Bicycle mobility: planners' attitudes under the influences of institutional functioning.

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Abstract

Environmental issues and sustainability are inherent parameters of mobility. The environmental emergency has influenced the paradigms of transport to give rise to new sustainable discourses. Changing of signifying patterns suggests transfiguring the discourses of what was in force. Thus, the main objective of this research is to understand the set of institutional characteristics that can be related to motivating the agents to have any more or any less favorable attitudes towards sustainable mobility. To this end, a theoretical contribution on governance, institutional work and sustainable mobility are used to understand the institutional mechanisms focused on mobility planning. The Attitudinal Stages method is at the core of the research on the any more or any less favorable planners' cycling attitudes. As a result of the interpolation of the methods, it will be verified whether there is a relationship between certain characteristics of institutional functioning and the planners' attitudes.

1. Mobility discourses through institutions

In the context of transportation, governments are undergoing processes of change and reflection concerning the mobility management of their cities regarding the low carbon transition, and green transformations (Pamucar et al. 2022; Dias, Lopes, and Silva 2021). Climatic factors, urban traffic, noise, use of natural resources and support low carbon mobility transitions (Lee, Feng, and Peng 2022; Haupt et al. 2022; Wimbadi, Djalante, and Mori 2021) induce the trend towards a decline in automobility consequently policy transitions to new mobilities (Emodi et al. 2022). The introduction of the bicycle as a transport mode and not only as a leisure activity. However, not all government systems are equal in policy (Haupt et al. 2022), nor in the significance given to the bicycle or other alternative modes of transportation. As such, the approaches focusing on institutional change have targeted the importance of institutional actors (Beunen and Patterson 2016; Mahoney and Thelen 2010; Lawrence, Suddaby and Leca 2019; Bettini, Brown and de Haan 2015) and to accelerate "implementation of sustainable mobility policies is an urgent concern for rapidly developing cities" (van Dijk, Samimi, and Zandler 2022). In this way, everyday pro-bicycle discourses can generate disruptions when they are introduced into government systems through institutions,

this being the core of the discovery and lack of studies on cities beginning to use the bicycle or sustainable mobility (Dias, Lopes, and Silva 2021; Silva, Lopes, and Dias 2022; Bærenholdt 2013; Doughty and Murray 2014).

On the other hand, recent research refers to the decline of the privilege of individualized automobility (Pamucar et al. 2022; Wimbadi, Djalante, and Mori 2021; Manderscheid 2014) due to the rise of new regimes of making and experiencing other more sustainable mobilities (Merriman 2014). In general, transportation studies the research has focused on user behavior and thus may neglect underlying factors such as geopolitical order, political governance, and the changes caused in the very system that governs organizations (Manderscheid 2014). This reality has been changing as we see in more recent studies that focus on the behaviour of technicians, politicians, and planners; and the study of tools for mobility management a sustainable focus (Silva, Lopes, and Dias 2022; Dias, Lopes, and Silva 2021; Bicalho and Silva 2019). It becomes a relevant factor when it is understood that there is institutionally a sense of acting and protection of the system that crystallized a system of standards, of management, ways of thinking and to bureaucratize the actions, which reflect the institutionalized discourses. Once this process of action and reaction is understood, it turns to the organizational systems of institutions (Haupt, Kern, and Irmisch 2022; Patterson and Beunen 2019), under a focus on the mobility management of cities in relation to the sustainable mobility, especially the cycling mobility (Pamucar et al. 2022; Bicalho and Silva 2019; Heinen 2016; Muñoz, Monzon and López 2016; Pucher and Buehler 2008).

Thus, in this system, the set of actors, whether in the interaction among them or with the system produces situations that direct the agents' attitudes in the face of change. As a result of a process of action and reaction to external and internal factors, institutions create a scenario of mechanisms, beliefs, narratives, and forms of management, in which numerous and diverse actors are involved. Institutional actors are considered important elements of decision-making in governance processes. Therefore, it is necessary to understand what is involved in the structural adaptations of procedures and human resources (actors) that can be facilitating factors for the implementation of more sustainable policies.

Beunen and Patterson (2016) explain that most research efforts focus on institutional structures to elucidate organisational behaviour and actions per se. On the other hand, currently the lens of studies is turning on the influence of actors' actions on institutions and themselves. Fligstein and McAdam (2012) elucidate the fact that there is little theorising about actors and their role in changing institutions through time. In this literature review, most of the research to date has focused on user behaviour and therefore may neglect underlying factors such as geopolitical order, political governance and the changes caused in the governs organizations regarding the bicycle mobility. In this system, the set of actors, whether in the interaction between them or with the system produces situations that direct the actors' attitudes in response to change.

The Attitudinal Stages method (Bicalho and Silva 2019) categorises planners into 5 stages - resistant, sceptical, interested, enthusiastic and committed, - referring to their favourable to less favourable attitudes towards cycling. From these factors, the main objective of this dissertation is to understand (1) what is the set of characteristics of institutional functioning that may be related to motivating institutional actors to have a more or less favourable attitude towards bicycle use. The secondary objective of this research is to understand theoretically: (2) as a result of a process of action and reaction to external and internal factors, institutions create a scenario of mechanisms, beliefs, narratives and forms of management, in which numerous and diverse actors are involved.

1.1. The influences of institutional functioning on actors: theoretical-conceptual model

The issues involving institutions are cited and presented in different perspectives. The theoretical-conceptual model (**Table 1**) aims to organize which are the institutional characteristics observed in the literature, and which were presented as determinants in the attitudinal stages. In the various theorizations presented, institutional characteristics are not always present in a direct way, therefore, given the context and presentations of the authors' case studies the characteristics assumed by their indirect form in the literature. The investigative references of this model of theoretical synthesis cover different strands, one directly related to governance systems in general (gray) and, the second focused on mobility (white).

