

What climbing means... The diversity of sport climbers in 2020

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Abstract

This article paints a portrait of sport climbing practitioners at a time when the discipline has gained recognition through its very first Olympic participation; simultaneously the sport climbing audience has seen relatively strong growth with the increased number of private commercial climbing gyms. The typology presented is based on a survey of over 11,000 practitioners from around one hundred countries, including some in Europe and North America. This research highlights the diversification of practice modes and audiences resulting from the sportivization of free climbing, which broke away from mountaineering in the 1960s in the United States, and subsequently in the 1970s in France and the rest of Europe. On a larger scale, the study sheds light on the effects of commercial dynamics on the transformation of sporting activities.

Keywords: Sport climbing – outdoor sport- sports participation survey

Abstract

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Introduction

In 2016, the International Olympic Committee included sport climbing in the 2021 Tokyo Games and the 2024 Paris Games. This Olympic participation has resulted in the sportivization of rock climbing, which began some 50 years ago. Combining the artificialization of climbing surfaces with commercialization, artificial climbing gyms, whether private or commercial, have progressively developed throughout the world to generate what could be called the “indoorization” of climbing. Starting in the 1990s, indoorization took off after 2005, bringing about a considerable and rapid increase in sport climbing audiences. Despite the recent Olympic acknowledgement and fast growth, as well as existing studies, the climbers remain little known, especially at international level. As the stakes surrounding this sporting discipline rise, this study addresses the relative lack of knowledge by means of a quantitative (n=11,562) international survey conducted in 2020. Using geometric statistical analysis tools (Le Roux & Rouanet, 2005; Lebaron & Le Roux, 2015) the research seeks to identify the types of climbers forming a space of practice styles. This space has emerged from the sportivization of climbing, which has taken form as a more fundamental division of social labor (Durkheim, 1964 [1893] 2013). Eventually, what was only one mode of practice became a "center of gravity" in a "system of distinctive signs" (Bourdieu, 1984).

Furthermore, the use of geometric statistical tools has allowed for the identification of the major oppositions that structure the space of climbers. The first opposition is the almost obvious one between indoor and outdoor climbing. The second is the relationship to risk, ranging from the most committed participants and technological climbing modes to those who refuse to take risks or manage them by refusing the mediation of protective material (e.g., ropes, anchors, belay devices). Finally, this investigation presents the driving forces behind

the upheaval of climbing practice styles generated by their sportivization and especially indoorization.

1. Diversity and diversification of climbing forms

Before taking the reader deeper into the field of climbing, the diversification of modes throughout the history of rock climbing will be described; these explain the above-mentioned structures, which will be highlighted below. First, this process has meant the diversification of surfaces. Rock was initially a surface amid the snow and ice encountered by mountaineers at a time when the high mountains were the legitimate place for the activity. Climbing places, outside mountain terrain, were then sites of preparation, whether they were cliffs on which one progressed roped up, or boulders whose low height did not require the use of belaying equipment. Gradually, crag climbing, and bouldering found an end in themselves. Some climbers have specialized on these terrains since the 1950s in the UK, the USA (Taylor, 2010), and since the 1970s in continental Europe (Thompson, 2012; Wilson, 1998).

Artificial climbing structures were developed from the 1980s, offering an alternative to outdoor sites and making the activity accessible in towns and regions without rocky outcrops. Diversification also concerns the use of means of protection. Depending on the area, climbing communities throughout history have allowed the use of removable or permanent anchors, such as pitons or bolts implanted by drilling. Some climbing communities, for example in England, have long made it a principle to exclusively use removable anchors, called chocks or cams (metal pieces stuck in cracks connected to the rope with a sling and a carabiner). The installation of a piton then was out of favor. Gradually, however, climbing on cliffs equipped with permanent anchors became the dominant form, under the name of sport climbing, from the early 1980s in both Europe and the United States. Climbers specialized in climbing on chocks, a practice that is known as traditional or "trad" climbing (Bogardus, 2012). Beyond the nature of the anchors, what matters is whether they are used for progression. In "free

climbing”, the climber refrains from using anchors and other pieces of equipment to progress, using only rock holds. Some climbers, on the other hand, make a speciality of “artificial climbing” by progressing with only artificial means, using removable or fixed anchors. Most often this is practiced when “free” progression is deemed objectively impossible.

The picture would not be complete without a description of modes of performance. For most climbers, the search for the highest difficulty for themselves or in the absolute is what gives meaning to their practice. Hence, a climber’s level is measured by the ascent of routes, or boulders which are characterized by their level of difficulty, measured by a grading scale specific to each country or area. In Europe, level is mainly measured on a grading scale of 2 to 9c. The major subdivisions are made using a number and a letter (a, b, c), followed by “+”, to establish a difference between 8b and 8b+, for example. The most difficult routes in the world are rated 9c. Such performances can be accomplished either in official competitions or freely within groups of peers who can, if necessary, attest to the achievement.

2. Observing the sociodemographic consequences of the sportivization of climbing

In addition to providing this background, which should familiarize the reader with technical terms related to climbing, this paper seeks to depict the logics at work in the development of the said climbing styles’ diversification and its adoption by climbers. The study comes almost thirty years after Jean Corneloup (1993) described climbing styles in the forest of Fontainebleau (France) and twenty after Brice Lefèvre’s survey (2002) in the Mont-Blanc massif, providing a view of international participants in high-altitude activities. In the United States, Taylor (2010) took a historical perspective to identify the successive emergence of types of climbers with increasingly performance-focused styles. Other authors (e.g., Author, 2002) have endeavored to show the diversification of modes of practice through sportivization and the wider range of practice styles. The process of sportivization appears cumulative since

it has left a trail of modes that have become increasingly closer to the dominant sporting model. The present publication is thus an extension of these studies, especially in the identification of the sportivization process which underpins its theoretical hypotheses.

In the 1960s in the United States (Taylor, 2010), and then in the 1970s in Europe (Thompson, 2012; Wilson, 1998), rock climbing outside mountain areas broke away from mountaineering when what was known as the “free climbing” technique became the legitimate way to climb. This technique, which forbids the use of artificial means of progression, put climbers on an equal footing and therefore made their performance comparable. As equality via established rules during a contest defines a sport (Guttman, 1978), the “free” rule was an evolution which made rock climbing sport-based (Author, 2005). This process of differentiation was not specific to climbing but was rather a fundamental spring for the evolution of society, as Pierre Bourdieu points out: *“The evolution of societies tends to make universes (which I call fields) emerge which are autonomous and have their own laws.”* (Bourdieu, 1998, p. 83)

This new legitimate free climbing evolved in the late 1970s, becoming closer to the dominant sporting model by virtue of its institutionalization, commercialization, and rationalization. The advent of free climbing with shared regulations was the first step of institutionalization. The second consisted in official competitions in the late 1990s. The third step was the creation, in 2007, of a supranational institution, the International Federation of Sport Climbing (IFSC). This governing body is mainly dedicated to organizing the international competition circuit. The institutionalization of climbing was completed with its inclusion, in 2013, in the 2021 Tokyo Games (Batuev & Robinson, 2019).

Commercialization is the second dimension of climbing sportivization, despite climbers’ initial denegation of economic considerations (Author, 2004). A specific industry was created with manufacturers of clothing and shoes, equipment, artificial climbing walls,

and private commercial climbing gyms. This climbing market intensified when industrial climbing gym chains appeared (e.g., Planet Granit & Earth Trek, Central Rock, and Touchtone in the USA; DAV in Germany; Climb Up, and Altissimo in France). Climbing brands were bought by the major sportswear companies, like Fiveten, the iconic US climbing shoe company taken over by Adidas in 2011. The interaction between these brands and the media has allowed the most high-performance climbers to turn professional (Author, 2004; Dumont, 2018; Thorpe & Dumont, 2019). Furthermore, an economy is developing in climbing spots where the sport has a positive financial impact (Bailey & Hungenberg, 2020; Maples et al., 2017).

The third dimension of sportivization is the abstraction of techniques and climbing surfaces. Sporting practices most often have their origins in elementary actions (running, jumping, throwing, climbing) carried out around natural environments or features (ditches, hedges, rivers, mountains/cliffs). The formalization of such practices as sports has consisted in an artificialization of the features and a “rationalization” (Weber, 1978) of specific, efficient training body techniques. The ditch becomes a jumping pit for long jump, just as the cliff leads to the creation of the artificial climbing wall. While the first experiments date from at least the 1970s, artificial climbing structures were mass produced by specialist manufacturers in the 1980s. In the early days, the reproduction of rock textures and shapes, holds and walls tended towards simplification, ergonomics, and decodability. This made the manufacturing processes more profitable as the activity became more accessible to beginners and more predictable for competitors.

The artificialization of climbing surfaces was more than rationalization. Whereas climbing was previously dependent on the presence of rocky outcrops, it could now be organized anywhere with an artificial wall. Combined with commercialization, artificialization thus paved the way for the massification of climbing, with private commercial

climbing gyms seeing spectacular growth. According to the available databases (Author, 2018), between 70 and 82% of the commercial climbing gyms of over 500m² created since 1992 were set up between 2005 and 2018. In Germany, 82% of the 208 commercial gyms existing in 2017 were set up after 2005; the same ratio is 70% in the United States; and 75% in France. In China, 67% of the 250 commercial gyms were created after 2014.

