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# **WORKING PAPER**

**The Social Roots of the Transnational  
Cleavage: Education, Occupation, and Sex**

Liesbet Hooghe and Gary Marks



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## **Abstract**

We develop a micro approach to assess how social structure is expressed in voting for Green and TAN parties. Using a cleavage perspective we explain the rise of green and TAN parties as a response to a single exogenous shock, an information revolution that transformed capitalism, recast relations among the sexes, and produced the transnational cleavage. We argue that the field in which a person is educated is more influential than the level of education in conditioning a person's partisanship on the contemporary cleavage, and we extend a field theory of education to occupational variation and gendered sorting to explain vote choice.

## **Keywords**

Transnational; cleavage; gender; education; educational field

This paper seeks to do three things.<sup>1</sup> First, it proposes a cleavage theory of party system change in which the rise of green and nationalist TAN parties since the 1980s is explained as a response to a single exogenous shock, an information revolution that transformed capitalism and recast relations among the sexes. Second, it proposes that the field in which a person is educated is more influential than the level of education in conditioning a person's partisanship on the contemporary cleavage. Third, it extends a field theory of education to gendered sorting and occupational variation in green and nationalist voting.

After setting out a cleavage theory of green and national voting, we evaluate our claims on the social roots of green and TAN voting using three waves of the European Social Survey with information on respondents' educational fields. The effect of field of education is robust across a range of potential confounders including level of education, occupational work logic, and generational effects.

## **Cleavage theory**

What aspects of social structure are mobilized in party competition? To what extent, and how, are voters' allegiances intertwined with their lives? These questions are vital in assessing the new divide that has arisen in Western societies, and they lie at the foundation of a theory of political cleavage.

Cleavage theory relates change in party systems to the structure of political conflict. In the Lipset/Rokkan (1967) model, a major shock to the fabric of society motivates opposition to the status quo on the part of groups whose lives are affected in ways that are difficult or impossible for them to escape. The resulting conflict is durable to the extent that a) the shock to the society has enduring consequences for the life chances of particular groups of individuals and b) the coalitions—political parties—that are formed have socially rooted cores, i.e. particular groups of voters who provide the party with a core basis of support.

Cleavage theory conceives voters as social beings who live in a multidimensional space of socially constructed locations. As social beings, voters are grounded in collective contingencies that shape their lives. They are embodied persons with a particular gender, education, and class (Burton 2020). This opens the door to the possibility that those in similar locations are similarly affected by an exogenous shock. How open the door is, depends on whether occupants are socially rooted.

A person is socially rooted to the extent that their life chances, the material and non-material goods they consider essential for a good life, are determined by circumstances that are difficult or impossible for them to change. Gender, class, and education are examples of socially constituted characteristics that can shape a person's social location, but which are themselves only weakly volitional. While none of these characteristics are irredeemably fixed over the course of a person's life, they can be changed only with considerable effort once a person reaches adulthood. The effect of these characteristics on a person's life chances are difficult to overcome because they depend on how a society is organized.

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This is precisely the case for the cleavages described by Lipset and Rokkan in their classic 1967 paper. The party families that dominated European politics – regionalist, Christian democratic, liberal, and socialist—originated in opposition to the status quo following a major social transformation. Each social transformation gave rise to a distinctive pattern of conflict. At stake were issues that were baked into a person’s life. Nation building and the industrial revolution reshaped society, creating and destroying ways of life and means of subsistence. These transformations structured life chances in ways that were difficult or impossible for a person to change. So the first thing that one can say is that a cleavage is about more than tastes over political issues. Cleavage theory seeks to put substance into spatial theory by hypothesizing how particular sequences of social change produce grievances expressed in the political alternatives available to voters. This does not require that one assumes sophisticated voters. Cleavage theory begins with the premise that most people have little motivation to pay attention to politics; little understanding of the issues contested by political parties; and little capacity to think coherently about their political choices (Converse 1964). Yet, a person may be tugged in a particular direction by features of their life that they may take for granted—how they are socialized, their gender, the choices they make in early adulthood.

One reason for thinking that the information revolution is an instance of this causality is that it, too, has produced a distinctive social basis for conflict: education (Bell 1976; Bornschieer 2018; Kriesi 1998; Marks et al. 2021; Stubager 2010, 2013). As knowledge has become the key to capitalist productivity, education has become decisive for a person’s life chances in two ways. First, the **level** of a person’s education, and in particular whether they have, or do not have, post-secondary education, shapes the opportunities that a person will have throughout their adult life. Knowledge and cognitive skills have become a resource for social stratification (Bornschieer 2010; Iversen and Soskice 2019; Kalmijn and Kraaykamp 2007). Second, the **field** of a person’s education limits the kinds of skilled jobs they are qualified for. The greater the role of knowledge in production, the more specific the fit between an occupation and a person’s field of expertise. What a person chooses to study shapes the possibilities of their working life and the kinds of people they work and live alongside (Schindler et al. 2021). At the same time, and as recent research has shown, both the level of a person’s education and their field of study express their social background and their socialization prior to adulthood (Elchardus and Spruyt 2009; Fischer et al. 2017; Hastie 2007). In our societies, a person’s field of education appears powerfully shaped by their gender alongside their parents’ educational and occupational experience (Breen and Müller 2020; Bukowski and Goldthorpe 2018; Carlana and Corno 2021; Hällsten and Thaning 2018; Kraaykamp et al. 2013; Kunst 2022; Triventi 2013).

## The information revolution

There are a multitude of terms to describe the transformation of western society in recent decades—post-industrialism, knowledge economy, postmaterialism—to name three. The term in the title of this section—the information revolution—is the earliest and most axiomatic.<sup>2</sup> It came

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2 From 1962, library researchers began to describe the computerized indexing and cataloguing as an information revolution. In 1962, the Special Libraries Association made a television film entitled “Is Knowledge Power” in which Senator Hubert Humphrey made a presentation on the “Revolution in Information.” In 1963, Heston Heald, a technical advisor in the Armed Services Technical Information Agency wrote an essay, “ASTIA and the Information Revolution,” describing the army’s plans for computerized indexing and cataloguing of scientific information (Special Libraries, Vol. 54(1): 40, January 1963). The first published use of the term that we can find is in a Masters’ Thesis written in 1962 (Greene). In 1965, John Diebold, a management theorist, wrote that “We are on the threshold of an ‘information revolution’ that will affect the practice of management in ways which our conventional notions of computers can only hint at” (76). At the end of the decade, Herbert Simon (1968: 623) observed that the “real significance of today’s information revolution [is that] information and the processing of information are themselves for the first time becoming the objects of systematic scientific investigation.”



into usage in the early 1960s when the computer was first perceived as having the potential to reshape society. The foundation of the information revolution is that reducing information to its simplest components allows immense economies of scale in storage, manipulation, and transmission.

As with prior transformations, the political effects of the information revolution unfolded in stages. The first transformed the logic of capitalist development around the production of knowledge. Education became decisive for an individual's life chances, and produced a divide between fields—business, engineering, applied science, informatics—attuned to the requirements of industrial capitalism and fields—the humanities, arts, most social science—that are removed from industrial capitalism. The latter fields are intellectually oriented to social values rather than economic efficiency and are skeptical of the profit motive as a source of social improvement. These fields provide most of their students with weak market bargaining power and, we argue, they provide a core constituency for green political parties.