Author	Research	Issues found	Institutional characteristic
Bergsma et al., 2017	- Institutional work in the Netherlands; - Adapting institutions to new realities.	- Formal rules and patterns.	- Hierarchy; - Vertical and horizontal institutional organisation; - Institutional actors; - Discourse, ideology and institutional posture.
Patterson and Beunen, 2019 Beunen & Patterson, 2016	- Concept of institutional work; - Institutional changes in the context of governance.	- Exogenous factors linked to specific contexts that require the institutional change; - Institution reflects a political position; - Institution is the reflection of a society; - Cumulative effects over years and different managements in the institutional work.	- Worldwide social, economic and political pressures; - Political colour; - Legislation and codes; - Colleagues' attitudes; - Hierarchy; - Cumulative effects of management.
Patterson & Huitema, 2018	- Institutional innovation in urban governance; - Institutional adaptation as a result of climate change.	- Innovation and institutional flexibility.	- Hierarchy; - Technical staff experience.
Gonzalez & Healey, 2005	- Sociological Institutional Approach; - Institutional innovation.	- Historical context, geographical position.	- Discourse, ideology and institutional position; - Global social, economic and political demands.
Silva & Mário, 2015	- New Institutional Sociology; - Institutionalism.	- Legitimisation of institutions (isomorphism); - Coercive, mimetic and normative isomorphism.	- Reproduction of institutionally created myths; - Political colour; - Global social, economic and political pressures; - Importation, mimesis and imitation of solutions; - Professional class patterns; - Cumulative effects of management.
Vasile, 2019	- Experience in the institutions; - Emotional work.	- Experience and background of each actor.	- Colleagues' attitudes.

Author			
BÆrenholdt, 2013	- Links mobility to Focault's concept of governmentality; - The power of mobility.	- Mobility is also associated with power and government; - The powers of the mobility study.	- Political colour; - Discourse, ideology and institutional position.
Banister, 2007	- Sustainability in transport terms; - Policy measures and their influence on improving mobility; - Mobility changes related to transport users, policies and institutions, and technology.	- Technocratic discourses over the years in mobility and the changing paradigms of "predict to provide" mobility management; - Moving towards sustainable mobility.	- Discourse, ideology and institutional position; - Sector interconnection; - Political colour; - Importation, mimesis and imitation of solutions.
Balsas, 2015	- Recent efforts towards sustainable transport; - Reflections on the solidity of the new discourses, whether they are temporary or have come to solidify and change.	- Alternative approaches; - Influence of transport engineering; - Technocracy.	- Discourse, ideology and institutional position; - Importation, mimesis and imitation of solutions; - Reproduction of created myths.
Bicalho & Silva, 2019	- Residual cycling in cities that are starters; - The degree to which increasing awareness of the cycling potential of starter cycling cities changes planners' attitudes and mitigates scepticism.	- Attitudinal change; - Research targeting urban planners; - Transtheoretical Model of Change.	- Discourse, ideology and institutional position; - Colleagues' attitudes; - Reproduction of created myths. - Professional and personal cycling experience.
Doughty & Murray, 2014	- Mobility policies; - Discourses; - Privilege of individual mobility; - Normative sets, knowledge and practices; - Prevailing normative discourses.	- The everyday and the institutional discourses of mobility; - Lines of thought and attitudes to mobility.	- Discourse, ideology and institutional position; - Stable organisations in the face of an institutional posture.
Manderscheid, 2014	- New mobility arrangements; - Knowledge interlinking; - Multifaceted power relations analysis.	- Institutionalised mobility discourses; - Institutional positions on an issue.	- Discourse, ideology and institutional position.
Pucher & Buehler, 2008	- The lessons from the Netherlands, Denmark and Germany that made cycling "irresistible"; - Policies and infrastructure implementation related to high cycling rates in these countries.	- Relationship of the political front in the adoption of pro cycling measures and education; - Comparison between countries that have different discourses and beliefs and the consequences on the number of trips and cycling enthusiasts.	- Discourse, ideology and institutional position; - Reproduction of created myths; - Importance of local actors; - Sector interconnection.

Table 1 - Bibliographic summary for the theoretical-conceptual model.

There is a theoretical framework that starts from institutions as a key aspect of governance systems. These theorists discuss how exogenous demands confront institutions and institutional work. In this group of authors, there is no direct relationship with mobility, but in general with environmental issues, institutions, institutional work, processes of institutional change. The reflections start directly from institutional work by linking actors, innovation,

exogenous and endogenous factors, narratives, links between old and new institutions, institutional character, performance, tensions, resistance, etc.

On the other hand, theorists focused on transport and urban mobility also reflect on exogenous factors that lead to changes in the new paradigms of mobility management. It is noted that there is a pattern of change in recent years that disconnects the arguments from the transport technocracy and leads the reflections on sustainable mobility. There is a clear vision of this group of actors in the influences of the narratives created, from an economic logic which led to environmental collapse. Once the technocratic influences on mobility are discussed, it is directed that the institutional characteristics that can have influences the actors are those related to power and politics, in addition to the current discourses in certain historical periods.

