

# Executive Summary FIRST NATIONAL SURVEY ON PUBLIC PERCEPTION OF SCIENCE AND TECHNOLOGY IN CHILE

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# Valuation of Science, a Challenge for Chile

Mario Hamuy Council President CONICYT

It is with great pride, as current president of the CONICYT Council, that I present the First National Survey on Public Perception of Science and Technology in Chile to the community. I say "the community", and not "our community", because these data will provide inputs for making decisions and designing instruments in all fields of knowledge, through the work of organizations, foundations and public agencies, to name just a few. This work becomes even more relevant with its presentation in the year that marks the beginning of the discussion of the Law that will enable the creation of a Ministry of Science and Technology for our country.

The fact is that the scope of the data obtained will have impacts beyond our community, because their value for our country cannot be calculated, since we have, for the first time, an x-ray of what our citizens think about science, technology and innovation.

The results prompt us and force us, as an institution, to double our efforts to make progress in the valuation of science and in the public policies that we must propose and develop as a country.

Likewise, they reveal the imperative need of strengthening and improving education on scientific topics, in order to foster among our children and adolescents the love for science, so that they will be interested in learning, understanding and knowing more about their environment. Through this road, we will not necessarily have more scientists in the country, but we will have citizens with greater curiosity, creativity and critical thinking, who will be capable of posing questions and obtaining answers through inquiry.

In order to move forward along that road, it is essential to strengthen links with teachers, inside and outside the classroom, and to make the teaching of science a permanent pleasure. We know it is a great challenge as a country, but, as a scientific community, we must commit ourselves to supporting this line of work.

We want this survey to be the kick-start and for it to be administered every three years so that the diagnosis on citizen perception of science, technology and innovation in our country will be built on pertinent and timely information. Our goal is for it to be conducted with the same rigor and seriousness as the current one and that its continuity and improvement will be guaranteed over time. Thus, we will be able to have an essential source of information to provide the necessary context to public policies dealing with scientific culture.

# Science Changes our Lives

Christian Nicolai Executive Director CONICYT

A century ago, saltpeter was Chile's main export product, reaching one fourth of the Gross Domestic Product (GDP) in 1924. The discovery of the synthetic version of this element by the German chemical industry brought about the end of that economic cycle, submerging us in a severe internal crisis.

Metal mining, and particularly copper, gradually became the replacement that would sustain Chilean economy to this day, mainly as an extractive industry of a non-renewable resource. In 2015, according to figures of the Central Bank, this sector reached a 9% share of the GDP and represented 53% of Chilean exports. Projections indicated that, over the next years, copper mining will continue to be our main economic activity.

Because of that, Chile has decided to take on the challenge of improving productivity, sustainability and inclusion, innovating and creating knowledge that will allow adding value to this activity and, why not, developing export services. Science and technology have historically boosted constant productive and social revolutions, by means of either creating knowledge and new solutions or improving industrial systems. All of them directly affect our living conditions. Some we do not perceive because of their celerity, while others we resist. In this dynamic and surprising road that we are exposed to through research, science plays its part and changes, in some way, our lives.

One evidence? In 2015, Chile had some 23 million mobile telephones, more than one per capita. In them, 10.4 million internet connections were recorded, 95% of which were made through smartphones. Few may know, however, that this device -which includes a touch screen, photographic camera, memory, a very powerful CPU, facial and voice recognition applications, GPS and, in addition, a telephone- contains technologies based on scientific knowledge, developed by different universities and research centers.

Only two examples: GPS is based on the general theory of relativity and on the development of quantum clocks; on the other hand, lithium batteries are based on scientific works on inorganic chemistry dating from the early 80s.

Science and technology accompany us day by day, even if we are not conscious of them. The ways in which we relate to others, entertain ourselves, move and communicate rely on them. Our economic and work activities are also linked to the knowledge economy, in terms that each day it will be possible to code and program more activities into a machine or robot, so that they will no longer be carried out by humans.

Hence, it is clear that science is not solely a concern of scientists, and neither is it a knowledge created to be shelved. Science and technology are present in all the areas in which we develop, but we still do not know how much they are valued in our country, how they change us and modify the course of societies.

Because of that, CONICYT has conducted the First National Survey on Public Perception of Science and Technology in Chile, taking on the challenge of establishing a solid baseline for the relationship between citizens and science and technology and to attempt to describe and understand scientific culture in Chile.

We are confident that this instrument will provide a first snapshot of a constant and periodical measurement that will reveal to us changes in people's knowledge, perception and valuation on these topics.

It is our conviction that the information collected will be an essential element for academic studies as well as other analyses. But we are also convinced that it will contribute to position these topics at a citizen level and will be a valuable input for the design of public policies aimed at bringing the benefit and usefulness of science and technology closer to the quality of life of Chileans.

# 1. General Results

The First National Survey on Public Perception of Science and Technology in Chile is a baseline for the relationship between our current society with the scientific and technological activity of the country.

From this perspective, one of the most significant findings is the level of interest on science and technology stated by the individuals. Among six different topics they were consulted on, science ranks fourth, being interesting for 58.1% of the population 15 years or older residing in Chile, while 68.4% finds technology interesting, placing it second in the list of the most interesting topics (sport was highlighted in the first place, with 68.8%).

If the level of interest seemed positive, the situation changed when people were asked about their level of information about the same topics: within the population that feels little or not informed, science ranks first with 76.9%, while 65.2% feels the same regarding technology.

The public perception on the benefits and risks of science and technology seems contradictory, with both of them coexisting at the same time. The belief that scientific and technological development will provide many or significant benefits over the next years is held by 84.9% of the population. Meanwhile, 70.8% of the population perceives that science and technology will bring about many or significant risks.

Delving deeper, 70% of Chileans understands that science and technology not only make our lives easier and more comfortable, but also that their scopes are tools to better face issues of great relevance, such as health care and the prevention of diseases, the protection of our surroundings and environment, and our understanding of the world.

The valuation of scientists also stands out, with 79% of the population believing that being a scientist is a prestigious profession, ranked third after doctors and engineers (out of a total of 12 professions).

In addition, over 80% of the people considers that scientists focus on science because of their vocation for research, for learning the truth, for understanding better our surroundings and solving people's problems, in contrast to other more individualistic reasons such as obtaining prestige, earning money of gaining power.

Finally, and as a sign of how little is known about scientific and technological development in the country as well as of how much more we need to make progress in the relationship between society and science and technology, only 17% of the interviewees answers that they recognize an institution dedicated to science and technology, mainly referring to universities.

# 2. Methodological Aspects

The First National Survey on Public Perception of Science and Technology in Chile is aimed at measuring the perceptions and representations on science and technology of the population 15 years or older, residing in Chile, as well as to ascertain how much it values them and the ways it appropriates them.

This survey also establishes a measurement baseline for the population 15 years or older regarding how it perceives science and technology, so as to have systematized and periodical information (every three years) that will contribute to the evaluation and definition of new public policy strategies for the relationship of our society with the scientific and technological spheres, along with positioning these topics at the academic, political and public opinion levels.

The theoretical framework that guides this survey is mainly developed based on the document "Considerations for the Definition and Measurement of Scientific Culture in Chile"<sup>3</sup> ("Consideraciones para la definición y medición de la Cultura Científica en Chile"), while also gathering conceptual guidelines from the Antigua Manual (2015)<sup>4</sup> of the Ibero-American Network of Science and Technology Indicators (RICYT by its acronym in Spanish). Both documents, in addition to the review of international experiences in this matter, provide the conceptual basis that enable CONICYT, with the support of the Social Studies Department (DESUC by its acronym in Spanish) of the Institute of Sociology of the Pontifical Catholic University of Chile, to design the final operational framework to design the questionnaire to measure public perception on science and technology in Chile.

The conceptual framework (Figure 1) used for building the questionnaire covers four main dimensions: a) Mental Representation; b) Appropriation; c) Valuation; and d) Institutional System. These include the image, interest and knowledge about science, technology and scientists; the knowledge, information habits and practices and access to science and technology content, as well as the valuation, impacts and benefits of scientific and technological development for the country, the region and different aspects of daily life.

Once the operational framework was defined, the process of building the questionnaire consisted in different phases for its design and validation: conducting cognitive interviews; validating questions with an expert panel; and applying the two pilots in two independent samples. This entire process made it possible to validate the understanding and pertinence of the questionnaire, the logical flow design and consistency of the survey, and the reliability of indicators and questions, allowing to validate and select the best ones, which would make up the questionnaire. The instrument includes 37 questions dealing with science and technology, with simple and multiple open and closed options, in addition to a set of questions on sociodemographic information<sup>5</sup>.

Finally, with the questionnaire already validated, the First National Survey on Public Perception of Science and Technology in Chile was administered through in-person interviews at home with a universe that encompassed people 15 years or older, who were usual residents of private housing, located in urban and rural areas of the 15 regions of the country. The field work was conducted between October 2015 and January 2016 by the DESUC.

<sup>&</sup>lt;sup>3</sup> Document prepared by a National Commission on Scientific Culture, which was convened by CONICYT and met between June and August 2014. http://www.conicyt.cl/wp-content/uploads/2014/07/Informe-de-Resultados-Comisión-Nacional-en-Cultura-Científica.pdf

<sup>&</sup>lt;sup>4</sup> Available at: http://www.ricyt.org/files/MAntigua.pdf <sup>5</sup> Full questionnaire available in Annex 1.

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Figure 1: Dimensions of the National Survey on Public Perception of Science and Technology in Chile

The result of the fieldwork was a sample of 7,637 people, distributed in 151 communes of all regions of the country, generating a total margin of error of  $\pm$  1.1% for a simple random sample and of  $\pm$  2% for a complex sample. The design of the sample considered an over allocation of the sample by region, which allowed to calculate the response and rejection rates, which were 74.6% and 11.1%, respectively, for the survey (see details in Table 1).

Two sampling frameworks used in 2015 by the National Statistics Institute (INE by its acronym in Spanish) were applied to select the sample. These frameworks are mutually exclusive and consist of the Blocks Framework (urban area MM2008-B) and the Sections Framework (rural area MS2002). It was necessary to complement them with registration efforts to make up for the lack of sampling frameworks as a result of land-use changes, urbanization, urban growth, among other changes in the regions.

In addition, the sample selection process was conducted in four stages, which correspond to the selection of the commune, the block, the home and the interviewee by means of the Kish Method.

#### Table 1: Sample Sizes by Region

Region	Target Sample <sup>1</sup>	Over-Allocated Sample <sup>2</sup>	Actual Sample <sup>3</sup>
XV. Arica y Parinacota	317	425	393
I. Tarapacá	440	585	487
II. Antofagasta	402	560	402
III. Atacama	211	295	210
IV. Coquimbo	516	725	566
V. Valparaíso	753	1,065	750
XIII. Metropolitana	1,529	2,170	1,388
VI. Libertador General Bernardo O'Higgins	364	485	330
VII. Maule	407	545	409
VIII. Biobío	793	1,085	864
IX. La Araucanía	514	680	510
XIV. Los Ríos	214	285	214
X. Los Lagos	434	580	432
XI. Aysén del General Carlos Ibáñez del Campo	297	395	277
XII. Magallanes y Antártica Chilena	443	585	405
Total	7,634	10,465	7,637

1: minimum expected simple per region.

2: size considering the non-response rate per region.

3: valid survey responses per region.

The survey administration included telephone and field supervisions to random samples of interviewees in order to test the truthfulness of responses and the correct application of the selection using the Kish Table. These supervisions were made over the telephone to 27% and in person to 16% of the total number of surveys. In addition, a desk supervision<sup>6</sup> was conducted for 100% of the surveys that were completely filled out.

The survey results were expanded to the national level, generating an expansion factor for each interviewee that was calculated based on three components: a) the inverse of the probability of selection of the interviewee; b) non-response adjustment, that is, the probability that someone at home fills the resident registry and the probability of ending the interview with the selected adult; and, finally, c) total population adjustment (post-stratification) based on the variables of gender, age and region, according to the projections made by the National Statistics Institute (2015).

