



# Why the Mind Matters

## A Cognitive Research Agenda for World Politics



Manjana Milkoreit

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## Author's Biography

**M**anjana Milkoreit ([manjana@mac.com](mailto:manjana@mac.com)) is a PhD candidate in Global Governance at the Balsillie School of International Affairs, University of Waterloo (Canada). She received her law degree from the University of Heidelberg (Germany) and graduated with a Masters of Public Policy as McCloy Scholar from the Harvard Kennedy School. Her research at Harvard focused on international relations, security studies (in particular nuclear non-proliferation), leadership and global governance. Using a complex systems view, Manjana's long-term research interest concerns the nexus between climate change and security, which she wants to explore with the use of agent-based models. Her dissertation focuses on the role of cognition in international climate politics. Using cognitive-affective maps and Q Method, she investigates the different belief systems and thought patterns of participants in the climate negotiations, asking whether and how cognitive processes influence the search for cooperative solutions.

## Acknowledgements

**M**any of the ideas presented in this paper have been and are still being developed in a series of discussions with colleagues at the University of Waterloo in meetings over the last two years. I would like to thank Thomas Homer-Dixon, Paul Thagard, Steven Mock, Tobias Schröder, Matto Mildenberger and Stephen Quilley for their significant intellectual contributions to this paper. I am also grateful for the helpful comments provided by Marcus Carson, Magnus Benzie, and Marion Davis at the Stockholm Environment Institute. The picture on the front page is courtesy of Wikimedia Commons; image by White House Photo by Pete Souza (The White House: A Breakthrough in Copenhagen) [Public domain], see:

[http://commons.wikimedia.org/wiki/File%3AObama\\_COP15\\_Peres.jpg](http://commons.wikimedia.org/wiki/File%3AObama_COP15_Peres.jpg)

## Executive Summary

**W**orking with the basic assumption that all human behaviour has cognitive origins, this paper explores the potential value of a cognitive approach to the study of world politics. After a brief outline of the fundamental questions that a cognitive research program could and should answer, the paper introduces cognitive-affective mapping as a novel research tool that can facilitate such a program by providing 'access to the mind'. Cognitive-affective maps open up a wealth of analytical opportunities, including a comparison of individual and collective belief systems and mental structures that shape political processes and outcomes at all levels from the individual to the global. The paper concludes with a brief summary of ongoing research that seeks to identify distinct belief systems regarding international cooperation on climate change among participants in the UNFCCC negotiations, using cognitive-affective mapping.

## Section 1: The Role of Cognition in Political Life and Theory

**E**very human behaviour, whether individual or collective, is driven by a certain motivation or mix of reasons. Humans are purposeful beings, pursuing desirable outcomes and trying to avoid harmful ones. That means everything we do starts in the mind. Yet, with a few notable exceptions (Mercer 2005; Renshon 2008; Lopez, McDermott, and Petersen 2011),<sup>1</sup> the mind is hardly being studied in Political Science or International Relations (IR), two academic fields that seek to explain some of the most important and also most destructive phenomena of human behavior: the emergence and functioning of states, the way people vote, how governments conduct foreign policy, under what conditions groups engage in violence, how people resolve conflicts, and why states enter into some international agreements (e.g., on trade or ozone-depleting substances) but not others (e.g., on energy or climate change).

Why are political scientists reluctant to focus on cognition and how do these disciplines make sense of the world with a severely limited understanding of human thinking?

One reason why many scholars have avoided the mind as a subject of research might be a straightforward and significant methodological constraint (Bleiker and Hutchison 2008) – it is very difficult to ‘access’ the mind of people, especially of people in important decision-making positions. How would we ever know what people think, when and why they change their minds, and what they thought in the moment they made a particular decision? It seems even more daunting to investigate how groups ‘think,’ how they form and change opinions or make decisions in the absence of a collective brain.