In short, in the literature analysed in 2020 to this investigation, a set of 14 characteristics of institutional functioning was found to have indications of influencing the agents' more or less favourable attitude towards a given change. The characteristics were systematised into three macro groups: exogenous factors, institutional set-up, and human resources. The exogenous factors are the relations and consequences of an institution with something external to it. Institutional structure is the functioning of institutional work, the way it is rationally organised, all its tools and methods. Human resources are the agents, technical and political, who act in the institution with all their influences at various levels. Thus, for each of the macro factors, aspects of the institutional characteristics were related, as shown in **Figure 1**.
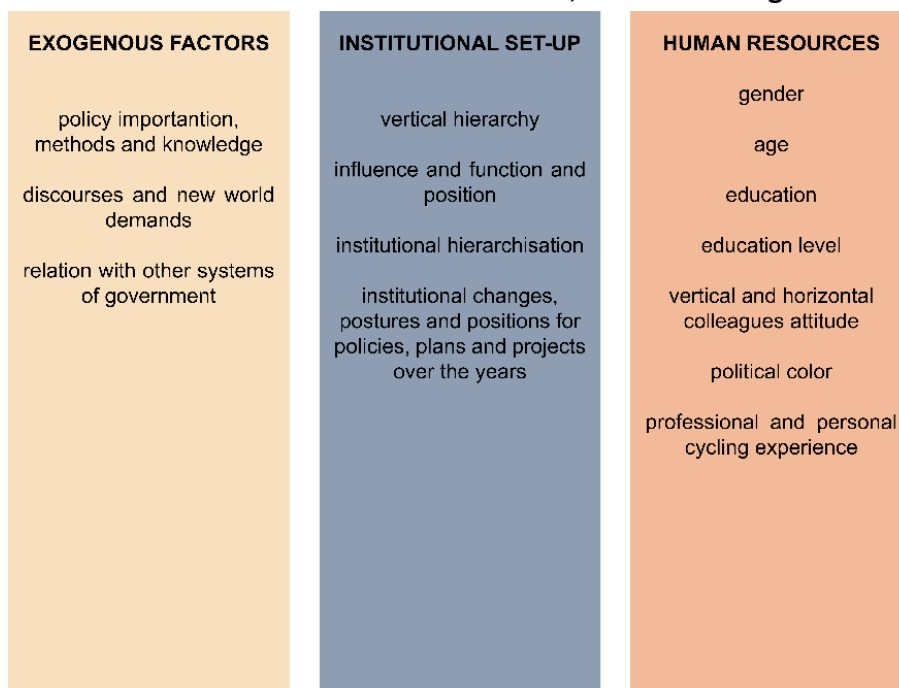
Figure 1 – Summary of institutional characteristics based on the theoretical-conceptual model.

For the exogenous factors it was reached 3 characteristics: importation of policies, methods and knowledge, discourses and new global demands and relations with other government systems. The category institutional structure, in turn, was divided into 4 subcategories which are: vertical hierarchy, influence of the position; position of the function; institutional hierarchy; trends, postures and institutional positions for policies, plans and projects over the years. Finally, the group related to human resources, which resulted in 7 characteristics:

age/gender, professional training, level of education, posture of colleagues at horizontal or vertical level, political color and professional and personal experience with cycling.

The theoretical-conceptual model allows naming the institutional characteristics to translate the context of institutional functioning to apply and relate it to the agents. In other words, the action and reaction to change, by the agents, can be understood when catalogued within characteristics that lead to the understanding of the institutional origin of the more or less favorable attitude stages of the agents. In this way, the translation of theory into key concepts leads to the elaboration of the set of statements for the surveys.

2. Materials and Methods

2.1. Attitudinal stages method

This stage is based on the results of the theoretical synthesis in chapter (1.1) and the application of the Attitudinal Stages method (Bicalho 2019; Bicalho and Silva 2019). The authors understand that the method is suitable for the analysis of identification and behaviour change, as it is the only one in the literature that "offers a visual location and progress of attitudes / mindsets on a progressive scale" concerning the stages of attitude towards cycling in public administration. Furthermore, they understand the concept of change as a continuous and non-static process.

Thus, the method of the Transtheoretical Model of Change adapted by Bicalho and Silva (2019) results in 3 stages, according to **Figure 2**: (1) Assessment and analysis of attitudes prior to the persuasion moment; (2) Presentation and discussion of the Cycling Potential Assessment Method's outputs (PCAM) (Silva et al. 2018); (3) 2nd Assessment of attitudes post persuasion and analysis of attitude change.
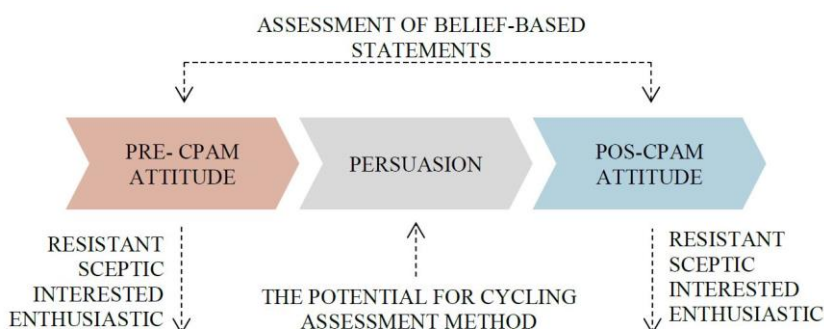
Figure 2 - Methodological conceptual framework. Bicalho (2019)[1].

In the stage named PRE-PCAM ATTITUDE, the stages mean of systematizing and naming the actors' attitudes in stages in a qualitative way, pre-persuasion. The authors elaborated analyses of the studies by Prochaska and DiClemente (1983) referring to the attitudinal stages that "were created through the translation of the expected characteristics associated with the stages of change of health psychology". Added to this, the approaches on cycling by Gatersleben and Appleton (2007) were associated from a perspective of attitudes towards the cycling potential of the cyclist in the starting cycling cities.

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[1] PRE-CPAM ATTITUDE in **Figure 2** presents a typing error and not to modify the author's original figure it was kept like this. The correct term is PRE-PCAM ATTITUDE as mentioned in the text.

