-occurrence of personal pronouns and articles like "my," "I," "you," "your," etc.)
- Endorse phrases of an imperative nature (based on an infinitive or noun as the subject of the phrase, such as "create a new law," "creation of a new law") but not employing an actual imperative verb
- Endorse contributions that project into the future (with verbs in the future or conditional tense)
- Endorse sentences containing infinitives
- Presence of authority markers (institutions, acronyms, etc.)
- Etc.

Note that the verbatims were all translated into English before analysis by the algorithm identifying rare or unusual ideas. However, the online machine translation service selected (Google Translate) has a tendency to correct a text's syntax when rendering it into English.

## Human review and selection

Using the algorithm described above, 1,000 verbatims per question were extracted from the Assembl platform. These were then read by humans, who selected around thirty nuggets for each question, which were in turn whittled down to about ten per question, which have been included in the summary report.

The selection criteria were as follows:

- Eliminate long lists that put forward several ideas in a single contribution
- Eliminate off-topic contributions that do not answer the question posed
- Prefer well-constructed, well-argued, grammatically correct contributions
- Prefer well-argued questions that put forward ideas that are either frequently brought up in the data corpus as a whole or are unusual and infrequently mentioned
- For the report, opt for contributions from participants from different geographical areas and maintain a balance of genders and a variety of age groups

# CASE STUDY USING DATA COLLECTED VIA THE EMPATHY QUESTIONNAIRE

RODOLPHE DESBORDES

There follows an analysis of the answers to the questions in the validated research questionnaire on empathy (independent of the analysis of the open questions) conducted by Rodolphe Desbordes, researcher at SKEMA and member of the Youth Talks Scientific Committee. The analysis is provided in the hope that it will inspire other researchers to use the data collected via this questionnaire. Its results concur with existing research.

## Introduction

***"There's a lot of talk in this country about the federal deficit. But I think we should talk more about our empathy deficit – the ability to put ourselves in someone else's shoes; to see the world through those who are different from us – the child who's hungry, the laid-off steelworker, the immigrant woman cleaning your dorm room."***
**Barack Obama, 2006**

Empathy can be broadly defined as the psychological tendencies to be in tune with other's feelings and perspectives **(Decety, 2006; Chopik et al., 2017)**. It involves feeling others' emotions (affective empathy) and understanding others' emotions (cognitive empathy). **Davis (1996), Preston & De Waal (2002), and De Waal (2010)** argue that empathy is a perception (action mechanism) arising from evolutionary pressures which increased survival likelihood and the emergence of complex social organisations by facilitating cooperation. **Konrath & Grynberg (2016)** provide a thorough survey of the literature, which confirms that empathic individuals have more prosocial behaviours directed towards strangers, have better romantic and professional relationships and are less likely to engage in antisocial behaviours. The reviews of **Derksen et al. (2013), Clark et al., 2019, Aldrup et al. (2022)** indicate that empathy may indeed matter for practising medicine, managing people, or teaching.

**Baron-Cohen & Wheelwright (2004)** argue that empathy is ***"the 'glue' of the social world, drawing us to help others and stopping us from hurting others"*** (p.163). **Rifkin (2009), Pinker (2011)**, and **Kzrnaric (2015)** thus consider that the expansion of empathic consciousness is possibly the key factor explaining why, over the last two centuries, equal treatment has been progressively granted to all human beings. These authors also believe that a new global surge in empathy is required to face collective challenges such as climate change. In parallel, empathy is also seen as one of the soft skills that graduates need to adapt to the transformations induced by the Fourth Revolution **(Edmondson et al., 2020)**. Worryingly, **Konrath et al. (2011)** report that empathy among American college students has been declining between 1979 and 2009; a trend that seems to have been noticed by future U.S. President Barack Obama.

Surprisingly, given the importance of the topic, there has been little exploration of the determinants of empathy in a broad sample of countries, at the exception of **Chopik et al. (2017)** who look at correlations between empathy scores and various measures of cultural values in an Internet sample of 104,365 adults from 63 countries. In contrast, using data collected by Youth Talks, we investigate the determinants of both inter-personal differences within countries and inter-national differences across countries through multilevel modelling of the responses from about 5403 young people located in 112 different countries.

