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Ethos through traditional construction processes: Historical development between community builder in the Minho Area of the North-western Iberian Peninsula and Pico Island in the Azores

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ABSTRACT

This article analyses the developmental transitions in traditional construction processes in two very different but historically related contexts: the Island of Pico in the Azores and the Minho Area in the North-western Iberian Peninsula. The Pico Island, with a young geology, presents a serious limitation of available material resources, and resulting in a markedly individualistic approach to building. The Iberian Peninsula, on the other hand, with an abundance of material resources, presents a strongly collective approach to the organization of building works. This paper described the forms of organization necessary to achieve similar constructive systems, with the objective of making different material realities visible in the ethos of both.

Activity-theoretical studies put an emphasis on the object enabling a longitudinal and rich analysis through time. A specific contribution in outlining the historical transformation of work of the community builder is made by using the life stories of two builders, one in Pico and another in the Minho Area, serving as the guiding thread.

The paper shows that activity theory provides useful analytical tools for the enrichment of studies in constructive systems.

1. Introduction

Comparison of construction processes in the execution of similar traditional building languages in the Minho Area and the Pico Island allows exploration of the complex interplay between the material and societal. This is a brief study focused on traditional construction activity to reveal the mediated relation between reasons, judgement, and action over a large scale of time (Guile, 2011). Material conditions of a specific environment can influence the way of understanding and interpreting the world, which ends up being realized in the individual behavior of the members of the community (Fig. 1). Through activity's sensibility, the human organism is capable of identifying in the environment regular patterns of features that denote elements important in life (Kaptelinin & Nardi, 2012).

There are two extreme positions when analyzing the behavior of individuals. On the one hand, there is the psychological or social determinism that places an individual action as the product of an earlier experience, where there is no choice. It is a naturalistic perspective that claims the possibility of explaining individual characteristics based on group relations (Rosenberg, 2011). In the other extreme it is radical contextualism, a theory that assumes that socialization is not necessary and everything can be explained by

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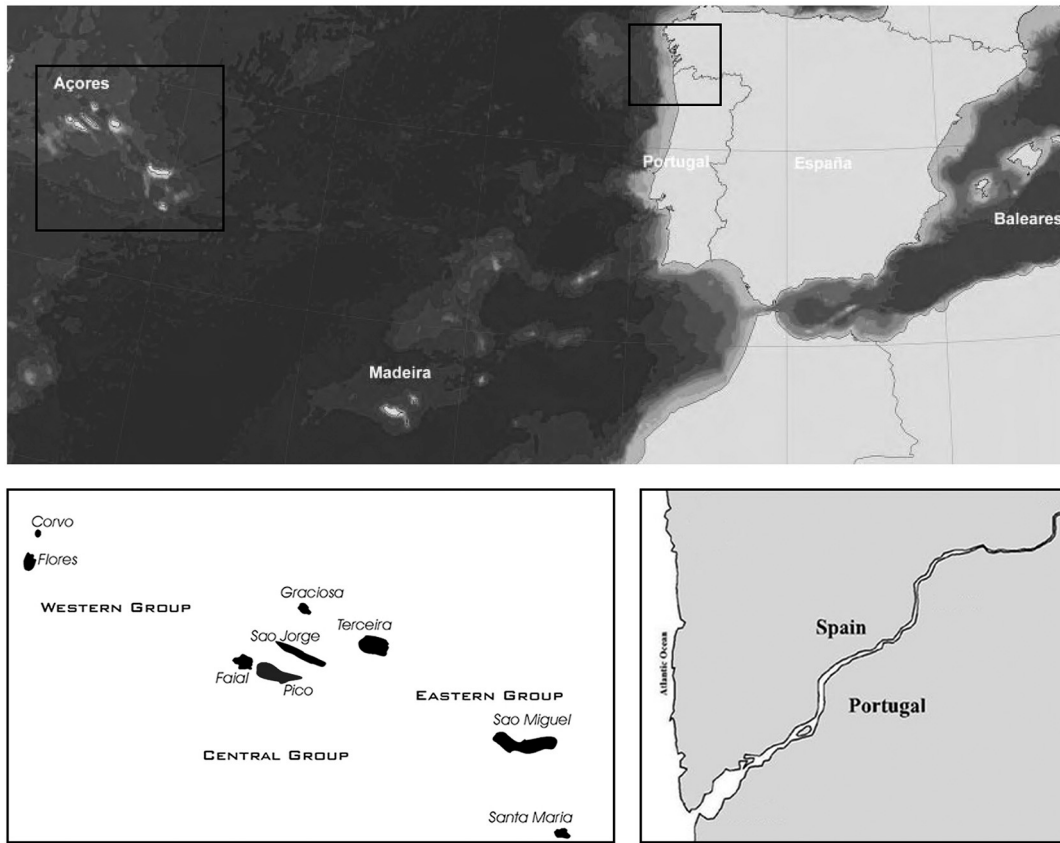


Fig. 1. Location of the Minho area of the North-western Iberian Peninsula and Pico island in the Azores.

giving it meaning in the momentary and immediate scene of action (Erickson, 1982). They are extreme positions that do not allow us to understand the processes through which norms evolve, where environments are modified and differentiated both physically and by historical events, although mutually influential (Bicchieri, 2006; Hall & Jurow, 2015; Jurow & Shea, 2015; Saxe, 2012).