Therefore, following the principles of the literature reviewed by Bicalho (2019), the authors elaborated a series of characteristics, beliefs, values, and perceptions that were associated with stages. To insert a given user in a stage, a negative or positive scale must be associated with a belief, for example. In the case of Bicalho (2019), the identification of attitudes is necessary for a subsequent analysis of stage progression after persuasion. That is, a user is associated with a stage and, therefore, it becomes visible in which level one is and post persuasion which level was reached. In the Attitudinal Stages method, a set of characteristics must be modified, not just one or two. **Figure 3** presents the five stages, together with the set of characteristics expected of each user to be inserted in them.
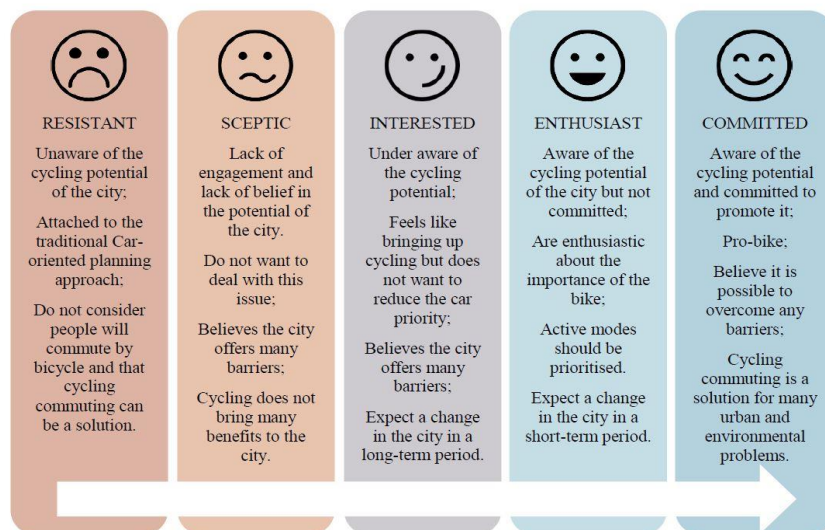

Figure 3 - Attitudinal Stages. Bicalho (2019).

However, unlike the Bicalho (2019) and Bicalho and Silva (2019) studies, this study does not intend to analyse the progression of the agents through the five stages. The methodological inspiration arises in the reflection that policy-making agents are not only influenced by personal factors, but also by the institutional structures where they work, which play a key role in their stances. Thus, it focuses only on stage 1, PRE-PCAM ATTITUDE, 1st Assessment and analysis of attitudes before the moment of persuasion, of the Attitudinal Stages method and backtracks to understanding whether there is one or a set of institutional characteristics that are related to agents finding themselves in a certain stage and whether it is possible to make this relationship with conclusive results.

2.2. Research methods: data collection

Two tools were used for data collection: surveys and interviews. Institutional characteristics and attitudinal stages were translated into statements and questions in the surveys. The interviews, in turn, part of the exploratory and complementary method to perceive details that could not be investigated in the surveys alone. The methodological goal is the cross-evaluation to relate institutional characteristics with attitudinal stages, to verify which of the 14 characteristics reveal influences on the planners' more or less favourable attitudes towards bicycle.

Therefore, the municipalities participating in the case study are those collaborating with the project BooST - Boosting Starter Cycling Cities, funded by FCT (POCI-01-0145-FEDER-031479) developed at University of Aveiro and University of Porto. A general invitation was made to all planners working with cycling and in the end 20 chambers were involved in data collection.

From these a response was obtained from 8 cities which are: Chamusca, Fundão, Lisbon, Maia, Oeiras, Trofa, Santa Maria da Feira and Valongo.

Due to the Covid-19 pandemic period, the survey was distributed by email, through a link on an online platform. It was intended that the study would reach the widest variety of municipalities in Portugal so that data collection would provide a broad sample, which would represent the regional variations of the country. It was possible to send responses from 25 May 2020 to 8 June 2020. A total of 62 responses were received during this period. And 5 users were available to participate in the interviews.

2.3. Data analysis

The data analysis is structured in 4 stages: (1) analysis of the statements of the section About your perception as a planner of the survey in a qualitative way for the counting and insertion of the agents in the 5 Attitudinal Stages (Bicalho, 2019; Bicalho and Silva, 2019); (2) systematization and analysis of all data from the 5 stages, that is, presentation of the data to relate to each question the stages and then analysis of the answers per stage; (3) and, finally, (4) analysis and dilution of the interviews, adding other factors the previous phases for the discussion of the data.

The second step involves the assignment of stages to users in this research was established based on the statements in the section About your perception as a planner of the survey. Thus, to the statements there were relationships with 3 themes: cycling potential of cities, inclusion of cycling in your city and reduction of car priority. In the experimental analyses of Bicalho (2019) and Bicalho and Silva (2019) there was already a test of the statements that would have greater weight in determining the stages. Therefore, there was no need to prove it and the statements used were only those stipulated and confirmed by the authors.

The stages of Attitudinal Stages present a scale of attitude from the least favourable to the most favourable regarding the city's cycling potential. When analysing the statements, the more they agree with a certain statement, the more favourable to cycling they will be on the 5-stage scale, the same happens when they disagree, they will move to the less favourable stages.

The third stage of analysis is based on the qualitative relationship between stages 1 and 2. Users will be classified into the 5 attitudinal stages so that it is visually possible to observe the relationship of all questions and answers, in addition to institutional characteristics. Consequently, it is analysed if there is a group of statements that follow the same pattern in the 5 stages or if there are no patterns that can be related. That is, from each possibility of response to the statements were highlighted in each alternative how many percent of each stage marked that statement. In this step, all 36 questions will be analyzed in search of patterns that stand out in each stage and that may justify more or less favorable to bicycles. It is also sought to relate opinions on institutional characteristics to understand whether the most resistant have the same opinion as the least resistant.

The last stage is the analysis of the interviews based on their transcripts. This stage investigates details that could not be linked and analysed in the survey or even in the theoretical findings. From a set made in the previous analyses, the data explored in the interviews may be attributed to the quantitative and qualitative analyses.

3. Analysis and synthesis: attitudinal stages under the context of institutional characteristics

The analysis of the results will be presented as from the users' division by stages interpolated with the questions of the surveys, that is, it is related the questions, the answers, and the

relationships of the stages for each selected answer. The intention is to understand which stages are related to the level of agreement for each question to establish a pattern between the attitudinal stages and the characteristics of institutional functioning. The transcription and analysis of the interviews complemented the reflections about the institutional characteristics. In this way, it was possible to interpolate what was investigated in the literature, with the purpose of confirming or integrating different hypotheses to the theme. In addition to the bibliographical references, the quantitative results could be complemented in greater detail.