Other reasons for the reluctance to analyze the mind might include the assumption that it does not matter what people think, it only matters what they do. After all, people can have a lot of thoughts but only act on some of them. So why bother with the confusing cognitive mess that never manifests itself in action? Focusing on behavior rather than on the underlying brain processes is not only easier from a methodological perspective, it can also create interesting insights contradicting much theoretical work. Behavioral researchers such as Daniel Kahneman,<sup>2</sup> Richard Thaler, and Cass Sunstein have demonstrated this impressively with ideas such as prospect theory (Kahneman and Tversky 1979), the winner’s curse (Thaler 1994), nudging (Thaler and Sunstein 2009) and fast and slow thinking (Kahneman 2011).

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<sup>1</sup> Political psychology as a multidisciplinary field of study seeks to understand political behaviour through the lens of psychological theories. However, it is focused on psychological mechanisms, rather than the ideational content of mental processes.

<sup>2</sup> Kahneman also studies cognitive processes, e.g., the role of heuristics that are relevant for political decision-making.



The field of International Relations has been reluctant to embrace either behavioral theories or cognitive approaches. The main theories of IR deal with the mind problem in a rather impoverished way, e.g., by making highly simplified assumptions about the mental work decision-makers do when they create policies, enter an international agreement or deploy military force. Political decisions are supposedly based on rational choice – a mental calculation of the expected costs and benefits of various paths of action, with the goal of selecting the path with the highest net benefits.

Further, researchers often don't bother with empirical verification of political decision analysis. They rarely ask any decision-maker how her calculations were made, what information she used and which types of costs she considered. Instead, scholars regularly put themselves in the actors' shoes and try to run the calculation in their own mind. They use general information about the given 'system structure' at the relevant point in time – the distribution of wealth and power among the various actors involved – to calculate the rational path of action, which is assumed to have been the result of the decision-makers' calculation too.

This 'decision-imitation' in the study of world politics is problematic for several reasons. The most obvious one is the fact that the decision-maker's perception of the given system structure might be very different from that of the researcher. What if she considered a set of benefits that the researcher ignored and how does anybody plug numbers into these equations? Predicting future energy prices (e.g., for the deployment of aircraft) is hard enough, but what about the value of a bombed home or a civilian casualty from aerial bombing?

More fundamentally, we need to ask whether rationality, or even bounded rationality (Simon 1985), is the right model. Does it adequately explain real-world decision-making? Did George W. Bush really calculate the costs and benefits of going to war with Iraq? If so, what costs did he include: the costs of deploying troops, of buying and maintaining military equipment, of contractors? How about the loss of American lives – or of Iraqi lives? The same can be asked about less controversial decisions. Did anybody come up with a list of costs and benefits of signing the Convention Against Genocide? Did Brazil provide humanitarian aid to Haiti because of expected pay-offs? Hardly.

This intuition appears to motivate an increasing number of researchers to look for answers outside the narrowly defined framework of rational choice theory. Within the field of IR, social constructivists have long argued that 'ideas matter' when people make political decisions. These scholars make a strong case for the importance of values, identities and concepts of justice in world politics, but they have difficulties providing general rules for how this ideational influence works. An increasing number of multidisciplinary studies at the boundaries between political science and other disciplines (e.g., psychology) have begun to explore the role of cognitive factors, in particular for conflict-related phenomena (Berns and Atran 2012; Crisp and Meleady 2012).

This working paper builds on these different approaches, emphasizing cognition and outlining in more general terms the potential value of a cognitive research program for the study of world politics. It proceeds in three steps. First, the paper

introduces a new and simple qualitative tool to study the mind: cognitive affective mapping. Second, it outlines some of the multiple possibilities of using cognitive-affective mapping both for scholarly purposes and more practically oriented policy-making processes. Finally, it showcases the application of cognitive-affective maps in the author's ongoing research on global climate politics.

## Section 2: Fundamental Questions for a Cognitive Analysis of Global Politics

**C**ognitive analysis – the attempt to identify, describe and understand the content, structure and dynamics of systems of mental representations – can fill this important gap in the study of international affairs. Building on recent advances in the cognitive and decision sciences as well as on rapidly evolving technological support tools for studying the mind, a cognitive approach to theorizing political behaviour promises new and interesting insights that could increase our knowledge about and our ability to influence political processes and social change.