Our hypothesis is that this sportivization process is a cumulative movement that leaves in its trail modalities comprised of practice styles which are increasingly similar to the dominant sport model. They are defined not only in themselves but also, and above all, “in relation to each other by a system of differences”, as identified by Bourdieu (1984) in the more general case of lifestyles. The observation of this diversification/sportivization inevitably raises the question of its cause. For that, it is necessary to consider that, in climbing, it is the form taken by the fundamental "division of labor in society" (Durkheim 1893, 2013) or the fundamental process whereby "the social world is the site of progressive differentiation." (Bourdieu, 1998, p. 83). Durkheim essentially identified this process in the economic field or professional groups, while Pierre Bourdieu (1996) demonstrated it in the fields of cultural production. The analyses of Durkheim and Bourdieu are interesting for us to understand what generates this process of differentiation. For Durkheim, increases in the division of labor are caused by the morphological change (Durkheim, 1964 [1893]; Halbwachs, 1970), whether quantitative or qualitative, of populations. To avoid competition they are unable to sustain, new entrants specialize in one modality of practice among others. They thus find "a market adapted to their products"(Durkheim, 1964 [1893]) when talking about an economic activity and a profession, or an activity "to their taste" in the sense of Pierre Bourdieu. Their "dispositions" allow them to appreciate the activity positively, especially but not exclusively when they can express themselves in it with a certain degree of success thanks to their properties, in this case corporal and cultural (Bourdieu, 2010). Young climbers' specialization in non-mountain rock

climbing—in Continental Europe in the 1970s and, by the same token, the definition of legitimate ways of climbing, i.e., the free climbing rule, are examples of this movement. It has been shown (Aubel, 2005) that the latter was the result of morphological changes in the alpinist population, itself a product of the growth of the middle class and the rejuvenation of France in the seventies (Castel, 1998). Many of the young climbers of the 1970s converted on account of the difficulties they encountered in high mountain areas and in establishing themselves within the mountaineering community (Aubel, 2005). In this way, these "revolutionary" free climbers creating their own style allowed new climbers who would not have practiced traditional mountaineering to do so. While the link between the advent of free climbing and the climbing population's morphological change has already been demonstrated, we know little about the consequences of more recent movements like the significant increase in the number of private commercial gyms since 2005. 75% of gyms in the US were created after 2005, 70% in France and 82% in Germany. This trend was even stronger in Asia, and particularly in China (Rahikainen, 2020). We know that according to these private commercial gyms, 30 to 40% of their new clients are non-climbers. This is especially true in geographical areas that are far from any rock outcrop (Aubel, 2019). Consequently, a new, particularly consequential morphological change in the population of may be envisaged.

More broadly, considering the sportivization/diversification of climbing styles in light of the theory of the division of social labor and that of progressive differentiation, and establishing a typology of climbers, allows the hypothesis that a structured space should be observed through the major oppositions existing between specializations/practice styles.

2. Method

2.1. A substantial international survey of climbers

General population surveys have not been sufficiently extensive to go beyond merely counting the number of climbers. Even an investigation such as that financed by the European Commission, the 2019 Eurobarometer on Sport and Physical Activity, fails to provide a list of the activities practiced by Europeans. In France and the United States, two studies on participation in outdoor activities present a more fine-grained description. In France, “Le baromètre des sports de nature 2016” (Nature Sport Barometer) counted and distinguished among all outdoor activities not only exclusively indoor climbers from outdoor ones, but also those who practiced both inside and outside (table 1.). As for the American equivalent, the Outdoor Foundation Survey, published under the title "Outdoor Recreation Participation Report 2019", it is more detailed and makes a distinction between indoor climbing, outdoor climbing, and alpine practices, although it is not possible to know if the figures given are mutually exclusive. This study enables the progression of these modes to be measured, i.e., 67,000 new indoor climbers annually and 95,000 outdoor ones between 2017 and 2018. Yet, and understandably since this is not its aim, the American investigation does not look at the climbing population with a view to drawing up a typology. Such an operation would, moreover, be of limited scope since, even if the three categories (indoor, outdoor, alpine) were mutually exclusive, climbers represent only 3.2 % of the sample, in other words about 642 people.

Table 1.

In addition to these general population surveys, some surveys have been conducted for marketing purposes by the sector's industrialists. The survey of the American Climbing Wall Association (Carter & Allured, 2022), which recurrently interviews climbers in gyms run by its members, is one example.

Faced with the restricted nature of the available studies, created partly by the difficulty and lack of interest in surveying this population, or market interest in maintaining the scarcity

of information, the publication of the present widescale study will make a useful contribution to knowledge on climbing publics.

In this study, variables have been used which describe the practices and sociodemographic characteristics of the respondents. The online survey collected 12,565 responses from 104 countries between November 2019 and January 2020. 11,562 of the questionnaires could be used. Conducted initially for marketing purposes, this survey was implemented in cooperation with the Italian company Vertical Life, in five languages: English, German, Spanish, Italian, and French. With 61 questions, it was divided into six blocks: socio-demographic, modes of practice, consumption and travels habits, media use, values, and ethical positions. According to the more restricted and sociological object of our study, namely to establish a typology of practice styles, we have retained only 32 of these 61 questions concerning socio-demographic characteristics, practice modes. We have retained here only the objectified information, i.e., the descriptions of practices or properties and not the descriptions of attitude or preference. The latter could be the subject of future publications. The survey was carried out on the anonymized Vertical Life database (n= 250,000) by virtue of its involvement in managing climbing gyms and publishing cliff guidebooks for outdoor climbers, as well as maintaining a reference site for climbers' outdoor performances and organizing international competitions. The survey was promoted through the company's partners in 23 countries, including commercial climbing gyms, national and international federations (IFSC), and social networks to reach more climbers outside the Vertical Life database. For contacts from the VL database or survey respondents from other networks, we have neither the exhaustive list of climbers that would have allowed for random sampling, nor the demographic variables of age and gender characteristics required to construct a quota sample (Aubel & Lefèvre, 2015). However, the representativeness of the

survey was tested and validated a posteriori by comparison with national surveys, which we will report on in the results section.

2.2. Typology produced by a three-stage geometric analysis of data

The objective was to show the structure of climbing populations. The essential aim was to produce a typology of climbers and provide a description of the identified profiles, both separately and in relation to each other. A relational definition of practice types corresponds to the idea that social identity is constructed and asserted in difference, in other words in relation to who we are, but also and more especially, to who we are not (Bourdieu, 2010). The relevant statistical methods for modeling the structure of a population related to a particular social question, here the practice styles of a sporting activity, is the geometric statistical model. It models the population, reported by using the variables of the questionnaire in the form of multidimensional point clouds from an individual x variables database to provide the most adjusted representation (Le Roux & Rouanet, 2005; Lebaron & Le Roux, 2015). The reader unfamiliar with quantitative methods may picture the responses to the various questions as points forming a cloud, like a storm cloud. The analysis describes the shape of this cloud by identifying the internal lines of the structure. The longest lines are the dimensions that represent most of this shape. Identifying the said lines is the objective of the first phase of this analysis.

The methodological procedure consisted of three stages: multiple correspondence analysis (MCA); hierarchical ascendant classification (HAC) to identify the relevant division of practitioners into “clusters” or “practice styles”; and description of the latter by establishing a “mode profile”.

In the first stage, the qualitative nature of the variables led to identifying the most structuring dimensions of the dataset through a multiple correspondence analysis (MCA)

(Greenacre & Blasius, 2006) in three steps. The first step identified the relevant dimensions. The second involved pinpointing the contribution of the different variables chosen to construct the analysis. The third analyzed the contribution of these variables in the definition of the different dimensions.

The second stage entailed hierarchical ascendant classification (HAC) (Benzecri, 1992) based on the relevant MCA factors, which allowed for a more detailed description of the “cloud” structure by isolating practitioner types.

In the third stage, based on the typology, a “mode profile” was established, describing each identified type according to certain useful variables. During this stage, Yule Q’s calculation (Bonett & Price, 2007) was systematically used to demonstrate both the correlation and its direction (attraction or repulsion between modes), as well as its strength (a significance threshold was established at 10%). Using this index, centered on 0 and ranging from minus 100% to 100%, demonstrates how people may be “classified according to our tastes and distastes” (Bourdieu, 2010). Applying this index at the end of a factor analysis coupled with classification thus corresponds to the spirit in which Bourdieu used this “relational procedure whose philosophy fully expresses what makes social reality” (Lebaron & Le Roux, 2015).

2.3 Selection of the active variables for MCA

The results produced by the MCA combined with HAC are essentially dependent on active variables, i.e., those which are hypothesized to structure the point cloud formed from the various responses. It clearly appears that this statistical work is indissociable from the modeling of the sociologist, who determines the choice of active variables by means of these hypotheses. In this study, five active variables were used: (1) number of years of practice; (2)

main indoor activity; (3) main outdoor activity; (4) outdoor climbing frequency; and (5) all-season outdoor practice.

Variable (1), number of years of practice, was chosen considering the hypothesis that the sportivization underway from 1970 to 2020 gathered climber types whose practice modes were representative of the beginning of this activity. Those having climbed the longest should, therefore, be closest to the early period of free and sport climbing, while later arrivals would have made their debut on artificial climbing facilities, or even focused exclusively on indoor climbing.