This article intends, through the study of the “niche” of constructive activity behavior in two different contexts, to establish the relationship between the social and the material, by analyzing the change of the dominant value of the philosophy of the first inhabitants of the Pico Island from the Minho Area of the Iberian Peninsula. The settlers of the Pico community, had to adapt to substantially different material conditions. It underlies the premise that any activity is a social feature so that individual (self) consciousness is always an achievement of social consciousness (Bourdieu, 1989; Roth, 2014; Stetsenko, 2005). Holland et al. (2001) also highlighted how discourse positions people in communities of practice and the ways in which individual agency can affect broader social and cultural change. From an extended time scale, it is possible to see that people's activities are integrated into traditions of activities that create some commonalities of experience and resources among those who share elements of this heritage. It is about activity systems that evolve over time, and how trails of sociocultural history are embedded into existing institutions and organizations (Daniels, 2008; Engeström, 2008). This is the case between the Minho Area and Pico Island, since the different material conditions over time have varied in one direction or another, as well as the distribution in the population of normative and empirical expectations that they initially shared. In such a way some norms which were initially in the minority, end up imposing hegemony, and at the same time others, previously dominant, end up disappearing. In the long-term this causes, a change in the community's ethos, on how to interpret and understand the world. It underlines the concept of interagency learning (Edwards et al., 2009), that is to say, reasoning to accomplish and/or modify regularly recurring activities that provide practical guidance that could bring valued changes in conceptual practices (Hall & Jurow, 2015).

Are different ways of performing similar constructive systems to be understood exclusively as a result of changes in the environment? To what extent are the different historical and physical contexts of each community the main causes of the change of ethos?

To achieve this goal, this article is further organized as follows. Firstly, the theoretical framework is presented focusing on the interrelation between the material and the societal. It is presented from the cultural-historical activity theory's that has analyzed it, with the purpose of visualizing the correspondence between the different community behaviors of constructive activities of the Minho Area and Pico Island and the ethos. Secondly, the main features that define the common history of the two communities are compared, and a description of the main building systems that make up their vernacular architecture is presented. Thirdly, the

methodology used in the research is shown, based on a comparative approach sustained with qualitative anthropological techniques. Fourthly, the case analysis is appropriately included, involving two levels of analysis. A descriptive part in which it is observed how the constructors act in each context and passing to a second part that allows implying a cognitive orientation. Finally, corresponding conclusions are made.

2. Theoretical framework

The modern human being constructs his environment at maximum anthropogenic levels, that is, never before has a living being constituted its environment in relation to itself in such a way thanks to reflective recursion processes that are increasingly complex and self-induced. By contrast, living systems are characterized by their constructive eco-organization. It is in the mediation between actors and their objects, often produced through technologies that our humanity is constituted (Goicoechea, 2016; Luhmann, 1995; Stetsenko, 2011). The human being is not a passive one, but actively constructs his environment, as a generative field of actions and relationships (Ingold, 1990). Activity is defined via the object of activity, which is the societal motive for the activity. Activity is broken down into actions connected to the situationally relevant goals and, further, into condition-specific operations (Del Rio & Alvarez, 2007; Stetsenko, 2005; Valsiner & Rosa, 2007).

In these processes, the human personality is modeled in relation to the institutions of its society since they are socially elicited in the context of culturally constructed structures. Meanings are formed as the product of a continuous cycle between the human and the environment (Määttänen, 2015). Therefore, meaning is not a merely mental phenomenon, but instead it is objective in the sense that it involves activity (Ilyenkov, 2014).

Each community has a principle that generates practices and, at the same time, the development of a human being as an intentional creative agent within a total field of organic-biological, psychological, sociocultural, historical-political relationships whose transformations describe a dynamic process throughout the life cycle (Gibson, 1977). The construction of the person as an agent in the context of processes and social and cultural structures in different physical environments is promoted by cultural differences in human enculturation through socialization and intergenerational sharing of culturally worked content (Goicoechea, 2016; Orland-Barak & Becher, 2011; Rosa, 2007). In the exercise of a social activity, the individual appropriates the purpose that activates it (Dewey, 1916); therefore, they participate in the promotion of some cultural differences in personalities. So, psychological processes are embedded in the behavioral system and culturally developed, reconceptualizing furtively the ethos of the community (Engeström, 1999; Rogoff, 2008; Stetsenko, 2012), since it is a superior psychological phenomenon.

Socializing or training in an occupation is also an exercise in the reasoning processes through situations of dissatisfaction when trying to incorporate new ways of tackling difficulties that end up gaining positions in the legitimized discourse. The use of any activity as a unit of analysis allows us to understand the reformulations that have been established between the individual and the sociocultural (Guile, 2011). The use of this unit of analysis underlies the idea that cultural artifacts incorporate important elements, previously singled out as contemporary and mutually exclusive approaches to culture (Hill & Cole, 1995). Any artifact, such as constructive details, through its creation and use, are both ideal (conceptual) and material. It offers the ideal starting point for studying the work of such culture organization (Nardi, 2005; Foot, 2002) that occurs synchronously and asynchronously in an ever-changing range of settings distributed spatially and temporally, over a range of changing sites (Nardi, 2007).

