



Article

Younger generations' expectations regarding artificial intelligence in the job market: Mapping accounts about the future relationship of automation and work

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Abstract

There is a deficiency of in-depth explorations of young people's visions of automation and work, and how these relate to popular projections found in the future-of-work debate. This article investigates such expectations, drawing on 62 interviews with Hungarian university students undertaking non-technical majors. Key characteristics of the interviewees' accounts included their malleable and changing nature. Although respondents were aware of the widespread messages of experts about the revolutionary nature of likely changes, they expressed scepticism about the extent of change both regarding the macro level and in relation to their own lives. Interestingly, developments in artificial intelligence were not a factor in these young adults' visions of their careers. The mechanisms and lines of reasoning underlying their expectations – such as a version of optimism bias – are discussed. The study highlights the importance of doing qualitative research on a topic which is dominated by quantitative research.

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Introduction

Speculation about the nature and likelihood of the potential disruption of jobs due to technological advance has been at the centre of vigorous debates in the media and academia for decades in many countries (Boyd & Holton, 2018). While many experts expect radical transformational change, with some even labelling the transformation the fourth industrial revolution, there are divergent views about the likely degree of job destruction and job creation (Autor, 2015; Frey & Osborne, 2013).

Although there may be a diversity of views concerning how emerging technology will change the labour market, the increasing presence of technological development in the form of sensors, cyber and physical systems, cognitive decision support systems, and robotics, is already visible in a range of workplaces (Clifton et al., 2020). Adaptability to and attitudes toward the growth of technology are clearly societal issues of considerable importance. Consequently, digital policy agendas around the globe are increasingly focusing on skill planning, learning cultures, and career pathways.

The study of the expectations of members of the public in this regard is of paramount interest, as analysis of the latter can represent valuable input into the nature of people's decision-making in the context of technological change and a changing labour market (Pulkka, 2019).

This article offers a qualitative interpretation of expectations about technological change. Earlier research that investigated lay expectations about the future of work in the context of automation was primarily quantitative and often applied (Dekker et al., 2017; European Commission, 2012, 2015, 2017; Pulkka, 2019; Smith, 2016; Wike & Stokes, 2018). Thus, little is known about how people, especially members of the younger generation, experience technological transition. We argue that a qualitative study of narratives that goes beyond the simple quantification of a few positions can make a valuable contribution to understanding the sense-making by the public about the future of work. It permits an investigation of processes and how members of the public build their arguments, rather than simply offering a static view of what they think, or the representation of answers on a scale.

Building on literature about technology-related expectations, the aim of this article is thus to reveal the expectations about work and automation in Hungary of young and highly educated interviewees. We were interested in responses at both the individual and the macro level that focus on the forthcoming 20–30 years. Besides looking at visions of the future, we also wanted to investigate respondents' choices and actions, and how these are related to their expectations. A further aim was to examine how the characteristics of their expectations compare to the popular expectations of experts. We discuss some of the mechanisms that led to the creation of these narratives.

Going further than earlier empirical research, we contribute by theoretically integrating the issue with sociological work about technology-related expectations and provide a deep qualitative investigation of what may lie behind these views. Further, we do this in the context of a country which has not been the focus of much related research, and represents an interesting case study.

The formulation of the study was motivated by the desire to examine the standpoints of a privileged group: those who are young, highly educated, and internet literate, with relatively few financial stressors. The assumption is that we may deepen our understanding of perceived job insecurity by analysing dimensions of the discourse, perspectives, and vocabulary of these interviewees. The sample consisted of university students on non-technical tracks whose professional trajectories are not exclusively linked to technology. Young people will be ‘living the future of work’ (Hill et al., 2019), thus it is highly relevant to study their expectations.

Research has shown that highly educated young people with economic stability and the ability to analyse internet data tend to have a profoundly more positive view about prospective job insecurity than those who have a lower level of education, or those in white- or blue-collar clerical positions, or with a lower income (Lübke & Erlinghagen, 2014).