Choosing the main indoor (2) and outdoor (3) activities as active variables fulfilled two functions. The first was to observe the specialization of climbers in the various modes. The second, if the response was “no” to main indoor or outdoor activity, was to observe the existence of a solely indoor practice. When respondents said they had no outdoor activity (answering “no” as opposed to not answering), this clearly pointed to an exclusively indoor climber.

Variable (4), outdoor practice frequency, traditionally divides sports participants in general population surveys (Aubel & Lefèvre, 2015). Those practicing at least one time a week are known as the “hardcore” of sports practitioners. A priori, this weekly practice frequency was expected to be an indicator of committed outdoor climbing.

Variable (5) concerning the practice or not of outdoor climbing in all seasons completed the indicators of a potential indoor or outdoor specialization.

The data was processed using R 3.6.3 software, and specifically FactoMineR packages (Husson et al., 2008) for MCA and HAC. The mode profiles were determined with the Rcmdr plug-in pointG, allowing for the implementation of Yule’s Q (Champely et al., 2012).

3. Results

3.1 Global sociodemographic description of the climbing population

The first striking result is the relative masculinity of the climbing community, even if the group considered to be growing the most, given its link to the rapid increase in climbing gyms, is marked by feminization. In our sample, 23.7% of women and 76.3 % of men answered the question about their gender (the non-response rate was 21%). Considering this female/male ratio is a way to test our sample representativeness. In comparison, for example, the Climbing Wall Association (CWA) survey conducted in 2019 on 12,000 clients of climbing gyms in the USA and Canada established a ratio of 56% men to 44% women (Carter & Allured, 2022). Although different from our own global and international (our scope is 104 countries) result, we nonetheless obtained the same figures as our Americans respondents: 44%/56%. Yet variations are significant from one country to another. In France, for example, the ratio is 23% women to 77% men. It is 28% for 72% among British climbers. Other points of comparison exist, such as those established by the Deutscher Alpenverein, whose members are 33% women. The German Alpine Club, besides being the hegemonic actor in terms of commercial indoor climbing structures in Germany, also deploys its activities outdoors. In fact, it can be considered that it is established on a perimeter comparable to ours, a description of indoor and outdoor climbers.

Concerning the respondents' age, the average is 33; the median age 31, and 62% of the population interviewed are between 25 and 44 years of age. A comparison of the respondents' age with that of the population of OECD¹ member countries or the self-declared sportspeople in the European Commission's Eurobarometer of Sport and Physical Activity (which describes sports participation in all outdoor and non-outdoor activities) reveals the relatively young age of climbers (Table 2.). By way of example, the present survey's modal class, namely the 25-34 age group, represents 40% of the total participants, whereas this age group accounts for only 16% of OECD's population and 18% of self-declared sports people in the

above-mentioned Eurobarometer. On the other hand, the over 45s, who account for 17% of our sample, represent 52% of the OECD and 45% of the Eurobarometer's sportspeople. We can add that the age distribution of our respondents is highly comparable to that obtained by Carter and Allured (2022) in the USA and Canada. This may also be an indication of the relative representativeness of our survey, but also of that of these two authors.

Table 2.

A study of the social position, expressed here by level of education, profession, and income, shows that, in this respect, the climbing population has not changed much compared to that reported by former surveys (Lefèvre, 2002). The vast majority of the climbing public have a university/tertiary education (75.1%)(Table 3). Comparison with the total population within the OECD perimeter in 2019 highlights the overrepresentation of the most highly qualified in the category of climbers. The rate of climbers who were higher education qualification holders (levels 5 to 8) was 37.7% in the area covered by the said organization², with 47.2% in Great Britain, 37.9 % in France, 29.9 % in Germany, and 19.6 % in Italy. In the United States and Canada, also included in our sample, the rate was 48.3 and 59.4% respectively.

Table 3.

This observation concerning the cultural profile is reinforced by the professional level. Those who Anglo-Saxon countries identify as professionals and managers represent 39 % of the survey's respondents in employment. Establishing a scope of comparison with other countries based on available statistics is very difficult given the differences in profession titles, data synchronization (2012 for the OECD's most recent data), and choice of countries. Nonetheless, the share of professionals and managers was 24.6% in France in 2012, 22.1% in Germany, 17.2 in Italy, and 34.2 in Great Britain. The relatively high representation of this

category among the sample's climbers in employment can thus be observed here, putting forward the hypothesis of employees and middle management being overrepresented.

Tables 4 and 5

3.2 Diversity of practice styles

3.3 MCA reveals main divisions in terms of practice modes

As explained in the introduction, the objective of this research was to study the diversity of climbers. It sought initially to show how climbers differ according to their practice modes, which have been used as active variables. In the second stage, the different types of climbers characterized by these active variables were isolated in two steps. The first step of this second stage was to identify the different dimensions or factors as aggregate variables expressing the variability of individual standpoints.

The first two MCA dimensions express 27.5% of the total dataset inertia. The first five dimensions express 55.6% of the same (Figure 1). Interpretation of the dataset may be limited to the first two dimensions if the focus is placed on the largest jump in inertia (Cattell, 1966), namely 3% between dimensions 2 and 3.

Figure 1.

Taking account of the correlation ratios makes it possible to assess the strength of the link between the different qualitative active variables and the first two dimensions (Table 6).

Table 6.

The first dimension was structured by the "all-season outdoor" variable, showing if the climbers climb outside during winter, and that of outdoor practice frequency. Contributions (Table 7) are respectively 31.6 and 36.2, while correlation ratios (Table 6) are 0.59 and 0.51. Consideration of the modes of the different variables strengthens opposition analysis

according to the level of engagement in outdoor climbing. The two strongest contributions to structuring the axis are the modes furthest apart in outdoor practice frequency (weekly and annual practice). The next two modes in the hierarchy of contribution are outdoor practice, or not, in all seasons.

Table 7.

The second dimension shows the opposition between bouldering and belayed climbing modes, which expresses the varying level of acceptance vis-à-vis informational and safety requirements. The two variables contributing the most to this second dimension (Table 8) are the self-declared main outdoor activity (contribution = 42.4) and the main indoor activity (47.3), which both describe all outdoor and indoor modalities. For the main outdoor activity, bouldering clearly stands out with a contribution of 32.6 to its variable and the second dimension.

Table 8.

Data visualization of the first two axes (Figure 2), on which not only the previously described active variables but also the supplementary variable modes appear, clearly depicts the oppositions in style. The first difference is that which separates the indoor climber from the outdoor one. The second expresses the distance between climbers on different climbing surfaces, specifically between boulderers (indoor and outdoor) and “cragmen”, or alpinists.

Figure 2.

3.4. HAC and mode profile

The realization of a joint HAC-MCA shows how these first results prefigure the construction of a typology with five categories of climbers, the number being determined based on the principle of inter-cluster inertia gain (Figure 3).

Figure 3.

The dendrogram indicates a dual opposition. The first is the division between climbers practicing predominantly indoors and those who climb outside. The two most distinct categories are indoor beginners, and climbers practicing alpine and traditional modes. The second opposition occurs between climbers according to the varying level of necessary restrictive protection for their physical safety. On the one hand, there are boulderers, who do not use ropes to ensure their safety given the relatively low height of the rocky routes they wish to climb. This does not mean that their practice is less dangerous. On the other are the cragsmen and, to a greater degree, enthusiasts of alpine climbing and of using removeable protection. The latter use ropes and other equipment to ensure their safety in a more complex environment, high-altitude mountains, and cliffs devoid of permanent equipment. Contrary to boulderers, they need to master rope techniques and to find out about the environment.

Based on the five relevant types or clusters identified, the following step was to describe them in the light of the active variables of the MCA and HAC. This identification was completed by determining the profile of the mode corresponding to each cluster. Each cluster is thus described by the HAC and MCA active variables as well as, and especially, by the supplementary variables. There are two groups of supplementary variables: the first concerns the climbing surfaces chosen (e.g., boulder, cliff, mountain) and the choice of particular modes (with or without rope, with removable anchors for so-called traditional climbing). The second group describes the relevant sociodemographic characteristics of the different types.

Table 9

It is important to point out that all the modes of all the variables are not systematically included in these mode profiles (Tables 10-14). The selection was based on two significant criteria: a V. test above 1.96; and a significant Yule's Q of 10% after deducting the error margin (SE(Q)).

3.4.1. The cragsmen

The first type of climbers is cragsmen focusing on outdoor climbing (Table 10) (21% of our sample). They give crag climbing and single pitch (referring to a single rope length) as their main mode, with a focus on outdoor climbing (Q= 56%, mod/cragsmen = 54% vs global= 32%). Concerning outdoor modes, they are fairly omnivorous: “multi-pitch”³, traditional climbing, and mountaineering. They clearly distance themselves from indoor boulderers, and even roped gym climbers. Cragsmen declaring the highest level of practice (grade eight or nine) are overrepresented (23.6% vs global 9.4%). It should be remembered here that, in climbing, the level of difficulty is expressed on a scale of 1 to 2 for low hand usage, advancing to 9. Extremely serious climbers generally succeed in reaching level 7, while level 9 represents the top level nationally and internationally. Quite logically, cragsmen stand out for their high commitment to the activity, indicated by a minimum weekly practice frequency, the fact that they climb outdoors in all seasons, and, for 46.8% of them, the fact that they have been climbing for at least 14 years. Demographically, they are mainly men (82.8% vs 76.3% globally), over 40 years of age (35.1% vs 24.7% globally), self-employed, or entrepreneurs. The paragon in this category of cragsmen is a 45-year-old man with a university degree, holding a position in the top management of his company, originally from the United Kingdom. He identifies himself as an outdoor climber and cragsman first and foremost, even though he adds that he also enjoys traditional climbing, multi-pitch routes, and mountaineering. He has been practicing for 24 years. His level in bouldering and cliff climbing is grade 7.

