

# Risk perception and hierarchy of risks related to recurrent floods in a regularized urban area: a discursive analysis

*Percepção e hierarquia de riscos de inundação recorrente em área urbana regularizada: uma análise discursiva*

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**ABSTRACT** This study analyzed discursive strategies adopted by residents who live in an area of risk of recurrent flooding to justify their stay in the neighborhood. It was based on their perceptions, risk hierarchisation criteria, preventive actions and risk mitigation actions. For this purpose, excerpts from field diaries and semi-structured interviews with two residents who disagreed about the risk of flooding and the need to stay in the neighborhood were analyzed. Results show that economic difficulties of relocation and the moral principles that prevent someone from selling their house are arguments used by the resident who wants to move from the neighborhood. The resident who wants to stay in the neighborhood tends to normalize the risks and to value the benefits of the region. Residents decide whether or not to let water enter their homes during a flood and whether or not to leave the house during the rainy season to carry out their daily activities based on their prior organization and attachment to the place and material goods. It is concluded that floods affect the daily lives of residents and involve decision-making processes, which need to be considered by the public authorities in risk management.

**KEYWORDS** Language. Perception. Risk management. Natural disasters. Floods.

**RESUMO** Este estudo analisou estratégias discursivas adotadas por moradores que vivem em uma área de risco de inundações recorrentes para justificar sua permanência no bairro. Foi baseado em suas percepções, critérios de hierarquização de riscos, ações preventivas e ações de mitigação de riscos. Para tanto, foram analisados trechos de diários de campo e entrevistas semiestruturadas com dois moradores que discordavam sobre o risco de inundações e a necessidade de permanecer no bairro. Os resultados mostram que as dificuldades econômicas de realocação e os princípios morais que impedem alguém de vender sua casa são argumentos usados pelo morador que quer se mudar do bairro. O morador que deseja permanecer no bairro tende a normalizar os riscos e a valorizar os benefícios da região. Os residentes decidem se devem ou não deixar a água entrar em suas casas durante uma enchente e se devem ou não sair de casa durante a estação chuvosa para realizar suas atividades diárias com base em sua organização prévia e apego ao lugar e bens materiais. Conclui-se que as inundações afetam a vida cotidiana dos moradores e envolvem processos de tomada de decisão que precisam ser considerados pelas autoridades públicas na gestão de riscos.

**PALAVRAS-CHAVE** Linguagem. Percepção. Gestão de risco. Desastres naturais. Inundações.

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## Introduction

Floods are the most common natural disaster worldwide, and their impact is likely to increase due to the effects of population, urban and climate changes<sup>1-3</sup>. These phenomena represent immediate dangers to human health, such as injuries and drowning, and long-term impacts, such as those resulting from illnesses related to contact with contaminated water<sup>4-7</sup>. Consequently, floods have been increasingly configured as serious public health problems, especially in developing countries like Brazil<sup>8</sup>, where the advance in legislation has not been accompanied by the guarantee of inspection and still requires the creation of participatory bodies and educational actions as complementary measures<sup>9</sup>.

Considering these measures, recent studies have pointed to the need to promote the resilience of the members of the communities affected by floods through community participation strategies for disaster risk reduction with public authorities<sup>10</sup>. Although public participation measures are the most effective means of promoting knowledge about potential disasters, strengthening confidence in public authorities and encouraging citizens to take more responsibility for disaster protection and preparedness, the experience of community members at risk and their trust or lack of trust in authorities and specialists, are the main factors that shape the perception of risk by members of a community, and this has been a challenge to the organization of integrated action strategies<sup>11</sup>.

For this reason, for the population to participate in disaster reduction, it is necessary that public authorities understand how the residents of a given region perceive the flood risks to which they are subjected<sup>12</sup>, which is the first priority of action in the Sendai Framework for Disaster Risk Reduction 2015-2030<sup>13</sup>. Thus, this procedure is necessary because the way people perceive the risks related to floods directly influences the

way in which they will understand their conditions of possibility to manage these risks<sup>14</sup>; and, based on this process, it is possible to achieve the second priority of the Sendai Framework, the strengthening of disaster risk governance to manage disaster risk.