The most prominent social science research about the future of jobs focuses on the advanced industrial societies of the West – with some discussion about how technological change is likely to affect outsourcing to primarily Asian countries. Hungary makes an interesting case study as labour is cheaper there than in Western Europe or the United States, but not as cheap as in some other parts of the world to which many Western companies outsource tasks. For some time, the economic competitiveness of Hungary has been based on a labour force that is cheap and skilled, coupled with an advantageous geopolitical position that attracts foreign investment. However, in the last 10–15 years, knowledge-based economic development has stalled. Hungary experienced the greatest decrease in the proportion of creative jobs among the Visegrád countries after 2010. Additionally, Hungary appears to be unique, as the proportion of the least innovative Tayloresque jobs in the country has increased compared to other countries, and to a greater degree (a 6% increase within ten years). According to some experts, these kinds of jobs are at most risk of automation (Makó & Illéssy, 2020).

In the article, we first discuss sociological literature about technology-related expectations and briefly summarize the prevailing expectations of experts about the future of work, which are also represented in the Hungarian public sphere. Following the section on data and methods, the expectation-related accounts of Hungarian university students are analysed and compared to the dominant projections of experts. Finally, in the conclusion we locate our qualitative results in a wider field of evidence, discuss the implications of the study, and formulate considerations for future research and policy making.

As we will discuss, respondents’ accounts were malleable and changing, and significantly diverged from the popular visions touted by experts. Interviewees were sceptical about the extent of change, and automation was not a factor that was considered when planning their careers. The mechanisms behind these narratives – including one form of optimism bias – are highlighted in the article.

What we aspired to do by adopting a qualitative perspective is to show the richness, complexities, and ambiguities of young adults' narratives about the ever-changing technological environment.

Technology-related expectations in the literature

Although some classic sociologists and thinkers have engaged with the topic of future orientation, many contemporary social scientists argue that a significant part of sociology has laid too much emphasis on the principle that 'history matters', rather than studying future orientations (Beckert, 2016; Mische, 2009). Recently, there has been an uptick in interest in the field of sociology about anticipation (Mandich, 2019). In line with this body of work, we argue that expectations about the future are an important area of study, as these projections have the potential to contribute to present action, thinking and feelings, and to moulding social processes.

Some authors claim that the role of future visions is not a historical constant, and a future orientation is stronger nowadays than it was in traditional societies (Beckert, 2016; Giddens, 2013). These authors argue that whereas in traditional societies the future in many respects was often seen as an extension of the past, with the rise of modernity a different view of the future has emerged wherein members of society are actively trying to shape the future. Some social scientists – who mainly belong to the field of the sociology of (technological) expectations – point out that future projections are especially important with respect to science and technology (Borup et al., 2006).

Future visions can operate on different levels. Individual actors can have expectations, but so can groups of specific actors or greater collectivities (Tutton, 2017). The expectations of individual actors are not born in isolation but are socially anchored. Many kinds of sources of social influences on expectations have been documented, such as the social position of actors, the dominant cultural frames, socialization processes, the public imaginary, and mass media content (Beckert, 2016).

There are visions for the future voiced by lay people and there are also projections that have been created by experts. The predictions of the latter often exude a sense of professionalism and scientific expertise. Uncertainty is often underplayed in these visions, and the future is made to look as if it could easily be predicted. However, even if the future is best not regarded as a completely open book, there is still some indeterminacy involved which these predictions often fail to consider (Beckert & Bronk, 2019).

Scripts about shared expectations assign roles to different actors, and thereby exert force – thus can be regarded as 'forceful fiction' (Van Lente & Rip, 1998). Imaginaries conjured by powerful opinion-formers can gain prominent status and thus contribute to shaping the future by marginalizing alternative channels of future development (Brown et al., 2017).

Although certain visions can operate as self-fulfilling prophecies, even powerful actors cannot always guarantee future outcomes (Brown et al., 2017). It has been demonstrated within the sociology of technological expectations that previous technological projections of experts have often failed because they did not consider many social factors (Geels & Smit, 2017). Individual expectations about the future – not just regarding

technology, but in general – have also been claimed to often be faulty and fraught with bias as they are influenced (and limited) by a range of different psychological, cognitive, cultural, and social factors (Mische, 2009). However, it is important to study the expectations of individuals, even if they are inaccurate, as they can influence the latter's decision-making and action in the present. Indeed, it has been argued that projectivity is a key element of agency (Emirbayer & Mische, 1998).