Table 10

3.4.2. Hardcore boulderers

Boulderers on low-height routes, for whom rope use is not necessary, represent 14.5 % of our sample (Table 11). 71.6% of them (57.1% of the global population) focus on indoor climbing. The distance from outdoor activities like single pitch³ (Q=-30%) and traditional climbing on removable anchors (Q =-39%) is large, and even larger in relation to mountaineering (Q= - 45%) or multipitch³ (Q=-58%). Hardcore boulderers are very committed, yet younger, since climbers with over 14 years of presence in the activity are underrepresented in this category (Q =-16%; mod/hardcore boulderer = 19.1% vs global =23.8%). The sociodemographic profile is male (Q = 18; mod/hardcore boulderer =80.4% vs global 76.3%), relatively young (under 25 represent 26.1% vs global 18.6%), and with a high income.

The paragon of hardcore boulderers is a 35-year-old man from the United States with a university degree and a position in the top management of his organization. His practice has been mainly indoor for the past 3 years. He is mostly committed to indoor bouldering more than once a week, while going on boulders outside once or twice a month. His stated level in bouldering is grade 8. His level is the same in cliff climbing.

Table 11.

3.4.3. The alpinists

Alpinists (table 12) represent 21.9% of our sample and are thus named because of their preference for the riskiest or most committed outdoor modes. Climbers on removable anchors (traditional climbing) are overrepresented (Q = 42%; 47.5% vs 31.4% globally), just like those practicing multipitch³ (Q = 55%; 66.5% vs 43.3% globally), and mountain climbing (Q = 37%; 39.1% vs 26.5% globally). On the other hand, they are the most distant from indoor (Q=-32%) or outdoor boulderers (Q= -90%), and from indoor climbers (Q=-99%). Although their bimonthly practice frequency may seem low (Q=100%; 97.7% vs 30.9% globally), this can be explained by the difficult access to their practice areas (high-altitude mountains,

unequipped cliffs, or high cliffs), which require favorable weather conditions and a longer journey to reach them. Their performance level in lead climbing is relatively high: 41.4% reach level 7 vs 36.6% of our sample climbers (Q=13%). This is coherent with the number of years spent practicing: 27.9% have been climbing for 14 years compared to 23.8% of the sample (Q= 14%). While there is no significant link to their demographic profile, those aged below 25 are underrepresented in this group (Q=-17; 17.7% vs 18.9% globally). The paragon of the category is a 55-year-old man from Poland with a university degree, employed, and whose practice is primarily outdoor. He says that he has been practicing mountain climbing, multi-pitch routes, and traditional wedge climbing for 21 years. He practices once or twice a month, says his level in climbing is grade 6 and 4/5 in bouldering. His indoor practice is mainly rope climbing.

Table 12

3.4.3. Indoor beginners

Beginners may be described as such because of their short time in the activity. Climbers practicing for less than 3 years account for 64.1% of this category, against 22.3 % in our sample (Q=82%).

Their outdoor engagement is relatively low. 99.9% of them do not practice outdoors all year round, unlike 59.8% of our sample (Q= 100%). When indoors, their preference seems to be the least restrictive mode, namely bouldering which does not require mastering rope maneuvers. The interesting result is that women are overrepresented in the newcomers' category (Q=22%; 32.8% vs 23.7% globally), as are the under 25s (Q=47%; 39.1% vs 18.9%), logically students, particularly those not yet at university. The paragon of this category is a 24-year-old female student who is German. She does not practice outdoors and

restricts her indoor activity to rope climbing. She has been climbing for one year. She does not specify any level of practice.

Table 13

4.3.5 Recreational climbers

Women are overrepresented in this category (Q=26%; 32.9 vs 23.7%). Most female climbers appear to consider climbing as a recreational activity given the relatively low frequency with which they practice. 91% of recreational climbers climb outdoors only once or twice a year, against 39.9% of the sample. Recreational climbers climb both outdoors on cliffs (single pitch) (Q=62%; 90.2 vs 74.1%) or indoors on walls requiring rope belaying (Q=50%; 60.3% vs 41.4%). They seem to avoid bouldering, whether inside or out, as well as the most committed modes, such as traditional climbing. The paragon among recreational climbers is a 32-year-old woman, university graduate and top manager from the Netherlands. She is focused on outdoor climbing where she practices all modalities except training and bouldering. Her main indoor and outdoor activity is rope climbing. She has been climbing two times a month for the last 5 years, she has grade 4/5 in bouldering and 6 in rope climbing.

Table 14

4. Discussion

The statistical analysis initially aimed to uncover structures in the scatterplot formed by the values taken by the different variables/questions for our respondents. These variables describe both the practice of climbing and the sociodemographic properties of the climbers. For this purpose, it was hypothesized that a certain number of active variables (Tables 6 and 7) would structure the space of climbing styles: the main outdoor activity practiced (specifying “none” means an indoor specialization); the main indoor activity; the seasonality and frequency of the

outdoor activity; and number of years of practice. An MCA was used to identify the two dimensions or structure lines of our dataset (axis 1 & 2 on Figure 1), which explain 27.2% of the inertia of the said dataset. As mentioned above, these dimensions are defined by the contribution of the active variables to their construction. In this case, the first dimension is defined by the seasonality and frequency of outdoor practice, and, to a lesser extent, the length of time spent in practice. By interpretation, this dimension can be understood as the one that separates indoor and outdoor climbers. The second dimension is defined by the nature of chosen indoor and outdoor activity, essentially the choice of bouldering or roped climbing (mountaineering, cliff climbing of one or more pitches or on a roped wall). Compared to bouldering, roped climbing has an additional dimension in terms of risk-taking and commitment to mastering protection techniques. This second dimension could therefore be called “commitment”, a term used by climbers to distinguish the degree of risk in a climb. The pinnacle of commitment, excluding soloing without a rope, is traditional climbing with removable anchors, their placement being relatively technical and often precarious.

The priority is given to outdoor practice and commitment, which are therefore the two dimensions or structural lines of the space of climbing styles emerging from our MCA. It is along these two axes that the five types of climbers identified by the hierarchical ascending classification are divided: alpinists, cragsmen, recreational climbers, hardcore boulderers, and indoor beginners. Even when presented separately, the definition of climbing styles is relational. In other words, they are not defined solely in themselves but in relation to each other. They form a space, in the sense of a space of styles (Bourdieu, 1984). The cragsmen (21% of the sample), more than the others, thus focus on outdoor and roped climbing, even if they are more omnivorous than the other climbers who perform both indoor climbing and bouldering or mountaineering. The frequency of their practice is relatively high compared to the others. They are the most longstanding in the activity. Frequency and seniority translate

into a high level of practice. In contrast, the hardcore boulderer (14.5% of our sample) focuses on indoor climbing and has little taste for cliff climbing, with even less for multipitch routes. Newer to the activity than cragsmen or alpinists, they quickly reach a high level by doing multiple sessions per week. The alpinists (21.9% of our sample) are close to the cragsmen but far from the hardcore boulderers. They are more adept at the most committed modes, such as multipitch or traditional climbing on removable anchors. Their frequency is less than that of boulderers or cragsmen because they are more distant from their preferred terrain. This lesser investment of time explains a lower level of practice than the two previous categories, even though they are as longstanding in the activity as the cragsmen and more so than the hardcore boulderers. Recreational climbers (26.6%) are so called due to the relatively low frequency of their practice. They mainly climb on ropes and are less interested in bouldering, and even less in traditional climbing on chocks. Finally, the indoor beginners (15.9%) are so named because, in most cases, they limit themselves to indoor climbing and even more to bouldering. Indoor bouldering, the least committed mode, thus emerges as the preferred entry point into the constellation of climbing practices.

For Bourdieu (1984), the space of lifestyles in the 1960s and 1970s was the space of practices and judgement on practices allowed by the dispositions associated with objective positions in social space. The sociodemographic variables that were not parameterized as active in the MCA nevertheless allowed for the characterization of the different types of climbers. However, it is not possible to speak of differentiated habitus (Bourdieu, 1977) for the different types of climbers. The mode profiles do not allow the relevant traits of the said types to be isolated for the variables of income, qualifications, or profession. The absence of distinctive features could mean that the social recruitment of climbers is relatively homogeneous in terms of income, education, and profession, and relatively higher than the OECD population taken as a reference. In contrast, the different types of climbers are

distinguishable by their age and gender. Thus, cragsmen and mountaineers are relatively older (40 and over) than boulder climbers or indoor beginners. Furthermore, men are overrepresented among cragsmen, mountaineers and boulderers, while women are overrepresented among indoor beginners and recreational climbers.

