

Attitude towards nuclear energy: focus on the young generation

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*Programme for Integration of Social Aspects into
Nuclear Research (PISA)*

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1. Introduction

This study seeks to determine trends in the young generation in what concerns opinion about and attitude towards nuclear-related issues. Among other, we tested the hypothesis that people younger than 30 years have a more negative opinion about nuclear energy.

The results reported are based on data collected in 2009 in the framework of the SCK•CEN Barometer, a large scale public opinion survey in the Belgian population. The sample of people interviewed (N=1031) is representative for the Belgian adult (+18) population with respect to province, region, level of urbanisation, gender, age and professionally active status. The large sample size of the survey allows highlighting general trends and conducting detailed analysis of subgroups of the population. The data collection method employed was Computer Assisted Personal Interviewing, i.e. personal interviews of 30 to 45 minutes carried out at the home of the respondents, the answers being directly recorded on a portable hard disk. The field work was done by a market research company with professional interviewers.

2. Method

Two groups were formed from the sample representative for the Belgian population:

Group 1: born before 1979 => 845 respondents

Group 2: born after 1979 (incl. 1979) => 186 respondents

Several measured variables were tested in order to detect if there an association between the age group and the measured variables. In addition we tested if there is a statistically significant difference in the mean values obtained for the two groups.

3. Analysis and results

The table below summarises the analysis and results.

Tested variables	Question	Answering categories	Results: comparison of the means of different variables for the 30+ and 30- age groups
General risk perception of accidents in nuclear power plants	<i>How do you evaluate the risks for an ordinary citizen in Belgium for .. an accident in a nuclear installation?</i>		No significant difference
General risk perception of radioactive waste	<i>How do you evaluate the risks for an ordinary citizen in Belgium for .. radioactive waste?</i>	1 = very low; 2 = low;	No significant difference
Confidence in authorities for managing risks from accidents in nuclear power plants	<i>Please state how much confidence you have in the authorities for the actions they take to protect the population against risks from... an accident in a nuclear installation</i>	3 = moderate; 4 = high; 5 = very high.	No significant difference
Confidence in authorities for managing risks from radioactive waste	<i>Please state how much confidence you have in the authorities for the actions they take to protect the population against risks from... radioactive waste</i>		There is an association with the age group, see next section.
Attitude towards nuclear energy: item 1	<i>In general I believe that the benefits/ advantages of nuclear energy outweigh the disadvantages.</i>	1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree;	Difference in means is statistically significant Group 30+: mean= 3.31 Group 30-: mean= 3.1
Attitude towards nuclear energy: item 2	<i>Keeping the nuclear power plants open will be necessary to have a secure energy supply.</i>	4 = agree; 5 = strongly agree.	No significant difference

Tested variables	Question	Answering categories	Results: comparison of the means of different variables for the 30+ and 30- age groups
Attitude towards nuclear energy: item 3	<i>The reduction of the number of nuclear power plants in Europe is a good cause.</i>		There is an association with age group, see next section.
Opinion about nuclear energy	<i>Please state your opinion about nuclear energy</i>	1 = totally in favour; 2 = rather in favour; 3 = neither in favour, nor against; 4 = rather opposed; 5 = totally opposed.	No significant difference
Personal risk perception: radioactive waste	<i>How do you evaluate the risks associated with radioactive waste for yourself?</i>	1 = very low; 2 = low;	No significant difference
Personal risk perception: accident in a nuclear installation	<i>How do you evaluate the risks of an accident in a nuclear installation for yourself?</i>	3 = moderate; 4 = high; 5 = very high.	No significant difference

Tested variables	Question	Answering categories	Results: comparison of the means of different variables for the 30+ and 30- age groups
Risk perception of the nuclear: indirect measurements: item 1	<i>I feel well protected from the risks of nuclear installations</i>	1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree.	There is an association with age group, see next section.
Risk perception of the nuclear: indirect measurements: item 2	<i>A nuclear accident as serious as Chernobyl could happen in Belgium?</i>		No significant difference
Risk perception of the nuclear: indirect measurements: item 3	<i>Nuclear power plants endanger the future of our children irrevocably.</i>		Difference in means is statistically significant Group 30+: mean= 3.32 Group 30-: mean= 3.56
Risk perception of the nuclear: indirect measurements: item 4	<i>Radioactive waste can be disposed in a safe manner.</i>		There is an association with age group, see next section.
Risk perception of the nuclear: indirect measurements: item 5	<i>Radioactive materials can be transported safely.</i>		No significant difference
Trust in information provided by authorities: waste	<i>Our authorities always inform us correctly about the risks of radioactive waste</i>		No significant difference
Trust in information provided by authorities: accidents in nuclear installations	<i>Our authorities always inform us correctly about the risks of accidents in nuclear installations</i>		No significant difference