Cognitive analysis seeks answers to four basic questions:

**How does the mind represent the world?** – Which concepts (mental representations) exist in a person’s mind and how do they relate to one another? How can one describe and analyze mental structure – as a network or as a complex system? If one assumes that there is only a limited number of possible and valid points of view on any global problem and its solution (i.e., there is a limited mental ‘state space’), e.g., because of logical constraints or other necessary characteristics of a viewpoint, one can explore whether all possible views are already represented in the public debate, which new ones can be created and why some points of view seem to be more popular than others (“cognitive magnets”).

**How do people make decisions?** – Do they make rational choices (calculating costs and benefits to their best ability) or do they rely on other criteria? Do they combine these rational and non-rational elements and how do these elements relate to and influence each other? Are there mental elements that we have not yet considered? How does increasing complexity in the decision-making environment influence this process?

**How do people’s minds change over time?** Why and how do people take on new beliefs and shed old ones? What is happening when mental structures change? Can a climate skeptic become an advocate of climate change policies? Is it easier for a conservative to join the Tea Party than it is for a liberal to become a conservative? How can a person move – or be made to move – from one basin of attraction to another?

**How can we understand the relationship between individual and collective beliefs and decisions?** Given that only individuals have brains and thus have the ability to think, does it make sense to speak of group cognition? How else could we talk about the foreign policy of country X, the decision of the World Bank to give a loan to South Africa, the intention of

the Hutus to wipe out the Tutsis, a company entering a new market or the concerns of a community regarding a planned wind farm project?

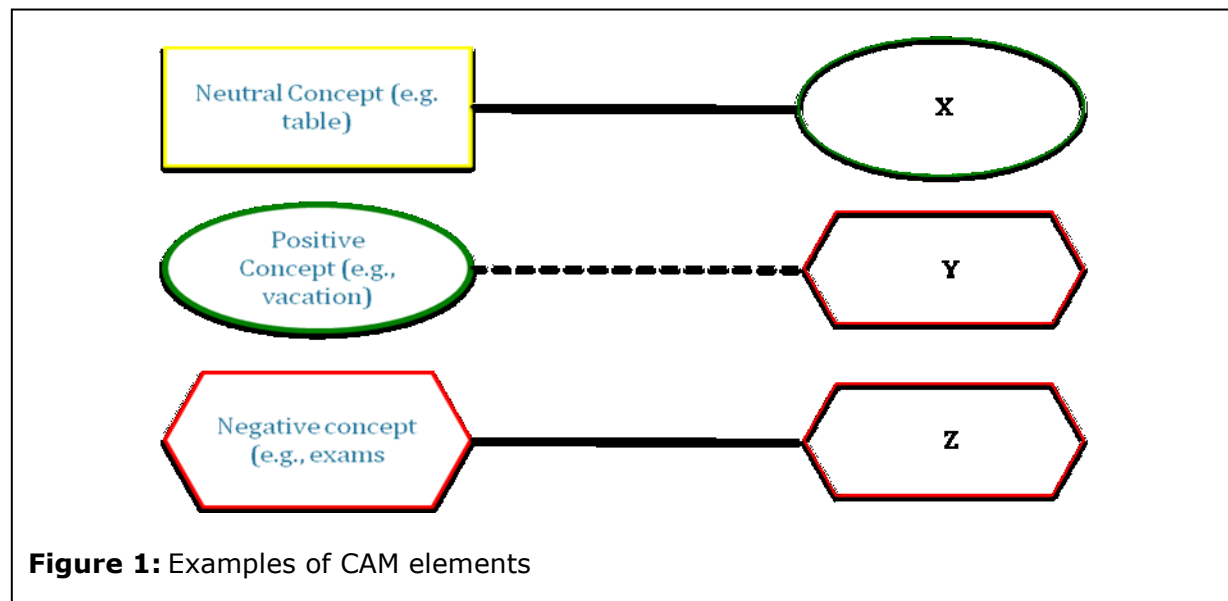
Exploring these questions may require the expertise of researchers across multiple disciplines: political science and IR, cognitive and neurosciences, psychology, sociology and policy studies. The theoretical and methodological challenges of such an endeavour are significant, but the resulting insights could be valuable, potentially informing policy-makers, negotiators and politicians in their efforts to bring about desirable social change (see below).