This argument is gendered. Perhaps the most fundamental social outcome of the information revolution has been to recast gender relations in the economy and in the family. Because the information revolution opened the door for women to perform at least as well as men in the university and in the labor market, it exposed the glass ceiling as a vestige of an obsolete social order. Vastly more women than men gained post-secondary education, and women predominated in educational fields, including the humanities and arts, most detached from industrial capitalism. The information revolution was driven by the logic of private profit under advanced capitalism, yet it produced a class of educated socio-culturalists and women who demanded collective action on gender and minority rights, ecological sustainability, and environmental degradation (Kitschelt 1988, 1989).

The second phase of the information revolution was characterized by drastically reduced barriers to trade and mobility across national borders resulting from the application of digital technology to communication in conjunction with the empowerment of international organizations (De Wilde et al. 2019; Hooghe and Marks 2018; Kriesi et al. 2006). This led to the diffusion of automation and offshoring, increased levels of immigration, the emergence of a transnational cleavage, and the rise of populist nationalist political parties. Those who lacked post-secondary education were in the crosshairs of this transformation (Im et al. 2019), and those trained as semi-skilled machine workers bore the brunt (Beramendi et al. 2015; De Vries 2018). As trade penetration accelerated from the 1990s, machine workers were vulnerable to automation and competition with the vast labor pool in East Asian countries. Again, gender plays a major role. Men are disproportionately drawn to technical-economic fields of education, and the occupations such persons take on—machine workers, transport workers, construction workers—are disproportionately male.

## **Education**

Information is an impure public good. This has profound implications for the structure of advanced capitalism. The consumption of information by one person does not detract from its consumption by another and it is difficult to exclude a person from using information that is in the public sphere. Information that is not kept in secret or sheltered by patent is a public resource (Stiglitz 1999, 310). It cannot efficiently be privately provided because others can use it at no cost. Because the returns to information can only be partially appropriated privately, governments have been induced to expand its provision by investing in education and research. In the thirteen countries sampled in this paper, the proportion of the population aged 25 years or more who completed tertiary education rose from 1.9% in 1950 to 6.3% in 1980 to 18.7% in

2010 (Barro and Lee 2015, 16). The information revolution was driven by the logic of private profit under advanced capitalism, yet it greatly enhanced the role of government in providing the educational basis for a knowledge society (Bovens and Wille 2017; Schofer et al. 2020).

The university is to the information revolution what the factory is to the industrial revolution. The factory concentrated masses of propertyless men and women in close proximity, alienated workers from the product of their labor, and nakedly exposed their exploitation. The university concentrates masses of knowledge workers in close proximity, detaches them from the culture of industrial society, and provides, in the words of Lipset and Dobson (1972, 146) potential “staging areas” for protest.

Whereas the factory divided those who sold their labor power from the rest, the university divides those with educational qualifications from the rest. Yet this simple distinction can hide more than it reveals. It was never sufficient to think of the proletariat as a homogenous political actor because workers in different occupations had contrasting life chances and political attitudes (Hobsbawm 1964; Marks 1989). To say that a person is university-educated is to say little until one knows the field of study. Each discipline engages particular puzzles, uses a distinct palette of methods, and attracts a particular kind of person (van de Werfhorst and Kraaykamp 2001). In their classic study, Ladd and Lipset (1975, 69) find that “subject matter—the areas of activity it encompasses, the problems and concerns with which its practitioners are involved, its distinctive styles and modes of thought, and the interests and groups outside the university which it defines—together influence the type of person recruited into the field.”

Following van de Werfhorst and co-authors (2004; 2005; 2020), we consider four resources that differentiate fields of education.

- A field is *cultural* to the extent it rewards expertise in artistic, literary, and cultural expression. Those who select into a cultural field are trained in historical analysis, artistic appreciation, writing, and reading.
- A field is *economic* to the extent it rewards expertise in business and market behavior. Those who select into an economic field are trained in management, accounting, commerce, and law.
- A field is *communicative* to the extent it rewards expertise in social interaction, group instruction, and public speaking. Those who select into a communicative field are trained in presentation skills, social psychology, communication, and teaching.
- A field is *technical* to the extent it rewards expertise in production processes and concrete tasks. Those who select into a technical field are trained in machinery use, automation, mathematical calculation, and test procedures.

The field a person selects reflects their socialization, their character, and how they conceive their role in society. Research linking field of study to political ideology finds that those in cultural-communicative fields are to the left of those in economic-technocratic fields (Fischer et al. 2017; Lazarsfeld and Thielens 1958; van de Werfhorst 2020). However, there is evidence that the effect of educational field is equally strong and perhaps stronger for GAL/TAN attitudes relating to gender, minority rights, and the environment. Those in cultural-communicative fields tend to be significantly more detached from business ideology than those in economic-technical fields (Ladd and Lipset 1975); they are more willing to emphasize situation and social explanations for individual life-chances (Guimond et al 1989, 128); less willing to reify existing cultural practices (Elchardus and Spruyt 2009, 449); more willing to be critical of the status quo on progressive grounds (Lipset 1982, 47); more likely to have pro-transnational attitudes

on immigration and Europe (Maxwell 2020, 20; Kunst 2020); and less inclined to express authoritarian preferences (Carnevale et al. 2020, 18; for a contrary assessment, see Bročić and Miles 2021).

These attitudes are related to partisanship on the transnational divide and ground the following hypothesis (H1): An individual educated in a cultural-communicative field is more likely to vote Green; an individual educated in an economic-technical field is more likely to vote TAN.

The logic of educational fields can be extended to occupations by conceiving each occupation as attracting or selecting individuals with a particular educational experience. The partisan complexion of an occupation is then a result of the mix of those with educational backgrounds and socialization in the occupation. This grounds the following hypothesis (H2): An occupation predominated by those educated in a cultural-communicative field has a relatively high incidence of Green voting, and an occupation predominated by those educated in an economic-technical field has a relatively high incidence of TAN voting.

## **Gender**

The physical advantages men have in labor disappear in the realm of knowledge, and in the knowledge economy physical prowess is secondary to social qualities on which females tend to score higher than males. The shift from an industrial society based on machine power and human brawn to one based on information and brain offered women the prospect of labor market entry in societies long characterized by patriarchal norms and glass ceilings. In every country that has undergone an information revolution, women predominate in most of the new and expanding sectors.<sup>3</sup> Women make up a larger proportion of employment in the knowledge economy than in the industrial economy; they get post-secondary education in greater numbers than men in the US, UK, and 25 of 27 EU countries, and predominate in cultural-communicative fields.<sup>4</sup>

As with prior social transformations, this has produced politically combustible friction. Because it reveals the possibility of emancipation, the information revolution paradoxically sharpens the sense of subjugation. The transformation of the workforce exposes ever more clearly a glass ceiling preserving the most prestigious and highly remunerated jobs for men. Traditional patriarchal norms continue to deny women control over their bodies and their lives. The tension between aspiration and oppression has generated intense grievance, particularly among educated women.

Perhaps the most consequential political result of the information revolution lies in the connection between GAL and women.<sup>5</sup> Gender equality is a core tenet in Green thinking, and women have been at the forefront in Green parties. Unlike socialist and left-socialist parties which were rooted in the male proletariat, Green parties could encompass female professionals without fear of alienating their traditional core constituency. Green political parties are the most feminized of all European party families. They have led the way in gender parity on electoral lists, spokesperson teams, legislative representation, and party executives (Bick 2019). When

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3 Women formed the majority of health professionals (70%), teaching professionals (71%), and legal, social, and cultural professionals (59%) across the EU in 2016. <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/EDN-20180307-1>.