Finally, the survey considers a set of sociodemographic variables that allow the identification of context differences among the diverse categorizations identified for each of the questions. The sociodemographic variables are gender, age, rural or urban area, macro-zone, socioeconomic level and educational level.

It is important to highlight that the age variable was divided into four ranges (15 to 29 years; 30 to 44 years; 45 to 59 years; 60 years or older); the area corresponds to the place of residence and it can be urban or rural; the macro-zone corresponds to a geographical division into four categories according to the region of residence<sup>7</sup>, the socioeconomic level is divided into three categories (D and E; C3; C1 and C2<sup>8</sup>); and, finally, the educational level was divided into three categories (incomplete high school; incomplete tertiary education or higher).

<sup>&</sup>lt;sup>6</sup> Full information revision and double typing.

<sup>&</sup>lt;sup>7</sup> North: Regions XV, I, II, III and IV. Center: Regions V, VI, VII and VIII. Metropolitan: Region XIII. South: Regions IX, X, XI, XII and XIV.

<sup>&</sup>lt;sup>8</sup> Increasing order, that is, groups D and E are the lower socioeconomic levels, C3 is a medium level and C1-C2 are high socioeconomic levels.

Table 2 presents a summary of the main methodological contents used in the processes of survey administration and results analysis<sup>9</sup>.

Study Design	Quantitative: In-person surveys administered at interviewees' homes
Target Population	Men and women 15 years or older, residing in urban and rural area of the
	15 regions of the country, in 151 communes
Instrument	Structured questionnaire, made up of simple and multiple open and closed
	questions
Field Work Dates	Housing census and data collection between October 4, 2015 and January
	31, 2016
Sample Framework	Blocks sampling framework updated up to the second semester of 2008,
	provided by the INE (MM2008-B) and the remaining urban areas
	framework and rural areas (MS2002).
	Probabilistic, stratified and multi-stage area sampling (communes,
	blocks/entities, housing and individuals).
Sampling Type	Without replacements, an over allocation of 27% was applied
	(n over allocation = 10,465)
Sample Size	7,637 complete surveys
	Absolute error of ±1.1% at the national level, under the assumption of a
Sampling Error	Simple Random Sampling, for a 50% share at a reliability level of 95%.
	Absolute error of ±2.0 at the national level, considering the design
	variables, for the dichotomic variable "Perceives Significant Benefits from
	Science and Technology" at a significance level of 95%.
Sample Over Allocation	Calculated based on the selection probabilities at all three stages, the non-
and Weighting Factors	response adjustment, and the post-stratification by gender, age and
	region. The propensity score and ranking techniques were used for non-
	response adjustments and post-stratification.
Response and Refusal	Response Rate (RR1): 74.6%
Rates (AAPOR* codes)	Refusal Rate (REF1): 11.1%

## Table 2: Summary, Methodological Fact Sheet

\*AAPOR: American Association for Public Opinion Research

<sup>&</sup>lt;sup>9</sup>The methodological details will be made available starting on August 22 in the Final Report on methodology and results of the survey.

# 3. Results for the Mental Representation Dimension

The mental representation dimension refers to the images, ideas and concepts that society has about science and technology and the people that work in those areas: scientists. It groups four sub-dimensions: the image of science; the image of technology; the image of scientists; and the image of scientific and technological applications.

The "spontaneous" image of science and technology is built on two open questions, which ask the interviewee to mention ideas he or she associates with the word "science" and with the word "technology" in a spontaneous manner. Thus, it is expected that free association will provide inputs to understand the existence of a concrete cognitive object with which each of these concepts is associated.

Most of the people are able to make a spontaneous association with each of these concepts. However, there is a significant number of people who do not know or who, at the time of the survey, cannot think of anything related to the concept of science (15.8%). Those who respond that they do not know anything or that nothing comes to mind regarding the concept of technology only reach 10.8% of the total number of mentions.

Only concrete mentions (in which an idea is mentioned) were considered for analyzing the results, excluding answers catalogued as "does not know", "does not respond" or "nothing". From the total number of surveys with concrete mentions about science (N=6,200), it is observed that there are neutral or positive and abstract images, associated with activities such as study, research experiment; with effects like progress and discoveries; and with disciplines, in which case medicine stands out with one of the highest mentions within the total group (Figure 2).

In addition, the analysis of the information according to sociodemographic variables reveals that, overall, men provide more concrete responses than women (87% versus 82%). The same is true for people residing in urban areas in comparison to those living in rural areas (86% versus 74%). It is also worth noting that concrete responses increase among interviewees with higher educational (incomplete tertiary education or higher) and socioeconomic levels (C1-C2 groups), in comparison to people with lower education and socioeconomic levels (incomplete high school or lower; D and E groups).



#### Figure 2. Q7. When I talk about "science", what comes to mind? (Open question)

N=6,200

It is observed that there is a greater capacity for cognitively associating concepts when people are asked about technology (N=6,535), with more concrete answers related to daily-use devices. The results indicate that, for the population, technology



mainly evokes images of devices such as mobile telephones, computers and appliances, while the main abstract concepts mentioned are progress and, far behind, advancements (Figure 3).



#### Figure 3. Q8. When I talk about "technology", what comes to mind? (Open question)

#### N=6,535

Questions were also asked regarding social imaginaries associated with the application of science and technology. Two responses are obtained for this dimension, aimed at learning about the type of mental representations made in relation to the application of science. As a first step, question Q9 presents a list of specific disciplines and interviewees are asked to indicate whether or not they are scientific. A second question then shows a series of press headlines, asking interviewees to classify their contents as linked to science, technology or both.

In the case of Q9, in accordance with the previous trend, people consider medicine as the main scientific discipline, being selected with 92%. Physics ranks second, with 77.2%, followed by engineering, with 60.5%, and psychology, with 57.5% (Graph 1).







N=7,637. Reliability intervals built with 95% of reliability. The "Does not respond" category is omitted from the bars.

In addition, it is observed that other disciplines traditionally considered as nonscientific, such as acupuncture, ancestral medicine and theology, have lower differences among people who distinguish them as scientific/nonscientific. In contrast, economy, a social science, is considered as nonscientific by the population.

When observing disaggregated results, it is clear that people with higher socioeconomic and educational levels recognize scientific disciplines (identified as such by experts) as the most scientific ones, including in this case psychology and economy, which obtain an overall lower recognition. It is also worth highlighting that people residing in urban areas identify scientific disciplines (recognized as such by experts) as being scientific to a greater extent than people living in rural areas.

In Q10, interviewees were asked to classify a series of press headlines and, as shown by the graph, the ones dealing with medicine or physics, such as "Organ Transplants between HIV-Positive Patients Obtain Promising Results" and "Researchers Indicate that the Life of the Sun Would End with an Instantaneous Explosion", are linked to science to a greater extent (53.8% and 51.1%, respectively), coinciding with the previous question about the disciplines associated with these specific topics.

In contrast, headlines referring to research or to work applied to other topics, such as "The Influence of Social Media on Interpersonal Relations is Being Studied" and "Foreign Company Inaugurates its First Eolic Park in Chile and Announces New Eolic Power Plants", are mainly associated with technology, reaching 46.6% and 39.6%, respectively.





N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

The notion of prestige of scientific and technological professions, as well as the motivations for becoming involved in these types of activities, are part of people's imaginaries on science and technology. From this perspective, the study inquired about the prestige attributed to different disciplines, including those related to science and technology. In this area, medical doctors are regarded as being the most prestigious, with 83.7%, followed, along the same line, by engineers (78.8%), while scientists are ranked third, with 76.8% in this category (Graph 3).



Graph 3. Q22. How prestigious do you think the following professions or activities are? Consider a scale from "1" to "5", where "1" corresponds to "Not prestigious" and 5 to "Highly prestigious". Total.



N=7,637. The "Does not know" and "Does not respond" categories are omitted from the bars.







There is a cross-cutting favorable perception of professions closer to science and technology among men and women, as well as among people of different ages, geographical zones, socioeconomic and educational levels.

Regarding the perception of the reasons why people to work in science and technology, the results show that vocation for research is a significant motivation, with 87.9% for science and a drop to 79.6% for technology. In addition, the option "Get to know the truth" is indicated by 87.7% of interviewees as a motivation for working in science, while 74% considers is a motivation for working in technology. Furthermore, 76.7% of interviewees believe that people decide to work in technology to earn money, while this percentage drops to 64.2% in relation to science. Following this pattern, 57.4% believes that "Having

power" is a motivation for working in technology, with a drop to 49.2% as a motivation for working in science, as shown in Graph 5.



Graph 5. Q23. From the following list, which do you think are the reasons why a person decides to work in science and/or technology? Total.

N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

# 4. Results for the Appropriation Dimension

This dimension aims to measure how people appropriate science and technology, the extent to which they are interested, become informed and have access to them, as well as how they apply science and technology to their daily lives, practices and activities. It groups the following subdimensions: interest in science and technology; level of information; activities carried out; consumption of scientific and technological information; application to daily situations and practices.

During the survey, people were asked whether or not they were interested in different topics, revealing the results shown in Graph 6. Interest in science ranked fourth (out of six topics), with 58.1%. It is worth highlighting that the topic of greatest interest was sports, with 68.8%, followed by technology with 68.4%. In contrast, the topic of least interest was politics, with 70.2% of the interviewees declaring it was of no interest to them.

When analyzing the results by sociodemographic variables, it is observed that, in each of the topics, men showed a greater percentage of interest than women. Particularly, 63% of men stated they were interested in science, versus 54% of women. For technology, the difference was larger, with 74% of men declaring their interest, in contrast to 63% of women. At the territorial level, there is a significantly higher percentage of interested people in urban areas than in rural areas (with differences ranging from 10 to 20 percentage points). In contrast, among residents of the macro-zones, significant differences are only detected in the southern macro-zone, where the percentage of interest is significantly lower than in the metropolitan macro-zone in the topics technology, science, and movies and theater (with differences ranging from 8 to 12 percentage points).

Finally, the results show that there are also significant differences between educational and socioeconomic levels, with the medium and high levels of both variables (complete high school and higher; C1-C2 and C3, respectively) presenting a significant greater interest in all topics, except for "sports" and "police and crime", in comparison to the lower education and socioeconomic levels (incomplete high school or lower; D and E, respectively).





N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

It is important to complement people's level of interest with their perception on whether or not they actually feel informed about each of the same topics. From this perspective, they were asked how well informed they felt, ranging from "highly informed" to "not informed", on certain topics. Graph 7 shows the results for this question, highlighting that, overall, the population feels "little informed" on all the topics covered. Specifically, science is the topic on which the largest number of people feel little informed (53.1%), while sports is the topic on which the largest number of people feel highly informed (10.4%).



Just as in the behavior on the level of interest, it is observed that men show significantly higher percentages of feeling very or well informed than women, except for "movies and theater" (with differences ranging from 6 to 15 percentage points). Likewise, people residing in urban areas show a higher perception of their level of information than those living in rural areas (with differences ranging from 11 to 20 percentage points).

Differences between educational and socioeconomic levels also stand out, with the higher levels (incomplete tertiary education or higher; C1-C3, respectively) showing a greater percentage of people who feel very or well informed, in general on all topics, in comparison to the lower levels (incomplete high school or lower; levels D and E), with differences ranging from 11 to 22 percentage points.





N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

It is worth noting that, when crossing the responses for the interest and level of information of interviewees on science and technology topics, it is observed that only 36% of those who state they are interested in science feel highly or well informed, versus 64% who declare feeling little or not informed on topics related to science. In contrast, the difference is less for technology, since 47% of the people who are interested in topics related to technology say they feel highly or well informed.