# Data

To measure the various dimensions of empathy, we adopt a 16-item version of **Davis (1980, 1983)** Interpersonal Reactivity Index which assesses four separate aspects of empathy **(Ingoglia et al., 2016:** empathic concern (EC; other-oriented feelings of sympathy and concern for unfortunate others), perspective-taking (PT; tendency to adopt spontaneously the psychological point of view of others), fantasy (FS; respondents' tendencies to transpose themselves into the feelings and actions of fictitious characters), personal distress (PD; self-oriented feelings of personal anxiety and unease in tense interpersonal settings). This scale is commonly used in the literature **(Konrath et al. , 2011)** and covers both affective (EC and PD) and cognitive dimensions (PT and FS). For each item, the score can range from 1 (does not describe me well) to 5 (describes me very well). **Table 1** provides the list of questions.

For each participant and subscale, we calculated the average value of the four answers. **Figure 1** shows that personalities vary across respondent but a large fraction of them demonstrates at least one strong empathic trait, such as EC or PD. These two measures of empathy are those the most associated with prosocial attitudes and behaviours **(Konrath et al., 2011)**. FS is less related to actual social situations and PD mostly involves self-orientation which may inhibit social functioning.

**Table 1: The interpersonal reactivity index**

| SUBSCALE | QUESTION |
|---|---|
| **Empathic Concern** | I often have tender, concerned feelings for people less fortunate than me. |
| **Empathic Concern** | When I see someone being taken advantage of, I feel kind of protective towards them. |
| **Empathic Concern** | When I see someone being treated unfairly, I sometimes don't feel very much pity for them (reverse scale). |
| **Empathic Concern** | I would describe myself as a pretty soft-hearted person. |
| **Perspective-Taking** | When I'm upset at someone, I usually try to put myself in his shoes for a while. |
| **Perspective-Taking** | I try to look at everybody's side of a disagreement before I make a decision. |
| **Perspective-Taking** | I sometimes try to understand my friends better by imagining how things look from their perspective. |
| **Perspective-Taking** | Before criticizing somebody, I try to imagine how I would feel if I were in their place. |
| **Fantasy** | I really got involved with the feelings of the characters in a novel. |
| **Fantasy** | After seeing a play or movie, I have felt as though I were one of the characters. |
| **Fantasy** | When I watch a good movie, I can very easily put myself in the place of a leading character. |
| **Fantasy** | When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me. |
| **Personal Distress** | In emergency situations, I feel apprehensive and ill-at-ease. |
| **Personal Distress** | Being in a tense emotional situation scares me. |
| **Personal Distress** | I tend to lose control during emergencies. |
| **Personal Distress** | When I see someone who badly needs help in an emergency, I go to pieces. |