4 [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Number\\_of\\_tertiary\\_education\\_students\\_by\\_sex\\_and\\_level\\_of\\_education\\_2018\\_\(thousands\)\\_ET2020.png](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Number_of_tertiary_education_students_by_sex_and_level_of_education_2018_(thousands)_ET2020.png)

5 The female implication of GAL was in the minds of the inventors of the acronym.

*Die Grünen* entered the Bundestag in 1983, a “Feminat” of six women led the parliamentary fraction, and in the 1987 parliamentary elections all but one of the Green *Länder* electoral lists were led by a woman (Mellor 1992, 232-3). The first senator elected for the Belgian Greens in 1981 was a woman, and since 1991 both Belgian Green parties have applied a “zipper” system alternating men and women on electoral lists. In 1984, the Swedish Miljöpartiet introduced female/male spokesperson teams. By the first decade of this century, nearly all Green parties (and to a slightly lesser degree, Green-Left parties) had introduced parity quotas, and they have led efforts to alter national laws.

The knowledge economy can be profoundly destabilizing for less educated men whose self-worth is grounded on patriarchal values (Gidron and Hall 2017). Over the past thirty years, males with only secondary education have come to experience worse employment prospects, lower occupational status, and worse real wage levels. Moreover, less educated men may feel culturally as well as economically vulnerable. The rise of educated women in the knowledge economy has threatened the identity of the male as exclusive breadwinner. Between 1980 and 2010, the share of women in employment rose from 54 to 71 percent across the OECD while, on average, the gender pay gap in OECD countries declined from around 30% in the early 1980s to 12.5% by 2019 (OECD s.d.; Gidron and Hall 2017, 65).<sup>6</sup> These trends can touch men in the sensitive parts of their self-esteem when their wives or partners earn a significant share of family income and come to have their own work space and status as colleagues or supervisors. Although many do not live up to the norm, men are expected to assume co-responsibility for childcare and domestic chores. When the GAL demand for equality is implemented by affirmative action policies, such men may feel that women, in Arlie Hochschild’s (2016) memorable phrase, are “cutting in line.”

Personal grievance may more easily translate into group grievance because of the social context in which semi-skilled occupations operate. Machine industrial jobs are overwhelmingly male and have become increasingly so in the past two decades (Roos and Stevens 2018, 141). While *vertical* gender segregation—i.e. the extent to which men dominate in higher-status, better-paid jobs—has declined markedly, *horizontal* gender segregation in which men and women are sorting into different occupations has increased (ILO 2016). The result is that “Women have hardly gained a foothold in blue-collar, male-dominated jobs such as plumbing, construction, truck driving, welding, and assembly in durable manufacturing industries such as auto and steel” (England 2010, 157). Machinery workers are almost exclusively male as are extraction and security workers. We expect that the political affinities of males intensify among those who self-select into groups dominated by males and who then interact almost exclusively with other males in the workplace.

Those who remain in traditionally well-paid routine manual occupations have seen the products of their labor lose value relative to those of knowledge occupations. A unit output from a carpenter, miner, or car mechanic has become considerably cheaper relative to that of a lawyer, doctor, or university professor (Autor et al. 2021, 10, 16). Outside the knowledge economy, insecurity has intensified (Kaihovaara and Im 2020). Manufacturing jobs have dried up, and service jobs are exposed to insider-outsider dualism (Abou-Chadi and Kurer 2021; Häusermann 2020; Pardos-Prado 2020; Rovny and Rovny 2017). Those who have risen in the knowledge economy have increased the demand for less skilled employment, for example, by outsourcing services previously carried out in the household. These jobs—child and elderly care, cleaning, meal preparation, and lawn care—tend to be low status, poorly paid, and a humiliating step down for a semi-skilled machine worker.

6 <https://data.oecd.org/earnwage/gender-wage-gap.htm>

## Data and empirical approach

To examine our expectations concerning the social bases of Green and TAN parties we use the European Social Survey (ESS) for thirteen European countries in years where one or both parties were available for voters. We use waves 2, 3, and 4 because they contain unique information on the substantive field of education that respondents have taken. The unit of analysis is the respondent who is at least 21 years old and who reports which party they voted for in the last national election. Vote choice is categorized by party family with the help of the Chapel Hill expert survey (CHES) data (Jolly et al. 2022). The Appendix contains details on operationalization.

Our chief interest is the mix of knowledge and skills acquired by a person through formal education because we hypothesize that this profoundly shapes a person's life chances in the information society and how they evaluate loss or opportunity. We adapt data collected in 1998 from a representative sample of Dutch respondents who were asked to what extent attention was paid to sixteen types of knowledge or skills in their field of education (van de Werfhorst and Kraaykamp 2001). These types can be grouped in four knowledge reservoirs: cultural (e.g. artistic expression, historical knowledge, writing and reading), economic (e.g. bookkeeping, law and procedures, management), communicative (e.g. instruction methods, group conversation, public speaking), and technical (e.g. automation, calculus, experimentation). People with a primary education were not asked to rate skills and therefore receive the lowest score across the board. This information is then aggregated to the educational field so that each field has a mean score for cultural, economic, communicative, and technical knowledge. Educational fields with higher cultural (C) and communicative (C) skills compared to economic (E) and technical (T) skills are theorized to be more detached from economic production and industrial capitalism. Our variable, *CECT*, is the ratio of communicative and cultural skills to all four types of skills, rescaled to 0-1 for ease of interpretation.<sup>7</sup>

We introduce this external information into the ESS survey in two ways. First, we project the field-specific *CECT* ratio to each respondent's chief substantive field of specialization from a list of fourteen subjects.<sup>8</sup> Each respondent who reported "in which one of these fields or subjects is [their] highest qualification" receives an *individual CECT* score. Second, to estimate the substantive knowledge environment in a person's work life, we calculate for each occupational category at ISCO-3 level the average *CECT* score in our sample and project this *occupational CECT* score to each individual. Here we take advantage of the micro-level information on occupation available in ESS. *Occupation* employs the 1987 schema Standard Classification of Occupations (ISCO-88) of the International Labour Organization which categorizes jobs in a hierarchical schema with four nested layers of increasing specificity from ISCO 1-digit (10 categories), ISCO 2-digit (28 categories), ISCO 3-digit (116 categories), to ISCO 4-digit (390 categories). Except where stated, the analysis is at the ISCO 3-digit level pooled across waves. ISCO 3-digit is more robust than ISCO 4-digit against outlying values produced by a small N.

Alongside these micro-class measures, we use conventional operationalizations for sex, education, age, location, secularism, and occupation (Table A.3-A.4). Sex is self-reported,

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7 Alternative operationalizations produce similar results. A difference variable, whereby ET is deducted from CC, correlates very highly with the *CECT* ratio (0.99). Substituting *CECT* ratio by two variables that estimate the cultural-communicative and economic-technical skills reservoirs separately produces similar effects on Green or TAN voting (see Appendix).

8 The fourteen fields in ESS correspond well with the eleven fields in the Family Survey Dutch Population. Arts and humanities are separate categories in ESS, and we allocate the Humanities/Arts *CECT* ratio to either ESS field. Technical & engineering, transport & communication, and science fall under a single Technical category in the Family Survey; we allocate the Technical field ratio to the first two, and estimate a new *CECT* ratio for scientists by combining the cultural-communicative skills of teachers with the technical and economic skills of technical fields.



whereby female takes on a value of 1. *Education* is a harmonized five-category ordinal ESS variable that implements the international ISCED–97 scale. *Higher education* takes on a value of 1 if the respondent has completed post-secondary or tertiary education, and zero otherwise. *Age* is the year of the survey minus a respondent's reported year of birth. *Rural* is a five-category variable whereby higher values stand for a less urbanized living environment. *Secular* is a seven-category variable tapping attendance in religious services, with higher values indicating that a person rarely or never attends. *Occupational Status* classifies a person's (past) job in eight categories using information on employment relationship, work logic, and job content derived from ISCO-88 (Oesch 2006). Two categories – production workers and socio-cultural professionals – are of particular interest.