Vygotsky established the starting point at the beginning of the 20th century, leaving a main legacy that was to think about human beings and human development in broader terms (Lima, 1995). The psychological theory of consciousness of Vygotsky and Leontiev disseminated the idea that consciousness is an inner plane, itself an activity developed in and reflecting real practical activity and human beings actively relate to their material praxis in and through consciousness (Mikhailov, 2002 & Leontiev, 2005 cited in Roth, 2014). It is assumed that psychological processes are culturally mediated, historically developed, contextually specified and arise from a human practical activity. Individual regards are born from experiences in a culturally constructed world (Vygotsky, 1978). An activity is being composed of subject, object, actions, and operations, what means that activity theory holds that the constituents of activity are not fixed but can dynamically change as conditions do (Leont'ev, 1974). This has been a steady "warming trend" (Sinatra, 2005) in research on conceptual change.

Vygotsky also inspired that anthropology does not build a bridge between an individual personality and the culture in "itself"; rather, this tradition explores collective culture as complex patterns of internalized and embodied schemas and practices, which are learned in active engagement with the world (Hasse, 2011; Hill & Cole, 1995). There cannot be a clear dichotomy between psychology and culture since culture is constitutive of personality since processes making up a person's history are produced at the level of social interaction in the discourse of a community (Greeno & van de Sande, 2007; Miller, 1994). Therefore, culture and psychology could and should be taken in research as a whole (Kottak, 2011). Culture and personality were considered as two sides of the same coin (Shweder, 1991). The culture makes reference to the patterned forms of thinking, feeling and behaving of members of a population, personality also refers to the patterned forms of thinking, feeling and behaving, but centered on the individual.

From cognitive anthropology and based on ethnographic variability, these ideas were combined in the concept of worldview as a characteristic form of a culture of perceiving, interpreting and explaining the world (Boudon & Viale, 2000). It consists of the identification of dominant themes or values that express the main thoughts and feelings of a culture (Harris, 1997). Although without taking for granted a monolithic and coherent culture, this leads to a consideration of culture as a system of shared meanings intersubjectively through which cultural models are created to interpret and guide actions in a wide variety of domains (D'andrade, 1990). The culture provides a task-oriented frame for any activity that is performed.

Any activity and the processes that accompany it are the result of a complex history in which materials, tools, trades and other details that made it possible are involved. This does not mean statism and immobility, since any local activity, always responsive to

local conditions and the creativity of individuals, brings new and multiple resources to situations (Bazerman, 1997). Agency is a key concept for analyzing and describing how “communities of practice” are mutually involved with and connected to the artifacts they produce, and how these activities are developed (Kawatoko, 2017). Haapasaari et al. (2016) emphasized that the formation of agency occurs collectively, and they examined the relationship between agency and the collective interactions over time.

It is about co-construction (Raeithel, 1996), a redefinition of the object of collective activity that necessarily involves intensive learning as new practices are being devised, which itself requires learning, and the new practices are intended to be learned by others. However, it is necessary to point out the co-construction concept, since it considers at the same time object construction and object instantiation (Kaptelinin & Nardi, 2006; Nardi, 2005). As we analyzed the instantiation of constructive details in the research, it is possible to identify the actions taken to attain an object with the definition of the social forms within which activity is carried out (Nardi, 2005) and also the intermediate form in the hierarchy, known as *ensembles*. In other words, sets of thematically related actions defined by a purpose (González et al., 2009).

The change, commonly, is produced by the actions of people joining the environments as part of the activities directed by each of the participants and in the pursuit of them (Giddens, 1984). Thus, the elements that are decanting a change in the forms of action that ultimately cause a change in the world view of the communities, come not only from the communication between individuals, but the social also refers to the relations between entities that, in themselves, are not made of “social matter.” It is a type of connection between elements that, in themselves, are not social (Cole & Wertsch, 1996; Latour, 2005). The actor is not the only source of action, but rather that; which is led to act by the intervention of many others. This means that the expansion of object-centered environments which situate and stabilize selves also define relationships. Objects thus simultaneously embody and measure a set of relations between heterogeneous elements' (Akrich, 1992). That is, the agency attributed to non-humans, the actants.

It is necessary to go beyond the individual, as it is a socio-technical *agencements* that involves multiple human beings in collaboration interacting with their artifacts that are reconfigured depending on the nature of both the actors and the actants (Callon, 2004). This leads to consideration of the agencies, in a reductionist way, as adaptive behaviors (Callon & Caliskan, 2005). However, through the perspective of Transformative Activist Stance (TAS) the idea of passive subjects merely reacting or adapting to their environments, subjects are instead positioned as active agents able to change themselves and therefore their environment (Stetsenko, 2014). This is the stance followed in this paper.