## Section 3: Creating Mind Access: Cognitive-Affective Mapping

Cognitive-affective mapping is a qualitative research tool to identify, visualize and analyze existing belief structures (Homer-Dixon et al. forthcoming). A cognitive-affective map (CAM) is a network diagram or concept graph that “displays not only the conceptual structure of people’s views, but also their emotional nature, showing the positive and negative values attached to concepts and goals.” (Thagard 2011).

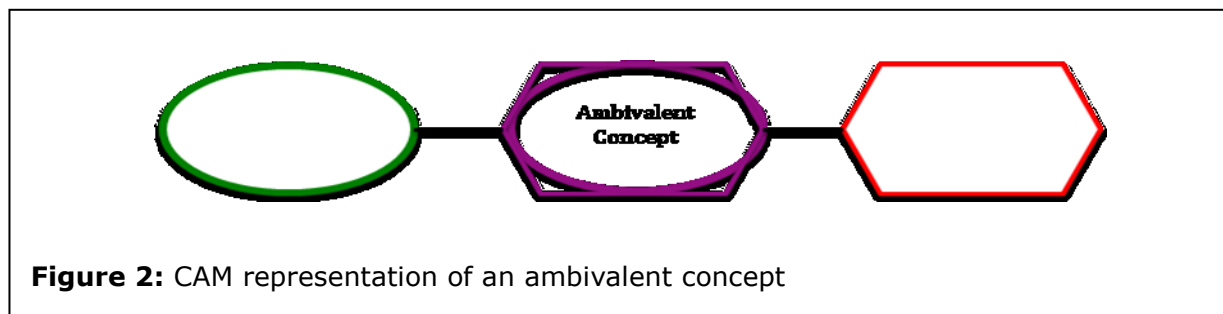
Cognitive maps have been used in the past (Axelrod 1976; Bonham 1993; Novak 1998), but the novelty introduced by CAMs is the ability to include affective information, adding an important layer of information about mental states and processes (Mercer 2010). In contrast to Axelrod’s mental maps, CAMs do not focus exclusively on causal beliefs, but on the network of all relevant concepts for a given subject matter (e.g., addressing climate change, the Arab-Israeli conflict or Iran’s nuclear program).

The networked representation of mental structures and processes is based on neural network research in the cognitive sciences that conceptualizes and simulates (biological brain processes in terms of connections between neurons that can be modeled computationally (Galushkin 2007).



**Figure 1:** Examples of CAM elements

The main elements of a CAM are the network nodes (cognitive elements, mainly individual concepts or propositions), emotional valences of these nodes (positive, neutral, negative, ambivalent) and links/connectors between two nodes. Positive nodes are depicted as green ovals, neutral ones as yellow rectangles and negative ones as red hexagons. Ambivalent concepts are perceived as positive in some contexts and negative in others, e.g., a sports car as a status symbol and source of joy vs. its role in a fatal accident. Hence, ambivalent concepts are depicted as a combination of an oval and a hexagon (purple). The thickness of a shape's edges represents the emotional intensity associated with the node. Links are solid or dotted lines, indicating compatibility or incommensurability between two concepts.