In addition to learning about the level of interest and information stated by people on various topics, including science and technology, another aim was to identify specific activities they had performed over the past 12 months (Graph 8), in order to observe their practices in activities related to science and technology. It is worth noting that the activity mostly carried out was "visiting a shopping mall", with 83.3%, while activities linked to science and technology, such as "visiting a science and technology laboratory or institution" are ranked in the last spots, with just 14.6% and 9.7%, respectively.

Differences were observed in the activity "visiting a laboratory", with a significantly higher percentage for men than women (11% versus 8%). In this same activity, there are also differences among age groups, with the older groups being the ones who least visited a laboratory over the past 12 months, in contrast with the group between 15 to 30 years old (with differences ranging from 7 to 13 percentage points).

Regarding the population's place of residence, it is observed that the share of people who have carried out each of the different activities is greater among those residing in urban areas than in rural areas (with differences ranging from 5 to 30 percentage points). A similar trend is revealed when analyzing responses by socioeconomic and educational level. Most of the activities presented as options have been performed by medium-high level groups, that is C1, C2 and C3 and complete

high school and incomplete tertiary education or higher, in contrast to groups belonging to the D and E socioeconomic groups and the incomplete high school or lower groups (with differences ranging between 6 and 19 percentage points).



Graph 8. Q3. Could you tell me if you performed any of the following activities over the past year (the past 12 months)? - Total.

N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

Another way of learning how the population appropriates science and technology is by identifying the frequency of information habits, that is, the usual ways through which people consume science and technology information and contents. Graphs 9 and 10 show the frequencies of the results for each activity, revealing that "watching shows on science, technology or nature" is the activity with the highest percentage of people who stated they did so always or most of the time (38.5%), while 73.9% said they rarely or never "visit science and technology museums, centers or exhibits".

"The analysis by sociodemographic variables showed significantly higher percentages of male interviewees who stated that they always or most of the time performed activities such as "reading scientific articles in newspapers" and "talking to friends or colleagues about science and technology", in comparison to the percentages for women (with differences of 7 percentage points). According to the characteristics of the place of residence, it is observed that the percentage of people carrying out all activities always or most of the time is greater in urban areas than in rural areas (with differences ranging from 4 to 16 percentage points).

Considering differences according to the educational and socioeconomic levels of interviewees, it is observed that the percentage of people who always or most of the time perform each of the activities is greater in the higher educational level (incomplete tertiary education or higher) in comparison to the lower educational level (incomplete high school or lower), with differences ranging from 5 to 26 percentage points. A similar situation is observed in the analysis by socioeconomic level, with a greater percentage of activities being performed by people belonging to the higher levels (C1 and C2), in contrast to the people belonging to the lower levels (D and E), with differences ranging from 3 to 20 percentage points.



Graph 9. Q4. I will ask you to indicate the frequency with which you perform the following activities. -Total.







N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

Finally, a summative index was created for Science Consumption<sup>10</sup>, which measures the practice of information activities related to science and technology, ranging from 0, corresponding to null science consumption, to 1, corresponding to high consumption. The total average was 0.28. Men showed a higher level of science consumption than women (0.3 versus 0.25), just like people residing in urban areas and belonging to the highest educational and socioeconomic levels (incomplete tertiary education and higher; C1-C2, respectively).

In addition to this question regarding the frequency of practices to obtain information, data was collected on the willingness to actively participate -in an unspecified future- in different options of activities related to science and technology. Results

<sup>&</sup>lt;sup>10</sup> The index is built by selecting alternatives for two questions - P3 ("d" to "i") and P4 ("a" to "h")- and then standardizing the score from 0 to 1. For further details, please see questionnaire in Annex 1.

show that 55.5% of the population would be willing to participate in an activity linked to "science and/or heritage routes within their region", while the activity "science clubs" would be the least attractive, with only 36.6% of preferences (Graph 11).

Statistical differences according to age were found when analyzing this question. The oldest groups (45 years or older) show a significantly lower willingness to participate in comparison to the youngest one (15 to 29 years old), with differences ranging from 5 to 26 percentage points.

Activities such as "Science and art festivals" and "Forums and other activities through the Internet on science and technology websites" were mostly attractive to people residing in urban areas than in rural areas (with differences ranging from 9 to 12 percentage points). Regarding the socioeconomic and educational levels, the results show that the willingness to actively participate was higher among people belonging to the medium-high level groups (complete high school or higher; C1- C2 and C3), in comparison to the lower levels (incomplete high school or lower; D and E).

It is worth highlighting that these results are fully in line with those of people's interest in these topics (science and technology), since the willingness to actively participate is significantly higher among those who expressed their interest in the topics than among those who stated that they were not interested (with differences ranging from 23 to 31 percentage points).



Graph 11. Q34. Using the following list, indicate in which of the activities you would be willing to actively participate. – Total.

N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

After learning about people's interests, participation and willingness to participate in new activities linked to science, the survey delves deeper into the population's beliefs regarding different fields of knowledge, with the aim of observing people's level of appropriation of science, In particular, it is worth highlighting that the majority of the population believes that miracles exist (65.2%), while, at the same time, 53.3% believes that only things that can be proven are true, revealing the potential coexistence of theoretically opposing or contradictory beliefs (Graphs 12 and 13).

Another result that stands out is that the statement "the only thing that is certain is that which can be proven" only presents significant differences between groups according to the educational level of the interviewee, with the percentage of believers being significantly lower in the group with the highest educational level (incomplete tertiary education and higher), with 48%, in contrast to the group with incomplete high school or lower (56%).







N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.





(% of Responses)

N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

On the other hand, the survey used a series of statements to inquire about the knowledge of the population about specific topics associated with science (Graph 14). It is observed that the great majority of people (69.8%) believe the statement "all the oxygen we breathe comes from plants" to be true. However, it is only partially true, since there is a small portion of oxygen that originates from single-celled plants living in the oceans, but it is understood that people provide a response based on the most popular knowledge. Another statement that stands out is that "sound travels faster than light", since only 45.1% said that this was false, which is correct. However, a similar percentage (43.5%) answered that the statement was true.

Graph 14. Q24. Tell me if you believe each of the following statements to be true or false. - Total.



N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

In addition, the survey sought to reveal how people apply scientific knowledge to their daily lives, whether under special circumstances -such as an earthquake- or usual ones -such as health care and nutrition, the use of appliances and others-. Graph 15 shows the actions of interviewees when faced with the particular situation of experiencing an earthquake, indicating that the results for all four options show that over 70% of the people agree that they would do what the statement says. It is important to highlight that, when faced with an earthquake, 96.9% of the people would move away from buildings, utility poles and power lines if they are in the street, which is correct, and they would also seek protection under a firm element or stand next to one (86%). However, there are two statements that involve risky actions and that high percentages said they would do them in case of an earthquake: "if you are driving, stopping where you are at the time" (78.5%) and "if you are attending a massive event, try to evacuate the place as soon as possible" (70%).





N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

The indicator on practices related to the adoption of scientific knowledge in people's daily lives is of great relevance to this study. Thus, the practice that interviewees mostly say they do always or most of the time is "follow medical opinion on an

illness", with 71.4%, while the practice of "reading the labels of food products" is the one with the lowest percentage among those who say they do it always or most of the time, with 42.5%. In contrast, the practice that people mostly say they rarely or never do is "seek information when facing a sanitation warning", with just 28.6% (Graphs 16 and 17).

It is worth noting that there are significant differences in this question in terms of the responses provided by groups according gender and age, with the percentage of men who stated they always or most of the time read labels or patient package inserts and followed medical opinion being lower than that of women (with differences ranging from 6 to 11 percentage points). Meanwhile, there are differences according to age for the always or most of the time responses to statements dealing with the search for information, such as "reading the dictionary or searching on the Internet when the meaning of a word is unknown" or "seeking information when facing a sanitation warning", with the youngest group (15 to 29 years old) shows a greater frequency of these practices than the oldest group (60 years or older), with differences ranging from 25 to 30 percentage points.

There are also differences according to the territory where people live for most of the daily life practices, since the share of people declaring to perform these actions always or most of the time is significantly higher among residents in urban areas, in comparison to those in rural areas (with differences ranging from 9 to 29 percentage points). This is particularly observed for the statements related to the search for information, such as "reading the dictionary or searching on the Internet when the meaning of a word is unknown", which reached 27% for residents in rural areas and 54% for inhabitants of urban areas, and "seeking information when facing a sanitation warning", for which the responses always or most of the time reached 21% for rural areas and a 50% of frequency in urban areas.

The analysis by socioeconomic level reveals that most of the daily life practices related to science and technology are greater among the C1-C2 groups (always or most of the time), with a difference of 6 to 29 percentage points in these activities in comparison to the lowest socioeconomic level group D-E.

On the other hand, according to their educational level, the majority of daily practices appear as significantly higher among interviewees who with higher educational levels, who declare doing them always or most of the time, particularly for practices such as "reading the dictionary or searching on the Internet when the meaning of a word is unknown" and "seeking information when facing a sanitation warning" (with 20 and 16 percentage points, respectively).



#### Graph 16. Q2. Tell me how frequently you... -Total.

N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.



# (% of Responses)



N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

In addition to the behaviors, knowledge and practices people carry out in relation to science and technology, it was relevant to learn the population's perception regarding the level of scientific and technological education they had received. It is worth highlighting that 51.3% of the population considers that the level of education received is low or very low, while only 7.3% perceives the level as being high or very high (Graph 18).

The results also show that, overall, women perceive their level of scientific and technical education as being lower than the one indicated by men (with differences of 5 percentage points). Meanwhile, according to age, the fact that older persons value the education received as low or very low stands out, in comparison to the youngest age group (15 to 29 years), revealing differences ranging from 11 to 17 percentage points. The differences by socioeconomic levels indicated that the higher the level (C1-C2 and C3), the lower the perception of having received low or very low scientific and technical education, in contrast to the lower levels (D-E), with differences ranging from 9 to 19 percentage points. This same trend is observed at the educational level, where the highest the level (complete high school or higher) the lower the perception of having received a low or very low scientific and technical education, in comparison to people with lower educational level (incomplete high school or lower).

Graph 18. Q26. Would you say that the level of scientific and technical education you have received is... -Total.



N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

# (% of Responses)

# 5. Results for the Valuation Dimension

The valuation dimension of the survey reveals people's judgements and valuations on science and technology; the perception of the usefulness of scientific and technological knowledge, their risks and benefits, along with their opinions on their impacts on people's lives.

Graph 19 shows the overall perception of the population on the benefits that science and technology will bring to the world, highlighting that 84.9%<sup>11</sup> of the population believes that scientific and technological development will bring about many or several benefits over the following years. Only 2.7% believes they will provide no benefits.

Delving deeper, it is observed that medium and high educational and socioeconomic levels show percentages statistically superior in terms of the perception that science and technology will bring about many benefits, in comparison to the incomplete high school or lower educational levels and socioeconomic levels D-E, with differences ranging from 10 to 14 percentage points.

Graph 19. Q11. I would like to ask you the following: Do you believe that over the next twenty years the development of science and technology will bring about many, several, few or no benefits to our world? -Total.



N=7,637. The "Does not know" and "Does not respond" categories are omitted from the graph.

The survey shows that, just as the population perceives the benefits that science and technology will provide, it also equally observes risks, since, 70.8%<sup>12</sup> of interviewees believes that science and technology will bring about many or several risks, and only 3.8% will render no benefits (Graph 20). It is worth highlighting that regarding risk perception, in contrast to benefits, no statistically significant differences were observed between groups according to sociodemographic variables, expect for people residing in the northern macro-zone, where the share of people who consider they will bring about many risks is significantly lower than in the metropolitan macro-zone (34% versus 42%).

 $<sup>^{\</sup>rm 11}$  The total for many benefits is 51.5% and for several benefits, it is 33.4%.

 $<sup>^{\</sup>rm 12}$  The total for many risks is 39.4% and for several risks, it is 31.4%.