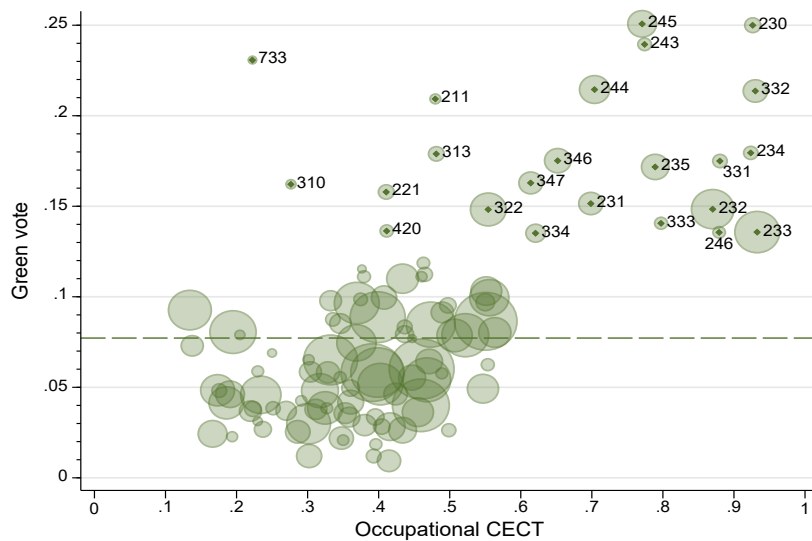
Our expectations are validated using multilevel mixed-effects logistic models, whereby individuals are nested in ISCO 3-digit occupations and countries. All models control for sex, education, age, rural location, secularism, and time.

### **CECT, occupation, and voting**

We begin by examining the distribution of CECT by occupation visually. Figure 1A and 1B picture how CECT capital is physically concentrated in particular occupations, and how this predisposes individuals to vote green or TAN. The X-axis arrays all 115 ISCO-3 occupations by the average CECT of individuals employed in that occupation, against, on the Y-axis, the proportion voting green (Figure 1A) or TAN (Figure 1B). The size of the circles reflects the size of the occupational category. The lists below describe in which occupations green voters or TAN voters are overrepresented relative to the average vote share of 7.7% for green parties (green dashed line) or 7.6% for TAN parties (orange dashed line).

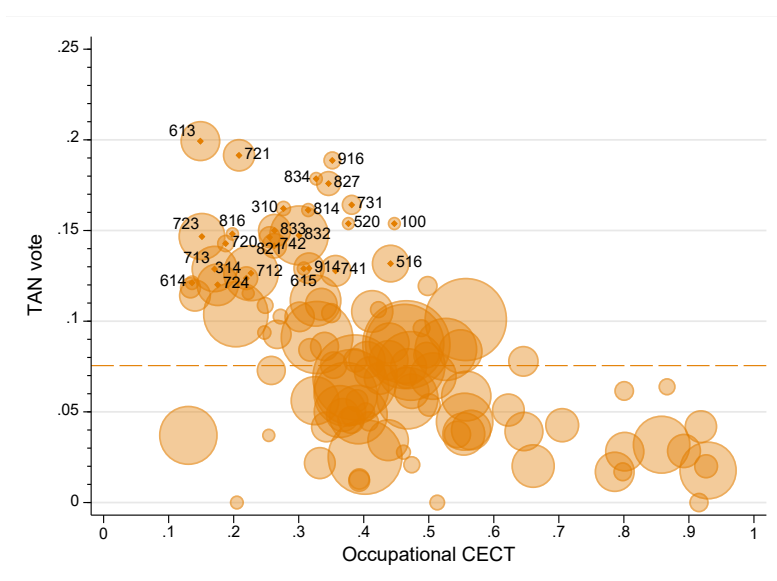
Green and TAN voters seem to inhabit different occupational worlds. Occupations that lean green employ mostly individuals who have invested in cultural-communicative knowledge over economic-technical skills. They are teachers from pre-primary to tertiary education; social workers; artists, writers, and handcrafters; sports professionals; librarians and archivists; and scientists from the social sciences to the life sciences. TAN-leaning occupations are disproportionately composed of individuals who put a premium on economic-technical skills. Many are semi-skilled working or trading in raw materials, machines, products – they cast, mold, stamp, forge, cut, grind, weld, paint, seal, bend or move ore, stone, wood, metal, or plastic. Here we find miners, construction workers, machine operators, vehicle drivers, engineers, or crop or animal producers. Of 115 categories only one occupational cluster figures on both the green and TAN list, the physical & engineering science associate professionals (310), an internally diverse and numerically small group.

**Figure 1A: CECT and voting Green**



211	Physicists and astronomers
221	Life science professionals
230	Teaching professionals
231	Higher education teaching professionals
232	Secondary education teaching professionals
233	(Pre-)primary education teaching professionals
234	Special education teaching professionals
235	Other teaching professionals
243	Archivists, librarians, related information professionals
244	Social science and related professionals
245	Writers and creative or performing artists
246	Religious professionals
310	Physical, engineering science associate professionals
313	Optical and electronic equipment, broadcasting, image & sound operators
322	Health associate professionals
331	Primary education teaching associate professionals
332	Pre-primary education teaching associate professionals
333	Special education teaching associate professionals
334	Other teaching associate professionals
346	Social work associate professionals
347	Artistic, entertainment, sports associate professionals
420	Customer services
733	Handicraft work wood, textile, leather, related material workers

**Figure 1B: CECT and voting TAN**



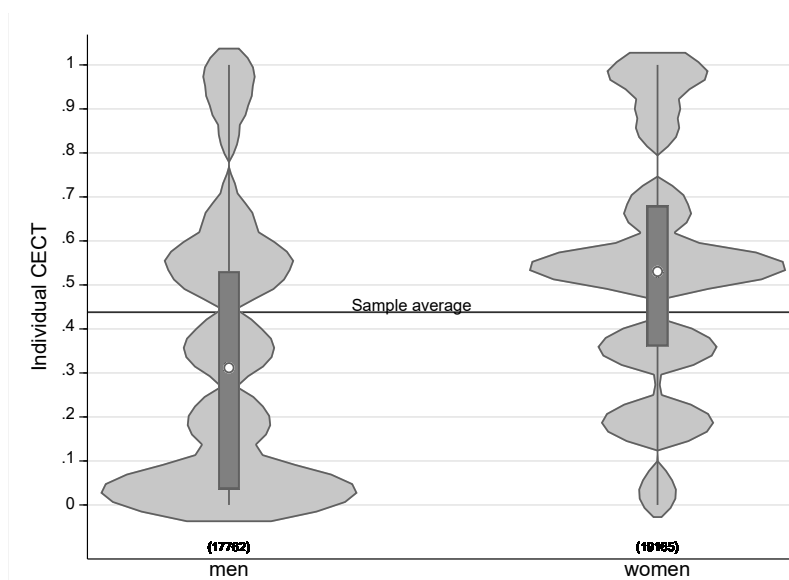
100	Armed forces
310	Physical, engineering science associate professionals
516	Protective service workers
520	Models, salespersons, and demonstrators
613	Crop and animal producers
614	Forestry and related workers
615	Fishery workers, hunters, and trappers
712	Building frame and related trades workers
713	Build finishers, related trades workers
720	Metal, machinery, or related trades workers
721	Metal molders, welders, sheet-metal workers, structural-metal preparation etc.
723	Machinery mechanics and fitters
724	Electric mechanics, electronic equipment mechanics and fitters
731	Precision workers in metal and related materials
741	Food processing and related trades workers
742	Wood treaters, cabinet makers, related trade work
814	Wood-processing, papermaking-plant operator
816	Power-production and related plant operators
821	Metal, mineral-products machine operators
827	Food, related products machine operators
832	Motor vehicle drivers
833	Agricultural, other mobile plant operators
834	Ships' deck crews and related workers
914	Building caretakers, vehicle, window, or related cleaner
916	Garbage collectors and related laborers