Looking more concretely at our topic of expectations regarding the future of work and automation, a range of quantitative studies have investigated the public's visions in this area (Dekker et al., 2017; European Commission, 2012, 2015, 2017; Pulkka, 2019; Smith, 2016; Wike & Stokes, 2018). According to Eurobarometer results, there is widespread consensus in Europe that the labour market will change, with anticipation that more jobs will disappear because of automation than will be created. However, the individuals surveyed perceived that their own job prospects were little endangered: according to the Eurobarometer 2017 survey, 5% of respondents believed that their job would be entirely substituted by robots, and 13% that it would be mostly replaced (European Commission, 2017). The phenomenon that respondents expect automation to cause unemployment but not to influence their own job has been observed in other surveys as well and has been sometimes referred to as 'optimism bias' (Matthews, 2017). The Hungarian results are similar, with responses to many automation- and robotization-related questions being close to the EU average in the 2017 Eurobarometer survey, albeit Hungarian respondents were sometimes slightly more pessimistic (European Commission, 2017).

Circulating expert expectations related to the future-of-work debate

In this section, we discuss popular visions that have been formulated by experts in relation to the debate about the future of work and automation (Boyd & Holton, 2018; Dyer-Witthford et al., 2019); later we will compare the expectations of the young people in our sample to these visions. Experts from a wide variety of backgrounds – both within and outside of academia – have made contributions concerning what the future of work is liable to be in connection with AI and robotics. Such experts include economists, policy makers, business analysts, computer engineers, self-described futurists and people working at think tanks (Vicsek, 2021). Expert visions constitute one type of important expectation in today's societies, and popular ones have the power to guide and inform action. We later analyse whether such projections have worked as 'forceful fiction' for interviewees.

One of the central issues in the discussions about the future of work and technology is what the effect of AI and robotics on employment and the future of work will be (Dyer-Witthford et al., 2019).

A popular view within the expert community in the West is that the rapid diffusion of technology will bring about drastic transformative change. While there are differences in experts' opinions concerning whether societies will take a turn for the better or worse, many have argued that there will be great change involving automation and changes in many jobs (Boyd & Holton, 2018; Vicsek, 2021).

Whereas academic work is more ‘measured’ (Ainsworth and Knox, 2022), some pop-scientific books go so far as to paint an apocalyptic vision of a future characterized by mass permanent technological unemployment and great parts of the population living in poverty (Ford, 2015) – thus suggesting that even those with university degrees will not be safe from the coming changes (Harari, 2018).

Other experts make more optimistic projections. Some emphasize that the transformation will mean that many new kinds of jobs will also be created and, even if there is growth in unemployment, it will not be massive or persistent (Autor, 2015; Bessen, 2016; Miller and Atkinson, 2013). Arguments that the content of work will become more convenient or attractive to people – less dangerous, more comfortable, more stimulating, and creative – have also surfaced, and technological progress has been linked to increased wealth for societies and rising wages (Miller & Atkinson, 2013). Even in the case of an optimistic scenario, however, some experts perceive rising unemployment in the short or mid term (Pulkka, 2019). In the case of those projections that do not argue for mass technological unemployment, there is acknowledgement that unemployment could still be concentrated among certain groups of the population, and that some occupations which require a university degree might not be exempt from this phenomenon (Sin-Wai, 2017). Whether optimistic or pessimistic views are taken, most experts agree that people’s job experiences will be greatly influenced by automation in the upcoming decades (West, 2015).

These predictions that great change is coming and will have negative or positive consequences are not only present in scientific and pop-scientific work but also circulate widely in media discourse (Brennen 2018). It has been argued that they influence the understanding of a great number of businessmen, politicians, governments and think tanks regarding future policies worldwide (Benanav, 2020).