In addition, studies in the field of public health have shown that the ways to prioritize certain risks and coping strategies over others are closely related to the perception that certain groups have of the risks to which they are submitted<sup>15,16</sup>. In the specific case of floods, cognitive, behavioral, socioeconomic, demographic, geographic, informational and cultural factors are key elements to determine the criteria taken into account, and need to integrate the process of analyzing risk perceptions and hierarchies of risks<sup>17</sup>.

Although evidently necessary, studies on risk perception and, consequently, on the ways to prioritize certain actions based on these perceptions, start from a realistic and naturalized conception of the world: they consider that the variability of social perception is the effect of distorted interpretations of reality and that hierarchy is based on an attitude that reflects internal coherence<sup>18</sup>. Therefore, in this perspective, there would be a correct perception of flood risks and an adequate way to prioritize risks. Such reading tends to position public and scientific authorities as holders of knowledge about risks; and the population, as groups that need to be made aware, which goes against the community integration movement and the valorization of local knowledge fostered in disaster risk reduction actions.

An alternative has been proposed within the scope of studies on discourse and discursive practices which aim to explore the discursive heterogeneity of statements<sup>18,19</sup>. A discursive perspective is justified because the processes of risk perception and hierarchy of risks make use of certain languages to talk about risks, which, in turn, are linked to speeches about risk<sup>20-21</sup>. In this perspective, perceiving risks means producing multiple

discursive versions of a phenomenon, as well as the attitudes that guide the hierarchy of risks configure a public positioning regarding a controversy or situation that requires decision making<sup>18</sup>. Starting from the theoretical principle that risk is constructed discursively, it allows exploring the interface between the audiences analyzed and the types of justification they adopt when producing or evaluating arguments related to the topic of interest<sup>22</sup>.

Considering such conditions, the present study analyzes discursive strategies adopted by residents who live in an area at risk of recurrent floods to justify their stay in the area. It is based on their perceptions of risks, the ways they prioritize risks and, consequently, prevention actions and preparation they prioritize.

The research was carried out in the Vila América neighborhood, in Santo André. According to the Brazilian Institute of Geography and Statistics (IBGE), data from 2010 with an estimate for 2013, the region is characterized as a fully regularized (integrated) urban area with a population of 4.518 inhabitants, distributed over an area of 0.53 km<sup>2</sup>, with 1.565 private households permanently occupied and, of that total, 88 in flood risk areas<sup>23</sup>.

## Material and methods

In order to achieve the objectives of this article, a methodological strategy was adopted that included the cross-checking of information from two sources: 1) field diary, produced from visits to the actors involved<sup>24</sup>; and 2) semi-structured interview with two residents with different opinions regarding the need to stay in the neighborhood<sup>25</sup>. To systematize the information related to the interviews, dialogic maps were created<sup>26</sup>.

The negotiation for the first visit to the neighborhood was mediated by the Civil Defense Department, which indicated a

community leadership as interlocutor. The approach with this leadership enabled the understanding of the floods in the place and the understanding of how residents in the area of risk deal with the problem. The choice of the research interlocutors was co-produced in action, between the researcher and the community leader, and, therefore, reflexivity was present in the choice of two participants<sup>25</sup>. The selection criterion was to interview two residents with different opinions regarding the desire and the need to stay in the neighborhood: one is N, the oldest resident in the neighborhood who, therefore, has lived in the region since the beginning of the floods and wants to stay; another is W, a resident who, although she has not lived there for a long time, is a community leader and has been very active since her arrival in the region, but who hopes to leave the area.