Tested variables	Question	Answering categories	Results: comparison of the means of different variables for the 30+ and 30- age groups
Trust in safe operation: item 1	<i>I trust that it is possible to operate a nuclear reactor in a safe manner</i>		Difference in means is statistically significant Group 30+: mean= 3.27 Group 30-: mean= 2.94
Trust in control: item 2	<i>I trust that there is sufficient control on safety in nuclear installations in Belgium</i>		Difference in means is statistically significant Group 30+: mean= 3.59 Group 30-: mean= 3.32
Knowledge of issues pertaining to the nuclear domain	Composite index of various issues. Percentage of correct answers to a number of exam style questions. 100% = correct answers on all questions.		Difference in means is statistically significant Group 30+: mean= 55% Group 30-: mean= 47%

4. Discussion

The hypothesis that people younger than 30 have a more negative opinion about nuclear energy was not supported by the empirical data. When the respondents were asked directly (in favour or not) about their opinion on nuclear energy there was no statistically significant difference in responses to this question between the two age groups considered (30+ and 30-).

However, the age divide seems to have a – mostly weak - influence on some of the items reported here, most often (but not always) pointing to a more skeptical/negative attitude in the younger generation. For instance, for the confidence in authorities related to the actions undertaken to protect the population against risks from accidents in a nuclear installations, younger people seem to have more often a neutral opinion (33% of the 30-respondents) than respondents older than 30 (24.5% of the 30+ respondents).

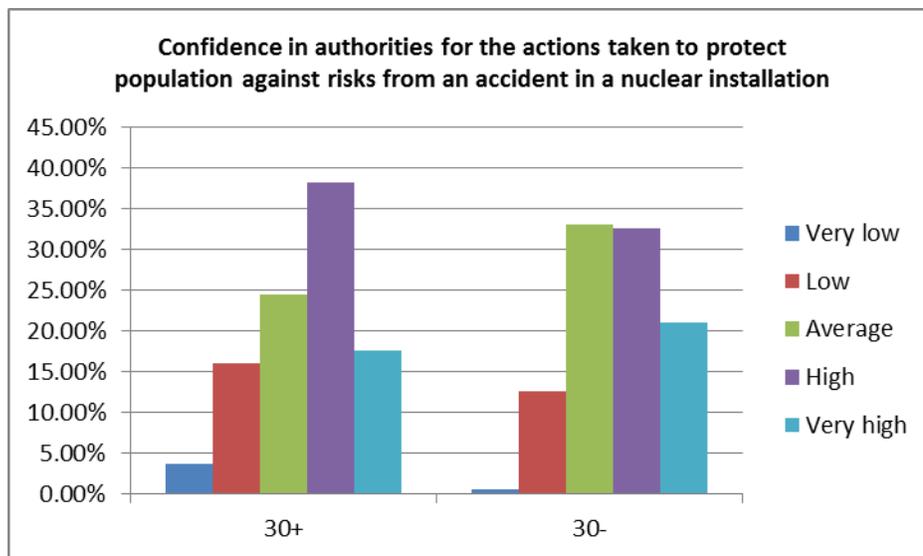


Fig. 1 Confidence in authorities for the 30+ and 30- population groups

Younger people agree less often that the benefits of nuclear energy outweigh its disadvantages.