In Hungary, such discussions about the effects of technological change are echoed in the media, with some articles addressing the specific Hungarian context (Scharle, 2018) and others discussing it as a general global phenomenon. Besides Hungarian experts, a range of Western experts and organizations that discuss such projections are now also cited in Hungarian media. One can encounter articles with titles containing statements such as ‘Robots will take our jobs’ (Kollár, 2021), and also those with the opposite perspective (‘This is why robots will not reduce human labour’) (Ecsenyi, 2019). There is a general atmosphere that great change is expected, and the expression ‘the fourth industrial revolution’ – used to reference the forthcoming widespread fundamental nature of change – has become a commonly used term in the media, in expert projections in Hungary, and at many universities. Several Western pop-scientific books on the topic – including Ford’s (2015) – have been translated into Hungarian and are being sold in bookstores. Consulting companies McKinsey (2018) and PwC (2020) have also made projections of significant change in Hungary in the upcoming years and decades.

Methods and data

The research involved semi-structured interviews with 32 BA students (or the equivalent level in terms of the year of study) and 30 MA students studying at universities in

Budapest, the capital of Hungary. The students were all taking majors that are not directly related to technology or hard science, but were otherwise heterogeneous, and included law, accounting, languages, psychology, international relations, management, marketing, arts, teacher/kindergarten teacher training, animation, communication, sports and recreation, human relations, international economics, sociology, and finance. The sample included 37 women and 25 men, with ages ranging from 19 to 27.

Interviews took place in November 2019 and April 2020. The second wave of interviews thus took place during the Covid-19 pandemic. As no significant differences were found in the discourses for the second wave of questioning compared to the first wave, we treated the group as a single sample.

The interview guide first contained questions about how respondents imagined their own future with respect to work, without bringing up the topic of technology. Then the topic of technology was introduced, and respondents were asked, among other things, to talk about what they imagined work and the labour market would look in 20–30 years' time in relation to robotization and AI. Afterwards, we inquired into how they saw the role of technology in certain white-collar jobs, and raised other questions related to the macro level and automation. Finally, questions focused on their own likely future jobs, and how the former perceive the role of technology in them. The average length of the interviews was 45 minutes.

Interviews were transcribed and analysed with the help of the qualitative data analysis software NVivo. Qualitative thematic analysis was conducted following many of the recommendations of Braun and Clarke (2006).

Analysis

Expectations concerning the societal level

No radical change. When asked about how they envision the future of work on the macro level, young university students talked of expecting automation to occur slowly and gradually, without any dramatic changes. This is in stark contrast to popular projections of experts, as discussed earlier.

Interviewer: The nature of the tasks ... what kind of work, and how much will people do (will the development of technology affect them)?

Lisa (20, BA, animation): Yeah, maybe. I mean, it's going to have a definite impact on some level, but not such a huge leap.

Respondents argued that slow and gradual change would typically be the case on both the global and Hungarian level, although slower development was especially expected for Hungary:

Interviewer: What do you think is going to happen with AI and robots considering professions and the job market in the following 20–30 years?

Ben (19, BA teacher education): I think first it will be possible to perceive the change in the field of manual work.... If change happens, it will be easier to replace them [these employees] ... for example, a factory worker rather than a non-manual worker who comes into contact with people at work.

Interviewer: Will this vision of the future will be true in Hungary and abroad as well?

Ben: I could imagine it primarily abroad, but sooner or later it will reach Hungary as well.

Scepticism with respect to the extent of change was often linked to the idea that automation would be incapable of replacing certain jobs. It was especially medical, educational, and creative sorts of work that were mentioned in this domain – being connected with the need for empathy, creativity, emotional intelligence, and other, similar humanistic traits. Scepticism was grounded in the idealizing of human qualities that respondents claimed were beneficial for some jobs. For example, in the case of human judges, corruption and prejudice were rarely referred to, but rather that the latter would be better decision-makers than robots in court cases as they are better able to take special circumstances into account, and are more accurate judges of character of defendants, and so on.

For some respondents, scepticism regarding what AI will be able to do in the next 20–30 years might be connected with not being aware of what AI is already able to do in the present. Near the end of the interviews, we showed some videos of current AI and robot applications. It was evident that some students were surprised at what capabilities already existed in the present (the technologies were more advanced than they expected). Others seemed somewhat aware of current developments in the field of AI and robotics, but in many cases still had only moderate expectations concerning what such technologies will be capable of in the future. Others interpreted the videos as demonstrating that robots and AI cannot currently do much.