Graph 20. Q12. And do you believe that over the next twenty years the development of science will bring about many, several, few or no risks to our world? – Total.



Therefore, the results indicate a contradictory nature with the coexistence of theoretically divergent ideas between the valuation perceptions of science and technology, because while people foresaw benefits they were also capable of seeing risks. It is worth highlighting that 60.3% of the populations perceives that scientific and technological development will bring about many or several benefits over the next 20 years and, at the same time, many or several risks. In fact, one in every four people perceive many benefits and many risks at once. On the other hand, only 2.9% of the population believes that scientific and technological development will provide few or no benefits, along with few or no risks. This confirms that these types of behavioral judgements are not organized in a continuum, but that they can rather coexist from parallel axes.

The coexistence between benefits and risks in relation to science and technology is not only evidenced in their direct descriptions, but also when people evaluate specific topics. In particular, graphs 21 and 22, which refer to concrete impacts of science and technology that can be beneficial or risky, show that a large share of interviewees agree, or strongly agree, with the statement that "science makes our way of life change too quickly" (76.8%) and that "science and technology are producing an artificial lifestyle (71.1%). Nevertheless, at the same time, they perceive benefits, like "science and technology are making our lives easier and more comfortable" (74.1%) and that they "have helped us to better face disasters of natural origin" (66.6%).

It is worth highlighting that, from the set of statements, social and nutrition impacts are less associated with benefits. In particular, it reveals that 40.8% disagrees, or strongly disagrees, with the statement that scientific and technological development will help diminish social inequalities.

In addition to these results, two continuous indicators were built, with values ranging between 0 and 1, to measure the perception on the benefits and risks of scientific and technological development<sup>13</sup>, finding some statistically significant differences according to sociodemographic variables. One result that particularly stands out is that men, as well as people from the highest socioeconomic levels (C1-C2 y C3) and the highest educational levels, show a greater benefits perception index than women and people from the lower socioeconomic levels (D and E) and the lower educational levels (incomplete high school or lower), respectively (with differences ranging between 0.02 and 0.05). In turn, the risk index shows a very different behavior, with differences between age ranges in which the youngest people (15 to 29 years old) perceive a lower risk index, as well as the people living in rural areas and those with a higher educational level (incomplete tertiary education or higher, with differences between 0.02 and 0.1).

<sup>&</sup>lt;sup>13</sup> The indices are built by grouping the statements of question 13 through a factor analysis. The risk index is built as the average of statements "d", "e", "j", "k", "l" and "m" and the one for benefits is the average of statements "a", "b", "c", "h" and "i". For further details, see the Questionnaire in Annex 1..

# Graph 21. Q13. I would like for you to tell me if you "strongly disagree", "disagree", "neither agree nor disagree", "agree" or "strongly agree" with each one of the following statements. – Total.



N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

Graph 22. Q13. I would like for you to tell me if you "strongly disagree", "disagree", "neither agree nor disagree", "agree" or "strongly agree" with each one of the following statements. – Total.





N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

This survey also sought to learn about people's perception regarding the current impacts of science and technology at the local level and the results confirmed that there is a positive evaluation of them. In particular, Graph 23 highlights that 59.1% of the population gives the maximum scores (4 and 5) to the question on whether or not Chile is better thanks to science and technology and that 50.3% also believes it to be so for their region (scores 4 and 5). However, 17.5% considers that their region is worse due to science and technology, a percentage that exceeds the one for the country level perception (11.5%).

The perception that the country is better thanks to science and technology (scores 4 and 5) reveals a statistically higher share among men and people with high school or higher studies and with high and medium socioeconomic levels (C1, C2 y C3).

Consequently, it is lower among women and people with elementary education or lower and belonging to the lower socioeconomic levels (D and E), with differences ranging from 6 to 13 percentage points.

Similar differences are observed regarding the impact on their own regions of residence, since, overall, the share of men and people living in urban areas, with higher socioeconomic levels (C1 and C2) and higher educational level was statistically higher than the reference shares (with differences ranging from 5 to 11 percentage points). On the other hand, interviewees inhabiting the northern macro-zone show a percentage of people who consider that their region is better thanks to science and technology that is significantly lower than the percentage for the metropolitan macro-zone (45% versus 53%).





N=7,637. The "Does not know" and "Does not respond" categories are omitted from the bars.

Regarding benefits and risks, the survey also asked about the level of usefulness of scientific knowledge perceived by people in some areas of their lives (Graph 24). It is worth highlighting that in the areas linked to health and disease prevention, the understanding of the world, and the caring for the surroundings and the environment, a large share states that scientific and technological knowledge proves to be very useful or quite useful (85.1%, 71.9% and 67.9%, respectively). In contrast, in areas related to their work or profession, their political and social opinion, and consumer decisions, the responses reveal perception percentages above 30% for the options of little or no usefulness of scientific and technological knowledge.

The perceptions of greater usefulness are significantly higher among people belonging to the highest socioeconomic level (C1 and C2) and with a higher educational level, in contrast to the low socioeconomic level (D and E) and the educational level with incomplete high school or lower (with differences ranging from 5 to 15 percentage points).

Graph 24. Q15. To what extent would you say that scientific and technological knowledge is useful in the following specific areas of life? Use a scale from 1 to four, where 1 is "not useful" and 4 is "very useful". – Total.



N=7,637. The "Does not know" and "Does not respond" categories are omitted from the bars.

Along this same line, people were asked which stakeholders they take into consideration to form their opinion regarding the construction of an electric power plant, offering the possibility of selecting more than one option (Graph 25). Overall, scientists and engineers would be the main referent to make up their mind regarding an issue, with 59.7% of interviewees considering them as the first mention and 82% within the three mentions. They are followed by citizen groups, which were mentioned in first place in 12.8% of the cases and mentioned by 54.4% on some occasion in the total mentions.

In addition, the comparison of the results according to sociodemographic variables highlights that the mention of scientists and engineers in the first place as stakeholders who influence their opinion was significantly higher among people belonging to the highest socioeconomic level (C1-C2) than among interviewees of the low socioeconomic levels (D-E), with 55% versus 67%. The same is true for the educational level, since 55% of the people with incomplete high school or lower education mentions scientists and engineers as their first choice, versus 66% of those with incomplete tertiary education or higher educational level.

Graph 25. Q16. If you had to give your opinion regarding the construction of an electric power plant (be it hydropower, thermal, nuclear, etc.), which of the following stakeholders would you consider for your opinion? – Total up to three mentions.



N=7,637. The "There are no more mentions", "Does not know" and "Does not respond" categories are omitted from the bars. Bars with mentions total do not add up to 100% because the question allows for multiple response.

# 6. Results for the Institutional System Dimension

Finally, the institutional system dimension is presented, which is linked to the perception of the conditions for developing scientific and technological activities in the country. It includes the following subdimensions: investment in science and technology; knowledge of institutions and their functions; and the perception of development in relation to international benchmarks.

Regarding this last subdimension, interviewees were asked about the level of development Chile has achieved, in different fields, in comparison to Argentina, Mexico and Brazil. Graph 26 reveals that the majority of respondents consider that the country is at the same level in terms of technology development (43.4%), economic development (41%), scientific research (38.1%) and sports (46%) compared to the other countries, while 53.6% believes that the country is behind in quality of education.







It is observed that the northern macro-zone presents percentages statistically lower in the perception that the country is more advanced in areas such as economic, technology and scientific research development, in comparison to the metropolitan macro-zone (with differences ranging from 6 to 8 percentage points). It is also observed that the perception that Chile is more advanced in the fields of economic and technological development is significantly higher among the medium and high socioeconomic levels (C1, C2 y C3), in comparison to the lowest levels (D and E), with differences from 5 to 7 percentage points.

In addition, the survey asked about what institutions people believe to contribute the greatest amount of money for scientific and technological research. The State is ranked first, with 29.5% of interviewees responding that it is the one that contributes the most money, followed by universities with 21.5% and private foundations with 17.6% (Graph 27). Now, when analyzing the total number of mentions, it is observed that the population mentions the State (39.7%), private foundations (39%) and universities (38.2%).

Taking into account just the first mention, it is worth highlighting that older people (45 years or older) make up the largest percentage of interviewees who believe that the State is the one contributing most money for research, in contrast with the youngest ones (15 to 29 years old), creating differences from 9 to 12 percentage points. The survey also revealed that the percentage of people belonging to the highest socioeconomic level (C1-C2) is significantly lower than the percentage of people belonging to the lowest level (D-E) who mentioned the State first (25% versus 34%).



Graph 27. Q19. Who do you think contributes more money for scientific and technological research in the country? – Total up to two mentions.



N=7,637. The "No more mentions", "Other" and "Does not respond" categories are omitted from the bars.

In addition, people were asked in which areas the State should increase its investment, excluding education, health and public safety. The results show that interviewees prioritize investments as follows: environment (20.2%); public works (17.8%); and justice (17.3%). Likewise, they mention environment (36.6%), justice (34.1%) and transportation (28.6%) as some of the priorities, as shown in Graph 28.





N=7,637. The "No more mentions", "Other" and "Does not respond" categories are omitted from the bars.



On the other hand, the increase of public investment in science and technology was mentioned less, with technology being mostly mentioned in 6.6% of the prioritized mentions and with a 11.8% if the total mentions. In turn, science only obtains 3.5% of mentions in the first place, with 10.5% of the total mentions.

The survey also inquired about the knowledge of institutions linked to science and technology in the country. Thus, it is observed that, of the total number of interviewees, only 17.1% indicated they knew some institution aimed at scientific and technological research (Graph 29).

Differences are observed between men and women: while 21.2% of male interviewees stated they knew some institution, only 13.1% of female interviewees answered yes. Likewise, it is observed that this response is affirmative in the youngest group (15-29 years old), with 20.4%, and declines towards the oldest ones, reaching 12.9% for the age segment of 60 years or older. Meanwhile, regarding socioeconomic and educational levels, the figures for those who do know an institution is greater among the higher-level groups. It is observed that the C1-C2 group reaches 29,2% of people who do know an institution aimed at developing science and technology in the country, while the percentages decline with 16.8% for C3 and just 7.3% for D-E. The same trend is observed according to educational level, with the group with incomplete tertiary education or higher reaches 39.2% of affirmative answers, while the percentages decrease for those with complete high school (12.8%) and incomplete high school or lower (5.4%). Likewise, there are differences according to geographical area, since in the urban area the group stating that they know some institution dedicated to developing science and technology reaches 18.8%, while this is true for only 5.6% in the rural area.





N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

People who answered affirmatively (N=946) were asked an open question regarding which institutions dedicated to science and technology they knew, with universities emerging as the main mention, followed by CONICYT, in addition to other diverse options such as laboratories, astronomical observatories, among others.

It is worth noting that CONICYT does not conduct scientific and technological research, but rather finances and supports other who do.

In addition, this same group that stated they knew an institution dedicated to research (N=946) was asked if they knew any within their region of residence. Results indicate that 72.6% knows one in the region (Graph 30). It is worth highlighting that no significant differences were found for the responses to this question among the groups of interviewees.

Graph 30. Q28. And, in this region where you live, do you know any institution focused on conducting scientific and technological research? – Total.



#### (% of Responses of those who do know of an institution)

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Total
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N=946. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

Graph 31. Q29. Prior to this survey, did you know the National Commission for Scientific and Technological Research, CONICYT? – Total.



(% of Responses)

Total

N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.



People were also asked regarding their knowledge about CONICYT, before administering the survey, and the results show that only 9.8% know the institution (Graph 31), without any significant statistical differences between answers by men and women.

The most relevant differences appear according to geographical area, with barely 2.5% of interviewees in rural areas indicating that they knew CONICYT before the survey, while 10.9% of urban area residents answered affirmatively. The analysis by macro-zone shows that people living in the north, south and center macro-zones present greater knowledge of the institution than those residing in the metropolitan macro-zone (with differences of approximately 6 percentage points).