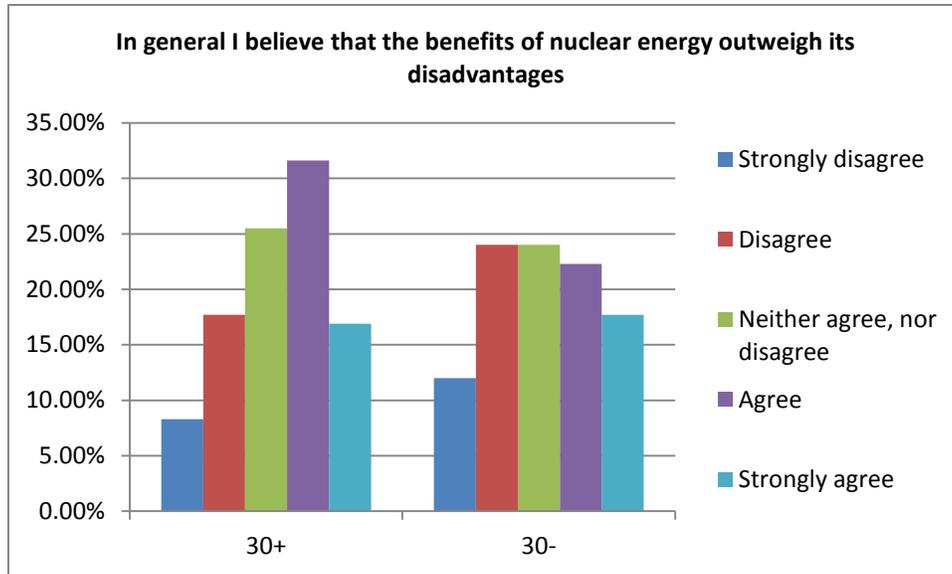


Fig. 2 Benefits vs disadvantages of nuclear energy as seen by the 30+ and 30- population groups

Respondents in the younger age group are also more inclined to believe that "nuclear power plants endanger the future of our children irrevocably" and –to a lesser extent- that "reduction of nuclear power plants in Europe is a good cause".

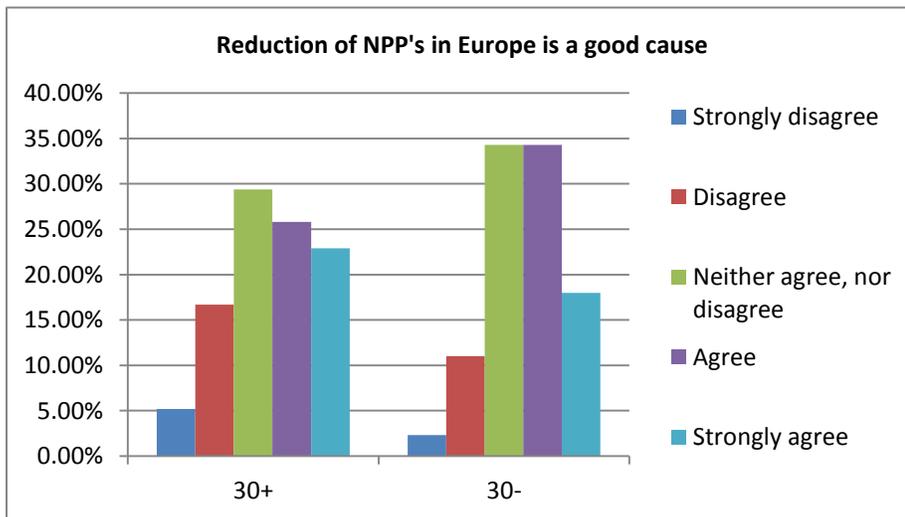


Fig. 3 Opinion about the reduction of NPP's in Europe for the 30+ and 30- population groups

When the respondents were asked if they "feel well protected against risks from nuclear installations", the situation is reversed: the younger generation (30-) feels more often well protected than the older generation (30+).