Beyond this Bourdieusian analysis of a climbing space structured as a field, it is possible to go further by returning to the initial hypothesis on this historical construction. In the end, the constitution of practice styles, like bouldering, crag climbing and alpinism, appears as an actualization of the sportivization process concerning the cumulative movement of the social division of labor (Durkheim, 1964 [1893]). Boulderers are the exemplary products of this evolution. As previously mentioned, bouldering was historically the training mode of alpinists. In the French massif of the Fontainebleau near Paris, world-known by specialists, alpinists created a “mountain circuit” of boulders for training (Corneloup, 1993). The Fontainebleau massif was the crucible of the great alpine conquests, such as the French Himalayan expeditions. Bouldering thus became a “center of gravity” of a “system of distinctive signs” (Bourdieu, 1984) forming a practice style. In their statements, boulderers expressed distance from climbing that requires rope use to ensure protection, as well as the most committed modes (mountains, climbing with stoppers) (Table 11).

As presupposed, this process of social division of labor is cumulative. It drives society towards increasingly differentiated worlds (Bourdieu, 2000) and leaves a trail of accumulated practice styles that are traces of the moments in history at which they emerged. The joint consideration of the age and seniority in the activity of the various types of practitioners indicates not only at which moment of climbing’s history they entered the activity, but also which particular stage of the differentiation process of styles of practice made this possible for them. Thus, hardcore boulderers (Table 11), but logically also indoor beginners, are among the youngest and the most recent in the activity. They entered the sport thanks to the

explosion in the number of commercial gyms since 2005, especially those dedicated exclusively to bouldering. They are younger, in age and seniority, than the cragsmen (Table 10) who have been present for more than 15 years and who are 40 years old. Their entry can be dated back to the end of the 1990s, before the massive indoorization movement started and during the golden age of sport climbing when the most representative cliffs and destinations worldwide were developed: Red River Gorge (USA), Ceuse, Gorges du Tarn, (France), Siurana, Margaleff, El Chorro (Spain), Kalymnos (Gr.), etc. It can be imagined, in 2020, that they were already climbing during the boom of sport crag climbing in the 1980s. Finally, the alpinists (Table 12), who seem to be both the oldest and the most senior, preceded cragsmen in their activity. Being aged 40 and over, and with 14+ years of practice, alpinists and cragsmen did not abandon the most demanding modes, such as multipitch routes, high-altitude or traditional climbing (Table 10 & 12). Just as the advent of omnivorous tastes (Peterson & Kern, 1996; Lefèvre & et al., 2020) could be observed in cultural practices, a gradual and more univorous specialization may be discerned among climbers, with the oldest, like cragsmen and alpinists, being more omnivorous than the more exclusive boulderers. This different degree of omnivorousness between the oldest and the youngest in the absolute and in the space of climbing may be seen as an illustration of the division of labor whereby new entrants specialize in what was only one modality among others for their predecessors.

The social division of labor underpinning the sportivization of climbing is, somehow, the *modus operandi* of an evolution whose *modus operatum* should be identified. This was made possible by the foremost oppositions revealed by the two main dimensions of the MCA (Figure 1).

The first dimension opposes indoor and outdoor climbers. Between beginner indoor climbers and boulderers, 30.4 % of our sample's climbers confine themselves to mainly indoors. They clearly differentiate themselves from cragsmen, alpinists, and recreational climbers. Placing

climbers in the polar positions of indoor and outdoor specializations creates a parallel with the McDonaldization of society (Ritzer, 2015). Heywood (1994) identified the McDonaldization of outdoor climbing as early as 1994 when commercial climbing gyms had not yet developed on a mass scale. Heywood underlines the responsibility of the media and brands which, through advertising, generate a growth in the number of climbers that is harmful for the natural environment: waste, damage to the rock, harm to fauna and flora. Without contradicting the previous analysis, in this study McDonaldization is taken to refer to the efficiency, calculability, predictability, and control that can be found in the fast-food industry and now particularly in indoor bouldering. Climbing was traditionally described as an “informational” practice in that it presupposed deciphering a path in the form of a route, or one of its sections, and decoding the grip of a hold, as well as, more globally, the characteristics of an itinerary in terms of difficulty and skills required. According to the process of abstraction, artificial walls are now totally different from natural rock, being made of wood and colored synthetic holds in specific, uncluttered shapes. Climbing is thus more decodable, predictable, and controllable for both the beginner and the competitor. This greater legibility, coupled with increased access, means that the quantity of climbing that can be done in the same amount of time is maximized and predictable. Indoor bouldering is not particularly time-consuming since it does not require any major journeys. It is thus an activity which is easy to “consume”. Hardcore boulderers and indoor beginners are part of this McDonaldization approach.

The second axis opposes the different styles regarding the nature of commitment required by their practice. Unlike alpinists, the boulderers, indoor beginners and recreative climbers have little taste for uncertain surfaces or environments that involve mastering rope techniques; similarly, they are not keen on placing protective equipment (especially removable ones), or gathering information on weather conditions or the state of the climbing

surface (rock, ice, snow). Based on this observation, two non-mutually exclusive hypotheses could be formulated regarding the relationship to risk.

The first is related to risk reduction or removal in climbing and more broadly in sports participation, especially for women participating mainly as recreational climbers or indoor beginners. This evolution also illustrates how jeopardizing one's physical safety is increasingly less popular. A growing unwillingness to take risks is a form of "euphemization" of violence, an indicator of the sportivization of traditional games (Elias and Dunning, 1986). The history of climbing seems to fit this description following the appearance of practice based on significantly reduced commitment. A salient feature of our climber population is gender, appearing as the variable that reveals the choice of practice modes. Women are overrepresented among indoor beginners (Q=22%; 32.8 and 23.7% globally) and recreational climbers (Q=26%); 32.9 and 23.7% globally). The low risk of somewhat aseptic indoor climbing could potentially be seen as a way of understanding their presence in this category. Some studies refer to men's taste for risk behaviors in general (Charness & Gneezy, 2012) and in nature adventure (Thorpe, 2010). Risk is also mentioned in sports such as climbing, although the perception of male practitioners concerning the latter is not that it is a risk activity, and even less an extreme sport (Robinson, 2008).

However, this risk reduction or avoidance does not concern the whole climbing population. For others, such as hardcore boulderers, it is not so much the avoidance of risk as alternative ways of managing it. As previously mentioned, bouldering can be viewed as a non-risk mode due to the low height of the blocs. However, it can be further nuanced as it is divided into modes, such as "highball bouldering" and "deep-water soloing", consisting of ropeless climbing on boulders and cliffs directly above the sea, with the risk of spectacular falls. "Normal" outdoor bouldering in itself also poses risks in case of a bad landing due to the relative height, even though this is lower than "highballs". Risk is therefore not excluded from

bouldering but is managed differently by practitioners, without the technological mediation that has been refined throughout the history of climbing. It is therefore less a question of refusing risk than a way of handling it without technical mediation. It would be interesting to complement this research with a series of interviews and in vivo observations to access what Weber (2013) calls “the intended meaning” in the practice of bouldering, by which he referred to a vision of the world and human existence (Weber, 1922). In a seemingly paradoxical way, while indoor climbing may constitute a new stage in the McDonaldization of the activity in the sense of a completed form of industrialism and commercialism, the growing popularity of bouldering, and especially outdoor climbing, can be seen as a reaction to the risk society (Beck, 1992) produced by industrial modernism.

Conclusions

This work contributes to filling the knowledge gap concerning the climbing public at a time when climbing has gained Olympic recognition, enjoys new visibility, and is a commercial reality. Such a large-scale survey, made possible by the online administration of Vertical Life, has not been previously published. Studying the division of practice styles shows the relative completion of sportivization as a cumulative process (Author, 2005; Taylor, 2010), through which emerge practice styles which increasingly resemble the dominant sports model. Alpinists are still present, as are cragsmen, who appeared more recently. Specialists in bouldering and indoor practice, as well as younger and female newcomers, can be added. As a result of this sportivization, the center of gravity of a population climbing mainly outdoors has moved towards one whose practice mainly occurs inside. Indoor practitioners now account for almost a third of all climbers. Consequently, climbing magazines that present cragsmen as representatives of what they sometimes call the

"climbing family" would be well advised to consider the shift of the climbing community's center of gravity towards indoor climbers.

Our survey opens up new perspectives. As the reader has certainly noticed, we have not exploited the fact that our survey has a wide international scope, which is nevertheless the value of it. We noted that the different countries were distinguished by the rate of progression concerning the creation of commercial climbing gyms, a factor contributing to the modification of the climber population's morphology. We should therefore continue to exploit our data by carrying out a multilevel statistical analysis (Gelman & Hill, 2006) to see what the diversity in climbing modalities owes to national specificities in the development of the climbing surfaces offered.

Our work also opens up the possibility of reproducing such a survey for other sports experiencing this phenomenon of indoorization highlighted by van Bottenburg, M., & Salome, L. R. (2010). Underlining this process as a form of evolution of our societies that has already been identified by classic sociology authors, such as Durkheim and Bourdieu, is a prerequisite of foresight. This would, in fact, make it possible to detect the diversifications of the future, especially from a marketing perspective of identifying markets that do not yet exist.