Other relevant differences appear between socioeconomic and educational level groups. The percentage of those who do know some institution dedicated to research is 18.7% for people of the C1-C2 socioeconomic level, while this is true for only 3.4% of the D-E levels. In terms of educational level, 25.7% of those with incomplete tertiary education of higher indicate they knew CONICYT prior to the survey, while the percentage for the group with incomplete high school or lower is only 2.1%.

The group that indicated knowing CONICYT before the survey was asked about the knowledge they had of the functions and/or tasks performed by the institution. The results show that 72.5% of them believe it grants funding to researchers or institutions that conduct scientific research, while 62.1% thinks it has research laboratories for science and technology, which is incorrect because CONICYT does not have the infrastructure to that end and it is not part of its work (Graph 32).



Graph 32. Q30. Which of the following functions and/or tasks do you believe are carried out by CONICYT? – Total.

N=580. Reliability intervals built with 95% of reliability.

People were also specifically asked about their knowledge of CONICYT's Explora Program, with 11.4% of interviewees stating that they knew about it at the time of the survey (Graph 33).

Among those who indicated knowing about the Explora Program, only 4.7% of rural area residents answered affirmatively, while the percentage for urban areas is 12.7%. In addition, there are also differences according to socioeconomic level. It is observed that 17.4% of the C1-C2 group knows the Program, while the figure drops to 6.1% in the D-E group. The same trend is observed according to educational level, with 22.3% of the group with incomplete tertiary education or higher declared knowing about it, in contrast to only 5.4% of the group with incomplete high school or lower.

People who stated that they knew CONICYT'S Explora Program (N=773) were asked about how they obtained this information. Graph 34 show that 32.4% learned about it through television or other mass communication media, 12% through social media, and 8.2% through information in the Santiago Metro (subway). In addition, it is worth highlighting that 28.5%



mentioned "other" means for learning about Explora, with school being the main channel mentioned for this category, followed by family and universities.

One of the aspects that stands out is that, of the group of people who stated they knew Explora, 21% of interviewees between 15 and 29 years old indicated they learned about it through television and other mass communication media, while the percentage increases to 41% for the group between 30 and 44 years old. It is important to mention that results for men and women are statistically the same and do not present significant differences.





N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.

Graph 34. Q32. In which media or activity did you hear about the Explora program? Mention the most important one. – Total.



#### (% of Responses of those who did know Explora)

N=7,637. Reliability intervals built with 95% of reliability. The "Does not know" and "Does not respond" categories are omitted from the bars.



# 7. Results for the Perception of Innovation Module

In addition to the public perception on science and technology, which is the main focus of this survey, CONICYT decided to include a last module to learn about the population's perception regarding innovation topics. This space can be configured as flexible over time and its topics may change in following administrations of the survey. The questions that make up this module were requested by the Innovation Division of the Ministry of Economy of Chile, in order to be incorporated into this measurement in 2015<sup>14</sup>.

The first question was open and sought to learn what people understand by innovation. The results of those who expressed some idea, excluding "nothing", "does not know" or "does not respond", show that the main concept that comes to mind is "changes", followed by concepts associated with novelty, such as "new things" and "something new" (Figure 4).

It is worth highlighting that 21.8% of interviewees answered "nothing" or said they did not know.

#### Figure 4. Q35. When I talk about "innovation", what comes to mind?



N=6,148

In order to learn more about people's imaginary on innovation, they were asked how innovative they think some institutions are, as well as Chileans (Graph 35). The results show that universities are considered as being more innovative, with 60.4% of the people stating that they are very or quite innovative. In contrast, public institutions were considered the less innovative, with 25.7% of the population indicating they are "not innovative". It is worth highlighting, likewise, that 53.2% stated that Chilean are little innovative. No statistically significant differences were observed according to sociodemographic variables.

<sup>&</sup>lt;sup>14</sup> The questions were not validated or designed together with the rest of the questionnaire, but they have been used by the Innovation Division of the Ministry of Economy in previous studies.

#### Graph 35. Q36. To what extent do you believe the following are innovators? - Total.



#### (% of Responses)

N=7,637. The "Does not know" and "Does not respond" categories are omitted from the bars.

Finally, in this module people were asked about the possibility for science and technology to generate innovative solutions to issues in different fields (Graph 36). The results show that, for all fields, most of the population (over 80%) agrees that science and technology can generate innovative solutions. The field with the highest level of negative responses, that is, for which people think that no innovative solutions can be provided is "quality of life", with 13.7%, in accordance to the pattern observed in other similar questions, in which the perception is that the more social issues are not associated with science so much.

According to people's socioeconomic level, it is observed that those belonging to the highest level (C1-C2) show greater percentages of belief that innovative solutions can be provided to issues, in comparison to those belonging to the lowest level (D-E), with a difference of 6 percentage points. The same behavior is observed among people with an incomplete tertiary education or higher level and those with an incomplete high school or lower educational level.





N=7,637. The "Does not know" and "Does not respond" categories are omitted from the bars.

# Annex 1

# NATIONAL SURVEY ON SCIENTIFIC CULTURE: PUBLIC PERCEPTION OF SCIENCE AND TECHNOLOGY IN CHILE

NATIONAL COMMISSION FOR SCIENTIFIC AND TECHNOLOGICAL RESEARCH (CONICYT by its acronym in Spanish)







## INSTRUCTIONS

- 1. Remember to provide the introduction letter of the study and informed consent to the selected interviewee.
- 2. Complete the survey in print and legible writing with a pen. Each alternative must be clearly marked, whether with a circle or with an "X" over the option selected by the interviewee.
- 3. Check that <u>all questions have a valid response</u> before finalizing the survey.
- 4. Once all the data collection process has finished, give the surveys back to the field coordinating team.

INFORMATION OF THE INTERVIE	WER				
Full name of the interviewer					
Date of the survey				Start time	:
	Day	Month	Year		
INFORMATION OF THE INTERVIE	WEE				
Name of the interviewee					
Gender	1	2	What is	your age?	Years
Telephone	Male	Female			
Address					
Commune					



Field Supervisor		Office Supervisor		Coder	Data Entry Specialist		
	Yes	No		Yes	No	Notes:	Notes:
Complete survey			Complete survey				
Logical flow			Logical flow				
Legible writing			Legible writing				
Score			Score				

# **MODULE A**

I will begin by asking you a few questions to learn about your beliefs and interests in different activities.

1. Now I will read to you a series of things that people believe in. For each one of them, could you tell me if you believe, are not sure or do not believe? (INTERVIEWER: READ EACH PHRASE AND MARK ONE ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

		Believes	ls not	Does	Does not	Does not
			sure	not	know	respond
				believe	(DO NOT	(DO NOT
					READ)	READ)
Α	Some numbers bring good luck	1	2	3	88	99
В	Spirits exist	1	2	3	88	99
С	The Tarot, the horoscope, divination and cards	1	2	3	88	99
	predict the future					
D	Miracles exist	1	2	3	88	99
Ε	There are space ships that come from other	1	2	3	88	99
	planets					
F	The only thing that is certain is that which can be	1	2	3	88	99
	proven					
G	Some people use psychic powers or a sixth sense	1	2	3	88	99
	to communicate (i.e.: they can read other					
	people's minds)					

2. Now I will read to you phrases that describe behaviors that people can adopt in their daily lives. Tell me how frequently you. (INTERVIEWER: SHOW CARD 1. READ EACH PHRASE AND MARK ONE ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

		Always or most of the time	Sometimes	Rarely or never	Does not know (DO NOT READ)	Does not respond (DO NOT READ)
Α	Read the instructions of the medications.	1	2	3	88	99
В	Reads the labels from food products.	1	2	3	88	99
С	Read the technical specifications of appliances.	1	2	3	88	99
D	Follow medical opinion on a diet.	1	2	3	88	99
Ε	Follow medical opinion on an illness.	1	2	3	88	99
F	Seek information when facing a sanitation warning (for example: bird flu, Ebola).	1	2	3	88	99
G	Read a dictionary or search on the Internet when you do not know a word.	1	2	3	88	99

# 3. Could you tell me if you performed any of the following activities over the past year (the past 12 months)? (INTERVIEWER: READ EACH ACTIVITY AND MARK AN ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

	Activities	Yes	No	Does not know (DO NOT READ)	Does not respond (DO NOT READ)
Α	Visiting a shopping mall	1	2	88	99
В	Going to a movie theater	1	2	88	99
С	Going to a stadium to see a match or sports competition	1	2	88	99
D	Visiting an art museum or exhibit	1	2	88	99
Ε	Visiting a science and technology museum	1	2	88	99
F	Visiting a national park, natural or ecological reserve	1	2	88	99
G	Visiting a zoo or an aquarium	1	2	88	99
Н	Going to a public library	1	2	88	99
I	Visiting a science and technology laboratory or institution	1	2	88	99

4. I will ask you to indicate the frequency with which you perform the following activities. (INTERVIEWER: SHOW CARD 1. READ EACH ACTIVITY AND MARK AN ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

	Activities	Always or most of the time	Sometimes	Rarely or never	No applicable (DO NOT READ)	Does not know (DO NOT READ)	Does not respond (DO NOT READ)
A	Watch television shows or documentaries on science, technology or nature (animals or vegetation)	1	2	3	87	88	99
В	Read scientific articles published in newspapers	1	2	3	87	88	99
С	Listen to radio shows or sections on science and technology	1	2	3	87	88	99
D	Read scientific dissemination journals	1	2	3	87	88	99
Ε	Read scientific dissemination books	1	2	3	87	88	99
F	Use the Internet to search for scientific information	1	2	3	87	88	99
G	Visit scientific and technology museums, centers or exhibits	1	2	3	87	88	99
Η	Talk to friends or colleagues about science and technology	1	2	3	87	88	99

# MODULE B

Now I will ask you about topics that are of interest to you.

5. I would like for you to tell me whether or not you are interested in the topics I will read to you. (INTERVIEWER: READ EACH TOPIC AND MARK ONE ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

	Topics	Interested	Not interested	Does not know (DO NOT READ)	Does not respond (DO NOT READ)
Α	Sports	1	2	88	99
В	Police and crime	1	2	88	99
С	Science	1	2	88	99
D	Movies and theater	1	2	88	99
Ε	Politics	1	2	88	99
F	Technology	1	2	88	99

6. I would like for you to tell me to what extent you feel informed about a series of topics I will read to you. Use a scale from 1 to 4, where 1 is "not informed" and 4 is "very informed". (INTERVIEWER: SHOW CARD 2. READ EACH TOPIC AND MARK AN ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

	Topics	Not informed	Little informed	Well informed	Highly informed	Does not know (DO NOT READ)	Does not respond (DO NOT READ)
Α	Sports	1	2	3	4	88	99
В	Police and crime	1	2	3	4	88	99
С	Science	1	2	3	4	88	99
D	Movies and theater	1	2	3	4	88	99
Ε	Politics	1	2	3	4	88	99
F	Technology	1	2	3	4	88	99

## MODULE C

- 7. When I talk about "science", what comes to mind? (INTERVIEWER: IF THEY RESPOND "NOTHING" WRITE IT DOWN)
- 8. And now, when I talk about "technology", what comes to mind? (INTERVIEWER: IF THEY RESPOND "NOTHING" WRITE IT DOWN)
- 9. Next, I will read a list of disciplines. For each of them, indicate if, in your opinion, their application is scientific or not. (INTERVIEWER: READ EACH ACTIVITY AND MARK AN ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

		lt is scientific	It is not scientific	Does not know	Does not respond (DO NOT READ)
Α	Medicine	1	2	3	99
В	Theology	1	2	3	99
С	Engineering	1	2	3	99
D	Ancestral medicine (of native peoples such as	1	2	3	99
	the Mapuche, Aymara)				
Ε	Physics	1	2	3	99
F	Economy	1	2	3	99
G	Acupuncture (consists in the insertion of	1	2	3	99
	needles into the body to recover health)				
Н	Psychology	1	2	3	99

10. Next, I will show you different headlines from the press. For each of them, indicate if, in your opinion, they are related to news about science, technology, both or neither of them. (INTERVIEWER: SHOW CARD 3)

		Science	Technology	Both	Neither	Does not know (DO NOT READ)	Does not respond (DO NOT READ)
Α	Headline 1: A New Software that Analyzes	1	2	3	4	88	99
	Developed.						
В	Headline 2: Organ Transplants between HIV-Positive Patients Obtain Promising	1	2	3	4	88	99
	Results.						
С	Headline 3: Experts Reduce the Growth Forecast in 2015 for Chile to 2.7%.	1	2	3	4	88	99
D	Headline 4: Researchers Indicate that the Life of the Sun Would End with an Instantaneous Explosion.	1	2	3	4	88	99
E	Headline 5: Foreign Company Inaugurates its First Eolic Park in Chile and Announces New Eolic Power Plants.	1	2	3	4	88	99
F	Headline 6: The Influence of Social Media on Interpersonal Relations is Being Studied.	1	2	3	4	88	99

# MODULE D

The following questions are aimed at learning about your perception of the effects of science and technology in several aspects of the world and our lives.