## CECT and sex

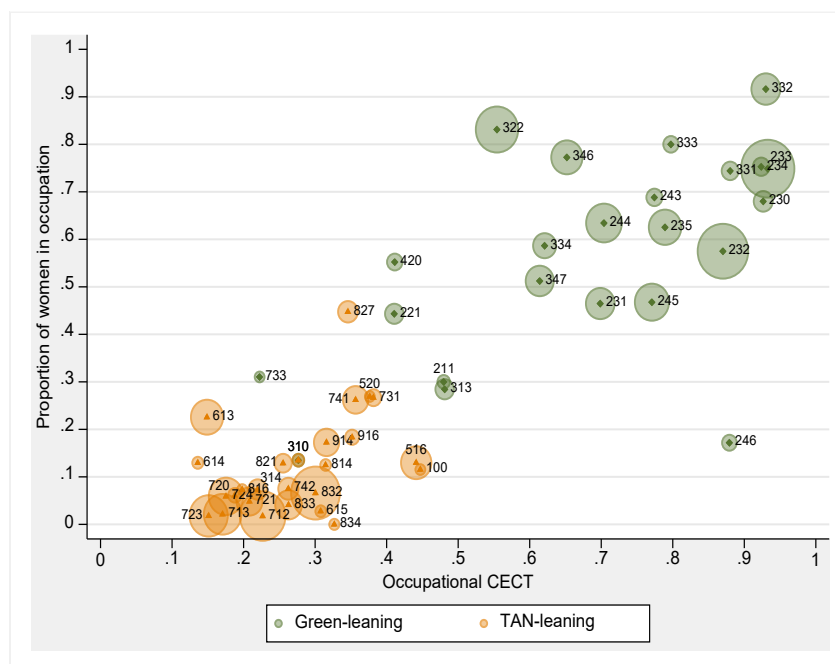
A key implication of the information revolution is that the shift from a society based on brawn to brain offered women the prospect of equal participation. For reasons that reach into gendered socialization, women tend to be overrepresented in educational fields and in occupations most distant from industrial capitalism.

**Figure 2: Individual CECT distribution by sex**



Note: European Social Survey, countries in which respondents are offered a TAN or Green party (2004-2008). This figure plots the distribution of individual CECT by sex; N=36927.

**Figure 3: Sex composition of TAN- and green-leaning occupational CECT clusters**



Note: European Social Survey, countries in which respondents are offered a TAN or Green party (2004-2008). This figure plots green-leaning and TAN-leaning occupations by occupational CECT against the proportion of women in the occupation; N=4935.

The violin plot in Figure 2 shows that women have, on average, much higher CECT scores than men: 0.53 against 0.34. Figure 3 plots the proportion of women in a green- or TAN-leaning occupation (Y-axis) against their average CECT (X-axis) and finds that green and TAN-leaning occupations differ sharply in their sexual composition. On average, 64.1% of employees in green-leaning occupations are women compared to 9.3% in TAN-leaning occupations.

## General results on educational field and occupational CECT

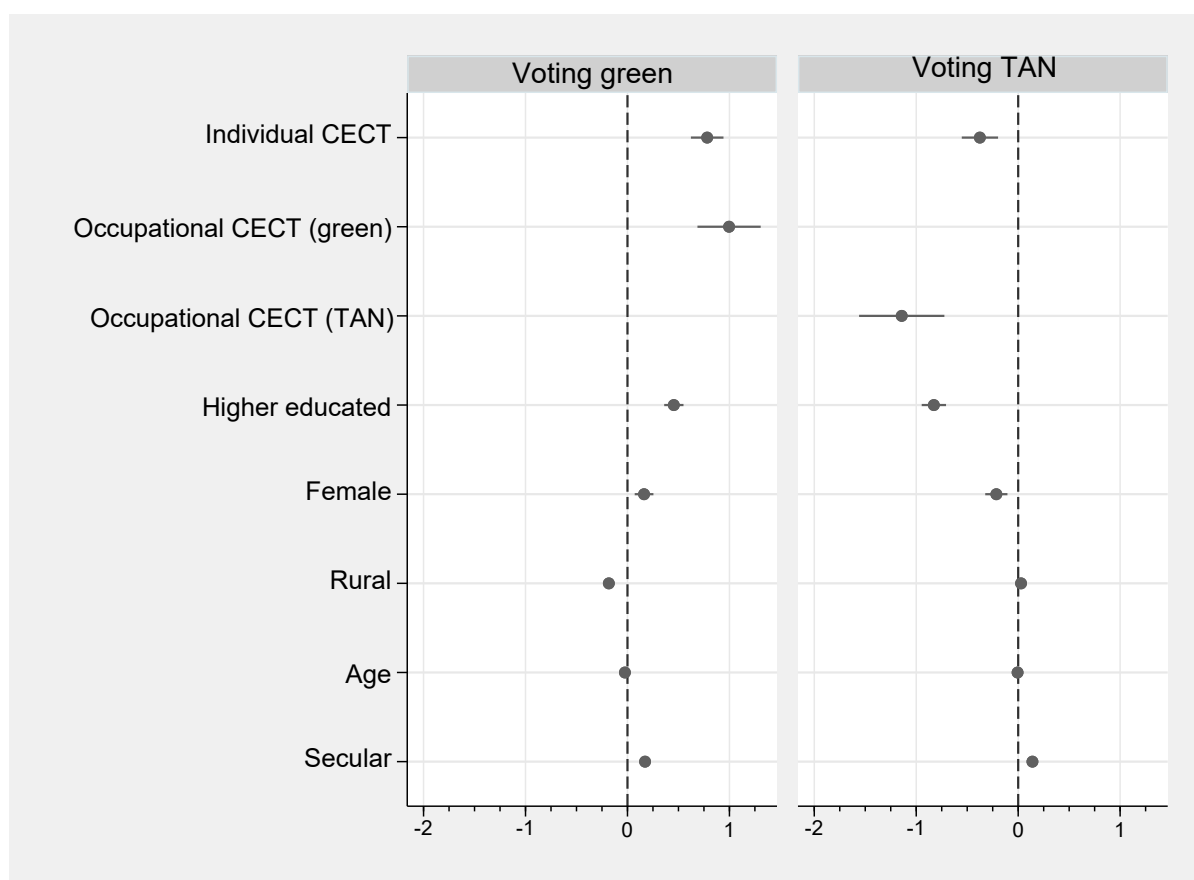
We now evaluate our expectations on how field of study and the CECT content of an occupation sort individuals into Green and TAN voting.

The conventional finding in the literature is that those with post-secondary education form the core of green parties and those with only secondary education form the core of TAN parties. We theorize that *the field* in which a person is educated explains more precisely which individuals sort on the transnational cleavage. In particular, we expect CECT to be aligned with green and TAN voting (H1). We also expect occupational CECT to have a partisan effect (H2).