Finally, we must point out the limitations of the present survey, which lie essentially in its sampling method. As we have already mentioned, the fact that we had neither a sampling frame nor any a priori indication of the profile of the climbers whose e-mail contacts we used or who spontaneously replied to us meant that we had to test the representativeness of our sample a posteriori. While it turned out to be relatively comparable to the few pre-existing data, the result could have been different and ruined a survey of this size. This is clearly a limitation. However, our survey, like those of comparable size, will gradually become a standard for future surveys, which will be conducted using more robust methods.

Notes

1. The Organization for Economic Co-operation and Development publishes sociodemographic statistics for the area of its member countries, which offer a good point of comparison.
2. Source: <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>
3. The cliffs differ according to their height. The most climbed are of such a height that with a rope length between 30 and 100m the climber reaches the top and is brought down to the ground by his belayer. The cliffs higher than 50 meters require to make "belay stations" every 40/50 m distance called « pitch ». The first ascensionist secure himself at the station and belays the ascent of his second who joins him. The team then starts the following pitches with the same method until the summit. By extension single pitch climbing indicates the modality consisting in confining oneself to small cliffs and multipitch on high cliffs known as a more engaged mode.

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Table 1. Statistics related to the number of climbers in the USA and France in 2018.

	Outdoor Recreation Report (USA) 2018	Outdoor French Sport Barometer (France) 2016 (n=4014) 2016
Indoor Climbing	5 112 000 (1.7%)	990 000 (2.1%)
Outdoor Climbing	2 184 000 (0.7%)	1 330 000 (2.9%)
Alpine Modalities (Traditional, Ice, Mountaineering)	2 541 000 (0.8%)	460 000 (1.0%)

Table 2. Age distribution and comparison with OECD and EU Eurobarometer (2018)

Age group	Vertical life international climbing survey	OECD	Eurobarometer Sport participants
15_24	21%	15%	18%
25_34	40%	16%	18%
35_44	22%	16%	18%
45_54	11%	16%	17%
55_64	5%	15%	13%
65+	1%	21%	15%
Total	100%	100%	100%

Source: VL-ICS; Authors with OECD data; Eurobarometer

Table 3. Level of education (25-64) in our sample and OECD area (2019)

Education level	n	%	OECD %
None	26	0.3%	2.1%
Primary and Secondary	1921	24.6%	41%
Tertiary Education	5571	75.1%	38%
Total	7518	100%	100%

Table 4. Occupation level of the employed respondents (n=5892)

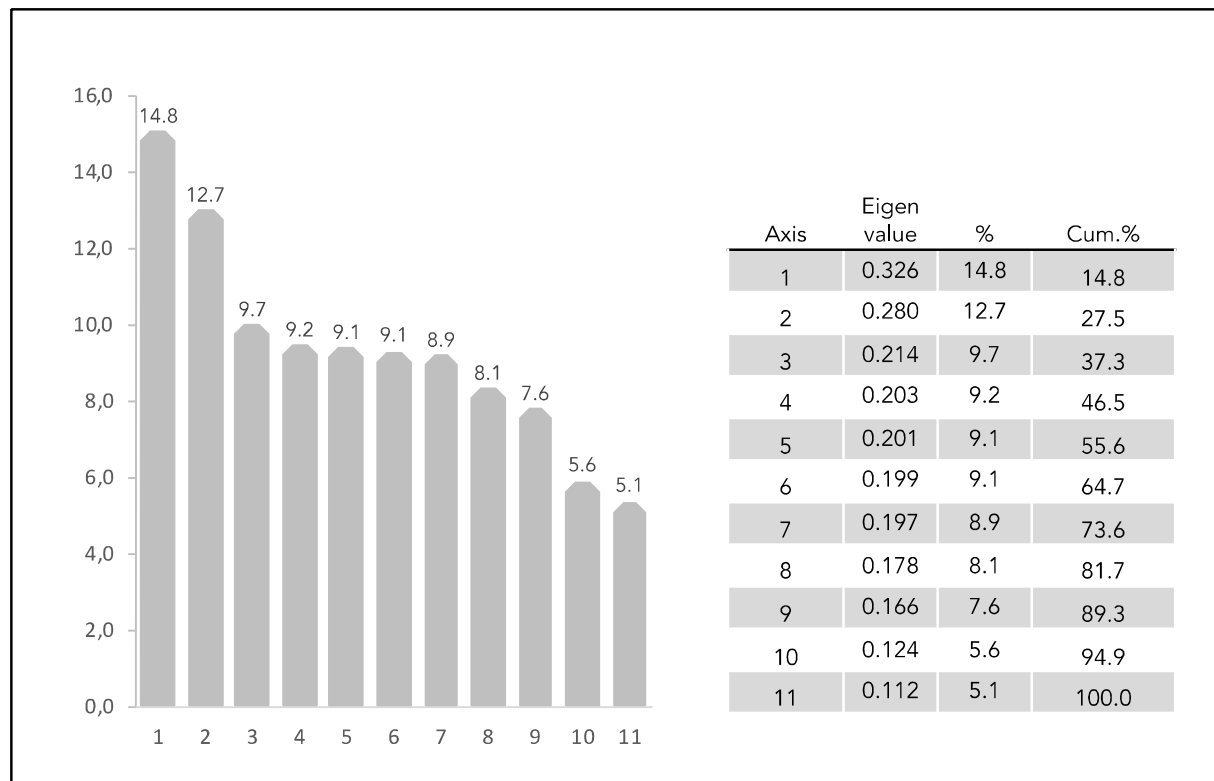
Occupation	n	%
Employee	1966	33%
Middle Management	1283	22%
Top Management and Professional	2322	39%
Worker	321	5%
Overall Total	5892	100%

Source : Source VL_ICS (2020)

Table 5. Monthly household net income in euros (n=6677)

Income group	n	%
Less than 1500	1844	28%
1500_2700	1500	22%
2701_5000	1678	25%
More than 5000	1655	25%
Overall Total	6677	100%

Source : Source VL_ICS (2020)

Figure 1. Breakdown of total inertia on MCA components**Table 6. Correlation ratio (η^2) between the active variables and the first two dimensions**

Variables	Dim 1	Dim 2
Outdoor Frequency	0.589	0.055
All-season Outdoor	0.514	0.071
N° of years of practice	0.286	0.019
Main Indoor Activity	0.148	0.663
Main Outdoor Activity	0.092	0.594

Table 7. Description of Dimension 1

Variable	Contribution	Level	Coord	Contribution	Cosinus2	Count
Main Outdoor Activity	5.7	Alpine	0.5	3.1	0.062	966
		Bouldering	-0.4	2.3	0.045	899
		No outdoor activity	1.1	0.3	0.005	21
		Single pitch	0	0.0	0.002	3104
Main Indoor Activity	9.1	Other	2	8.2	0.138	163
		Indoor Bouldering	-0.2	0.8	0.028	2646
		Indoor rope	0	0.0	0.001	2181
All-Season Outdoor	31.6	No	-0.7	16.1	0.514	2452
		Yes	0.7	15.5	0.514	2538
Outdoor Frequency	36.1	Once a week and more	1	19.1	0.451	1545
		A couple of times a year	-0.9	17.0	0.434	1800
		A couple of times a month	0	0.0	0	1645
N° of years of practice	17.5	14 & more	0.7	9.2	0.21	1450
		Under 3	-0.8	4.8	0.091	680
		3 to 6	-0.4	3.4	0.08	1533
		7 to 13	0.1	0.2	0.003	1327

Table 8. Description of Dimension 2

Variable	Contribution	Level	Coord	Contribution	Cos2	Count
Main Outdoor Activity	42.4	Bouldering	1.6	32.6	0.6	899
		Alpine	-0.7	7.0	0.1	966
		Single pitch	-0.2	2.7	0.1	3104
		No outdoor activity	0.7	0.1	0.0	21
Main Indoor Activity	47.3	Indoor rope	-0.9	26.5	0.7	2181
		Indoor Bouldering	0.7	20.4	0.6	2646
		Other	0.4	0.4	0.0	163
All-Season Outdoor	5.0	No	-0.3	2.6	0.1	2452
		Yes	0.3	2.5	0.1	2538
Outdoor Frequency	3.9	A couple of times a month	-0.3	2.3	0.0	1645
		Once a week and more	0.3	1.6	0.0	1545
		A couple of times a year	0.1	0.1	0.0	1800
N° of years of practice	1.4	7 to 13 years	0.2	0.8	0.0	1327
		14 & more	-0.1	0.4	0.0	1450
		Under 3 years	-0.1	0.1	0.0	680
		3 to 6 years	0.0	0.0	0.0	1533

Figure 2. Modality description (axis 1:2)