- 11. I would like to ask you the following: Do you believe that over the next twenty years the development of science and technology will bring about many, several, few or no benefits to our world? (INTERVIEWER: WAIT FOR A RESPONSE AND MARK ONE ALTERNATIVE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)
  - 1. Many benefits
  - 2. Several benefits
  - 3. Few benefits
  - 4. No benefits
  - 88. Does not know (DO NOT READ)
  - 99. Does not respond (DO NOT READ)



- 12. And do you believe that over the next twenty years the development of science will bring about many, several, few or no risks to our world? (INTERVIEWER: WAIT FOR A RESPONSE AND MARK ONE ALTERNATIVE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)
  - 1. Many risks
  - 2. Several risks
  - 3. Few risks
  - 4. No risks
  - 88. Does not know (DO NOT READ)
  - *99. Does not respond (DO NOT READ)*
- 13. I would like you to tell me if you "strongly disagree", "disagree", "neither agree nor disagree", "agree" or "strongly agree" with each one of the following statements. (INTERVIEWER: SHOW CARD 4. MARK ONE ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	DOES NOT KNOW (DO NOT READ)	DOES NOT RESPOND (DO NOT READ)
Α	Science and technology contribute to improving the environment	1	2	3	4	5	88	99
В	Science and technology have helped us to better face disasters of natural origin (for example: earthquakes, tsunamis, floods due to rain)	1	2	3	4	5	88	99
С	Science and technology have helped us to improve our food intake	1	2	3	4	5	88	99
D	The applications of science and technology are making people lose their jobs	1	2	3	4	5	88	99
E	Science and technology are responsible for most of the environmental problems that we currently face	1	2	3	4	5	88	99
F	The scientific and technological development will help diminish social inequalities	1	2	3	4	5	88	99
G	Science and technology are best developed by women than by men	1	2	3	4	5	88	99
Η	Science provides the most trustworthy knowledge in the world	1	2	3	4	5	88	99

I	Science and technology are making our lives easier and more comfortable	1	2	3	4	5	88	99
J	Science makes our way of life change too quickly	1	2	3	4	5	88	99
К	Scientists make little effort to inform the public about their work.	1	2	3	4	5	88	99
L	Science and technology are producing an artificial life style	1	2	3	4	5	88	99
Μ	We depend too much on science and not enough on faith	1	2	3	4	5	88	99

# 14. On a scale from 1 to 5, where 1 is "much worse" and 5 is "much better"... (INTERVIEWER: SHOW CARD 5. MARK ONE ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

		Much worse				Much better	Does not know (DO NOT	Does not respond (DO NOT
							READ)	READ)
Α	Would you say that CHILE is worse or better thanks to science and technology?	1	2	3	4	5	88	99
В	Would you say that your REGION is worse or better thanks to science and technology?	1	2	3	4	5	88	99

15. To what extent would you say that scientific and technological knowledge is useful in the following specific areas of life? Use a scale from 1 to four, where 1 is "not useful" and 4 is "very useful". (INTERVIEWER: SHOW CARD 6. MARK ONE ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

		Not useful	A little useful	Quite useful	Very useful	Does not know (DO NOT READ)	Does not respond (DO NOT READ)
Α	Your understanding of the world	1	2	3	4	88	99
В	Health care and disease prevention	1	2	3	4	88	99
С	Caring for the surroundings and the environment	1	2	3	4	88	99
D	Your decisions as a consumer	1	2	3	4	88	99
E	Political and social opinions	1	2	3	4	88	99

<b>F</b> Your profession or job 1 2 3 4 88 99
---

16. If you had to give your opinion regarding the construction of an electric power plant (be it hydropower, thermal, nuclear, etc.), which of the following stakeholders would you consider for your opinion? If you wish you may mention up to THREE stakeholders according to their order of importance (INTERVIEWER: SHOW CARD 7. WAIT FOR A RESPONSE AND WRITE IT DOWN IN THE CELL SPACE)

		I mention
1	The members of Congress	
2	Scientists and engineers	2 <sup>nd</sup> mention
3	Armed Forces (army, navy, air force)	
4	Religious leaders	
5	The President of the Republic	3 <sup>rd</sup> mention
6	Citizen groups (organizations and community groups)	
7	Family, friends and acquaintances	
88	Does not know <b>(DO NOT READ)</b>	

# The following questions are aimed at learning your opinion on the priorities for public investment and research.

**MODULE E** 

- 17. In which of the following sectors, besides education, public safety and health, would you increase public investment? If you wish you can mention up to TWO sectors according to their order of importance. (INTERVIEWER: SHOW CARD 8. WAIT FOR A RESPONSE AND WRITE IT DOWN IN THE CELL SPACE)
  - 1 Public works
  - 2 Transportation
  - **3** Technology
  - 4 Environment
  - 5 Defense
  - **6** Justice
  - 7 Culture
  - 8 Science
  - 9 Sports
  - 10 None
  - 88 Does not know (DO NOT READ)

99 Does not respond (DO NOT READ)

99 Does not respond (DO NOT READ)

1 <sup>st</sup> mention
2 <sup>nd</sup> mention

1<sup>st</sup> montion

- **18.** In which of the following specific fields is the research effort a priority in the future? If you wish you may mention up to TWO alternatives according to their order of importance. (INTERVIEWER: SHOW CARD 9. WAIT FOR A RESPONSE AND WRITE IT DOWN IN THE CELL SPACE).
  - 1 Solutions to pollution by metals in residential sectors (derived from industries) 1<sup>st</sup> mention
  - 2 Research associated with seismic movements and tsunamis
  - **3** Renewable energy sources (solar, wind, biofuels)
  - 4 Solutions for facing the lack of irrigation water
  - **5** Reducing the environmental impact of the meat processing industry (meat processing, slaughter or other)
  - 6 Effects of air pollution
  - 7 Sustainable management of agriculture and forestry production
  - 8 Effects of the introduction of other animal species into Chilean ecosystems
  - 9 None in particular
  - 88 Does not know (DO NOT READ)
  - 99 Does not respond (DO NOT READ)
- 19. Who do you think contributes more money for scientific and technological research in the country? If you wish, you can mention up to TWO alternatives, according to their order of importance. (INTERVIEWER: SHOW CARD 10. WAIT FOR A RESPONSE AND WRITE IT DOWN IN THE CELL SPACE)
  - 1 State
  - 2 Businesses
  - 3 Universities
  - 4 Private foundations
  - 5 Foreign institutions
  - 6 Other, 19.1 Which one?\_\_\_\_
  - 88 Does not know (DO NOT READ)
  - 99 Does not respond (DO NOT READ)
- 20. In your opinion, what do you believe is Chile's level of development in comparison to Argentina, Mexico and Brazil in the following areas? (INTERVIEWER: SHOW CARD 11. MARK ONE ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

		More advanced	At the same level	Behind	Does not know (DO NOT READ)	Does not respond (DO NOT READ)
Α	Sports	1	2	3	88	99
В	Economic development	1	2	3	88	99
С	Development of	1	2	3	88	99
	technologies					
D	Scientific research	1	2	3	88	99
Ε	Quality of education	1	2	3	88	99
F	Caring for the	1	2	3	88	99
	environment					



2<sup>nd</sup> mention

1<sup>st</sup> mention

## **MODULE F**

The following questions are aimed at learning about your perception of several aspects associated to competencies and professions.

21. What competencies or abilities would you like the educational establishments to develop more in our youth? Imagine your children, grandchildren or future children. If you wish, you may mention up to TWO alternatives, according to their order of importance. (INTERVIEWER: SHOW CARD 12. WAIT FOR A RESPONSE AND WRITE IT DOWN IN THE CELL SPACE. MARK WITH A CROSS ON "FLIP OVER" ACCORDING TO THE ALTERNATIVE WITH WHICH THE CARD BEGINS. FURTHER DETAILS IN THE INTERVIEWER MANUAL.

# FLIP OVER

1	Management of the English language	1 <sup>st</sup> mer
 2	Foster the curiosity for developing knowledge and attitudes	
3	Solidarity and concern for other people	
4	Command of computer skills	2 <sup>nd</sup> me
5	Assess more than one solution when facing problems	
 6	Capacity to search for and select information in the Internet or books	
7	Ability to work with others	3 <sup>rd</sup> me
88	Does not know <b>(DO NOT READ)</b>	

99 Does not respond (DO NOT READ)

22. How prestigious do you think the following professions or activities are? Consider a scale from "1" to "5", where "1" corresponds to "Not prestigious" and 5 to "Highly prestigious". (INTERVIEWER: SHOW CARD 13. MARK AN ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

		Not prestigious				Highly prestigious	Does not know	Does not respond
							(DO NOT READ)	(DO NOT READ)
Α	Engineers	1	2	3	4	5	88	99
В	Doctors	1	2	3	4	5	88	99
С	Teachers	1	2	3	4	5	88	99
D	Lawyers	1	2	3	4	5	88	99
Ε	Scientists	1	2	3	4	5	88	99
F	Judges	1	2	3	4	5	88	99
G	Politicians	1	2	3	4	5	88	99
Н	Sports players	1	2	3	4	5	88	99
I	Journalists	1	2	3	4	5	88	99
J	Business owners	1	2	3	4	5	88	99
К	Military personnel	1	2	3	4	5	88	99
L	Religious	1	2	3	4	5	88	99
	personnel							



23. From the following list, which do you think are the reasons why a person decides to work in science and/or technology? Let us begin with science... (INTERVIEWER: BEGIN WITH SCIENCE AND MENTION EACH ONE OF THE REASONS. THEN SAY, "NOW, REGARDING TECHNOLOGY..." AND PROVIDE THE REASONS ONCE AGAIN)

				A. Science			[	B. Technology	,
		Yes	No	Does Not	Does Not	YES	No	Does Not	Does Not
				Know	Respond			Know	Respond
				(DO NOT	(DO NOT			(DO NOT	(DO NOT
				READ)	READ)			READ)	READ)
Α	Earn money	1	2	88	99	1	2	88	99
В	Vocation for research	1	2	88	99	1	2	88	99
С	Having prestige	1	2	88	99	1	2	88	99
D	Solve the problems of the	1	2	88	99	1	2	88	99
	people								
Ε	Having power	1	2	88	99	1	2	88	99
F	Get to know the truth	1	2	88	99	1	2	88	99
G	Better understand the	1	2	88	99	1	2	88	99
	environment								

## **MODULE G**

This MODULE includes questions that go from general knowledge to interests.