Malleable and changing expectations. The expectations in the accounts of the interviewees were to a degree malleable and changing. The extent of change that was expected by the respondents to occur was typically emphasized to be less at the beginning of the interviews than in later parts.

During the early part of the interviews, when respondents were asked about how they see the future of work in the context of technology, their first reaction was that there would not be any great or drastic change, and that unemployment may increase for a smaller segment of society (for factory workers or manual workers) – the focus was mainly on robotization. As the interviews progressed, simply by being asked to think more about the potential relationship between white-collar jobs and automation, participants started to talk more about the changes also coming to these jobs because of technology. Unemployment in other kinds of professions besides manual ones was not emphasized. However, when prompted by the interviewers for their opinion about jobs which require a stronger educational background, interviewees increasingly started to consider how many kinds of non-manual jobs robots and AI could take over – even jobs requiring a university education. Sometimes even the most important tasks related to specific white-collar jobs were seen to be at risk of being taken over by robots or AI.

There was a typical path of development in the narratives over the course of the interview: at first, interviewees talked about robots and AI as very different entities from humans, and of a lower level of automation potential. As the interviews progressed, they sometimes started to envision AI being able to do more than just simple tasks. Some respondents even started to emphasize specific similarities between the abilities of robots and humans. Even so, dramatic social and economic changes were not expected, even in the later parts of the interviews.

Moderate optimism. Respondents almost unanimously did not envision a general negative effect of automation on work, or a great social crisis in the coming 20–30 years. Their accounts contained a more optimistic tone, albeit one characterized by only moderate optimism and with recognition of potentially negative employment consequences for a small segment of the population. Optimism was often expressed in relation to the future of non-manual workers, while a degree of job loss among factory workers, manual workers, and less educated people was envisioned as these occupations were particularly seen to be at risk of automation.

Andrew (21, BA trade and marketing): Well, I suppose the work of blue-collar workers will be done by robots in the future, while those jobs that require intelligence will remain with humans.

In the accounts, the respondents often stopped at envisioning unemployment, and did not think through what the consequences could be of job losses of a segment of society – for example, growth in poverty, social tension, and social crisis.

Although unemployment for a segment of the population was a part of respondents' expectations, their narratives were not clouded by worry for the working classes: respondents did not express their solidarity with potentially unemployed people. Despite the fact that – as we will see later – they imagined themselves being in a good situation in the future, they did not express social responsibility for the fate of unemployed people.

Respondents mainly underlined that proliferating automation would only be a problem for manual (blue-collar) workers, and that human checks and balances would not let bad things happen to individuals due to automation. In terms of Hungary, lay respondents noted a lag in the development of automation; however, they did not see this as a disadvantage; instead, they reflected some optimism in relation to social structures, especially towards the legal system – it was believed there was enough time to figure out an exact and sound legal framework for managing AI and working together with smart robots.

Some of the students emphasized that robots and AI might take over the less interesting or more dangerous and uncomfortable types of jobs and tasks – an idea in line with the more optimistic views in the literature. According to the respondents' ideas, jobs could improve due to automation in many ways. Monotonous, time-consuming, or dangerous tasks could be done through automation. In other responses, an improvement in the quality of jobs was linked to fewer working hours, a decrease in the level of energy needed for tasks, an increase in the need for creativity in everyday work, or even more appreciation of sports and arts as human pursuits.

Meanwhile, an important argument of the more optimistic experts – the birth of new types of jobs – was only mentioned in a minority of our interviews. Instead, most

respondents emphasized changes due to tasks that could be automated, or the complete takeover of manual jobs. Thus, most respondents did not perceive that the degree of transformation of society would be so great that a whole range of completely new jobs would be created.