The sample that classifies users into stages aided in the general characterization of the group of planners studied and collaborated in the comparison of the global panorama with the specifics of the statements. Furthermore, the amount of each answer was taken into consideration to verify whether the sample pattern could be considerably applicable or not, given that the pattern of answers of the statements might just be following the pattern of the general sample of attitude stages.

Under this context, presents the classification of the 62 users in the 5 attitudinal stages. The less favourable users, resistant and sceptical, represent 50% of the total sample. The most favourable which are divided into interested, enthusiastic and committed are 50% of the sample, i.e. there is an equal split between less and more favourable to cycling. The interested are considerable 21% of the participating users. Enthusiasts and committed, account for 29% of the sample.

Regarding to the interviews, the real names of the respondents were modified and renamed from 1 to 5 and all are addressed in male gender. Of the 62 survey respondents, only 5 were willing to collaborate in the interview phase. It was sought to relate the attitude stages and the characteristics of the users to their experiences. The facts of the interviews are resumed and analyzed, there is the intention to complement perceptions or contradict facts of qualitative data.

Concerning the analysis, the 3 macro groups of the institutional characteristics are resumed together with the specific characteristics. Therefore, the structure of the sub-chapters of the data analysis starts from the organisation of the arguments from the 3 groups of institutional characteristics: exogenous factors, institutional structure, and human resources.

Not all survey questions have been analysed and described in this paper to synthesise the discussion of the data. In any case, at the end of each macro characteristic a summary table was presented with the characteristics of institutional functioning that seem or do not influence attitudes.

3.1. Exogenous factors

In the exogenous factors are concerned, when asked about the importation of ideas (**Figure 11**), the considerable sample can be verified in those that agree and those that are neutral to the statement. The respondents who strongly agree/strongly disagree cannot be considered as a factual reality since there are few agents who marked these scale levels. The agents who agree and are neutral show heterogeneity in their answers, following the logic of the general sample of stages. Sceptics and interested are expressive in those who disagree. Therefore, it is not an institutional characteristic that can be considered as determinant in some postures towards cycling from the sample.

It is common to observe the importation of mobility solutions for bicycles implemented by other institutions
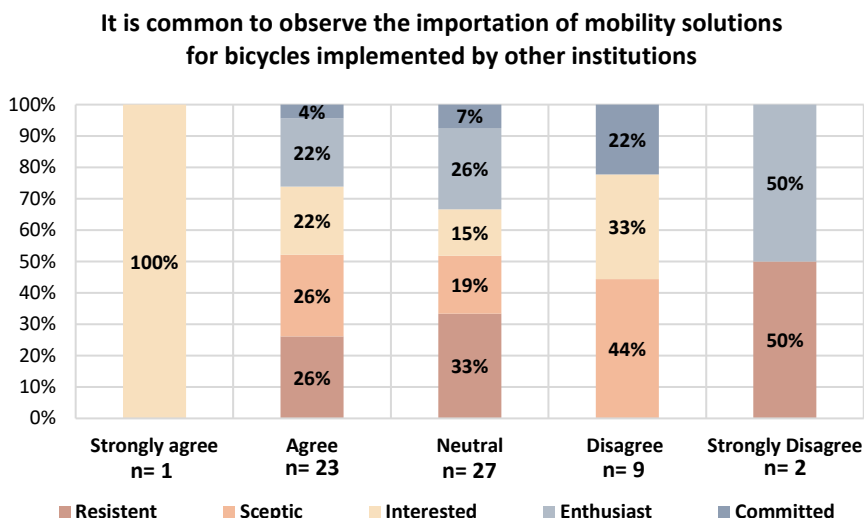

Figure 4 - The solutions imported from other institutions related to attitudinal stages.

In synthesis, there is only one statement corresponding to the exogenous factors, which is the summary of three characteristics (**Table 2**). The statement arises from the synthesis of the literature review and was not considered, in this case study, a characteristic that shows evidence of influencing the less or more favorable cycling stages.

Macro characteristics	Characteristic	Corresponding statement	Influence corresponding to the posture
Exogenous factors	Policy importation, methods and knowledge; Discourses and new world demands; Relations with other systems of government.	It is common to observe the importation of mobility solutions for bicycles implemented by other institutions	Does not show signs of influence

Table 2 - Determination level of the exogenous factor and its sub relations.

Finally, two new characteristics related to exogenous factors emerged from the interviews: opinion leaders and the ONGs power to influence. Therefore, one considers two extra factors to those already mentioned in the literature review synthesis. Thus, no patterns of influence to the planners' posture were established due to the provenance of a small sample of 5 people.