We used a single letter to substitute the name of each participant, seeking to comply with the Research Code of Ethics 466/12, which emphasizes, among other things, the protection of participants. The research was approved by the Research Ethics Committee of the Pontifical Catholic University of São Paulo (CEP-PUC/SP), opinion number 1.403.575.

Regarding the interview script, some guiding questions were elaborated on the theme of the study, such as: 1) How long have you lived in the neighborhood?; 2) When you moved to the neighborhood, did it already have flooding, and if not, when did it start?; and 3) What is it like to live in a flood area? The interviews were scheduled according to the residents' availability and carried out in places of their preference. It started with the presentation of the objectives and procedures of the research and with the request to sign the Free and Informed Consent Form (TLCE), explaining confidentiality, the possibility of withdrawal and permission to record.

As for the procedures for analyzing the information obtained in the interviews, dialogic maps were created. Dialogic maps are tools

that give visibility to the analysis process and to the context of co-production of discursive practices. The analysis process started with two forms of familiarization with the discursive material: Sequential Transcription (ST) and Integral Transcription (IT). ST was the first approach to the material to be analyzed, made through a careful listening to the audio, through which we sought to identify the subjects covered, thus enabling the grouping of them into thematic categories to be used on the map. Then, the IT of the audio was carried out, including all the speeches and expressions used in the interview. It was done literally, preserving the original discourse of the research context, enabling

the understanding of who speaks, about what they speak and how each one speaks<sup>26</sup>. After this stage, the transcription Lines (L) were enumerated, to allow the location of the speech referred to in the dialogic map and in the discussion of results. We used this strategy in the two interviews carried out, with W and N, creating a dialogic map for each one. After the elaboration of the two maps, the themes/categories common to the two interviewees were analyzed, resulting in a third map with the content of each interview located in separate columns. This map made it possible to analyze the residents' coexistence with the recurrent floods in the region (*chart 1*).

Chart 1. Dialogic map of the excerpt of an interview with W

Positioning	Normalization of risk and bargaining, or trade-off	Relocation difficulties	Moral and legal principle
Q: what is it like to live in a flood area?	W: we are already used to 5 or 6 floods and the water entering about one handbreadth into my house. I am already resigned. I prefer that rather than collapsing everything. The first time I cried because there was a palm of water in my house. The first time I wanted to leave, I stayed away for 40 days, I left my home, I didn't want to come back because it was too much scary, I had never seen that. But over time you become hardened. Today, if it's only one handbreadth of water, I'm even happy with that.	This here, looks like a ghost town, a lot of abandoned houses. The ones who had financial conditions went away, but I do not have. I've lost a lot with the 2011 rain; I work here, I've lost machinery, I've lost everything. How am I going to pay rent? A house like this, how much is the rent of a house like this?	I bought the house, spent everything I had and had not to renovate it, and 40 days later I found out that floods occur, on my 7-year-old daughter's birthday [...] But I don't have the courage to sell the home and undo someone else's dream as well. How will I sell it? I will tell and no one will buy it.

Source: Own elaboration.

After this stage, statements related to discursive strategies adopted by the interviewees to justify their risk perceptions of living in an area subject to floods and the ways in which they prioritize flood risks and prevention and preparedness actions were selected. The material was associated with field diaries, public domain documents and scientific literature in the areas of discourse and environmental disaster studies.

## Results and discussions

### Arguments to justify staying in the flood risk area

The research made it possible to identify that, according to public authorities, it is the residents' own desire that keeps them in the area of risk. For the resident who wants to leave, the justifications are the difficulties of relocation and financing and moral issues related to the sale of the house. Finally, for the resident who wants to remain in the area of risk, the normalization of flood risks and exposure of the benefits of the region work as rhetorical strategies to justify the permanence.

#### THEY STAY BECAUSE THEY WANT TO

The first contacts were made with the Public Authorities. During the request for documents containing information about the flooding problem in the region, the public authorities of the Municipal Environmental Sanitation Service of Santo André (Semasa) emphasized the insistence of Vila América residents to remain on site, as explained in this conversation with the researcher.