Expectations at the individual level

Technological change is not a factor. It was clear that robotization, automation, and the development of AI were not at the forefront of these young people's thoughts in terms of their individual futures, and their accounts show that, as a consequence, the former are not items for consideration when choosing what to study or what job to do in the future. Interviewees did not spontaneously make connections between the collective discourses about technological change and their own individual expectations for the future. At the very beginning of the interview, respondents were asked what jobs they would be doing in 15–20 and 30 years' time, and what their workday would look like. At that time, we did not tell them that the topic of the interview was technology, thus the interviewees were able to observe whether respondents spontaneously reflected on these topics. Automation and technological change was surprisingly lacking from almost all visions of individuals' future work – even often in the case of jobs for which considerable developments have already occurred due to the application of AI (such as translation, accounting, and animation). Students imagined having such jobs without considering whether these kinds of jobs would exist, and automation was basically left out of the discourse:

Petra (22, BA, American studies): Because I want to be a medical interpreter, I think I will work in a hospital and translate between foreign patients and doctors and other hospital staff.

When thinking through their likely tasks during a typical workday in the future, technology did not emerge as a means of carrying out those tasks – even for less complex, more administrative-type tasks. Rather, respondents imagined either human colleagues or themselves doing such tasks. Thus, their future jobs were imagined as consisting of similar tasks to those they consist of today, including those non-creative and routine tasks done by humans:

Paul (24, law): It could easily happen that in 20 years' time I will be handling a divorce lawsuit, who knows? I hope that I will have co-workers or a secretary, something like that, and they will help me to keep everything in mind so that I do not have all the responsibility.

Interviewer: What professional tasks would this consist of?

Paul: Probably there will be a lot of paperwork and sitting in front of the computer, but I hope that I will be not become tired of my job too soon – I want to find the exciting parts of my work.
...

Interviewer: Please describe what a day will look like for you.

Vicky (24, MA, management and organization): I guess there will probably be some kind of administrative work for me to do too, so that my brain can switch off a little sometimes, but

at the same time there will be more challenging things – for example, a brainstorming meeting with co-workers when we have to solve more challenging tasks. I would like to work with people, I think this is why I chose the area of HR.

It seems that widespread expectations about automation and respondents' own future plans are not well connected. In fact, almost all respondents reported that they had not – for example – taken the development of automation into consideration when choosing their profession or thinking of career goals. Either they connected the concept of automation directly to (information) technology, which was the foundation of their disinterest in technological areas in relation to their choice of profession, or they stated that they wanted to pursue their career path in line with their own decisions and interests, but not according to external factors or expected (future) workplace needs.

Optimistic narratives. When interviewees were asked to think of potential connections between robotic and AI technologies and their own future work, all of them basically espoused completely optimistic narratives about their own future. In fact, respondents often cited current applications and forms of automation as 'interesting', 'exciting', or 'promising'.

Many voiced the view that they could shape their future, and that their education would 'protect them' from job loss. The vast majority believed in the idea that the higher the level of qualification, the safer the workplace. In this 'mental safe space', respondents usually did not offer rational and detailed reasoning about how security of employment and an academic degree were correlated; on the contrary, they mostly referred to their beliefs, wishes, and intuition. Despite the frequent emphasis on the importance of having an academic degree (or being an intellectual) as a protective factor, technological education and technical skills were, surprisingly, not specifically mentioned as useful or required to ensure one's future in the job market.

Optimism bias could be observed in cases when respondents claimed that automation might be applied to many tasks, including in some fields that require a university education, but not their own future jobs. Respondents typically emphasized that they simply could not imagine that the most important tasks related to their jobs would be able to be done by AI because of their complexity and the need for a human perspective. For example, one law student said that:

Tony (21, law): I find it impossible to imagine that AI could make a decision instead of a human judge. Since no judge decides specifically on the basis of written law, but must be fair to the person, they have to take into consideration the accused's personal circumstances, and this fairness is again an emotionally based thing that AI will not be capable of, I think.

This opinion contrasted with that of some other respondents from other backgrounds, who, when asked about the same topic, said that many tasks related to law could be automated, and some juridical jobs might even be taken over by AI. The optimism bias thus seemed to be underpinned not by a belief in respondents' personal capabilities or skills, but the professions they had chosen.