3.2. Institutional set-up

About the institutional hierarchy, in the statement about the superior hierarchical being pro-bicycle can be considered the levels from neutral to very agrees with the statement, as there was the highest number of respondents (**Figure 5**). There is heterogeneity of attitudinal stages in this statement, which may refer to the same pattern of the overall sample, with caveats. There was only one response that strongly disagrees and none that disagrees with the statement, so these are samples that cannot be taken into consideration due to the number of respondents. There is a reduction in the resistant and increase in the enthusiastic with the direction of the pro-bicycle position of the superior, this agrees, but there is also a reduction in the committed with the increase in the pro-bicycle position of the superior. Therefore, the results have a tendency for pro-bicycle to agree that they work with a superior who is also pro-bicycle.
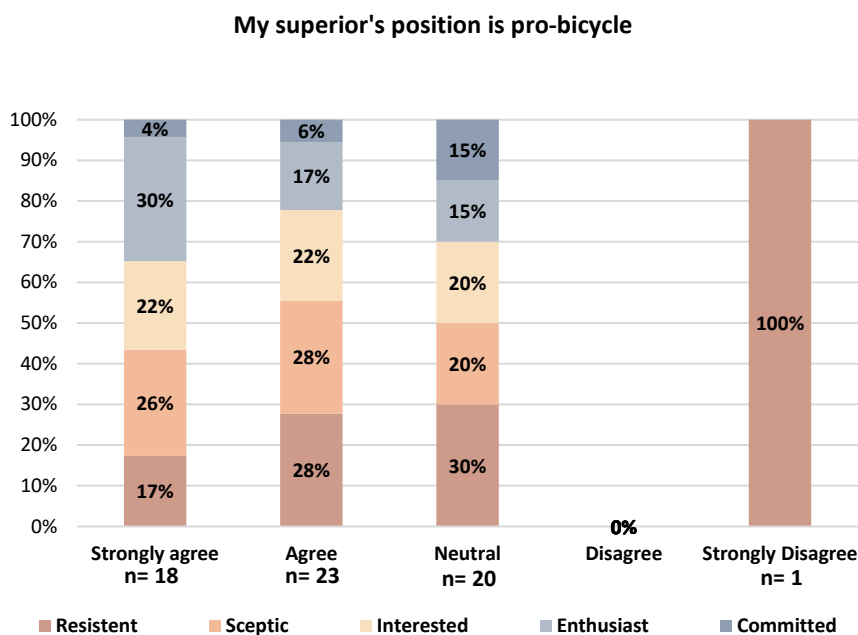
My superior's position is pro-bicycle

Figure 5 - Position of the hierarchical superior concerning the bicycle.

The discussions about cycling being cross-cutting in institutions (**Figure 6**) there are a few significant responses from neutral to strongly disagree. The patterns of the stages are heterogeneous for the neutrals, with a slight flattening of the resistant ones. On the strongly disagree scale there is a predominance of resistant users and a flattening of sceptical, interested, and enthusiastic users. Even if the resistant users are majority on the global scale, when disagreeing a lot, they are half of the sample, this way, one can consider the expression of the resistant ones. The enthusiasts present themselves significantly when being neutral or disagreeing with the statement, along with the committed. Therefore, there is a relationship between the favourable attitude and the belief that the discourses permeate the different spheres of the institution. Thus, when one believes that a discourse permeates several levels there is an ambiguous framing and, in this case, not so conclusive.

The way in which the governance system is structured in this institution makes it impossible for cycling discussions to reach the various levels of this city government
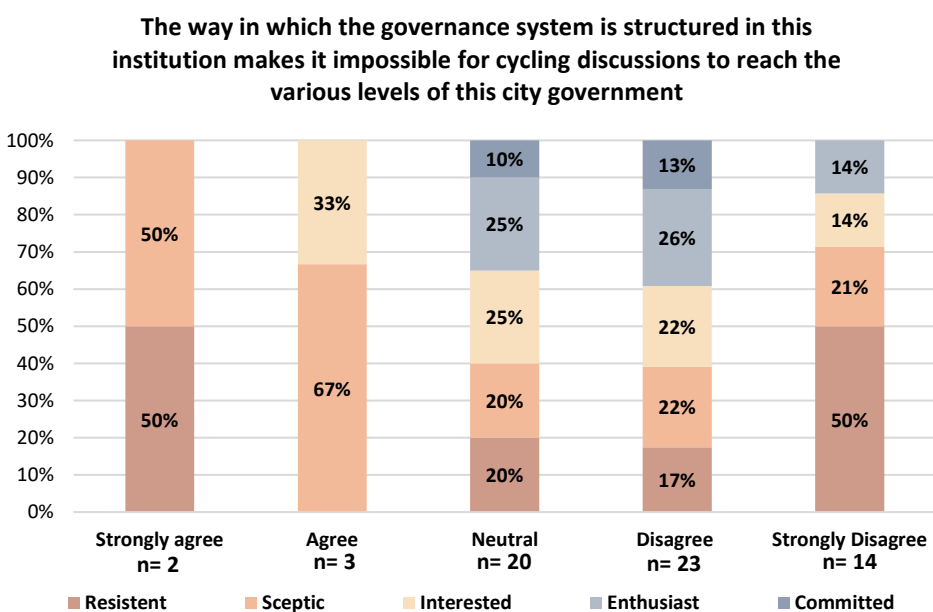

Figure 6 - The government structure and the discourses transversality.

In conclusion, in this case study there were 6 statements out of a total of 8, which present indications of influencing the attitudinal stages towards cycling. Therefore, in an analysis of the totality of characteristics that presented indications of influence, the macro characteristic "institutional structure" is deemed influential in the planners' attitudinal stage (**Table 3**). Statements that do not present indications of influencing total two. Therefore, three characteristics are deemed as being of relevance within the scope of influences: vertical hierarchy; influence and position of the position and institutional trends, postures, and positions for policies, plans and projects over the years.

Macro characteristics	Characteristic	Corresponding statement	Influence corresponding to the posture
Institutional set-up	Vertical hierarchy	My superior's position is pro-bicycle	Presents evidence of influence
	Influence of function and position	I feel able to contribute to the promotion of bicycle mobility in the planning of this city	Presents evidence of influence
		I consider myself involved in the final decision making concerning urban mobility	Presents evidence of influence
	Institutional hierarchisation	The way in which the governance system is structured in this institution makes it impossible for cycling discussions to reach the various levels of this city government	Does not show signs of influence
	Institutional trends, postures, and positions for policies, plans and projects over the years	The institution's positions have remained stable over the years	Presents evidence of influence
		The institution in which I work opens new discourses on sustainable urban mobility	Presents evidence of influence
		The mindset of the institution where I work makes it difficult to change mobility to cycling	Does not show signs of influence
		Projects, plans and policies in mobility try to strengthen the ideas of cycling	Presents evidence of influence

Table 3 - Determination level of the institutional set-up factors and its sub relations.

Finally, it was presented an extra characteristic to those observed in the literature review are: the negative/positive feedback on projects, plans and policies. Considered characteristic, it is noticed that it was mentioned in the interviews, however, it was not presented in the literature, and it was not in the survey statements that there is a significant sample. Therefore, this characteristic was disregarded in the assessment of the influence under the agents.