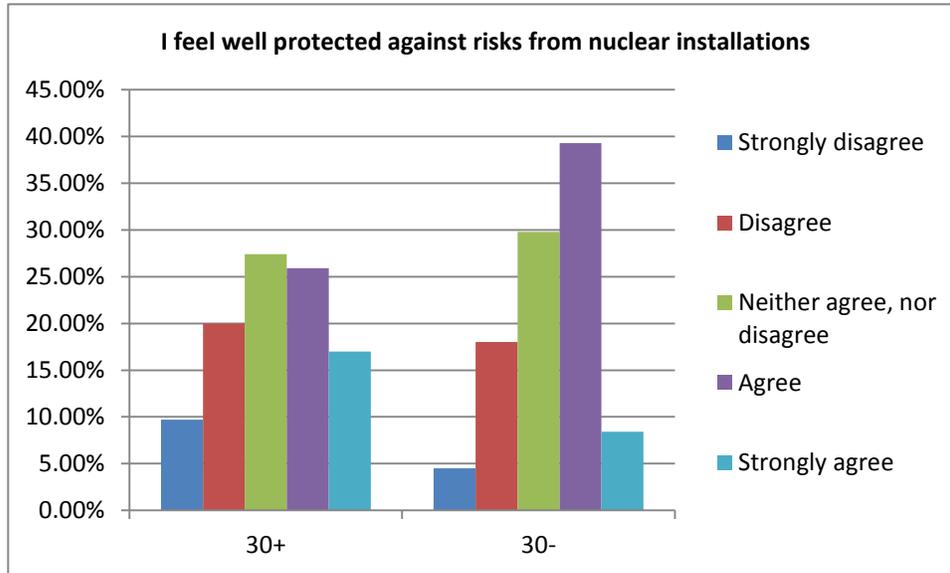


Fig. 4 Do people feel well protected against risks from nuclear installations?

Contrary to that, for trust in the safe operation of nuclear installations and the control on the safety of these installations, younger people express somewhat lower trust than respondents who are more than 30 years old.

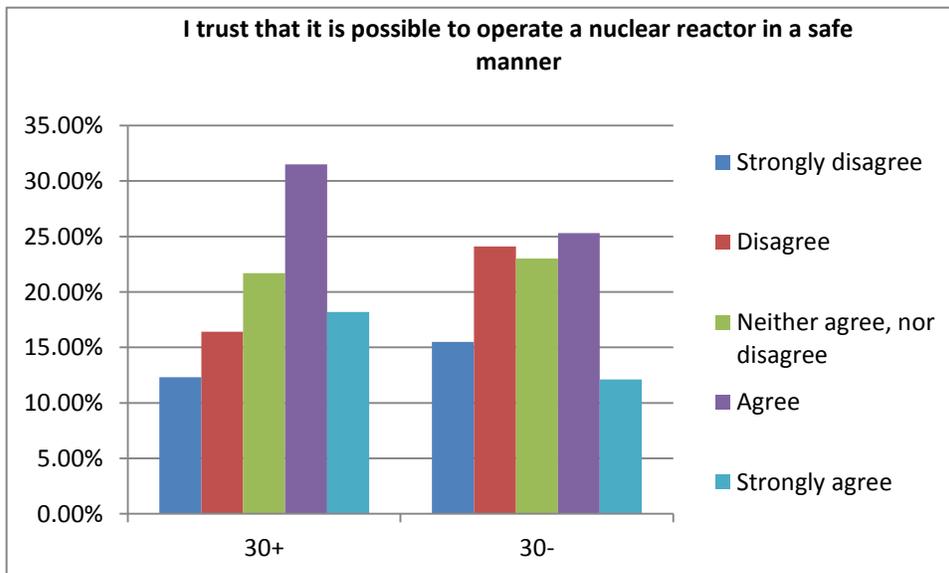


Fig. 5 Can nuclear reactors be operated in a safe manner?

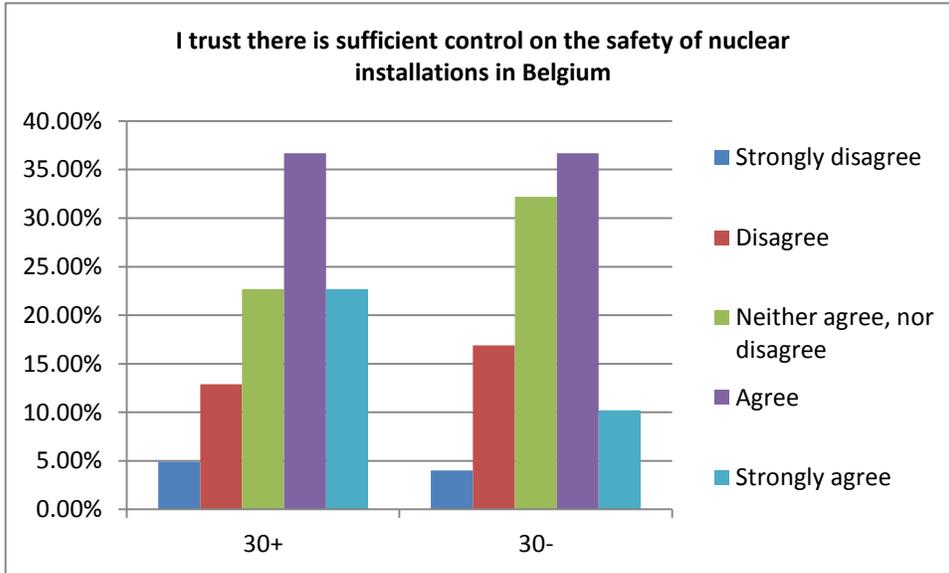


Fig. 6 Perceived control of nuclear installations: the 30+ and 30- population groups

When it comes to disposal of radioactive waste, the younger generation is again slightly more skeptical that this can be done in a safe manner.