## Figure 1: Distribution of empathy scores

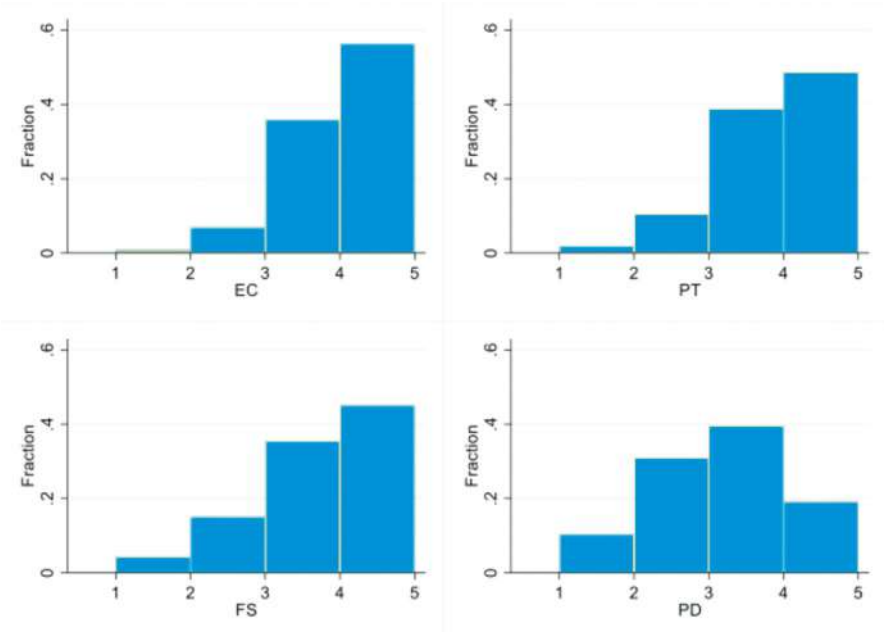



**Table 2** shows that EC and PT are also the most correlated dimensions of empathy, suggesting, as argued by **Davis (1983)** that one dimension (e.g. PT) may feed the other (e.g. EC).

**Table 3** provides the list of individual-level variables included in the regression model. In addition, at the country level, we used the Human Development Index (HDI) as a broad measure of human, social, and economic development. For example, the HDI tends to be highly correlated with high governance values **(Worldwide Governance Indicators)**, low economic inequality **(disposable income inequality)**, and secular-rational/self-expression values **(Inglehart–Welzel Cultural Map)**.

## Table 2: Correlation coefficients

| VARIABLES | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| (1) EC | 1.000 | | | |
| (2) PT | 0.411*** (0.000) | 1.000 | | |
| (3) FS | 0.360*** (0.000) | 0.352*** (0.000) | 1.000 | |
| (4) PD | 0.152*** (0.000) | 0.152*** (0.000) | 0.312*** (0.000) | 1.000 |

*** p<0.01, ** p<0.05, * p<0.1

## Table 3: List of explanatory variables

| VARIABLES | EXPLANATIONS | MEAN | STD. DEV. | MIN. | MAX. |
|---|---|---|---|---|---|
| AGE | | 21.95 | 3.84 | 15 | 30 |
| FEMALE | Only Male/Female considered | 0.50 | 0.50 | 0 | 1 |
| HIGHER ED BA | Respondent Education; 'other' not considered | 0.42 | 0.49 | 0 | 1 |
| HIGHER ED MAS | Respondent Education (Masters + above) | 0.31 | 0.46 | 0 | 1 |
| P HIGHER ED BA | Parents' Education; 'other' not considered | 0.26 | 0.44 | 0 | 1 |
| P HIGHER ED MAS | Parents' Education (Masters + above) | 0.42 | 0.49 | 0 | 1 |
| HIGH INC | Higher than 5 on a 1–10 scale | 0.41 | 0.49 | 0 | 1 |
| HDI | Human Development Education | 0.73 | 0.14 | 0.39 | 0.96 |