But, in what way does this happen? What are the processes involved? The understanding of these processes is fundamental because without a clear understanding of the interrelation of the processes involved, a sociocultural approach can be assimilated to other approaches that examine only a part of the whole. Following Rogoff (1990, 1993) this transmission of culture in any activity is carried out through three interdependent mechanisms: *apprenticeship*, *guided participation*, and *participatory appropriation*. The *apprenticeship* focuses attention on the specific nature of the activity involved, as well as its relation to practices and institutions of the community in which it occurs - economic, political, spiritual, and material. In the *guided participation* it refers to the direction provided by cultural and social values. The concept of *participatory appropriation* is when individual changes can be produced as a result of preparation in previous situations. It is a dynamic, active perspective in which there is a shift from the interpersonal to the intrapersonal field as a result of a long series of events in its development. This process attends the fifth principle of activity theory that proclaims the possibility of expansive transformations through relatively long cycles of qualitative transformations, resulting when the object and motive of the activity are reconceptualized to embrace a radically new horizon than that in the previous mode of activity (Engeström, 2001). Also there is a correspondence to Bateson's theory of learning that points out that expansive learning activity produces culturally new patterns of activity, and consequently new forms of work activity (Bateson, 2000).

Thus, the object of analysis in this article are the peculiar forms of mentality that arise in relation to the construction processes of traditional architecture, defined by the resources understood as mediating devices that require the gathering of the existing community worldview and the peculiarities of the social and material situations historically specific. So the variation of environment involves changes in activities that gradually modify the worldview. The mind is intrinsically linked to the organization of social activity (Greeno & van de Sande, 2007; Hill & Cole, 1995; Minick, 1989).

3. History and constructive characteristics of the two communities

There are a number of different links between the Pico Island in the Azores and the Minho Area of the North-western Iberian Peninsula. Most notable is the common history they share. The settlement of the Atlantic Archipelago was one of the first experiences of Portuguese colonization (Ribeiro, 1962/1994).

Pico is one of the nine islands that make up the archipelago of the Azores. It was the last island to be populated in the year 1439 under the orders of Don Henrique mainly by native inhabitants of the North of Portugal among other places (Ávila, 2015; Leite, 2012). However, the cultural reference was the characteristic landscape of Minho, which “was almost completely transposed there” (Ribeiro, 1962/1994). Although these “transplanted” architectural models of the Portuguese mainland have been rapidly modified, adapting to the characteristics of the site through a certain “subsistence culture” that characterizes and endows Azorean vernacular architecture with identity (Meneses, 2010).

“When the first settlers arrived, they all had to improvise to guarantee their livelihood” (Ávila, 2015, p. 40). Communications with the continent had always been very rare and freight costs, expensive. Population lived in relative isolation even within the island itself. Proof of this is the variety of Portuguese accents that linguists have come to identify on the island (Serpa, 2014 February 20).

In fact, until the middle of the 20th century, the Azorean islands were almost ignored lands, often by those who administered these territories, as it seems to indicate the fact that the electrification of the island occurred in the second half of the 20th century as well as the construction of the first highway that crosses the island (Interview, 22/8/2020). There were few contacts that their people

had with the outside and, many Azoreans were born, lived and died without knowing the island that bordered them (Ávila, 2015, p. 105). Others emigrated during periods of great economic crisis in the 18th, 19th and 20th centuries to Brazil, the United States and Canada and never came back.

The climate of the Azores is not very different from the Minho Area, with mild summers and cold and humid winters, although higher precipitation records and more abundant cloudiness characterizes the island of Pico. Climates are evidently influenced by the Atlantic, which attenuate the extreme values, creating a warm, temperate climate regime with high moisture content of the air, mild levels of solar radiation in addition to regular and abundant rainfall and strong winds (SRAM, 2009). Great maritime storms were common, accentuating periods without external contacts. *“It is said that the old Mother Church, built around 1506, was badly damaged by the various invasions of the sea, often leaving fish on the altars”* (Ávila, 2015, p. 56).

At the geological level, there are clear differences between the two zones. Pico is the most recent island of the Azores archipelago in terms of its geological formation. The last eruptions responsible for its formation date from 1710 to 1720, eruptions that marked the landscape, and influenced the way the island was occupied (Nunes, 1999).

Geologically, the island is characterized by the presence of basalt, which constitutes 80% of the total existing rocks. This high presence of basalt gives the soil very special characteristics. In the shallow layer, the soil is sandy loam with loose stone. Under this layer, the volcanic rock is reached, and between its cracks exists some soil that is the product of basalt erosion or wind transportation (Nunes & Forjaz, 2001). There is almost no vegetable layer that allows the development of an abundant agricultural activity. Only 4% of the land is cultivable.

There is a popular saying on the island that reflects this reality and that shaped the life there: “pedra donataria”, the stone is the owner of the place. Another common expression from the neighbors of the island of Faial states: *“This is not a place to live. Only stone and more stone. There is nothing to do”* (Interview, 05-30-2017).

The settlement of Pico Island is intimately related to this situation. The introduction of the vineyards on the island is attributed to the Franciscan religious order, from the origin of their occupation in the fifteenth century. Since they had similar experiences in Mediterranean locations, they ventured to repeat the experience by bringing vines strains, specifically “Caste Verdelho” to the island. They planted among the basaltic stones thanks to the contribution of topsoil that was brought from the Faial Island, thus beginning one of the activities that would define Pico Island; the production of wine (Eiras-Dias et al., 2006).

Flemish settlers and slaves, as well as prisoners, were also determinants in the formation of Pico's identity (Leite, 2012) since they were one of the first groups to populate the island, the first as landowners driven by the handover of the Pico's captaincy to the flamenco Jos de Utra and the second as forced laborers of the same (França, 2016). It was not easy to encounter people who wanted to voluntarily move and live on an island that lacked resources and where subsistence became a daily struggle. They built many of the vernacular constructions typical of the island's wine culture, such as the “poços de maré¹” (tidal wells), wine-cellars, Manor House, “currais²” (walled area) etc. (Duarte Jr, 2001).