Figure 4 plots the coefficients of our baseline model with individual CECT, occupational CECT, and level of education. Field of education—at the individual level and as a feature of a person's occupation – is a strong predictor of green voting. A two-standard deviation shift (0.61 on a 0-1 scale) on individual CECT – from engineering to personal care, for example— increases the probability of voting green by 2.2 (plus/minus 0.3) percentage points keeping all other variables at their mean. The CECT content of the occupation has also a substantial effect: a two-standard deviation increase in occupational CECT adds 1.8 percent (plus/minus 0.5) to the probability of voting green.

H1 and H2 find also support for TAN voting, though the effect of CECT is weaker: a reduction of 0.8 percent for individual CECT and of 1.2 percent for occupational CECT. The chief driver on the TAN side is whether someone has completed post-secondary education. The probability of a person without post-secondary education to vote TAN is 3 percent higher than for someone with a post-secondary diploma. For voting green, that difference is 2.3%.

**Figure 4 - Education and voting: the effect of individual field of study, field content of the occupation, and level of education**



Note: Multilevel mixed-effects logistic with oim clustering by country and ISCO-3 occupational categories. ESS data for 2004-2008. Occupational CECT (green) averages the individual CECT by occupation aggregated across the 11 countries with a green party; occupational CECT (TAN) does the same across the 10 countries with a TAN party. The results are similar when occupational CECT is aggregated across the 13 countries with a green or TAN party.

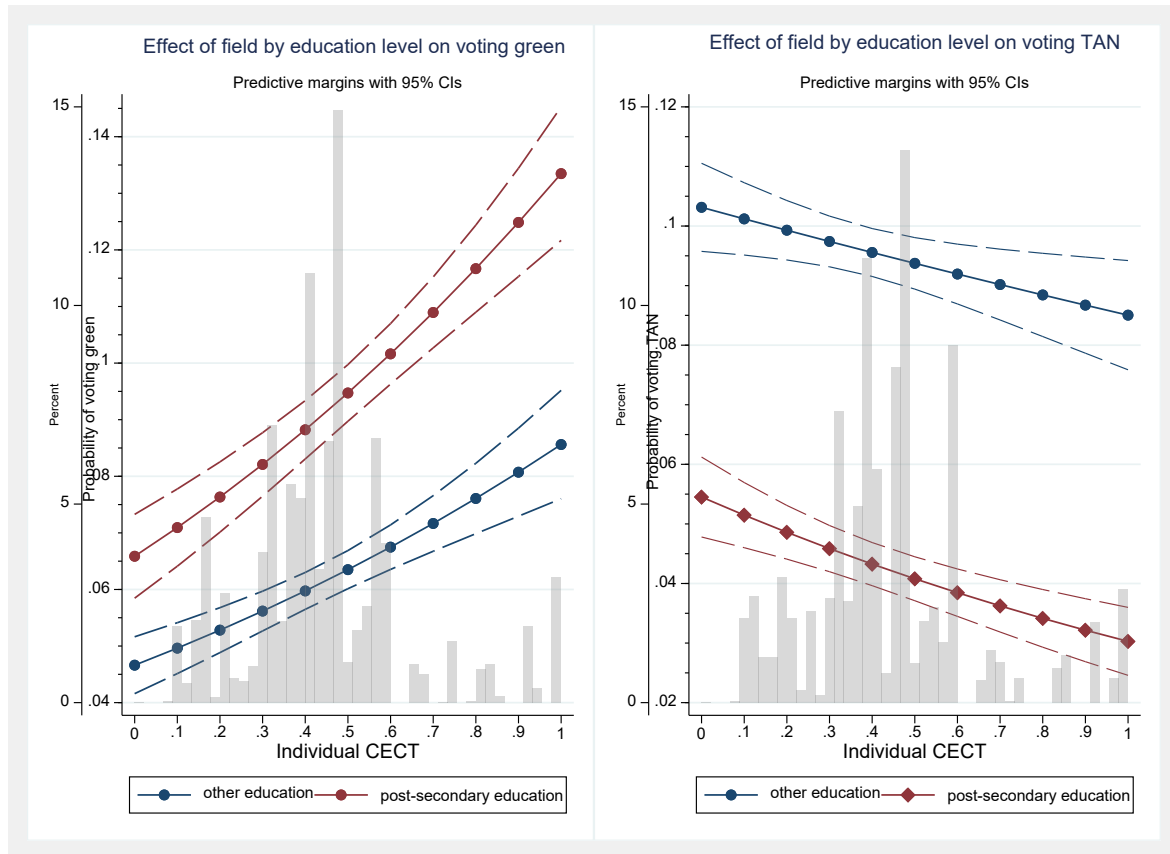
### Potential confounders: educational level and compositional effect

We next take a closer look at two potential confounders. The first is that *field* of education may merely reflect the *level* of education because the incidence of postsecondary education is unevenly distributed across fields of study. For example, nearly 70% of individuals tapping humanities as their specialization have a post-secondary degree, but only 26.5 percent of those specializing in agriculture do. If field were a stand-in for level of education the effect of individual CECT should wash out in an interaction. Figure 5 indicates this is not the case. For both green voting (left panel) and TAN voting (right panel), the effect of individual CECT is significant *among* lower educated and *among* higher educated. Moreover, individual CECT is more discriminating for higher educated than lower educated.

For example, the probability of voting green for someone with a postsecondary degree in social studies (CECT=0.86) is 12.2% (+/-0.8%) against 6.8% (+/-0.3%) for a postsecondary engineer (CECT=0.03). The difference is less steep for TAN voting where higher education biases heavily against, but it is still significant: a social studies person without a postsecondary diploma has a 3.3% (+/-0.5%) probability of voting TAN against 5.3% (+/-0.6%) for someone

without postsecondary education in engineering. Hence the effect of field of education works within as well as between levels of education.

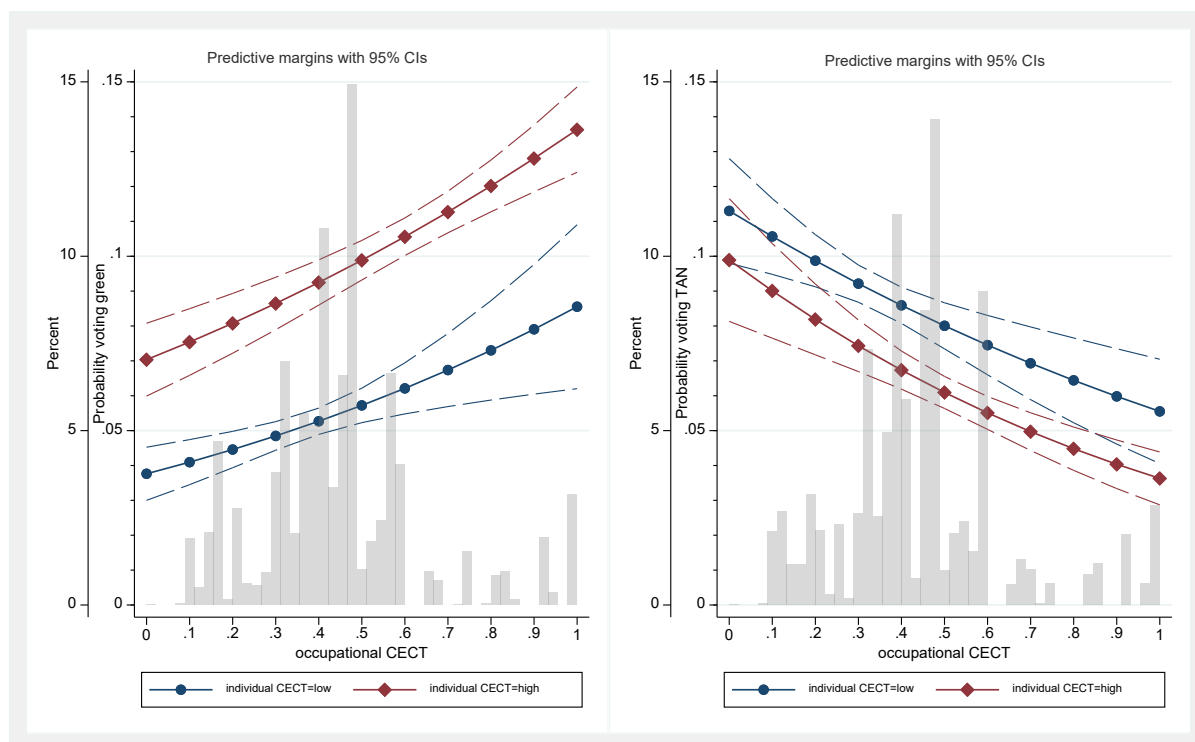
**Figure 5: The effect of field of education among higher and lower educated**