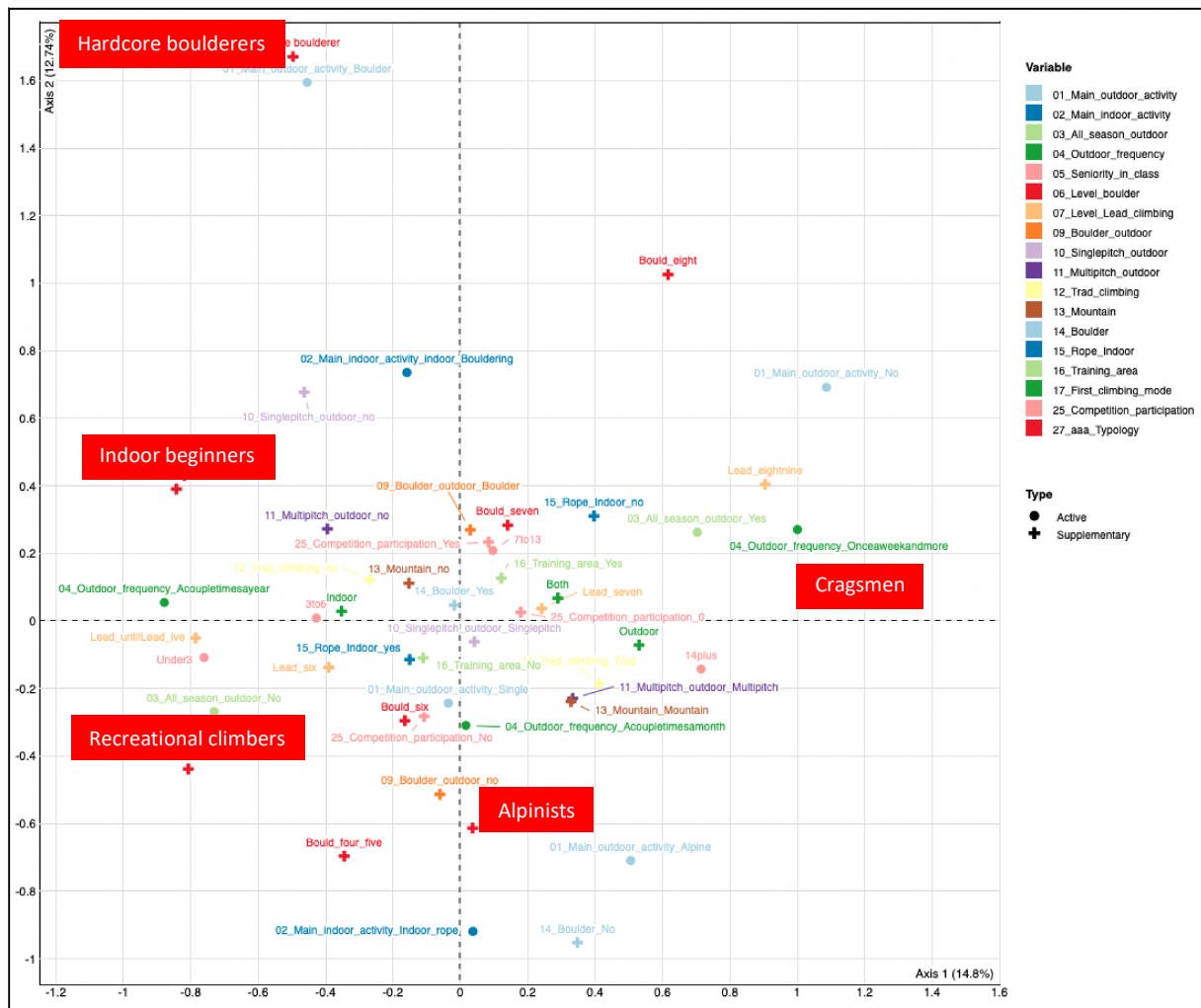


Figure 3. Dendrogram & inertia gain leading to a five-cluster HAC

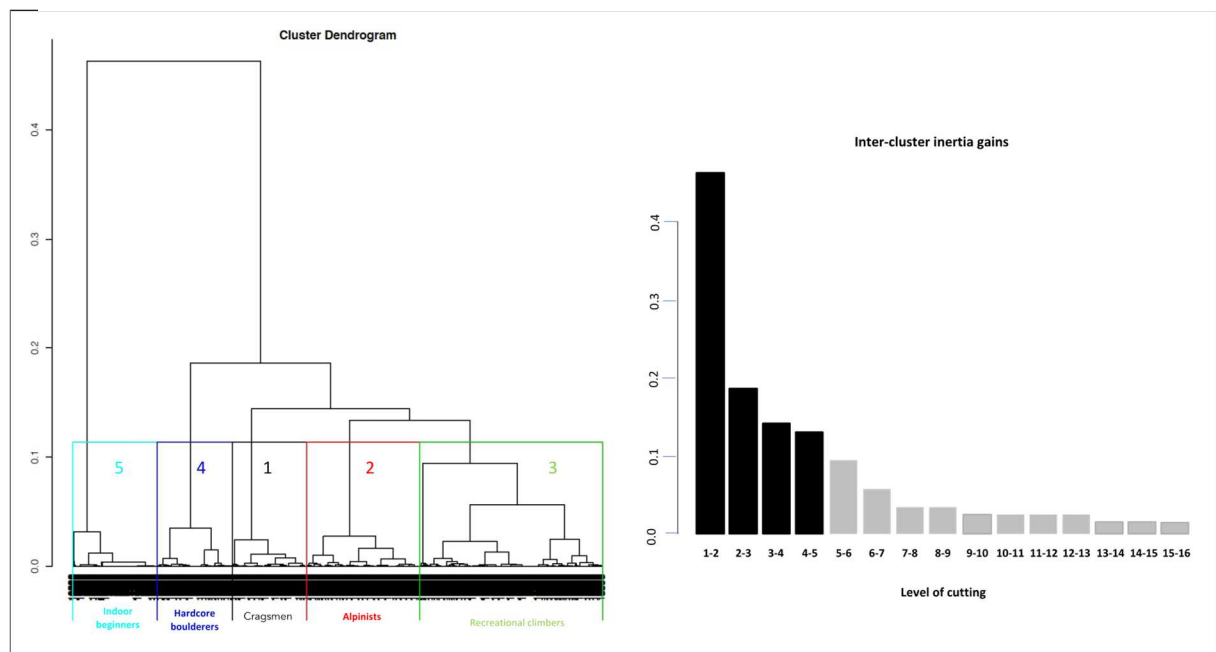


Table 9. The five types of climbers

Types	%	n
Cragsmen (1)	21.1%	2377
Hardcore Boulders (4)	14.5%	1633
Indoor Beginners (5)	15.9%	1793
Alpinists (2)	21.9%	2463
Recreational Climbers (3)	26.6%	2996
Total	100%	11262

Table 10. Cragsmen profile

	Mode	Q	se(Q)	Mod/ cragsmen	Modality/global	n	V.test	p. value
First Climbing Mode	Outdoor	56%	2%	54.0%	32.0%	1201	28.07	8.3e-143
	Indoor	-59%	2%	32.2%	57.1%	716	-18.9	5.2e-163
Outdoor Modalities	Single pitch	79%	2%	95.0%	74.1%	2258	29.5	8.9e-151
	Multi-pitch	65%	1%	72.3%	43.3%	1719	32.2	7.1e-226
	Traditional climbing	55%	2%	54.1%	31.4%	1285	26	1.6e-157
	Mountain	45%	2%	42.6%	26.5%	1013	19.4	2.6e-89
	Boulder	25%	2%	61.8%	52.0%	1470	10.9	2.2e-27
	Main outdoor modality: Single pitch	46%	2%	68.7%	50.6%	1644	20.7	4.8e-93
Indoor Modalities	Training area	18%	2%	48.5%	41.5%	1154	7,8	6.4e-15
	Bouldering	-46%	3%	84.2%	91.5%	2002	-13.4	2.67e-46
	Rope climbing	-48%	2%	51.3%	70.2%	1220	-22	3.1e-113
	Main indoor modality: Bouldering	-23%	2%	44.4%	54.1%	1062	-10.3	5.8e-25
Level of Engagement	Frequency outdoor: Once a week and more	98%	0%	90.4%	29.2%	2149	Inf	0.0e+00
	All-season Outdoor: Yes	86%	1%	84.1%	40.2%	1999	Inf	0.0e+00
	Years practicing: 14 and more	61%	2%	46.8%	23.8%	1109	28.6	4.3e-194
	Lead level: Eight & nine	69%	2%	23.6%	9.4%	517	24.2	3.8e-147
	Lead level: Seven	34%	2%	49.8%	36.6%	1089	15.5	1.1e-47
	Lead level: Six	-53%	2%	25.1%	46.3%	548	-20.5	3.9e-112
	Boulder level: Seven	30%	2%	52.1%	40.2%	1042	9.3	5.1e-34
	Boulder level: Six	-26%	2%	37.1%	47.7%	742	-12.5	3.5e-26
Demography	Gender: Male	29%	3%	82.8%	76.3%	1594	9.3	1.5e-19
	Age in mod: Over 40	39%	2%	35.1%	24.7%	680	14.2	2.1e-48
	Age in mod: 25 to 30	-16%	3%	20.9%	25.2%	404	-4.6	2.5e-07
	Age in mod: Under 25	-41%	3%	12.0%	18.9%	232	-11.9	5.2e-33
	Occupation: Entrepreneur	39%	4%	13%	8%	241	9.6	8.7e-23
	Occupation: student	-39%	3%	12%	21%	221	-10.7	5.3e-28

Reading: Mod/cragsmen means that x% adopt it. This number must be compared to modality/global which expresses the % of the global population to adopt it. In this way, we can understand how cragsmen differ or not from climbers in general.