Azorean historians record several “years of hunger”. In the nineteenth century, the emergence of the disease in the vineyards, phylloxera, was a major setback for the wine industry and increased the problems of subsistence of the population. This why a new economic activity was taking force for the inhabitants of the Azores, including Pico Island; the participation of hunting whales (Amorim & Santos, 2009; Ribeiro, 1998). However, this brought another limitation linked with the previously existing: shortage in male human resources related with temporary emigration. The need to ensure the enlargement of the means affected of a geographical endogamy and women had an important role in the familial economy with their participation beyond the domestic household into agricultural work and small craft industries (Amorim & Santos, 2009; Perdigão, 2004).

Another popular saying of the place condenses the experiences of that time: *“Here one thing is never enough”* (Interview, 1-6-2017). On the island there was always a shortage and people were encouraged to master various trades to expand livelihood opportunities in an environment that was always short of resources. The inhabitants of Pico were raised and progressed from their ability to adapt by adjusting the continental way of life to the geographical reality of the islands (Nemésio, 1929).

In a gastronomy comparison *“In the absence of an oven, they baked on the slab from volcanic stones the rudimentary bread from their frugal meals, and later the cake. (...); they roasted the meat on the embers, the fennel replaced the vegetable that had not yet had time to grow, since rarely; they invented sauces, grateful to the palate, to make up for the lack of olive oil, which is late in fruit, a custom that endures...”* (Soares de Lacerda Machado, cited in Ávila, 2015, p. 40).

As Nemésio, creator of the term *açorianidade*, stated *“geography is as valuable to us as history”* (cited in Pimentel, 2014).

“After five centuries of isolation, permanent contact with the sea, volcanic cataclysms, a finite horizon, he is no longer the ‘Minhoto’ or the ‘Alentejano’ who arrived in the ships of the settlement.”

Morais (1983, p. 147)

¹ “Tidal Wells”, fundamental elements of quadrangular or approximately circular section that were constructed near the coast, often with significant depth, for the catchment of underground water accumulated by the action of the tides. This water, often with high percentages of salinity, was used in household services (Silva & Carqueijeiro, 2004).

² Small divisions of land divided by walls of geometric shapes that are characterized by their low height and the black color of the basalt with which they were constructed (Silva & Carqueijeiro, 2004).



Fig. 2. Typical cistern from Pico.

3.1. Description of the construction systems of the two regions

In the description of the construction systems of the two regions, the influence of the island's architectural culture in relation to the origins of its settlers is confirmed, that is, with the architectural culture of Continental Portugal (Ribeiro, 1962/1994).

According to Ribeiro (1962/1994), the North Atlantic area of the Iberian Peninsula was the cultural reference for the island of Pico, characterized in both cases by an architecture closely linked to production activity with compact buildings, orthogonal plan, rectangular and with few openings. They were generally two stories high, reserving the residential function for the second floor and the ground floor for functions related to agricultural activity. These were independent spaces, with outside stairs, and the kitchen assumed a central role as organizer of the house (de Llano Cabado, 1996, Fernandes, 2007).

Starting the 19th century, the houses of Pico began to incorporate cisterns that collected rainwater. This element ended up being a distinctive element of the economic capacity of the families as well as the spirit of self-sufficiency of this community (Interview, 24/8/2020) (Fig. 2).

The construction systems, in both cases, stand out as architecture deeply determined by local resources, namely, the abundance of rocks, constituting the main material of these buildings. They are most commonly found in the construction of the foundation and walls. In the case of the Minho area, granite was mainly used and, to a lesser extent, slate. On Pico, however, the stone used was basalt. In both cases, the foundation consisted only of a widening of the bearing walls until reaching solid ground.

The construction technique mainly used for the walls was dry masonry, with an average thickness of 50 to 80 cm, in the case of the Minho area, and 60 to 75 cm in the case of Pico. In order to ensure the integral behavior of the envelope walls, which assumed the structural function of the building, the corners of the buildings were interlocking. In these encounters and in the formation of the holes, carved stones of the dimensions of the wall thickness were used. In the case of the Minho area, the interior partitions of the ground floors also contributed to improve the unity of the whole. While in Pico the partitions did not participate in this function and were built using *tabique* (wattle and daub technique), covered by a lime plaster with the addition of puzzolana (volcanic ash) to obtain a hydraulic set, and often mixed with vegetable fibers or cow hair in order to minimize problems with retraction (Correia Guedes & Oliveira, 1992).

Although there was and is a risk of earthquakes in Pico, these walls could only resist movements of moderate intensity, as the supportive behavior of the buildings that ensures better response to these horizontal forces depended solely on corners to not use any type of binder in the construction of the walls.

Wood was the second most used material in the traditional architecture of the two regions. In the Minho area, the local species used were mainly chestnut and oak, while in Pico, other local species such as the Incenso tree (*Pittosporum undulatum*), Beech (*Fagus sylvatica* L.), Acacia (*Acacia melanoxylon*) or Conifer (*Cryptomeria japonica*) were commonly used (Dutra, 2010). In both cases the wood was used for the structure of the roof, the floors, as well as interior and exterior carpentry.