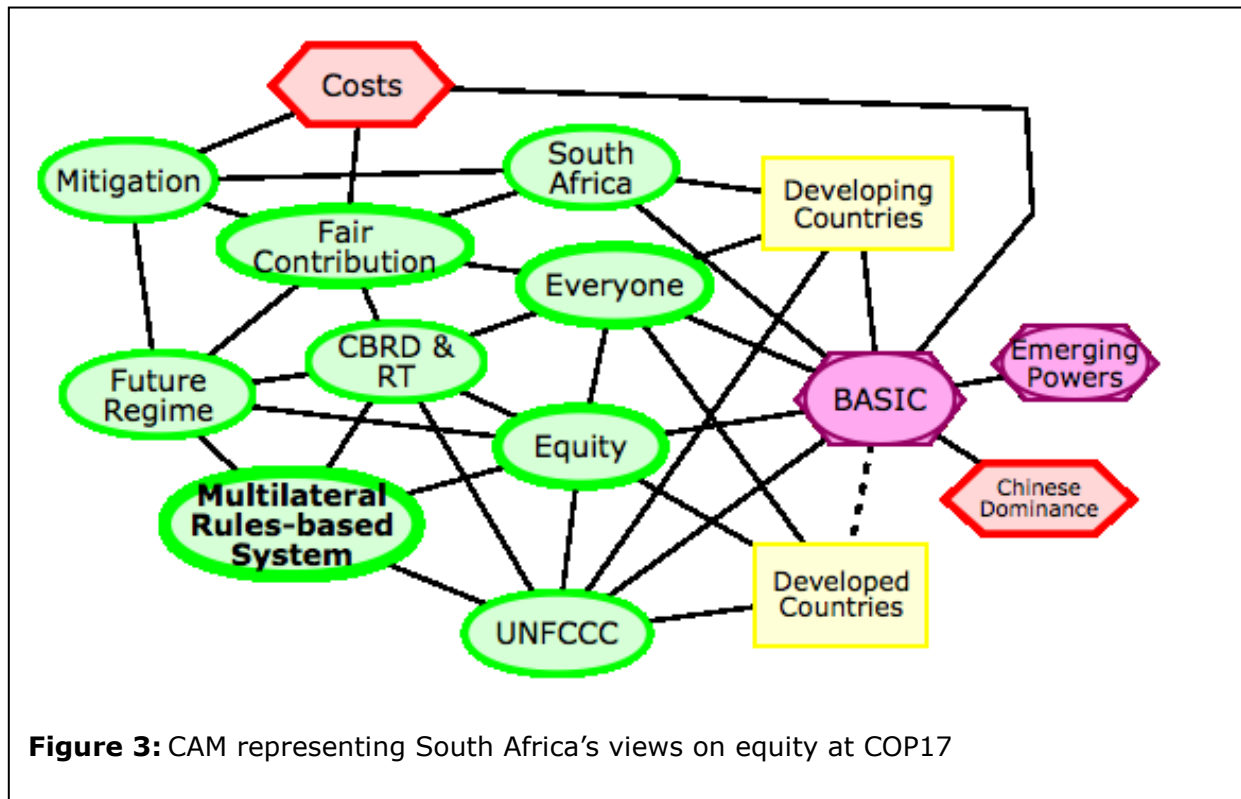


CAMs can be generated in a number of different ways, which can include the use of software tools such as [Empathica](#) (Thagard 2010).<sup>3</sup> The research subject can be asked to develop his or her own CAM of a specific issue. Alternatively the researcher can generate the CAM based on data gathered through qualitative interviews, observations or from primary and secondary written sources (e.g., published statements, speeches, journal articles, statutes). The validity of such a researcher-generated CAM can be verified in a second interview with the research subject, providing the opportunity to correct the map by adding, deleting or changing concepts, emotional valences or links. Another way to verify an initial CAM that is based on text sources is to have other researchers generate a CAM based on the same source material, then compare the results.

CAMs can reveal and represent the deep, ideational content of various political situations that deserve analysis. They can reveal the breadth of factors that influence foreign policy decision-making and strategy, offering very different insights compared to game-theoretic considerations of system structure and pay-offs. They can depict the complexities that lead to (violent) social conflict, including genocide and terrorism. CAMs can reveal the existence or absence of normative motivations among state and non-state actors and – if tracked over time – the dynamics that lead to the acceptance of a new norm and abandonment of an old one in people's minds. CAMs can also help understand difficult negotiation processes like the Camp David agreement (Findlay and Thagard forthcoming), the Doha trade round or the climate change talks.

<sup>3</sup> Empathica, which is available for free, was created in 2011 by fourth-year software engineering students at the University of Waterloo. Learn more at <http://cogsci.uwaterloo.ca/empathica.html>.