24. Tell me if you believe each of the following statements to be true or false. (INTERVIEWER: READ EACH AFFIRMATION AND MARK ONE ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

		True	False	Does not know (DO NOT READ)	Does not respond (DO NOT READ)
Α	All the oxygen we breathe comes from plants	1	2	88	99
В	The gene of the mother determines if a baby will be a boy	1	2	88	99
	or a girl				
С	Sound travels faster than light	1	2	88	99
D	Acid rain is related to the gases produced by the exhaust	1	2	88	99
	pipes of cars				
Ε	Tsunamis or seaquakes are only caused by earthquakes	1	2	88	99



25. In case of an earthquake, which of the following actions would you carry out to protect yourself during the seismic movement? (INTERVIEWER: READ EACH PHRASE AND MARK ONE ALTERNATIVE IN EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

		Would do it	Would not do	Does not know	Does not respond
			it	(DO NOT READ)	(DO NOT READ)
Α	If you are in the street, move away from buildings, utility poles and power lines.	1	2	88	99
В	If you are attending a massive event, try to evacuate the place as soon as possible (even during a seismic movement).	1	2	88	99
С	Seek protection under a firm element, or stand next to one. (for example: a table).	1	2	88	99
D	If you are driving, stopping where you are at the time. (during the seismic movement).	1	2	88	99

# 26. Would you say that the level of scientific and technical education you have received is... (INTERVIEWER: READ THE ALTERNATIVES AND MARK ONLY ONE)

- 1. Very low
- 2. Low
- 3. Normal
- 4. High
- 5. Very high
- 6. Did not receive scientific or technical education (DO NOT READ)
- 88. Does not know (DO NOT READ)
- 99. Does not respond (DO NOT READ)
- 27. Do you know any institution focused on conducting scientific and technological research in our country? (INTERVIEWER: WAIT FOR A RESPONSE AND MARK ONE ALTERNATIVE)
  - 1. Yes  $\rightarrow$  MOVE ON TO Q27.1
  - 2. No  $\rightarrow$  MOVE ON TO Q29
  - 88. Does not know **(DO NOT READ)**  $\rightarrow$  MOVE ON TO Q29
  - 99. Does not respond **(DO NOT READ)**  $\rightarrow$  MOVE ON TO Q29

Q27.1 Which ones? (INTERVIEWER: MAXIMUM THREE MENTIONS. IF THEY RESPOND "NEITHER", WRITE IT DOWN UNDER THE FIRST MENTION AND LEAVE THE REST BLANK)

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_



- 28. (INTERVIEWER: ONLY IF THEY RESPOND "YES" IN Q27) And, in this region where you live, do you know any institution focused on conducting scientific and technological research? (INTERVIEWER: WAIT FOR A RESPONSE AND MARK ONE ALTERNATIVE)
  - 1. Yes  $\rightarrow$  MOVE ON TO Q28.1
  - 2. No  $\rightarrow$  MOVE ON TO Q29
  - 88. Does not know **(DO NOT READ)**  $\rightarrow$  MOVE ON TO Q29
  - 99. Does not respond **(DO NOT READ)**  $\rightarrow$  MOVE ON TO Q29

Q28.1 Which ones? (INTERVIEWER: MAXIMUM THREE MENTIONS. IF THEY RESPOND "NEITHER", WRITE IT DOWN UNDER THE FIRST MENTION AND LEAVE THE REST BLANK)

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_

# MODULE H: INSTITUTIONAL KNOWLEDGE

In this following section, we will ask you about your institutional knowledge and your interest in participating in Science and Technology activities.

- 29. Prior to this survey, did you know the National Commission for Scientific and Technological Research, CONICYT? (INTERVIEWER: WAIT FOR A RESPONSE AND MARK ONE ALTERNATIVE)
  - 1. Yes  $\rightarrow$  MOVE ON TO Q30
  - 2. No  $\rightarrow$  MOVE ON TO Q0
  - 88. Does not know **(DO NOT READ)**  $\rightarrow$  MOVE ON TO Q0
  - 99. Does not respond **(DO NOT READ)**  $\rightarrow$  MOVE ON TO Q0
- 30. Which of the following functions and/or tasks do you believe are carried out by CONICYT? (INTERVIEWER: THE CATEGORY "DOES NOT KNOW" IS VALID FOR THIS QUESTION, THEREFORE YOU MUST READ IT AS AN ALTERNATIVE TO THE RESPONSE) (REACH EACH FUNCTION AND MARK ONE ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

		Yes	No	Does not know	Does not respond (DO NOT READ)
Α	Provides scholarships or other aids to students	1	2	3	99
В	Provides funding to researchers or to institutions who	1	2	3	99
	conduct scientific research				
С	Possesses research laboratories for science and technology	1	2	3	99
D	Carries out scientific and technological dissemination	1	2	3	99
	activities for the general public				
Ε	Defines policies related to science and technology in Chile	1	2	3	99
F	Other, which one? Q30.1	1	2	3	99

- 31. Do you know or have you Heard about CONICYT's "Explora" program? (INTERVIEWER: WAIT FOR A RESPONSE AND MARK ONE ALTERNATIVE)
  - 1. Yes  $\rightarrow$  MOVE ON TO Q32
  - 2. No  $\rightarrow$  MOVE ON TO Q34
  - 88. Does not know (DO NOT READ)  $\rightarrow$  MOVE ON TO Q34
  - 99. Does not respond (**DO NOT READ**)  $\rightarrow$  MOVE ON TO Q34
- 32. (INTERVIEWER: ONLY IF THEY KNOW EXPLORA IN Q0) In which media or activity did you hear about the "Explora" program? Mention the most important one. (INTERVIEWER: WAIT FOR A SPONTANEOUS RESPONSE, WRITE IT DOWN AND THEN CODE IT ACCORDING TO THE LIST)

Spontaneous response	<b>32.1</b> Code

- 1. Santiago Metro
- 2. Conferences "Conversations with scientists"
- 3. Journal "Chile has its science" ("Chile tiene su ciencia")
- 4. Events "Sciences goes out on the street"
- 5. Explora website
- 6. Social media (Facebook, Twitter, YouTube)
- 7. Television and other media
- 8. Other
- 88. Does not know (DO NOT READ)
- 99. Does not respond (DO NOT READ)
- 33. (INTERVIEWER: ONLY IF THEY KNOW EXPLORA IN Q0) Which of the following activities do you believe that the Explora program of CONICYT carries out? (INTERVIEWER: READ EACH ACTIVITY AND MARK AN ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

		Yes	No	Does not know (DO NOT READ)	Does not respond (DO NOT READ)
А	National science and technology week	1	2	88	99
В	National science and technology day	1	2	88	99
С	Travelling science/art exhibits	1	2	88	99
D	Science camps for students	1	2	88	99
Е	National competitions for valuation and dissemination	1	2	88	99
	projects				
F	Other, which one? <b>33.1</b>	1	2	88	99



34. (INTERVIEWER: EVERYONE RESPONDS) Using the following list, indicate in which of the activities you would be willing to actively participate. (INTERVIEWER: READ EACH ACTIVITY AND MARK ONE ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

		Yes	No	Does not know (DO NOT READ)	Does not respond (DO NOT READ)
А	Science fairs	1	2	88	99
В	Hands-on science workshops	1	2	88	99
С	Lectures by and with scientists	1	2	88	99
D	Science and art festivals	1	2	88	99
E	Science and technology camps (for children or nephews or nieces)	1	2	88	99
F	Science and/or heritage routes within your region	1	2	88	99
G	Science clubs	1	2	88	99
Н	Forums and other activities through Internet on science and technology websites	1	2	88	99

## **MODULE I: INNOVATION**

## In this section, we will ask you questions about innovation

- 35. When I talk about "innovation", what comes to mind? (INTERVIEWER: IF THE RESPONSE IS "NOTHING" WRITE IT DOWN)
- 36. To what extent do you believe the following are innovators? (READ EACH STAKEHOLDER AND MARK ONE ALTERNATIVE IN EACH ONE)

		Not innovative	A little innovative	Significantly innovative	Very innovative	Does not know (DO NOT READ)	Does not respond (DO NOT READ)
А	Chileans	1	2	3	4	88	99
В	Businesses	1	2	3	4	88	99
С	Universities	1	2	3	4	88	99
D	Public institutions	1	2	3	4	88	99



37.	Do you believe that Science and Technology can create innovative solutions to issues in? (READ EACH
	SERVICE AND MARK ONE RESPONSE IN EACH ONE)

		Yes	Νο	Does not know (DO NOT READ)	Does not respond (DO NOT READ)
Α	Health	1	2	88	99
В	Environment	1	2	88	99
С	Education	1	2	88	99
D	Telecommunications	1	2	88	99
Ε	Performance of businesses	1	2	88	99
F	Quality of life of the population	1	2	88	99

# MODULE J: CHARACTERISTICS OF THE HOUSEHOLD

1. How many people usually live in this household (including yourself)? (INTERVIEWER: REMEMBER TO INCLUDE CHILDREN AND ELDERLY)

1	2	2	л	5	6	7	0	0	10	11	12	12	14	+15	88	99
T	2	5	4	5	0	/	0	9	10	11	12	15	14	+12	(DNK)	(DNR)

INTERVIEWER: FOR THE FOLLOWING QUESTIONS, WRITE THE RESPONSES IN THE FOLLOWING CHART. EACH LINE REPRESENTS A MEMBER OF THE HOUSEHOLD, AND EACH COLUMN A QUESTION FROM Q2 TO Q9.

<ol> <li>Could you please tell me how many people usually live in this household? (INTERVIEWER: WRITE THE FIRST NAME OF ALL THE PEOPLE WHO LIVE IN THE HOUSEHOLD IN THE FIRST COLUMN. REMEMBER CHILDREN AND ELDERLY. BEGIN WITH THE</li> </ol>	<ul> <li>6. Age (INTERVIEWER: WRITE DOWN THE AGE IN NUMBER OF YEARS. IF THE CHILD IS LESS THAN A YEAR OLD WRITE DOWN ZERO)</li> <li>7. What is the highest educational level you have attained or what educational level are you currently attaining? (INTERVIEWER: SHOW CARD 14)</li> </ul>	<ul> <li>8. Did you complete the education level mentioned in the previous question?</li> <li>1. Yes</li> <li>2. No</li> <li>88. Does not know (DO NOT READ)</li> <li>99. Does not respond (DO NOT READ)</li> </ul>
INTERVIEWEE)	1. Never attended $\rightarrow$ MOVE ON TO O9	<b>9.</b> At present, what is your main
<ul> <li>3. (DO NOT READ) IDENTIFY THE INTERVIEWEE.</li> <li>1. Interviewee</li> <li>2. Another member of the household.</li> <li>4. Could you tell me which member is the <u>Head of the</u> <u>Household</u>? (Who provides the main income in the household)</li> <li>1. Head of the Household</li> <li>2. Another member of the household</li> </ul>	<ul> <li>Q9</li> <li>2. Nursery or pre-school → MOVE ON TO Q9</li> <li>3. Kinder / Pre-kinder → MOVE ON TO Q9</li> <li>4. Special education</li> <li>5. Primary (old system)</li> <li>6. Elementary</li> <li>7. Humanities (old system)</li> <li>8. Scientific-humanist High School</li> <li>9. Technical, Commercial or Normal- School (old system)</li> <li>10. Vocational High School</li> <li>11. Postsecondary technical school (1-3)</li> </ul>	<ol> <li>At present, what is your main activity? Are you</li> <li>Working</li> <li>Studying and working</li> <li>Unemployed, not seeking for a job</li> <li>Unemployed, seeking for a job</li> <li>Performing household chores</li> <li>Under the care of an adult (children)</li> <li>Retired or rentier</li> <li>Other</li> </ol>
1. Male 2. Female	<ol> <li>Postsecondary technical school (1-3 years)</li> <li>Professional degree (4 or more years)</li> <li>Master's degree</li> <li>Does not know (DO NOT READ) →</li> <li>MOVE ON TO Q9</li> <li>Does not respond (DO NOT READ)</li> <li>→ MOVE ON TO Q9</li> </ol>	<ul> <li>88. Does not know (DO NOT READ)</li> <li>99. Does not respond (DO NOT READ)</li> </ul>