The roof construction systems of both regions were mainly trusses, although there are more remarkable examples of complexity in the Minho area than in Pico in terms of structural span, dimensions and complexity of the assemblies of the pieces (Fig. 3). A wooden batten was placed perpendicular across the trusses to serve as support for the traditional clay tile. Although in Pico, it was common to find stones arranged in rows parallel to the bottom of the eave, to avoid the displacement of the tiles due to wind or the small tremors characteristic of the island.

4. Method

This study on the identification of the values that guide the actions has required a work on the articulation between the material



Fig. 3. a. Trusses from Minho area.
b. Trusses from Pico.

practices, policies practices, and discourses (Foucault, 2000), a work that allows bringing to light the profound logic that links different social practices. Specifically, the search for these articulations was made using the perspective of a synchronic and comparative analysis, thanks to the use of a mobile ethnography (Marcus, 1995) that has tried to follow the practices associated with the execution of similar constructive systems in different locations. Although the perspective adopted has a peculiarity: the life stories of two builders, one in Pico and another in the Minho Area, served as the guiding thread. In the uniqueness of their stories, general social conditions can be discovered in this complex two-way relationship between self and social context. Being the individual and the social crucial elements in any study of social life, in this case understanding cultural change since the past is part of individual lives in the present. (Harrison, 2008). The choice of this technique is based on three essential points: First, it allows gathering collective representations that include mental and emotional attitudes, as well as worldviews. Second, in the choices made by individuals or groups such as the family to resolve the crucial issues of the work, mixed decisions are made at the individual and collective levels, consciously and unconsciously, socially and personally. Finally, both social solidarity and the conflicts of daily life are expressions of the interaction of the objective and the subjective (Passerino cited in Fraser, 1993).

In any case, life histories have been evaluated both in terms of their internal consistency and compared with evidence from other sources.

The research focuses its interest on the cultural patterns of building in those related contexts that are read through the construction processes used in buildings with common architectural traditions. It highlights how the differences in the implementation processes in different environments allow us to recognize the worldview that underlies the sociocultural framework in which they are developed. They attempted to ethnographically construct the major differences in thought patterns in which the Pico constructive community was socialized in comparison to the Minho Area.

In May 2017, participant-observation was carried out on a rehabilitation of a traditional house located in the eastern corner of Pico Island, specifically in Bandeiras. The work was in the process of gathering material, dismantling the elements that were in poor condition, and assembling the roof structure. This builder, Antonio Teixeira, was contacted through instructions from other

construction workers who identified him as the main reference in the refurbishment of the island's traditional heritage. He is around sixty-five and has worked in different fields, as is usual on this island, although his main job has been in the field of refurbishment.

In-depth interviews were conducted with a heterogeneous group of people from the island. Professionals such as the municipal architect of the island of Pico, Mónica Silva Goulart; architects, Jorge Silva, who is doing his PhD about Pico's architecture, and Igor França architect author of an extensive research about Pico's society; the geologist, Paulino Costa, head of the island's natural park; the sociologist, José Carlos García, an expert on the whaling world; the historian, Maria Norberta Amorin, born in Pico who has an extensive collection of publications on the islands of the Azores; a young geographer as Andreia Lemos in her 30s and a teacher in her 40s, Cristina Ferreira; the historian, Manuel Costa, director of the Pico museum; Bruno Machado, president of the São Roque parish council Manuel Serpa, former parish priest of the place; Rui Martins, anthropologist professor from Azores University. Other informants who also shared their knowledge were the construction worker, Paulo Machado, the son of the island's roofer, Carlos Silva, Mrs. Amelia da Rosa Pereira, a woman from Pico in her 70s, Rafael Serpa, a worker in his 30s from the Pico museum. In all, around fifteen semi-structured interviews were carried out. Subsequently, telephone contact was made with some for additional information or clarification of some issues.

In the case of the Minho Area of the Iberian Peninsula, data was obtained through privileged informants of two retired builders living in A Guarda, Pontevedra Province, Galicia, in Spain, as well as interviews with other professional informants such as the senior builder, Mario Ribeiro and the anthropologist João de Pina Cabral. It is worth mentioning the importance of the family tie of one of the authors of this article to one of the builders living in A Guarda. His name is Joaquín Lima, a builder in the area for three decades, although before settling in this trade he experimented in other areas such as selling wood and making tiles. The other informant is David Vicente, who unlike the previous one was dedicated exclusively to the stone trade.

5. Findings

In order to analyze the way ensembles were used to establish workload, the scope of work, and the development of the type of relationship that will be set with others, the extracted information is structured based on three specific elements: the foundation, the walls and the roof.

5.1. Foundation

Any work began with the collection of stone that would be used for the walls and foundation. In rural villages of the North Atlantic Minho area, it was customary to collect the material on the farm or in other nearby and accessible plots of the family environment. If there was not enough for the planned work, the builder went to a nearby quarry.