Note: Multilevel mixed-effects logistic with oim clustering by country and ISCO-3 occupational categories, with controls for occupational CECT, gender, age, rural, secularism, time and country. ESS data for 2004-2008.

A second issue concerns the veracity of the contextual effect of CECT in the workplace. Is this a true effect or a compositional effect, an artefact of how individuals with similar CECT cluster in occupations? What speaks against the compositional hypothesis is the rather large average variation in CECT within ISCO-3 categories (0.31), though variation is somewhat lower in GAL-leaning and TAN-leaning occupations (0.26 and 0.25). To assess this more rigorously, Figure 6 plots the interaction between individual CECT and occupational CECT.

**Figure 6: The effect of occupational field among individuals with low and high CECT**



Note: Multilevel mixed-effects logistic with oim clustering by country and ISCO-3 occupational categories, with controls for level of education, gender, age, rural, secularism, time and country. ESS data for 2004-2008. Low individual CECT (<0.04): agriculture/forestry, transport, or technical and engineering (20% of the sample); high individual CECT (>0.86): social studies, humanities, arts, teacher training (12% of the sample).

This figure is suggestive of a contextual effect beyond the individual effect of educational field. For example, a technician (low individual CECT) working among teachers (occupational CECT=0.9) has a 7.9% (+/-1.8%) probability of voting green while that probability is just 4.3% (+/-0.5) if the technician works with blacksmiths or in construction (occupational CECT=0.15), and this 3.6% voting gap is statistically significant at the 0.001 level.<sup>9</sup> The effect of occupational context is slightly more pronounced for voting TAN with a voting gap of 4% for that same technician in teaching versus construction.

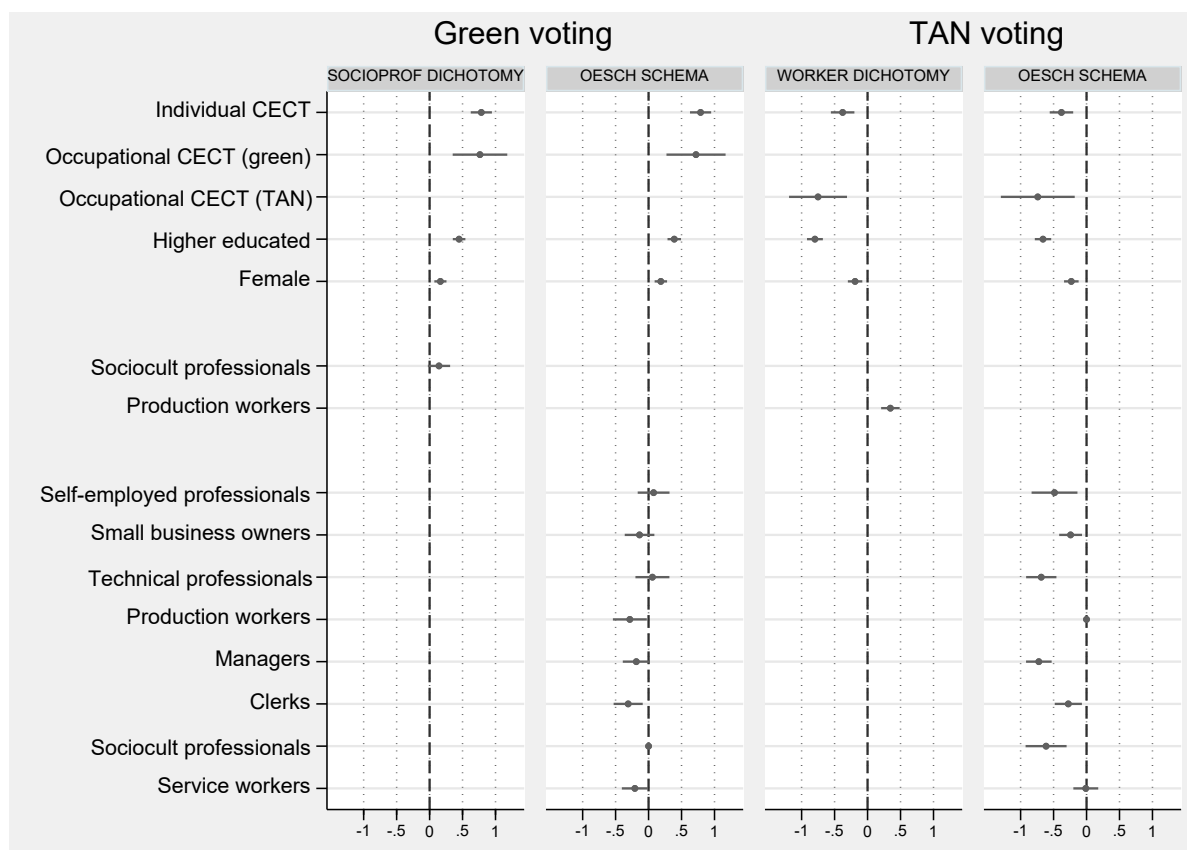
<sup>9</sup> The probability of voting green for high-CECT individuals is equally sensitive to the CECT content of the occupation. A social scientist working in teaching has a probability of 12.4% (+/-0.8%) and just 7.8% (+/-0.9%) in construction.

## Field logic and occupational logic

Our argument about educational field differs quite radically from the conventional argument as epitomized by Daniel Oesch's occupational schema. An occupational explanation emphasizes on-the-job features: the nature of employment relations and work logic (Kitschelt and Rehm 2014; Oesch 2006; Oesch and Rennwald 2018). This field or CECT explanation highlights a knowledge and skills base that distances a person from industrial capitalism and that is acquired *prior to job market entry*. While we do not rule out additional on-the-job socialization, we suspect, consistent with extant research, that the weightier links in the causal chain are forged earlier in life including in how a person chooses her field of study consistent with their prior values, their gender, the position and values of their parents, and those of their social circles (Carlana and Corno 2021; Kunst 2022). If so, one can say that the transnational cleavage involves educational and occupational decisions that themselves express life-long characteristics.

Models that include occupation as dichotomy or using the eight-category Oesch schema confirm that field of education, while more distal in the causal chain, is a more powerful predictor than occupation. This effect is greatest for green voting (panels on the left).