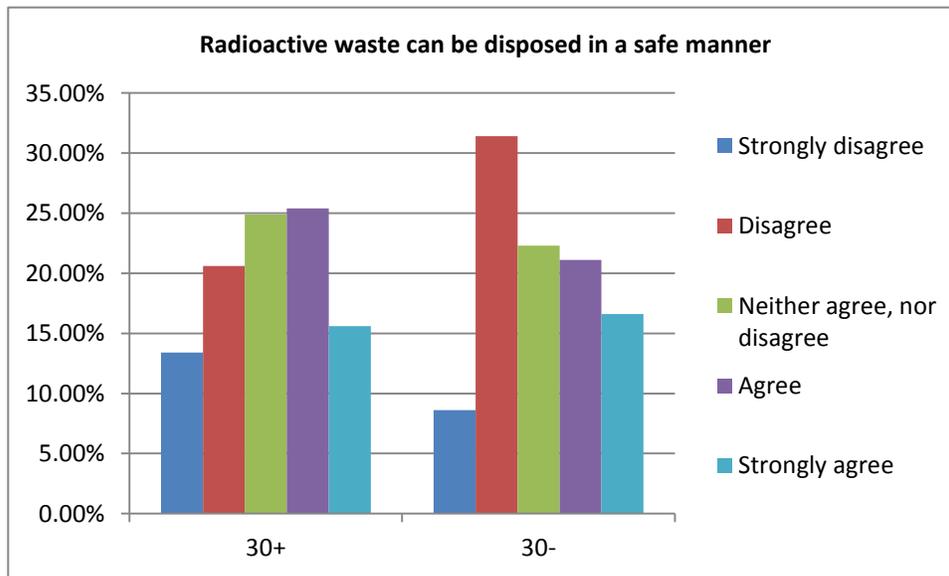


Fig. 7 Opinion about radioactive waste disposal

Apart from this, we noticed that respondents younger than 30 years old have somewhat lower knowledge of issues pertaining to the nuclear domain. This was measured as the percentage of correct answers given to a set of exam-style questions. Answering these questions required specific knowledge about i) protective measures in a case of nuclear emergency (7 items); ii) location of nuclear installations in Belgium; and iii) nuclear technologies (12 items). More details on these questions can be found in Perko et al (2010).

Table 1 Knowledge about nuclear in the Belgian population and the 30+ and 30- population groups

Question	% correct answers		
	Belgian sample	30- age group	30+ age group
Is a radiological dispersal device (also known as dirty bomb) the same as an atomic bomb?	47	47	47
Will exposure to radiation necessarily lead to a contamination with radioactive material?	26	26	26
Which percentage of electric power in Belgium is produced in nuclear plants?	29	30	29
<i>Please indicate whether the following towns have a nuclear power plant</i>			
Doel	70	54	73
Hasselt	65	59	66
Tihange	73	62	76
Liege	54	43	56
Lier	63	60	64
<i>Which of the following sectors makes use of nuclear technology?</i>			
production of electricity	95	91	96
medical sector	86	80	88
food industry	25	22	26
textile industry	50	50	50
Belgium has decided to phase out nuclear energy.	43	31	46
There exists a plan to ensure the protection of the population in case of a nuclear accident.	71	68	72

5. Conclusions

The results suggest that communication with the 30- generation in the nuclear field has to focus on building up the trust in the safe operation and control of nuclear installations and on clarifying issues related to the disposal of nuclear waste.

6. References

Perko T., Turcanu C., Schröder J., Carlé B. (2010). Risk perception of the Belgian population. Results of the public opinion survey in 2009. *Open Report of the Belgian Nuclear Research Centre SCK•CEN, BLG-1070*. ISSN 1379-2407. Mol, Belgium.