Table 11. Hardcore boulderers' profile

	Mode	Q	se(Q)	Mod/ hardcore boulderer	Global	n	V.Test	p. value
First Climbing Mode	Indoor	37%	3%	71.6%	57.1%	1166	21.4	4.5e-102
	Outdoor	-40%	3%	18.7%	32.0%	304	-7.9	1.6e-15
Outdoor Modalities	Boulder	98%	0%	98.5%	52.0%	1608	Inf	0.0e+00
	Single pitch	-30%	3%	62.8%	74.1%	1026	-10.9	1.3e-27
	Traditional climbing	-39%	3%	18.1%	31.4%	296	-13.0	6.0e-39
	Mountain	-45%	3%	30.7%	26.5%	1231	-13.8	2.6e-43
	Multipitch	-58%	2%	19.5%	43.3%	318	-21.9	4.0e-106
	Main outdoor: Bouldering	100%	0%	99.9%	15.8%	1633	Inf	0.0e+00
Indoor Modalities	Boulder	93%	3%	99.6%	91.5%	1627	16.1	2.5e-58
	Training area	16%	3%	48.1%	41.5%	786	5.5	5.7e-09
	Bouldering	98%	1%	98.7%	54.1%	1611	Inf	0.0e+00
Level of Engagement	Frequency Indoor: Once a week and more	47%	4%	93.9%	86.2%	1529	11.8	4.81e-32
	Freq. Outdoor: A couple of times a year	33%	2%	53.7%	39.9%	28	18.1	1.7e-73
	Freq. Outdoor: Once a week and more	-27%	3%	20.6%	29.2%	336	-4.1	4.5e-05
	All-season Outdoor: Yes	17%	3%	47.2%	40.2%	771	6.2	4.0e-10
	Competition participation: Yes	47%	2%	68.6%	52.2%	1115	18.4	6.2e-76
	Years of practice: 14 and more	-16%	3%	19.1%	23.8%	310	-4.6	3.8e-06
	Boulder level: Eight	67%	3%	12.8%	4.4%	205	16.6	8.1e-62
	Boulder level: Seven	39%	2%	57.0%	40.2%	914	18.2	6.3e-74
Demography	Gender: Male	18%	4%	80.4%	76.3%	1015	3.0	2.8e-03
	Age in mod: 25 to 30	15%	3%	30.5%	25.2%	393	4.0	5.7e-05
	Age in mod: Under 25	13%	3%	26.1%	18.9%	336	3.4	6.7e-04
	Age in mod: Over 40	-34%	4%	13.6%	24.7%	175	-8.9	4.9e-19
	Income in euros: More than 5,000	17%	4%	30.5%	24.5%	296	4.1	3.5e-05

Table 12. Alpinists' profile

	Mode	Q	se(Q)	Mod/ Alpinists	Global	n	V.test	p. value
Outdoor Modalities	Mountain	37%	2%	39.1%	26.5%	963	15.6	7.2e-55
	Multi-pitch	55%	2%	66.5%	43.3%	1638	26.2	9.5e-152
	Traditional climbing	42%	2%	47.5%	31.4%	1169	19	4.4e-80
	Single pitch	82%	2%	95.6%	74.1%	2354	31.1	5.9e-213
	Main outdoor modalities: Bouldering	-90%	2%	1.4%	15.8%	31	-26.8	1.1e-157
Indoor Modalities	Main indoor modalities: Climbing with a rope	42%	2%	57.7%	41.4%	1447	19.7	3.7e-86
	Main indoor modalities: Bouldering	-32%	2%	42.2%	54.1%	1014	-14.5	9.2e-48
Level of Engagement	All-season outdoor: Yes	26%	2%	50.5%	40.2%	1243	11.7	9.1e-32
	Outdoor frequency: A couple of times a year	-97%	0%	1.9%	39.9%	47	- inf	0.0e+00
	Outdoor frequency: A couple of times a month	100%	0%	97.7%	30.9%	2406	- inf	0.0e+00
	Years of practice: 14 and more	14%	3%	27.9%	23.8%	686	5.8	4.9e-09
	Years of practice: Under 3	-26%	3%	15.8%	22.3%	389	-8.5	1.3e-17
Performance Level	Lead level: Seven	13%	2%	41.4%	36.6%	1003	10	2.3e-23
	Lead level: Eight/Nine	-25%	4%	6.5%	9.4%	157	-4	6.1e-05
	Lead level: Up to five	-30%	5%	4.9%	7.8%	119	-4,7	2.9e-06
Demography	Age in mod: Under 25	-17%	3%	17.7%	18.9%	358	-4,5	5.5e-06
	Occupation: student	-18%	3%	16.5%	20.9%	324	-4,6	4.4e-06

Table 13. Indoor beginners' profile

	Mode	Q	se(Q)	Mod/ Indoor beginners	Global	n	V.test	p. val
Indoor Modalities	Main indoor modalities: Bouldering	40%	2%	70%	54%	1272	15,9	7.2e-5
	Main indoor modalities: Rope climbing	35%	2%	28%	41%	490	13,4	3.5e-4
	Indoor Modalities: Bouldering	41%	5%	96%	92%	1719	7,8	4.9e-1
Outdoor Modalities	Main outdoor activity: No outdoor activity	100%	0%	100.0%	17.4%	1791	-27.3	0,0E+0
Level of Engagement	All-season Outdoor: No	100%	0%	99.9%	59.8%	1792	Inf	0.0e+0
	Years of practice: Under 3	82%	1%	64.1%	22.3%	1048	-27.8	1.4e-1
	Climb expenses 500 to 900€	36%	2%	41.1%	27.1%	736	13.9	2.3e-4
	Climb expenses: Less than 500 €	32%	3%	30.3%	20.3%	543	10.9	4.8e-2
Performance Level	Boulder level: Four/Five	40%	4%	14.1%	7.8%	219	9	2.1e-1
	Boulder level: Six	26%	3%	58.9%	47.7%	915	8.1	4.5e-1
	Lead level: Up to five	67%	2%	24.0%	7.8%	250	11.8	5.0e-3
	Lead level: Six	32%	3%	58.9%	46.3%	637	-5.1	4.2e-1
Demography	Children: No	34%	4%	90.6%	82.4%	1624	9.1	1.0e-1
	Occupation: Student	39%	3%	34.2%	20.9%	443	10.3	6.9e-2
	Gender: Female	22%	3%	32.8%	23.7%	435	5.2	1.9e-1
	Education level: Primary/Secondary	21%	3%	34.3%	25.6%	454	4.7	2.5e-1
	Age in mod: Under 25	47%	2%	39.1%	18.9%	532	13.9	7.5e-4

Table 14. Recreational climbers' profile

	Mode	Q	se(Q)	Mod/ recreational climbers	Global	n	V.test	p. value
First Climbing Mode	Indoor	37%	2%	69.71%	57.08%	2074	-7.1	1.80E-178
Outdoor Modalities	Single pitch	62%	2%	90.2%	74.1%	2702	25.1	3.60E-139
	Bouldering	-16%	2%	45.7%	51.9%	1374	-7.9	6.80E-15
	Traditional climbing	-17%	2%	26.3%	31.4%	788	-7.1	1.10E-12
	Main outdoor modality: Single pitch	68%	1%	77.3%	50.6%	2339	36	2.90E-284
	Main outdoor modality: Bouldering	-85%	2%	2.1%	15.8%	61	-27.9	5.90E-171
Indoor Modalities	Main indoor modality: Climbing with a rope	50%	2%	60.3%	41.4%	1825	25.2	2.10E-140
	Main indoor modality: Bouldering	-42%	2%	38.3%	41.4%	1130	-20.9	9.42E-98
	Indoor Modalities: Climbing with a rope	42%	2%	82.5%	70.2%	2473	17.8	2.50E-71
Level of Engagement	Outdoor frequency: A couple of times a year	96%	0%	91.0%	39.9%	2726	inf	0,00E+00
	All-season outdoor: no	64%	2%	83.0%	59.8%	508	-31.5	8.10E-218
	Years of practice: under 3	-21%	3%	17.2%	22.3%	514	-7.5	7.20E-14
	Years of practice: 3 to 6	26%	2%	39.7%	30.9%	1187	12.5	2.80E-36
	Years of practice: 7 to 13	13%	2%	26.7%	23.1%	798	5.9	3.40E-09
	Years of practice: 14 & more	-29%	3%	16.5%	23.8%	493	-10.7	7.60E-27
	Climb expenses: Less than 500€	16%	2%	24.2%	20.3%	725	6.06	1.30E-09
Performance Level	Lead level: Six	33%	2%	58.3%	46.3%	1677	19.5	1.10E-84
	Lead level: Up to five	15%	4%	9.4%	7.8%	270	5.3	1.20E-07
	Boulder level: Six	28%	2%	58.3%	47.7%	1525	19.5	1.40E-28
	Boulder level: Four/Five	24%	4%	10.6%	7.8%	278	5.8	4.80E-09
Demography	Gender: Female	26%	2%	32.9%	23.7%	771	-8.1	1.80E-21
	Occupation: Entrepreneur	-18%	6%	7.5%	7.5%	134	-3.7	2.30E-04
	Occupation: Worker	-23%	7%	2.6%	3.7%	60	-3.3	7.90E-04