When prompted about the role of technology, respondents sometimes expressed that they expected to receive help from emerging technologies throughout their career.

Jeannie (19, BA, trade and marketing): So if, for example, if I went further in the direction of marketing, and let's say I had a role in advertising production, then I think that if technology becomes more advanced ... I would have ... many opportunities ... with such tools for creating advertisements.

As can be seen, the young respondents tended to resolve the potential tension caused by the automation of work with the idea of a potential partnership between man and machine.

Conclusion

In the article, after arguing for the sociological relevance of visions in connection with technologies, and after discussing mainstream expert projections about the future-of-work debate, we analysed young people's accounts of their expectations of technological change.

We identified five core characteristics of their narratives. Visions of gradual, non-radical change, malleable and changing narratives, and moderate optimism over a 20–30 year time span were typical of the accounts on the macro level. On the individual level, technological change was not a factor in visions of respondents' future work or in their education and career choices, which were characterized by strong optimism.

Comparison of the students' lay expectations with the widespread projections of experts revealed some differences. The expert visions that have impacted the choices of many governments and organizations and can be found in the media – including the Hungarian media – which have operated as forms of 'forceful fiction' for the latter actors were not found to have had such a forceful effect on respondents. Although interviewees were surrounded by a media landscape in which the term 'the fourth industrial revolution' has become a commonplace, in the accounts of the interviewees change was not expected to be dramatic, revolutionary, or transformational. Instead, students stressed that change would be linear and moderate, with unemployment mainly a problem for a small segment of society.

We have described some of the mechanisms and lines of reasoning that contributed to this scepticism. Scepticism about transformative change in the interviews was grounded by beliefs (idealization) about the need for human traits in certain jobs, the slower pace of change in Hungary, and the association of AI with lower-level areas of application. Respondents were sometimes unaware of the technological development that has already been achieved or had expectations that future technological development would only be moderate.

On the societal level, and in relation to the next 20–30 years, respondents almost unanimously do not envision the kind of semi-apocalyptic change which characterizes some approaches (Ford, 2015) – rather, their descriptions are marked by a more optimistic tone: the emphasis was on the idea of technologies assisting humankind by taking over monotonous and dangerous tasks. On the other hand, respondents' narratives were not as

rosy as those of utopian experts either, as unemployment was envisioned to be a risk for a segment of society – although this did not cause significant concern.

It was apparent that most of the students we interviewed had heard about expectations concerning automation in the media or at their universities. In the interviews they often referenced the media, and sometimes what they had heard at their universities. However, they had not connected and integrated these visions into their own individual expectations. Consequently, they omitted consideration of aspects of technological change when thinking of what their future work experience and career development would look like. Although some experts predict that working together with robots and AI in the future might require different skills than are needed nowadays (Boyd, 2021; Dekker et al., 2017), this issue was not brought up by the respondents. Technological education and technical skills were not specifically mentioned as being useful or required for achieving future success in the job market: none of the students talked of planning to improve these.

A dual form of distancing from technological change was identified in the interviews: on the one hand, at a personal level (with respect to the respondents' own futures), and on the other hand, in the latter's distancing themselves from segments of society which could face difficulties related to technological change.

Respondents' optimism about their own futures and distancing in relation to the effects of technological change on their own careers could be traced back to the idea that getting a university degree would protect them, and to claims that special skills are needed for their chosen profession. Regarding the latter, optimism bias could often be observed.

Our results contribute to the literature on optimism bias. Several quantitative research projects have demonstrated that optimism bias exists with respect to the effects of automation (European Commission, 2017). With the qualitative methods used in this study we have shown some of the mechanisms that may explain this issue. For our interviewees, a belief that their own prospects for work were better than others' was not associated with individual attributes (i.e. 'I am better than others'), but rather to a belief in the complexity of their future jobs, and the special human traits needed for them – even compared to other jobs that similarly need a stronger educational background.