The CAM below is a small section of the South African negotiation position at the latest round of climate negotiations in Durban (COP17, held in December 2011). It depicts a cluster of concepts relevant to South Africa's views on equity in global climate governance. Source material for this CAM included a number of press briefings by the South African delegation in Durban,<sup>4</sup> two statements made by President Jacob Zuma during the conference,<sup>5</sup> and an interview with Alf Wills, the South African chief negotiator, conducted by the South African Institute for International Affairs (SAIIA) in 2011, available online as a podcast.<sup>6</sup>



The CAM captures and simplifies some of the central themes of the complex equity debate in the climate negotiations and reveals how South Africa's views differ from those of others. In line with arguments made by the developing

<sup>4</sup> Available as webcasts on the UNFCCC website: [http://unfccc4.meta-fusion.com/kongresse/cop17/templ/ovw\\_onDemand.php?id\\_kongressmain=201#](http://unfccc4.meta-fusion.com/kongresse/cop17/templ/ovw_onDemand.php?id_kongressmain=201#).

<sup>5</sup> Available on the website of the UNFCCC: [http://unfccc.int/files/meetings/durban\\_nov\\_2011/statements/application/pdf/cop17cmp7\\_opening\\_stat\\_zuma.pdf](http://unfccc.int/files/meetings/durban_nov_2011/statements/application/pdf/cop17cmp7_opening_stat_zuma.pdf) and [http://unfccc.int/files/meetings/durban\\_nov\\_2011/statements/application/pdf/111206\\_cop17\\_hls\\_jacob\\_zuma.pdf](http://unfccc.int/files/meetings/durban_nov_2011/statements/application/pdf/111206_cop17_hls_jacob_zuma.pdf).

<sup>6</sup> SAIIA podcast "South Africa's Chief Negotiator, Alf Wills, speaks to SAIIA ahead of COP 17", November 14, 2011, <http://saiiapodcasts.podhoster.com/index.php?pid=27252>.

countries<sup>7</sup> and the emerging powers in the BASIC group (Brazil, South Africa, India, China),<sup>8</sup> South Africa believes that an equitable distribution of the mitigation burden in the future climate regime has to be based on “common but differentiated responsibilities and respective capabilities”, an equity principle anchored in the UN Framework Convention on Climate Change, a much valued multilateral treaty. A novel aspect is the view that everyone – not only the developed countries – should make a fair contribution to reducing global emissions. The basic principle still applies and determines what is fair – the strong do more and the weak do less – but every country (including South Africa) should carry some part of the mitigation burden.

CAMs are not only a valuable analytical tool, but could also be used for more practical and policy-oriented purposes. First, mutually mapping the views of parties in a conflict or negotiation can provide a rich amount of information for stakeholders or mediators, but can also reveal misperceptions and previously hidden concepts that are relevant for the discussion. CAMs can promote a better understanding of the parties’ views of each other and the substance of the conflict, especially when conflict parties map what they believe to be their opponents’ perspective and also undertake a comparison of these CAMs. In some cases the opportunity to correct misunderstanding and unearth deeper layers of meaning might contribute to identifying areas of agreement and potential solutions. A more contentious but also powerful application of CAMs would be as strategic support tools for designing conflict or political interventions with the purpose of changing people’s minds – e.g. to frame more persuasive arguments and communication strategies.

The next section details the various ways in which cognitive-affective mapping can be used, distinguishing various levels of analysis for its application, possible types of insights and fields of study where it could make valuable contributions.

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<sup>7</sup> The largest grouping of developing countries is the G77&China, which issues statements on behalf of its members during the negotiations, e.g., <http://www.g77.org/statement/getstatement.php?id=120515b>.

<sup>8</sup> The BASIC group repeats this argument in the joint statements issued after multiple ministerial meetings since 2009, e.g., <http://www.indianembassy.org.cn/newsDetails.aspx?NewsId=267>.



## Section 4: A Universe of Research Opportunities

### 4.1. Individual Thinking

**C**AMs provide rich insights into the belief systems that shape how an individual perceives another person, country or entity (e.g. Barack Obama, China, Greenpeace), a specific problem (such as climate change), the relative merits of different policy options (e.g. cap-and-trade vs. a carbon tax), the causes of and solutions to conflict, even scientific questions such as the role of climate change affecting droughts in the Amazon, or philosophical issues such as the relationship between humankind and nature.