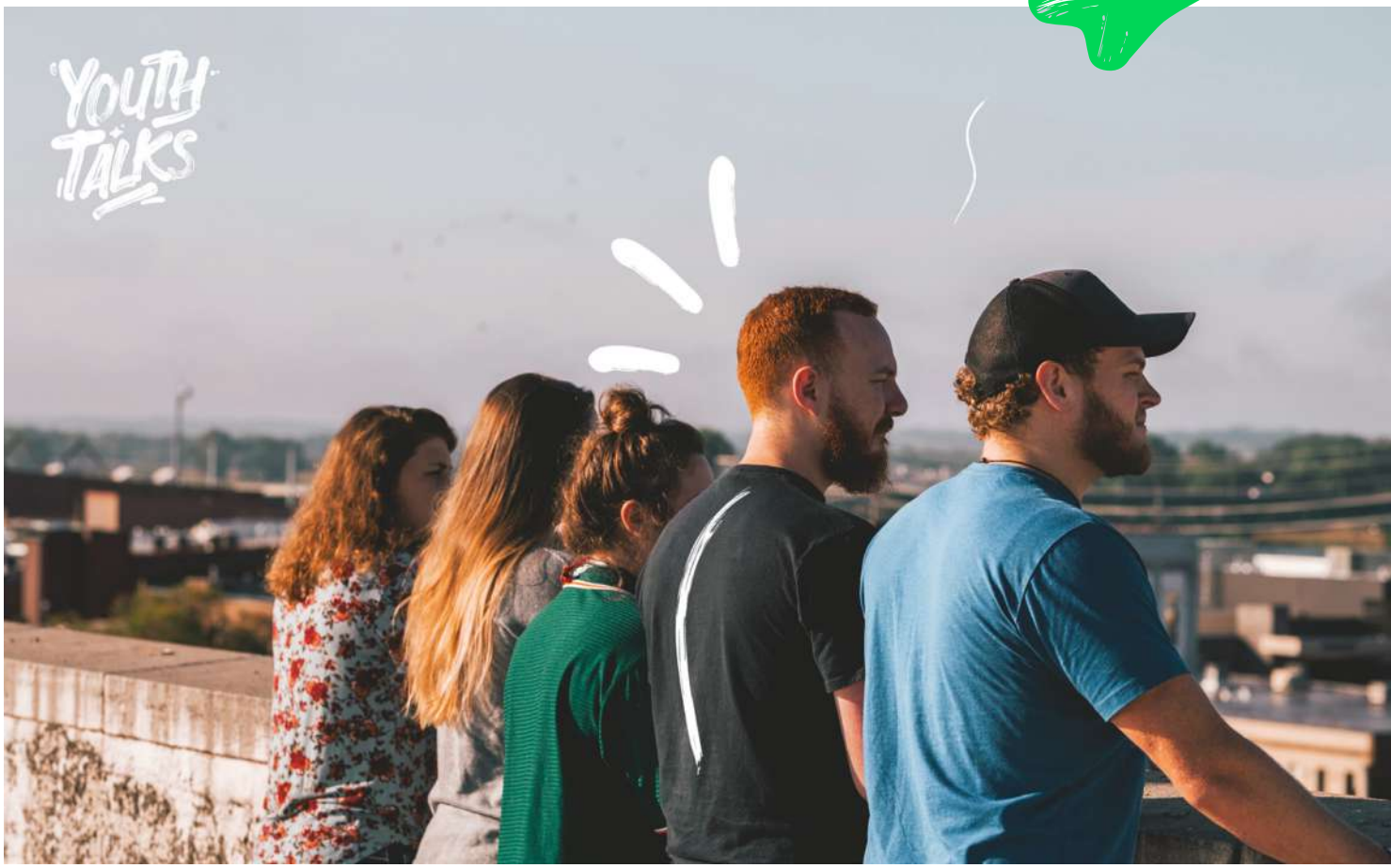
# Econometric model

Following **Bell et al. (2019)**, we adopted a within-between random effects (WBRE) model:

$$Empathy_{ij} = \beta_0 + \left(X_{ij} - \underline{X_{ij}}\right)\beta_W + \beta_B HDI_j + \left(\alpha_j + \epsilon_{ij}\right)$$

where Empathy_ij is a measure of empathy of respondent i in country j, X are individual characteristics, HDI is the human development index, a_j is a random effect for country j and e_ij is an error term.

The empathy measures vary ***within*** countries and ***between*** countries as individuals (level 1), diverging in their characteristics, are located in different countries (level 2). The WBRE simultaneously accounts for both levels. Differences within countries are purely explained by individual-specific characteristics associated with the vector of coefficients b_W (the X variables are demeaned to remove any cross-country information), whereas differences across countries are explained by differences in HDI across countries associated with coefficient b_B. Note that, by construction, the estimation of b_W cannot be affected by any omitted variable varying at the country-level since identification is based on within-country information. On the other hand, b_B may not reflect the 'true' effect of HDI but the relationship of the latter with another unobserved country-specific factor. The random part of the model corresponds to the sum of the random effect for country j and the error term.