The sociology of technological expectations emphasizes the importance of future visions (Tutton, 2017). This does not mean that presently circulating narratives are necessarily omnipotent, and that people apply them to their own lives. In fact, what we observed in this research was how frequently interviewees distanced themselves from certain macro narratives about technological change. While many aspects of popular expert expectations were not echoed in their answers, our research suggests that individual expectations did influence respondents. As interviewees typically imagined a good future work situation for themselves, with working circumstances that would change only minimally, such expectations seem to have contributed to their lack of consideration of technological change in relation to their educational and career choices, or their thoughts about what skills they should improve. This may result in unpreparedness when changes do occur – and if the attitude we found in our sample is widespread, could reduce the labour pool of those with appropriate technological skills, perhaps leading to the slower adaptation of some new technological solutions in Hungary.

Expectations with respect to automation are also relevant, as fears of automation have been linked with right-wing radicalization (Dekker et al., 2017). However, we found that, in this regard, optimism was more prominent than fear. The fact that among our interviewees hopes regarding technological change were stronger than fears is also a relevant finding, as such hopes and fears will affect public acceptance of the development and introduction to society of new technologies. This in turn can influence investment in these technologies and economic growth potential (Dekker et al., 2017).

Popular expert positions involving fundamental, transformative change have been challenged in the academic literature on several grounds (Benanav, 2020; Boyd, 2021; Boyd & Holton, 2018; Dyer-Witheford et al., 2019; Vicsek, 2021). Among other critiques, it is claimed that although significant change is likely to occur, it is not certain that the AI industry will deliver on all of its promises (Boyd & Holton, 2018) as it is currently in a period of hype – which has occurred before, followed by cycles of disappointment (Dyer-Witheford et al., 2019; Vicsek, 2021). It has also been emphasized that many commentators who project radical change have not considered the influence of social and cultural factors on the embedding of technologies in societies as they too easily equate technological development with the spread of technology. Furthermore, from a historical perspective, social and cultural factors have often slowed down the dissemination of technologies (Geels & Smit, 2017). It is notable that the gap between the pace and degree of change that the interviewee students expect and these more cautious academic expectations is less than that between students' projections and the widespread visions of revolutionary change.

New academic work claims that it is not useful to focus on estimating the quantity of related job losses and job creation, not least because of the uncertainty and complexity involved in such forecasts, but also because it is more fruitful to attend to changes in experiences at work derived from alternations in human–machine patterns of interaction (Boyd, 2021). However, what we found was that these aspects of potential changes in experience were also absent from students' spontaneous imaginings of the future. What they expect a workday in the future to look like was basically derived by projecting the present into the future, thus alterations in human–machine interactions were not a relevant factor.

This article was written to demonstrate how qualitatively informed social science can contribute to the study of people's understanding of the future of work. Our study illustrates the complexities and ambivalences that can be present when members of the public make sense of technological change. The semi-structured interview method made it possible for respondents to frame issues in their own terms. The qualitative focus of our study also enabled us to provide a rich and deep description of experiences with technological change. Additionally, rather than giving a static view of what people think, as is the case with surveys, we show how narratives can be malleable as respondents engage more deeply with a topic.

That the narratives shifted was treated not as a problem in the research but as an indication of the ambivalence that interviewees struggled with. Seen in this light, we argue that survey findings about this issue can give a false sense of certainty about opinions. Another challenge for survey research on attitudes towards automation is an old problem: the fact that how questions are presented can influence answers. As we have

shown, as the interviews progressed, simply by having to think more about white-collar jobs and AI due to the interviewer's questions, interviewees started to talk more about potential changes to a wider range of jobs.

This suggests that if surveys contain only a few general questions about the effects of automation, respondents may not think about these issues. Rather than relying only on simplified representations of public expectations about automation, such as those which locate respondents' answers on a scale, we argue that policy makers should also take into consideration the findings of qualitative methods, which can show the ambivalences and complexities involved in these visions.

The limitations of our research include the non-representative nature of the study. However, as very similar responses were recurrently given, the findings may be of relevance outside of the concrete situation in which they originated.

In summary, our results reinforce the need for further research that helps unfold subjective experiences about technological change in relation to their social, cultural, and contextual complexity. The sociology of technological expectations typically focuses on expert or business projections, and the study of lay people's visions is somewhat neglected. Focusing more attention on the latter, and acknowledging their fluidity, merits further study.

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