3.3. Human resources

This sub-chapter refers to the survey questions and statements that were classified as human resources. Therefore, on the gender of the users, it is found that women present less resistant and more sceptical and committed. Male users present resistant and enthusiastic in the same proportion. Therefore, regarding age, users from 36 years onwards have the most significant samples in number of respondents. There are few respondents in the age group between 25 and 35 years, besides the evident pattern is similar to that of the general sample, therefore, it hinders conclusions about this age group. In users between 36 and 55 years there is

expressiveness in the percentages of enthusiasts, considering that it is not the stage with greater representativeness in the general sample, in this way, it is considered a favorable age group to the bicycle. Those older than 55 are between resistant and interested. In this manner, there is clearly greater resistance as age increases even though there are people for and against the bicycle at all ages.

Agents who do or do not have direct experience with the bicycle are concerned, there is heterogeneity in the respective stages related to replies (**Figure 7**). Institutional actors who pointed out that they have not worked/do not work with the bicycle are expressively more resistant and skeptical, totaling 71% of all respondents of this sample. There are no users who have never worked with the bicycle in the committed stage. To those who answered yes, there are users in the resistant and skeptical stages, but there are higher results of interested, enthusiastic and committed. The data follows the proportion of the overall sample of the attitude stages. However, in the largest sample, of those who have already worked with the bicycle theme, there is a flattening of the stages not favorable to the bicycle. Thus, we conclude that there is a tendency towards a posture in favor of the bicycle for those who have already worked with the modal in some period.

Have you ever worked or do you work on the cycling subject?
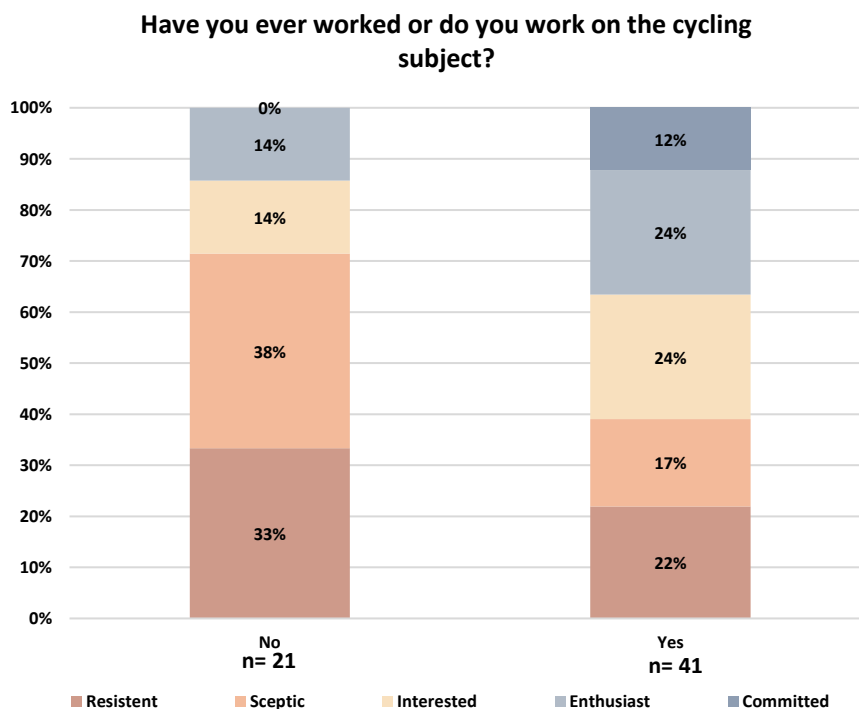
Figure 7 - Contact with the bicycle in their role as planners.

In summary, there are 11 statements for human resources, of which 7 present indications of influencing the agents' stages and 4 do not present indications of influencing (**Table 4**). This being the case, the macro characteristic is considered determinant in the planners' attitudinal stages. Age; level of education and posture of colleagues at vertical and horizontal levels and professional and personal experience with the bicycle are considered determining characteristics in the stages of attitude favourable or not to the bicycle.

Macro characteristics	Characteristic	Corresponding statement	Influence corresponding to the posture
Human resources	Gender	Gender	Does not show signs of influence
	Age	Age	Presents evidence of influence
	Education	What is the area of your higher education or your updating courses?	Presents evidence of influence
		There is an establishment of ideas of mobility from a professional class acting in this institution	Does not show signs of influence
	Educational level	Educational level	Presents evidence of influence
	Vertical and horizontal colleagues' attitude	My work colleagues have dominant positions against cycling	Presents evidence of influence
	Political colour	Political colour influences cycling policy positions	Does not show signs of influence
	Professional and personal cycling experience	Do you currently use the bicycle as transport?	Presents evidence of influence
		Have you used the bicycle as regular transport at any point in your life?	Does not show signs of influence
		How long have you worked in urban and/or transport planning?	Presents evidence of influence
		Have you ever worked, or do you work on the cycling subject?	Presents evidence of influence

Table 4 - Determination level of the human resources factors and its sub relations.

Finally, the presence of activists was a characteristic that emerged from the interviews. Users mentioned colleagues who have a history of pro-bicycle activism. The posture of the colleagues was not considered determinant, however, when talking about activists, it can be considered determinant in this case.

4. Conclusions

The literature review revealed that there are many studies on governance and institutional change. These studies are related to climate change and sustainability in a broad way, besides mentioning topics such as innovation, institutional patterns, political factors, institutional cumulative effects, among others. On the other hand, mobility studies permeate the behaviour of bicycle users, infrastructure, levels of bicycle use in cities, pro-bicycle policies, among others.

There are, also, studies associated with the institutional changes caused by mobility. It is perceived the importance and relevance in the institutions of the new mobility practices, whether in the structure or in human resources. However, there are no specific investigations on the consequences of the changes combined with the characteristics of institutional functioning that relate stages of agents' attitudes, from the perspective of cycling. Factors such as political order and political governance related to cycling are sometimes overlooked or studied less frequently.