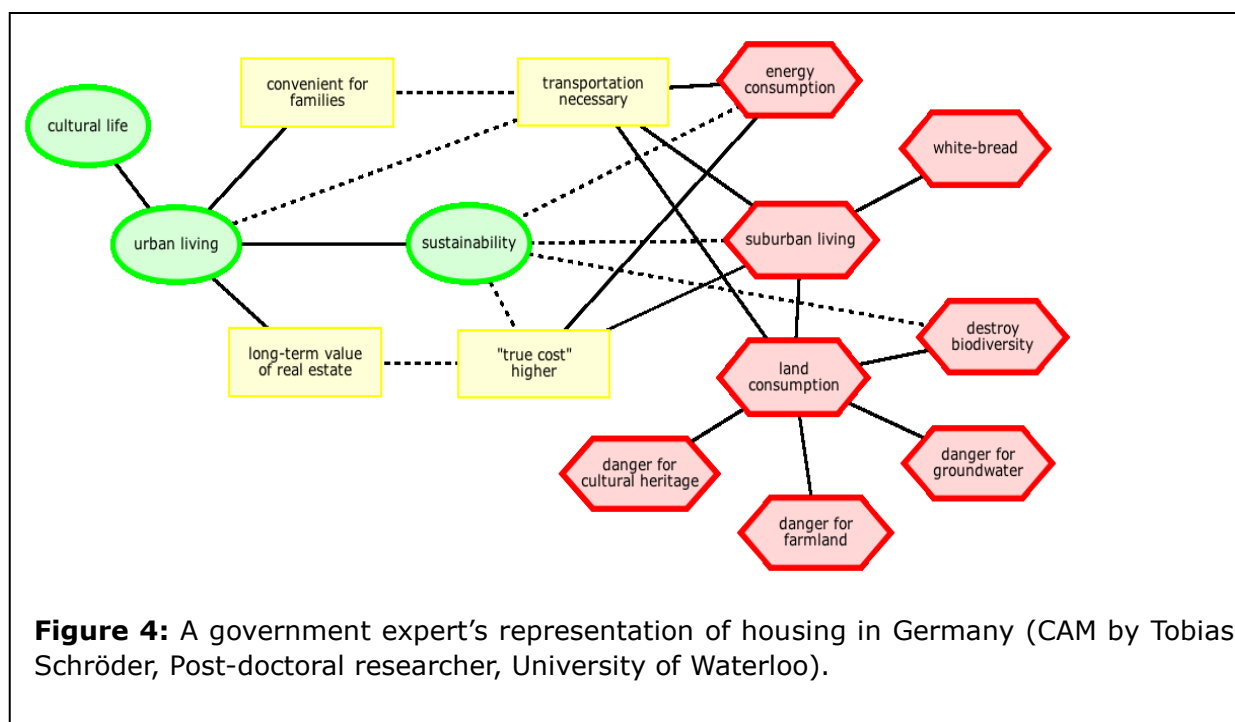
Individual-level analysis can identify the most important concepts that a person uses to make sense of an issue and the mental connections that exist between these concepts. By exploring the person's mental structure, the researcher can learn about the sources of meaning in a given belief system and which concepts are most important for that person, and thus least likely to change. For example, a person's stance on equity in climate negotiations might be driven by a pragmatic view of who has more resources, by a deep-seated resentment of colonial powers or by a fundamental sense of social justice. The resulting stance might be the same, but the person's willingness to negotiate and trust another's good intentions might differ considerably. Clusters of concepts (e.g., all concepts related to the global impact of climate change) offer sub-scales within a CAM that might display patterns and structural characteristics that are similar to those on larger scales. By exploring the person's mental structure, the researcher can learn about the sources of meaning in a given belief system, e.g., which concepts are more central than others and therefore harder to change.

Although it will be generally difficult to generate CAMs of a specific decision maker's thoughts at the moment of the decision, a memory based CAM can nevertheless be insightful. One could map multiple decisions by an important individual, e.g., US President Obama, to assess whether there were regularities in the criteria he used for decisions in very different political and policy contexts, e.g., running for president, selecting Hillary Clinton as Secretary of State, making health care his first term priority or killing Bin Laden. It might be possible to track changes in and influences on the decision-making pattern over time or compare decisions of different decision-makers (see below). This work could provide substance and structure to research on leadership and the role of personality in international affairs.