In this stage of stocking materials, both the construction team's laborers and family members, for whom the house was intended, were involved. All members of the family, regardless of age or sex, participated in the first days of work, transferring the necessary stones by wheelbarrows, horses, mules and even oxen to the worksite. Family work played a fundamental role of support in processes that did not require special skills. On the other hand, in Pico, the master builder carried out this phase of material collection alone, without the participation of anyone else. The stocking material activity as a socio-technical *agencement* of the building processes allows drawing out cultural differences, that have been worked through generations pointing out reformulations that have evolved over time in reasoning processes ending up with a shift to an individualistic pattern.

After the collection of material, the foundation proceeded to be staked out. The construction methods used in this phase, like the previous one, are highlighted by the marked cooperativeness in the area of Minho versus the high degree of individualism prevailing in Pico. Taking into account similar requirements, one had a minimum of three workers, compared again with the exclusive role of the master builder in Pico.

In the Minho area, a series of stakes and ropes were positioned that would serve as a guide for the excavation of the foundation ditch. Afterwards, they proceeded to fill it, transferring the stones by hand among several men, since the foundation used the largest stones, arranging the material to ensure a good lock.

In Pico, in order to favor autonomy, the process differs. The foundation is executed in two phases in which staking out and execution operations are intermingled. In the first phase, isolated footings are built in the corners of the future building, and in a second phase trenches are excavated between the footings previously made to contain the foundation. That is to say, in the first phase the reference points are defined by permanent elements, the insulated footings, allowing the excavation of the trenches between them as well as being able to fill in slowly over time without fearing the loss or deterioration of the layout. This was motivated by the versatility of the worker of Pico, that when the whale hunting season was opened, they were forced to stop the construction work to dedicate themselves to this other seasonal practice which allowed them to diversify sources of income, one of the defining characteristics mentioned above of the Pico community. This material practice is an ethnographic vignette of the fifth principle of activity theory that illustrates how expansive learning activity produces new forms of work activity. Both stoking materials and foundation proceedings allow identifying the object instantiation since the taken actions try to foster autonomous work, the main reasoning that provide practical guidance in Pico community. The relationship between agency and the collective interactions over time has shaped this "community of practice" since are mutually involved with and connected to the artifacts they produce, and how these activities are developed.

This guided participation was apparent in other domains as hunting whales as a system of shared meanings. Although this activity was so risky, it required several men to carry it with relative safety. However, it was necessary to regulate its practice by means of several decree-laws that were issued between the end of the 19th century and throughout the 20th century where, among other

aspects, was stipulated the minimum number of men who should participate (Interview, 25/8/2020).

5.2. Walls

In the Minho area, the same group of three workers continued working after finishing the foundation. First, to proceed with the building of the walls, the group as a whole would make a new selection from the initial collection of stones. For the first meter and a half high, the large stones were placed by between two to three men. From this height, simple scaffolds were mounted based on a system of wooden stakes and boards, braced in situ. By means of a pulley, managed by one of laborers, stones were raised to the upper courses of the building while the other two men were arranging them, ensuring that the vertical joints were broken as well as the homogeneity of the seat of each piece to avoid rupturing of parts due to excessive and uncontrolled tension points.

In the case of large pieces such as jambs, lintels, sills and corner pieces, these were raised directly from the ground by pulley, in the same way described above. Since these pieces were larger, there was a risk of damage by leaning them on the scaffolding, which is why they are placed directly on the wall.

In the case of Pico, the mechanism used to lift the stones does not differ substantially but is carried out by a single operator, which means a longer construction time. Perimeter scaffolding was also available to provide a work surface that allowed the builder to work on the higher levels of the wall. The builder, being a single operator, had to raise the stones to the necessary height of the wall using a pulley, and then secure the pulley and climb onto the scaffolding to place the stones in the wall.

The main difference in the construction process between the two areas lays in the horizontal transport of the parts through the work, that is, the way in which in Pico the builder moved the large stones to the location of the pulley. A track was made by means of wooden rails arranged on the ground on which the stones to be moved were placed one by one. At the beginning, the builder rolled the stone over the rail until he was able to lift the rail and rolled them by the weight of gravity onto the next track. This operation was repeated until reaching the desired location. "All these operations do not require more than the strength of a man's arms" (Interview, 9/12/2017). It is a summary shared worldview expression that let show the legitimized discourse in Pico as the *guided participation* that provide the direction in an occupation by cultural and social values through training.

There is evidence of great effort made to ensure an autonomous work, preferring to invest in a longer construction time to displace large loads, rather than collaborate with other operators. This shows how autonomy is an important value that it is possible to linked with the fact that in this society the exchanges were almost exclusively through "more or less consensual" barter. Very few owned money as a means of exchanging goods and services. Reciprocity in the form of favors prevailed. But, the demand for a favor added a source of uncertainty about the costs involved in thanking such help, since being a population with few resources there was no security of being able to return the favor, which meant a loss of freedom (Fisher et al., 1982), thus avoiding going into debt by promoting the aforementioned autonomy. As one interviewee commented: "nobody wanted to owe favors" (Interview, 8/24/2020). In the day of the slaughter pig was reflected the importance of this exchange of favors since this activity ended with the preparation by the woman of the house of "presents to friends and people to who owed 'favors'" (Ávila, 2015, p. 38).

5.3. Roof

At this stage of the work, with the walls and other structural elements completed, the roof structure was started.