# Results

Table 4 presents the econometric results. At the individual level, only gender and age appear to be systematically related to empathy. Female and older respondents are more likely to exhibit empathic personalities. These results are consistent with previous studies **(Chopik et al., 2017)**. Like **Depow et al. (2021)**, and in contrast to **Stellar et al. (2012)**, we do not find that respondents from relatively more favorable backgrounds (i.e., high education and high income) are less likely to be empathic. Parents' education may even reduce feelings of personal distress (column 4).

At the country-level, higher HDI tends to reduce empathy, possibly because economic development is associated with an atomistic and self-centred culture, leading to an "empathy deficit." Indeed, **Jami et al. (2023)** highlight that studies tend to find that empathy tends be higher in collectivist cultures than in individualistic cultures, the latter being more prevalent in high HDI countries according to the Inglehart-Welzel cultural map. While a high HDI may reduce 'other-orientation', its larger negative effect, four times larger in column (4) than in other columns, is on self-oriented feelings of personal distress. Hence, the net effect of HDI on empathy is ambiguous and possibly positive overall.

The effects of age, gender, and HDI are modest, in qualitative terms. Being female, 12 years older, or moving on the HDI scale from 0.2 to 1 would, at best, only increase EC or PT by 0.24 points. Furthermore, the total variation in empathy explained by the model ($R^2$) is less than seven percent. Hence, empathy appears to be highly specific to the background of each individual.

## Table 4: The determinants of empathy

| | (1) EC | (2) PT | (3) FS | (4) PD |
|---|---|---|---|---|
| **INDIVIDUAL-LEVEL** | | | | |
| FEMALE | 0.23*** (0.037) | 0.020 (0.029) | 0.28*** (0.049) | 0.34*** (0.063) |
| AGE | 0.021*** (0.0039) | 0.020*** (0.0034) | 0.00026 (0.0059) | -0.0067 (0.0062) |
| HIGHER_ED_BA | 0.020 (0.035) | -0.0060 (0.039) | -0.015 (0.048) | -0.032 (0.042) |
| HIGHER_ED_MAS | 0.010 (0.043) | -0.0041 (0.043) | 0.024 (0.065) | -0.042 (0.047) |
| P_HIGHER_ED_BA | 0.026 (0.035) | 0.033 (0.031) | 0.0063 (0.036) | -0.085** (0.043) |
| P_HIGHER_ED_MAS | 0.061** (0.025) | 0.0059 (0.032) | 0.025 (0.036) | -0.086** (0.044) |
| HIGH_INC | -0.0052 (0.020) | 0.030 (0.024) | 0.025 (0.038) | -0.011 (0.023) |
| **COUNTRY-LEVEL** | | | | |
| HDI | -0.32** (0.14) | -0.37*** (0.14) | -0.38** (0.19) | -1.23*** (0.21) |
| Constant | 4.21*** (0.11) | 4.05*** (0.11) | 3.90*** (0.13) | 3.89*** (0.14) |
| Observations | 5,403 | 5,403 | 5,403 | 5,403 |
| Number of countries | 112 | 112 | 112 | 112 |
| Overall $R^2$ (%) | 3 | 1 | 3 | 6 |

Cluster-robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

# Conclusion

Using Youth Talks data, we have shown that young people in our sample tend to exhibit empathic features associated with prosocial attitudes and behaviours. These empathic traits cannot be easily explained by common individual and country-level characteristics. Most notably, higher education does not appear to contribute systematically to the development of empathy.

As acknowledged by the ***global citizenship education*** movement **(Goren & Yemini, 2017; Risberg, 2021)**, if collective empathy is truly the driver of revolutionary changes in human history, there is an urgent need to foster young people's affective and cognitive connections with humankind, and more broadly, the biosphere through pedagogical activities. This may be especially important in societies that put a high value on self-development.

Lastly, our results can be interpreted as supporting the view that promoting gender equality and group diversity in decision-making is important **(Van Knippenberg et al., 2020)**: women exhibit higher affective empathy and individuals vary strongly in their empathic traits in non-easily identifiable ways.

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