*Is it possible to release documents about Vila América's floods? (Researcher).*

*Yes. But I'll tell you, the residents of Vila América are not poor fellows, they know that they are in a*

*floodplain area and that it floods there. They are also economically able to leave, but they do not leave. (Public Authority).*

The representative assumes that the residents' knowledge that the region is a floodplain area and their favorable economic condition are sufficient for them to leave the flood area. Therefore, she cannot find a plausible explanation for the permanence of these people, which may lead to the understanding that, for public authorities, people continue to live in this area because they want to.

*But why do you think they don't leave? (Researcher).*

*Some don't leave because they don't want to. They expect compensation from the government, but the price is high because it is a middle class area region. The city does not have the money to indemnify all the houses in the area of risk. Some residents left there, abandoned their homes and went elsewhere. (Public Authority).*

The same kind of rhetorical strategy was identified in an analysis of coverage of printed news after Hurricane Katrina in the USA, in which it was found that journalistic representations were based on rhetorical devices and semantic strategies whose discursive construction resulted in the transfer of guilt from government agencies for the 'victims' and 'survivors' of the disaster<sup>27</sup>. The attribution of responsibility and, consequently, of blame to the victim is a common resource when the target audience is poor, either because the assigner is conservative<sup>28</sup> or because he denies his own conditions of poverty<sup>29</sup>.

What stands out in the case under analysis, however, is that the financial issue is overwhelmed by a cultural issue in the process of attributing responsibility and guilt: the relatively privileged economic position of Vila América residents in relation to other residents of areas of high-risk has raised indignation of segments of society that, because they do not

understand the reasons for their permanence, end up blaming those affected by their own situation. The cycle of blaming the victim is reproduced even if in a relatively privileged social class. As Mary Douglas teaches us, generally the blame for an adverse event is made to someone or a group that is not popular with others, like these residents<sup>30</sup>.

### ECONOMIC DIFFICULTIES, RELOCATION AND MORAL PRINCIPLES

Although the argument of attributing blame to the affected group is present in the speech of public authorities, it is questioned by residents of the region with other arguments, as seen in W's statement:

*The former Civil Defense superintendent said that we need to get out of here. So I asked how to buy a new home. We easily buy a new car after losing one, but not a house. (W).*

*But he told you to get out of here and do what with the house? (Researcher).*

*He said informally that he once lived in a place where floods used to happen, but that, when he grew up, he left there. So I told him that I don't have the money to buy another house. (W).*

A meaningful reason for staying in areas at risk of flooding is the difficulty in moving to other places. The difficulties of relocating in a flood situation were previously pointed out in studies in the area with justifications such as the lack of a place to live, a lack of money or the absence of an equivalent place to live<sup>31</sup>. They are all expressed by W in the excerpt below.

*This here, looks like a ghost town, a lot of abandoned house. The ones who had financial conditions went away, but I do not have. I've lost a lot with the 2011 rain; I work here, I've lost machinery, I've lost everything. How am I going to pay rent? A house like this, how much is the rent of a house like this? (W).*

However, although these are the main reasons pointed out by W to justify her permanence, she still makes use of a resource not cataloged in the literature: the moral and legal principle of informing the flood situation to potential buyers, which makes the sale unfeasible.

*I bought the house, spent everything I had and had not to renovate it, and 40 days later I found out that floods occur, on my 7-year-old daughter's birthday [...] But I don't have the courage to sell the home and undo someone else's dream as well. How will I sell it? I will tell and no one will buy it. (W).*

At the beginning of her narrative, W tells of her first experience with flooding in the house she had just bought and her lack of knowledge on the subject, which caused a lot of pain and suffering. In the end, she justifies the reason for not leaving the house where she is: she cannot do with others the same as they did with her, she bought something without having been previously informed of the problems with floods.