In the Minho area, a carpenter built the roof structure. He was usually hired directly by the master builder. He was responsible for the manufacturing of pieces in the workshop and the on-site installation. Usually he worked alone, helped by a son or apprentice in the workshop who could also accompany him to the building site and help him in the heaviest work tasks, although there he worked mainly with the crew of the master builder who helped him to hoist the pieces of wood by means of the pulley and the previously used scaffolding.

Once the carpenter had assembled the wooden roof structure, it was the crew of the master builder who arranged the clay tiles and the carpenter went with the apprentice, (if any), to mount doors, windows and floors.

In the case of Pico, it is again the master builder who alone assembles the wooden elements that the carpenter made in the workshop. Another "little reality" based in autonomous work as the dominant value identified. Beams, braces and "*frechais*" (wall plates) are lifted up to their position by the pulley. Again, in order to ensure an autonomous work, the structure is designed to ensure that the dimensions of the pieces do not have a large size, as it would make it difficult to assemble the pieces alone. It is about a reconfiguration of the socio-technical *agencement*, going beyond reacting to its environment since large pieces are available, but builders as active agents capable of changing themselves as stated by the perspective of Transformative Activist Stance choose for changing the construction system on roof to ensure autonomous work as pursued by the individualistic world view of Pico. Additionally, in the case of Pico, when working practically alone and therefore delaying the construction time, it was necessary to be more sensitive, if possible, to weather patterns at the time of the roof assembly. Untimely rains would increase the humidity of the wood and therefore favor the appearance of xylophage attacks, or future pathologies. "It is important to calculate the building timing of each house so that you do not get caught in the rains when assembling the roof" (Interview, 11/12/2017).

6. Outlook

In this case, the aim is to apprehend the practical relationships that are established in the construction systems through a multi-situated ethnography of socio-technical *agencements*, and thanks to the strange solidarity of the levels of practice, to capture the cosmovision of each community. As Pierre Bourdieu (2016) states, it has consisted of going to look closer without risking getting lost

in the details.

The migrants from mainland Portugal found themselves in a new settlement context, an island, which is a closed system, with a young geology that lacked two of the main resources for life; accumulated fresh water and topsoil for food cultivation. The initial soil to plant the strains of vines had to be brought, from the island of Faial, and it was necessary to create “*poços de maré*” (tidal wells) for potable water.

The generating principle of the socio-technical *agencements* imported from continental Portugal by the migrants was adapted to these new and difficult situations, and ended up defining a new worldview for this displaced community. This was possible thanks to the interagency learning since, at the same time they were forced to modify in this new environment building proceedings, it brought changes in community values. From a world in which resources are limited and inextensible, two theoretical avenues of action appear: cooperation or individualism (Foster, 1967). It seems that in Pico the second option was the one that prevailed and ended up defining the *guided participation*.

Based on the conceptual basis that each activity system is consistent with the norms of the general (Linton, 1982), the analysis of the socio-technical *agencement* of the construction processes has made it possible to confirm the individualist ethos of Pico against the cooperative of the Minho area. Although in the beginning there was a common cultural link between Pico and the Minho area, there have been different agencies facing similar construction challenges. As the fifth principle of activity theory states, it has been taken place an expansive transformation during centuries. As a result, in Pico's community those activities that required a work of considerable physical strength were guided by an individualistic spirit, which differentiated them from the mode used in the Minho area. They favored the creation and implementation of solutions that required greater technical creativity, and/or greater commitment of time, in order to ensure greater autonomy of work. In fact, cooperation seemed underestimated, as it appeared in an underlying way in the interviews conducted in Pico.

The world view of the inhabitants of the island can be understood only within the dynamics of processes that continuously reshape it, such as the development of activities and the formation and transformation of sociotechnical arrangements.

These differences in the construction processes between the Minho area and the island of Pico are the product of the sensitive reading of local conditions and the progressive *participatory appropriation* of the members in a synergic work. They are born from the assembly of people with the resources of each medium. A reconfiguration of the original socio-technical *agencement* of continental Portugal was made. The inhabitants of Pico were taken to act mainly by the singularities of the environment as active agents changing also themselves as points out the Transformative Activist Stance.

The scarcity of resources in Pico which was noticeable in most key areas, such as food, also occurred in other domains such as construction. The clay had to be brought from the island of Faial, already made as a tile, and lime (whose raw material is limestone), had to come by boat from mainland Portugal (Interview, 5/29/2017). Natural puzzolana, used in the manufacture of hydraulic lime mortar, was brought from the island of S. Miguel (Velosa & Veiga, 2001). That is to say, even the constructive means were governed under conditions of shortage of raw materials.

The main engine of change of the psychological processes of the community of Pico was the shortage of resources in the new island environment. This case study shows that what humans want, think, or feel in terms of their agency is shaped by the hybridization of humans and artifacts with new worldview emerging in the end. This can still be traced in areas such as traditional construction because it is still the *guided participation* used by older people in the area based in a legitimized discourse that can be captured throughout object instantiation from building proceedings: a clear individualist task-oriented frame.

The demonstration of the “embedding” of constructive action in networks of interpersonal connections and in particular cultural conditions opens a new approach: the anthropology of building systems (c.f. Granovetter, 1985) where activity theory provides a useful analytical tool for the enrichment of studies in this field. A new application of activity theory emerges that provides the conceptual tools to address the complexities by studying relations between micro-level behaviors and macro-level phenomena.

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