	Q2_NAME	Q3_INT	Q4_HH	Q5_GEN	Q6_AGE	Q7_EDUC	Q8_EDUC2	Q9_ACT
1								
2								
3								
4								
5								
6								
7								

# FILTER (DO NOT READ)

			_
<b>Q1</b> . IS TH	E INTERVIEWEE	WORKING? (CHECK Q3_INT AND Q9_CUR IN THE CHART)	
Yes	→ mov	/E ON TO Q1, MODULE K	
No	→ mov	/E ON TO FILTER Q2	

# MODULE K: INTERVIEWEE (INTERVIEWER: ONLY THE INTERVIEWEE RESPONDS)

 What is your occupation or trade? Indicate the full name and provide details, for example: fruit picker, shoe salesman at a shopping mall, high school teacher of language and communication, nurse at a hospital, etc. (INTERVIEWER: WRITE DOWN THE SPONTANEOUS RESPONSE WITH CLEAR HAND WRITING. THEN CODE)

ľ	TERVIEWER. WRITE DOWN THE SPONTANEOUS RESPONSE WITH CLEAR HAND WRITING. THEN CODE									
	Code 1	Code 2	Spontaneous response							

# Code 1 (Sociology Institute of the Pontifical Catholic University of Chile, ISUC by its acronym in Spanish)

- 1. Minor occasional or informal jobs
- 2. Minor trade, unskilled worker, day workers, domestic service workers with a contract
- 3. Skilled worker, foreman, junior staff, microentrepreneurs
- 4. Mid- or low-level administrative staff, salesperson, secretary, specialized technical personnel
- 5. Mid-level Executive (sub manager), general manager at a medium or small business
- 6. High-level Executive, general manager at a big business, director or owner of a medium business

# Code 2 (ISCO)

- 0. Armed Forces
- 1. Members of the executive branch and of the legislative bodies and executive personnel of the public administration
- 2. Scientific and intellectual professionals
- 3. Mid-level technical personnel or professionals
- 4. Clerical workers
- 5. Services and Sales Workers of stores and markets
- 6. Skilled agricultural, forestry and fishery workers
- 7. Officers, operators and artisans of mechanics' crafts, and related trades
- 8. Plant operators, machine operators and assemblers
- 9. Unskilled workers

FILTER (DO NOT READ)
Q2. IS THE INTERVIEWEE THE HEAD OF THE HOUSEHOLD? (CHECK Q3_INT Y Q4_HH IN THE PREVIOUS
CHART)
Yes $\rightarrow$ <b>MOVE ON TO Q3</b> No
FILTER (DO NOT READ)
Q3. IS THE HEAD OF THE HOUSEHOLD CURRENTLY WORKING? (CHECK Q4_HH AND Q9_CUR IN THE
PREVIOUS CHART)
Yes $\rightarrow$ MOVE ON TO Q2 No $\rightarrow$ MOVE ON TO Q3

2. What is the occupation or trade of the Head of the Household? Indicate the full name and provide details, for example: fruit picker, shoe salesman at a shopping mall, high school teacher of language and communication, nurse at a hospital, etc. (INTERVIEWER: WRITE DOWN THE SPONTANEOUS RESPONSE WITH CLEAR HAND WRITING. THEN CODE)

		,
Code 1	Code 2	Spontaneous response

# Code 1 (Sociology Institute of the Pontifical Catholic University of Chile, ISUC by its acronym in Spanish)

- 7. Minor occasional or informal jobs
- 8. Minor trade, unskilled worker, day workers, domestic service workers with a contract
- 9. Skilled worker, foreman, junior staff, microentrepreneurs
- 10. Mid- or low-level administrative staff, salesperson, secretary, specialized technical personnel
- 11. Mid-level Executive (sub manager), general manager at a medium or small business
- 12. High-level Executive, general manager at a big business, director or owner of a medium business

# Code 2 (ISCO)

- 10. Armed Forces
- 11. Members of the executive branch and of the legislative bodies and executive personnel of the public administration
- 12. Scientific and intellectual professionals
- 13. Mid-level technical personnel or professionals
- 14. Clerical workers
- 15. Services and Sales Workers of stores and markets
- 16. Skilled agricultural, forestry and fishery workers
- 17. Officers, operators and artisans of mechanics' crafts, and related trades
- 18. Plant operators, machine operators and assemblers
- 19. Unskilled workers

3. What was the last educational level attended by your father? (SHOW CARD 15 AND MARTK THE ALTERNATIVE IN 3.A) And what was the last educational level attended by your mother? (SHOW CARD 15 AND MARTK THE ALTERNATIVE IN 3.B)

	Q3. A Father's education	Q3. B Mother's education
Without formal education	1	1
Incomplete pre-school or nursery education	2	2
Complete pre-school or nursery education	3	3
Incomplete elementary education	4	4
Complete elementary education	5	5
Incomplete high school/ humanities/ technical,	6	6
commercial, vocational or normal (old system)	0	0
Complete high school/ humanities/ technical,	7	7
commercial, vocational or normal (old system)	/	7
Incomplete Post-secondary technical school	8	8
Complete Post-secondary technical school	9	9
Incomplete University (1 to 3 years)	10	10
Complete University	11	11
Post-graduate, Doctorate or Master's	12	12
Does not know <b>(DO NOT READ)</b>	88	88
Does not respond (DO NOT READ)	99	99

Now I will ask you some questions about your marital status, beliefs or religion, occupation and income.

- 4. What is your marital status?
  - 1. Single
  - 2. Married
  - 3. Living with a civil partner (Civil Union Agreement)
  - 4. Living with a partner
  - 5. Widowed
  - 6. Separated
  - 7. Annulled
  - 8. Divorced
  - 88. Does not know (DO NOT READ)
  - 99. Does not respond (DO NOT READ)



5. What is your nationality? (READ THE ALTERNATIVES AND MARK ONLY ONE)

- 1. Chilean (exclusively)  $\rightarrow$  **MOVE ON TO Q6**
- 2. Chilean and another (dual citizenship) → MOVE ON TO Q5.1
- Other nationality (foreigner). SPECIFY COUNTRY: \_\_\_\_\_ → MOVE ON TO Q5.1
- 88. Does not know (DO NOT READ)  $\rightarrow$  MOVE ON TO Q6
- 99. Does not respond (DO NOT READ) → MOVE ON TO Q6

Q5.1 How many years have you lived in Chile? (WAIT FOR A RESPONSE AND WRITE DOWN THE NUMBER OF YEARS)

88. Does not know (DO NOT READ)

99. Does not respond (DO NOT READ)

- 6. In Chile, the law recognizes nine indigenous peoples, do you belong to or are you a descendent of any of them? (WAIT FOR A RESPONSE AND WRITE IT DOWN)
  - 1. Aymara
  - 2. Rapa-Nui (Pascuenses)
  - 3. Quechua
  - 4. Mapuche
  - 5. Atacameño (Linkán Antai)
  - 6. Coya
  - 7. Kawésqar (Alacalufes)
  - 8. Yagán (Yámana)
  - 9. Diaguita
  - 10. Does not belong to any indigenous peoples
  - 77. Does not apply (The interviewee is not Chilean) (DO NOT READ)
  - 88. Does not know (DO NOT READ)
  - 99. Does not respond (DO NOT READ)
- 7. How do you consider yourself in religious terms? (READ THE ALTERNATIVES AND MARK JUST ONE)
  - 1. Observant religious person
  - 2. Non-observant religious person **MOVE ON TO Q8**
  - 3. Atheist
  - 4. Agnostic

88. Does not know (DO NOT READ)

MOVE ON TO Q9

- 99. Does not respond (DO NOT READ)
- 8. What is your religion or faith? (WAIT FOR A RESPONSE AND MARK JUST ONE)
  - 1. Catholic
  - 2. Evangelical
  - 3. Protestant of a historical or traditional church (Anglican, Lutheran, Presbyterian)
  - 4. Another religion, such as Jehovah's Witnesses, Mormons, Jewish, Muslims, Orthodox or any other
  - 88. Does not know (DO NOT READ)
  - 99. Does not respond (DO NOT READ)



9. Using a scale from 1 to 10, where 1 represents "more left wing" and 10 "more right wing", in what position would you be? **(INTERVIEWER: SHOW CARD 16)** 

Write down number	

87. I do not identify with any position (DO NOT READ)
88. Does not know (DO NOT READ)
99. Does not respond (DO NOT READ)

- 10. Have you used the Internet over the past 12 months? The access and use of the internet can be through a land line or mobile device, a computer, a mobile or Smartphone, tablets, TV or a gaming console with internet access enabled, either in your home or somewhere else. **(INTERVIEWER: WAIT FOR A RESPONSE AND MARK ONE ALTERNATIVE)** 
  - 1. Yes  $\rightarrow$  MOVE ON TO Q11
  - 2. No  $\rightarrow$  MOVE ON TO Q1, MODULE L
  - 88. Does not know (DO NOT READ) → MOVE ON TO Q11
  - 99. Does not respond (DO NOT READ) → MOVE ON TO Q11
- 11. Over the past 12 months, how frequently have you personally used the Internet for the following activities? (INTERVIEWER: SHOW CARD 17 READ EACH ACTIVITY AND MARK ONE ALTERNATIVE FOR EACH ONE ACCORDING TO THE RESPONSE OF THE INTERVIEWEE)

		Never	Less than	At least	At least	At least	Does not	Does not
			once a	once a	once a	once a	know	respond
			month	month, but	week (but	day	(DO NOT	(DO NOT
				not weekly	not daily)		READ)	READ)
Α	Read emails	1	2	3	4	5	88	99
В	Chat (instant	1	2	3	4	5	88	99
	messaging,							
	WhatsApp)							
С	Read news	1	2	3	4	5	88	99
	online							
D	Seek information	1	2	3	4	5	88	99
	online to learn							
	about a topic							
Е	Social media,	1	2	3	4	5	88	99
	such as							
	Facebook or							
	Twitter							

# MODULE L: HOUSEHOLD, INCOME AND ASSETS

		Yes	No	Does not know (DO NOT READ)	Does not respond (DO NOT READ)
1	Smartphone	1	2	88	99
2	TV Connection through cable or satellite	1	2	88	99
4	Microwave Oven	1	2	88	99
5	Computer (desktop or notebook)	1	2	88	99
6	Paid Internet connection at home (NOT through mobile phones)	1	2	88	99
7	Car used solely for private use	1	2	88	99
8	Full-time domestic service (4 or more days per week)	1	2	88	99

#### 1. Does this household have any of the following devices in use or some of the following services hired?

2. In the past month, taking into consideration all the incomes in your household, could you tell me the approximate total net income in the household per month? Please, include salaries, pensions, rents and other incomes (INTERVIEWER: SHOW CARD 18)

 			-	- 1	
\$					

Code	

Less than CLP \$210.000 1

2 CLP \$210.001 to CLP \$290.000

3 CLP \$290.001 to CLP \$380.000

4 CLP \$380.001 to CLP \$470.000 5

CLP \$470.001 to CLP \$580.000

6 CLP \$580.001 to CLP \$700.000

- 7 CLP \$700.001 to CLP \$880.000
- CLP \$880.001 to CLP \$1.170.000 8
- 9 CLP \$1.170.001 to CLP \$1.800.000
- 10 More than CLP \$1.800.001

88 Does not know (DO NOT READ)

99 Does not respond (DO NOT READ)

Ending time (**REGISTER THE TIME THE INTERVIEW ENDED**)

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# (READ ACKNOLEDGEMENTS)

We thank you for your participation in this survey. If you have any questions about this study, you may contact our offices at the phone numbers that can be found in the information on the Introduction Letter.