The Attitudinal Stage method was suitable for this thesis, but demonstrated contradictions and limitations when related to the interviews. When working with users' attitudes before a

certain situation one notices that the quantitative methodology limits and simplifies some interpretations. That is, there are deeper discourses that only quantifying the answers of a given sample may interfere with the understanding of the global context of the argument studied. As an example, one can cite the case of the statement about the higher hierarchical and the political colour, which determined any relationship with the stages. However, in the interviews it was perceived with greater emphasis that the councilors are higher hierarchical with decision-making and determining influences on the posture of the teams. For future studies on the theme, it is proposed to extend the studies concerning the methodology to improve the relations between the surveys and the interviews.

The institutional characteristics, presented in the interviews, were: opinion leaders, ONGs, negative/positive feedback on the projects, plans and policies and the presence of activists. The sample of interviews presented a small sample of participants and were not used as determinant characteristics in the more or less favourable cycling stages. The tools helped in the perception about the characteristics presenting or not signs of influencing the attitude stages and contributed to verify new characteristics of the institutional functioning. However, these new factors should be considered in future investigations. Thus, regardless of whether the planners agreed or not, the sample is too small and thus they were not considered as determinants in the attitude stages in this investigation. Therefore, Figure 8 presents the final table with the characteristics of institutional functioning covered in this investigation. Those in black are the final characteristics observed in the literature, those highlighted in red are those presented by the planners interviewed in this case study.
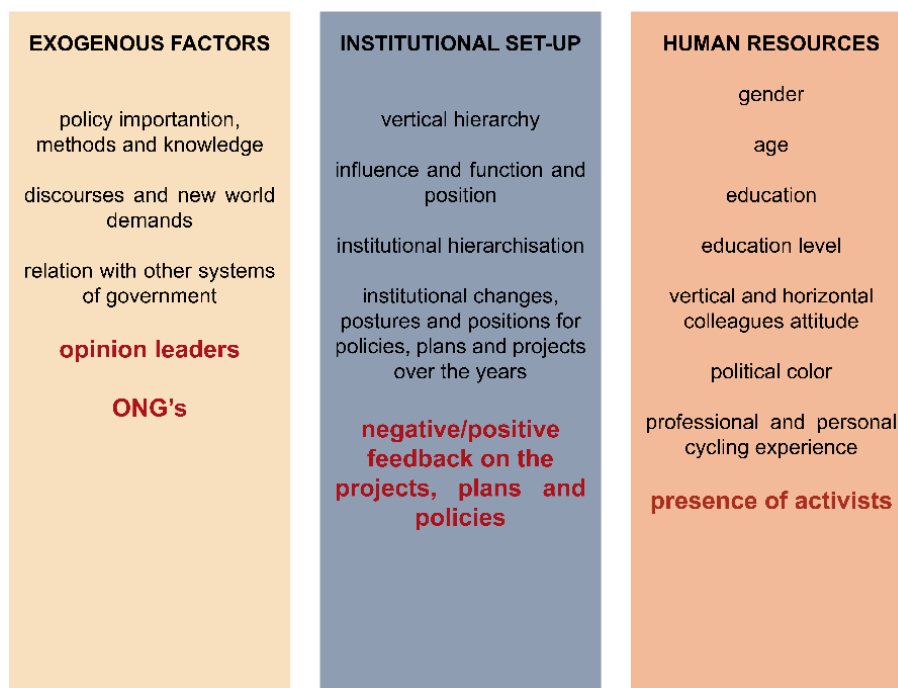
EXOGENOUS FACTORS	INSTITUTIONAL SET-UP	HUMAN RESOURCES
policy importantion, methods and knowledge	vertical hierarchy	gender
discourses and new world demands	influence and function and position	age
relation with other systems of government	institutional hierarchisation	education
opinion leaders	institutional changes, postures and positions for policies, plans and projects over the years	education level
ONG's		vertical and horizontal colleagues attitude
	negative/positive feedback on the projects, plans and policies	political color
		professional and personal cycling experience
		presence of activists

Figure 8 - Summary of the characteristics found in the literature and in the interviews.

Thus, through the association of characteristics with the users' attitudinal stages, it was perceived which are the stages that may be correlated with a particular institutional characteristic. The relationship was possible due to the scope of the research. On the other hand, it was impossible to realize whether or not there are micro factors related to the characteristic and the stage. This fact is only pointed out without being able to deepen the reason for these results. The example of committed agents who have never used the bicycle or agents who are resistant/sceptical when they have colleagues who are favourable to the

bicycle is mentioned. At first, it seems contradictory, but there must be another sphere of factors that determine this relationship that could not be investigated due to the scope of this investigation.

The proposed research answered the initial hypothesis about the theme; however, it demonstrated and recommends the possibility to extending the study to other municipalities. Moreover, studying different municipalities guided to a comprehensive set of experiences and confirmations of the theory. On the other hand, studying a wide range of municipalities, given the time of the research, did not make it possible to understand the middle of the road between a certain stage and a certain institutional characteristic, as already mentioned. That is, it was found that there is the possibility that there are other factors, whether of the stages or of the institutional characteristics, which can be determinant in understanding the institutional functioning and its influence on the actors.

It is suggested to add to the "Exogenous factors" the characteristic related to the financial dimensions and the perception of the territorial context of the municipality involved in the case study. About the "Institutional structure" it is suggested to add the institutional position of the Mobility department, i.e., in some cases in Portugal the Mobility Department was related to the Projects Department or the Planning Department, for example. These characteristics were perceived only at the end of the studies as important to be studied.

Finally, this research is considered important since planners and councillors are actors of influence in the transformation of the cities. To perceive which are the mechanisms that generate resistance to changes is a process that may enable the advancement when planning for sustainability in mobility, in addition to mitigating, at the institutional level, the obstacles in pro-cycling planning.

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