**Figure 7: Field of education, occupation and voting**



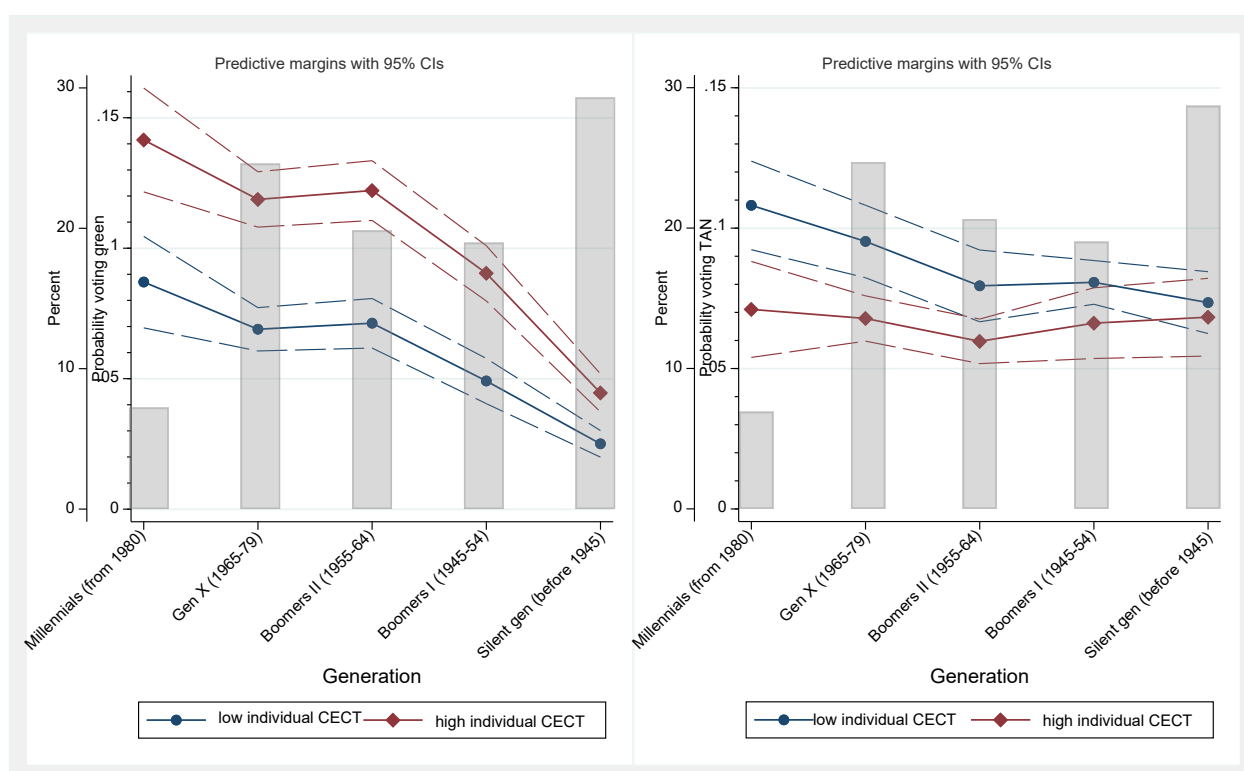
Note: Multilevel mixed-effects logistic with oim clustering by country and ISCO-3 occupational categories, with controls for age, rural, secularism, time and country not shown. ESS data for 2004-2008. The left two panels show coefficients for models explaining green voting including the dichotomous variable sociocultural professionals or eight Oesch categories. The right two panels show coefficients for models explaining TAN voting including the dichotomous variable production workers or eight Oesch categories.

## CECT across generations

Our argument roots the transnational cleavage in the information revolution, beginning in the 1960s and picking up steam as education expanded in the following decades. Hence field or level of education should be more discriminating for green or TAN voting with cohorts that came of age once the constraints on people's life chances became tangible.

Figure 8 displays the effect of field of education for respective generations on green and TAN voting. Indeed, the gap in the probability of voting green between those with low CECT or high CECT sharply widens for those coming of age during the information revolution: from just 1.9% for the silent generation born before 1945 to 4.1% rising to 5.4% for the next four generations. Unsurprisingly, the patterns are more subtle on the TAN side because the level of education is more powerful than the specialization, at least for those who did not complete postsecondary education. Still, here too the gap between those with low and high CECT widens for younger generations. The divergence materializes a solid decade later, with the Boomers II generation that came of age in the 1980s (2%). This timing is consistent with the onset of transnationalism, and it has been rising to 3.4% among Millennials. In all, these results appear consistent with a cleavage perspective.

**Figure 8: The effect of field of education by generation**



Note: Multilevel mixed-effects logistic with oim clustering by country and ISCO-3 occupational categories, with controls for occupational CECT, level of education, gender, rural, secularism, time and country. ESS data for 2004-2008. The panels show the effect of individual CECT (low<0.04; high>0.86) by generation on voting green (left) and TAN (right). We adopt the conventional generational definitions (Pew 2019): Silent or pre-war generation (born before 1945), Boomers I generation (born between 1945 and 1954), Boomers II generation (1955 and 1964), Generation X (1965-1979), and Millennials (born from 1980).

## Conclusion

This paper takes a micro approach to uncovering the social bases of voting on the transnational cleavage. Broad occupational and educational categories serve as first approximations, but to assess how a person's education, occupation, and sex ground the divide between Green and TAN parties we need to zoom in. We do this by theorizing the grievances that arose in successive phases of the information revolution and matching these to specific groups.

Cleavage theory suggests that democratic conflict cannot be reduced to competition among policy prescriptions. It is about how people lead their lives and how they think they ought to be able to lead their lives. It is about who they feel they are, and who they are not. These feelings have implications for policy, and policy preferences are aligned with voting, but the causality lies deeper.

A breach in the society emerged between those with and those without post-secondary education. However, the main effect of education is related to its content, rather than its extent. Education is the process of acquiring particular knowledge and skills, and the more a person is educated, the greater the specialization. So much so, that post-secondary education (and in many countries, the final phase of secondary education) is field-specific. We find that a person's field of study is as decisive for a person's life chances, and ultimately, their partisanship, as the sheer fact that they have had post-secondary education.

The groups we identify—educated women in the humanities and social sciences, scientists, designers, and teachers, on the one side, and male dominated groups of semi-skilled machine workers, security workers, and extraction workers on the other— are socially rooted. Their life chances are built into ascriptions and choices that are difficult to change over the course of a lifetime. The social characteristics that divide them are highly consequential but, once in place, only weakly volitional. This is consistent with the idea that the transnational conflict is a cleavage. It is durable, not ephemeral.

Gender differences overarch the groups we identify. The information revolution has undermined traditional gender stereotypes. It has shaken the patriarchal presumption of privilege in the workplace, in the family, and in the wider society. It has offered women the prospect of social, economic and political equality while magnifying the distance between the ideal and the reality. Women in knowledge-intensive occupations were decisive in the rise of Green political parties. Men in occupations vulnerable to the economic and cultural consequences of the information revolution are the core of TAN political parties.

It is worth emphasizing that there is nothing intrinsic in the political affinities of those educated in different fields, just as there is nothing in the sexual orientation of a person that is inherently GAL or TAN. By creating a knowledge society that both liberated and suppressed women, the information revolution predisposed educated women to reassess their gender role in their jobs and at home. The vast increase in tertiary education encompassed fields that are detached from business, wary of market externalities, and critical of the status quo.

Each of the major party families – regionalist, Christian democratic, liberal, and socialist— originated in socially rooted grievances following a major social transformation. The result for European party systems was a sequential pattern of cleavages that structured political conflict over an extended time—so extended, in fact, that it could explain party competition right up to the 1960s when Lipset and Rokkan were writing their influential article. If, through the course of democratic compromise, grievances arising from the information revolution were to soften, we might then see the transnational cleavage follow the course of the class cleavage: expressed



in policy differences among political parties with indistinct social bases. If so, the transnational cleavage would merely be the most recent of an ongoing series of socially rooted conflicts.

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