Contrary to what happens in other countries, Brazil still does not systematically adopt flood insurance. Although the initial obstacle to the implementation of these risk transfer strategies was overcome with the opening to the international reinsurance market, in 2007, and insurance models for hydrological risks have been developed<sup>32,33</sup>, this is still not the hegemonic practice to manage these events in the Country. Sellers are required by law to report on these situations, which usually leads to the abandonment of the purchase by the interested party, or they commit acts of bad faith, as occurred with W.

In addition to not finding it fair to sell your home without informing buyers of floods, she also informs buyers of neighboring houses, which has led to conflicts with other residents.

*When someone comes here wanting to buy a house I say that it fills with water about 2 meters. I've already shown photos and videos. Some neighbors*



*don't like it, they get angry if I say it floods. But if I don't say and the person buys, they will be angry afterwards.* (W).

#### RISK STANDARDIZATION AND TRADE-OFF

Not all residents, however, make use of negative justifications for staying in the neighborhood. N prefers to emphasize the positive aspects of living in the neighborhood to the detriment of floods that, in his speech, become a minor event.

*Here is a great place to live, it is close to everything, it is easily accessible. We only have this flood problem when it rains. People's life here is a little scary when the summer season comes. Other than that, we have a great neighborhood, they are people who have lived here for a long time.* (N).

Two discursive strategies used together to justify staying in the region were used here: risk normalization and bargaining, or trade-off. The normalization of risk occurs when exposure to recurrent floods for a long period increases awareness, but decreases the aversion to flooding: it becomes an integrated element in the daily life of the community. With regard to bargaining, it is a process in which the perceived benefits of living in the area outweigh the perceived problem of recurring floods of low to medium intensity. Combined with risk normalization, this process allows for risk taking and compromises the potential to anticipate and adapt to an increasing flood risk resulting from climate change and other global changes, because it discourages residents from engaging in activities and making adjustments that reduce the risk and increase the preparation<sup>31</sup>. Although it was N who makes the normalization and bargaining regarding flood risks, it is in W's speech that its discouraging effects appear.

*We are already used to 5 or 6 floods and the water entering about one handbreadth into my house. I*

*am already resigned. I prefer that rather than collapsing everything. The first time I cried because there was a palm of water in my house. The first time I wanted to leave, I stayed away for 40 days, I left my home, I didn't want to come back because it was too much scary, I had never seen that. But over time you become hardened. Today, if it's only one handbreadth of water, I'm even happy with that [...].* (W).

Regarding the use of rhetorical resources used to justify the permanence of housing, it is possible to identify that government agents tend to blame those affected, that W justifies their stay for financial and moral reasons while N justifies their stay due to the normalization of the risks of flooding and the benefits of living in the region.

#### Arguments to justify the hierarchy of risks

In the present study, two questions were fundamental for the discussion on the ways to prioritize flood risks: the decision to let the water enter or not in the residence and the decision to stay or leave the house during periods of rain.

#### TO LET OR NOT TO LET WATER IN?

Regarding the first discussion, it is commonplace in the field of climate studies that keeping weather outside is an essential function of a building in almost any climate. However, about floods, two strategies can be adopted: resilience to flooding or resistance to flooding. Flood resilience is promoted by forms of construction that control how much water enters buildings, which is also known as wet-proofing. Such forms of construction must be able to recover from flooding with minimal intervention. Flood resistance, in turn, also known as dry-proofing, is a process in which water is kept outside the building by barriers or materials with a high level of water resistance<sup>34</sup>.

Both cases refer to buildings in which there has been some type of preparation for flood resistance. The interviewed residents adopt the strategies of letting water in or out of the home based on these principles, although their houses were not previously built with this in mind. N, for example, gave up trying to contain the strength of the water that overflows from the Guarará stream and chose to let it freely enter his home. There was a time when there was a gate with a floodgate in it, but, as a result of heavy rain, that gate was uprooted, and after that, the resident decided not to put it on again. N justifies his decision with the following argument:

*So you let the water go in freely? (Researcher).*

*For sure. For the wall to support a height of 2.20m of water, a concrete structure like a swimming pool, a wall is necessary. It is not any wall that will hold 2.20m of water under pressure. The area of my house is 10 to 11 meters front and 20 meters depth, it is not possible to hold it, the wall would explode. (N).*

In the process of justifying N, he defends the entry of water in contrast to the opposite method that could damage the structure of the house. In fact, studies in the area have indicated that the dry-proofing strategy should be used with caution, as there are physical limitations on the amount of water that can be kept outside, in terms of structural stability of the building, in the most common forms of constructions. There is also a risk of flash flooding through opening, such as windows<sup>34</sup>. N makes use of this argument to defend the entrance of water in the house, even if it had not been previously built for this. In the ranking of risks, the explosion of walls and structural damage to housing are more harmful than the entry of water, and he again presents another argument for this: the internal preparedness of his home.

*I once had a gate, but it fell down in one piece*

*and took the pilaster and the wall with it. Since then I have not put any more, just a sheet to close the property and say that someone is living here. Sometimes I think about making a structure to support it, but the only thing I do at the moment is to keep my materials, clothes and utensils on the top, as you can see. I put these wooden structures to keep them always on the top. So when it floods, I don't have to run to lift things up. (N).*

W prefers to resist the force of the water using floodgates, so that her house is not affected, and her belongings destroyed, every time a flood occurs, but she recognizes that it is not the best thing to do due to the force of the water.

*I have a flood gate, and this is the second one I buy. I also have a pump with a check valve in the sewer and rainwater so that I can close it when it starts to flood, so it prevents water from flowing through the kitchen sink. I just didn't lose things before because I take care of them. I use the gate to try to reduce the losses, I don't always want to lose my things. It is crazy to hold water like we do, the right thing would be to let it in. I know this is destroying the house because of the water pressure. You have no idea, the floor, the walls, I don't even know how to explain, it seems that you feel the pressure of the house.*

*There was a time a neighbor's gate fell down and a rebound effect occurred, many of them also fell down. My floodgate sustained it, but the side wall didn't. Nobody can deal with the force of the water, the floodgate bends, gets distorted, makes noise, creaks, opens. We don't know what else to do. (W).*

Despite experiencing the effects of preventing water from entering her home, W continues to do so. She justifies this practice due to the need to maintain the material goods of her residence, her memories.

*It is horrible to get your home destroyed. Everything we have is inside the house. I lost my memories, and no one is going to return my past life, my photos, my daughter's kindergarden graduation tape. Because*



*of the expense of rebuilding the house in one of the rains, I could hardly perform my daughter's wedding, so I had to sell the car. (W).*

The importance of goods that materialize memories after floods was evident in interviews with affected people in a flooded community and with an employee who worked in support after the disaster. In addition to loved ones, the possessions that were most missed were family photos, family heirlooms and souvenirs, as gifts that connected victims to their ancestors. The loss of these possessions resulted in a process of suffering and grief like that experienced in the death of a loved one<sup>35</sup>. Therefore, for W, losing material goods is a greater risk than the risk of rupture in the structure of the house.

#### WHAT IS THE RISK OF LEAVING HOME FOR A TIME?

Living with the risk of frequent flooding has changed the daily lives of these residents of Vila América. W had to change her work routine, alternating the time of arrival and departure according to weather forecasts, as well as trips, tours and, especially, surgeries.

*I had to have surgery and I hadn't. My husband had two hernias and needed surgery, but he had to cancel and wait for the rainy season to go away. How was he going to be recovering at home with the flood? What if we need to lock the floodgate and lift everything?*

*The furniture is very heavy and we have to carry them when there's the flood. Once my bed fell on my arm and I got a cyst. I have to treat, have surgery, but how? My daughter also got hurt in the flood, she was 10 years old and dislocated 9 spine vertebrae from place. The accident happened when I was on a diet, with a newborn baby. (W).*

Living in a flood risk area has made W organize her life around these events. In the hierarchy of risks, leaving home for surgery cannot even be considered, since the risk of

canceling the surgery is less important than suffering the impacts of a sudden flood.

N also avoids going out at that time so as not to run the risk of being isolated from home due to the flood.

*Building walls and floodgates improves the situation, but it does not solve it. The region floods the same way and we are prevented from leaving the house, we stay under water. How will you be leaving? The person got rid of having a certain loss, but is refraining from leaving. The problem is if there is an emergency and you need to leave. But I don't go out when it rains, because I may run the risk of not being able to get home. (N).*

## Conclusions

Considering that floods have been increasingly configured as serious public health problems in Brazil and seeking to meet the priorities established in the Sendai Framework<sup>13</sup>, it is necessary for public authorities to understand how residents of a given region perceive the flood risks to which they are submitted.

In this perspective, this article, within the scope of studies on discourse and discursive practices, sought to analyze discursive strategies adopted by residents who reside in an area at risk of recurrent floods to justify their stay in the area from their perceptions of risks, the ways they prioritize risks and, consequently, the prevention and preparation actions they prioritize.

First of all, it should be noted that we are talking about anthropic risks, that is, those that became present as a result of interventions in the urban landscape, such as works that resulted in diversion of streams and rivers or bottlenecks resulting from these works. Therefore, in a more macro perspective, planning that takes into account the geographic (stream, terrain) and urban (density of existing and already consolidated housing) characteristics of the area would be necessary. This, as widely

discussed in the book 'Living in areas of risk'<sup>36</sup>, requires participatory planning in dialogue with the affected population. However, as the data from this research show, the government's tendency is to avoid responsibility, after all, they say that 'they stay because they want to'.

In discursive terms, the controversy that arises, between versions of rights, ends up providing strategies for coping with recurrent risks, be it flooding, as is the case in this research, or living in risk areas<sup>36</sup>: normalize (risks that are always present and we learn to live with them) and/or emphasize the trade-offs, contrasting benefits and losses (in the case of houses in risk areas, literally, no longer having a roof over their heads).

The research made it possible to identify several justifications for staying in the flood risk area and an ambivalence between staying and leaving. As for the resident who wants to leave the region, we identified the following arguments: 1) economic and relocation difficulties, which, according to studies in the area, are related to the lack of a place to live, lack of money or the absence of an equivalent place to live<sup>31</sup>; and 2) moral principles, this being an original justification not found in the researched literature. In relation to the resident who wishes to stay, the normalization of flood risks and the exposure of benefits in the region works as a rhetorical strategy to justify the permanence, that is, he prefers to emphasize the positive aspects of living in the neighborhood to the detriment of floods, which, in his speech, become a minor event. As for the position of public authorities, it is the residents' own desire that makes them stay. This position makes it possible to blame the residents for continuing to live in areas of risk.

Regarding the flood hierarchy of risks, two questions were fundamental to understand the justification: 1) the decision to let the water enter the residence or not; and 2) the decision to stay or leave the house during periods of rain. In the first aspect, different positions were noted among residents – while for N the explosion of walls and the structural damage to housing is more harmful than the entry of water, for W, losing the material goods is a greater risk than the risk of breaking the house structure. In the second question, there was a convergence of opinions, because the two residents reported changes in daily life due to the risk of flooding, that is, they fail to perform tasks in the imminence of a potential event. Thus, in the hierarchy process, the risk of not performing tasks is smaller than suffering the impacts of a sudden flood.

The results of the research showed that the different ways of perceiving and dealing with the flood risks produce multiple discursive versions of the phenomenon, as well as the attitudes that guide the hierarchy of risks configure a public position regarding a controversy or situation that requires decision making. For further studies, we propose to explore in other cases the moral element as an argument for the relationship between permanence or housing transfer.

## Collaborators

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