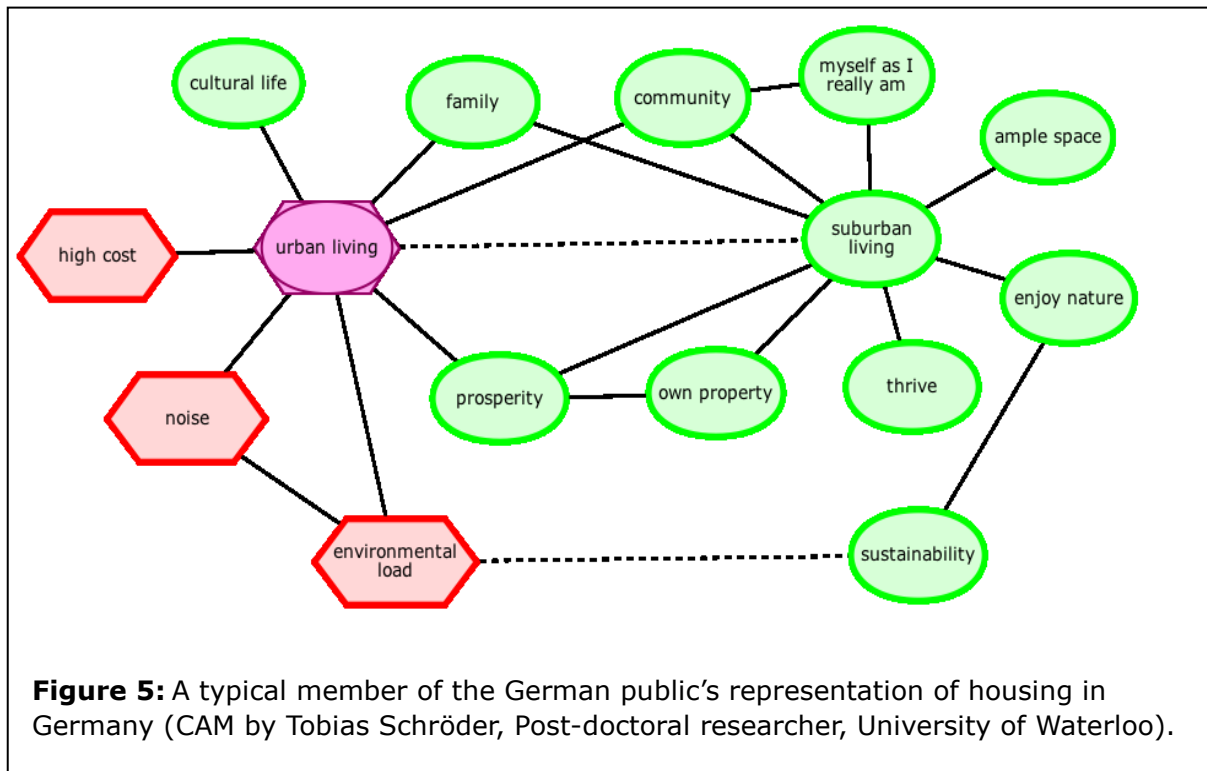
## 4.2. Contrasting Views

A comparison of individual viewpoints can enable the researcher to identify categories of concepts (meta-concepts) that are part of every CAM being compared, but take on very different meanings in each of them. For example, one might observe that all research subjects deploy concepts related to justice when considering whether their government should provide development aid to a country in Africa. However, the relative importance of equity concerns compared with other considerations, such as economic costs, might differ among individuals. Every person might have a different understanding of equity. The next step then is to compare their definitions of equity and justice, and the relative weight each person gives to different aspects of a decision (e.g. is the ability to pay a crucial factor or are moral values the priority?).

Comparing the cognitive content and structure of different individuals can also reveal important similarities or differences in the concepts used and linked and their respective emotional valences and weights. In the field of policy analysis, CAMs could identify sources of policy failure based on a disconnect between the representative ('ideal type') views of policy-makers within the government and those of citizens. The CAMs below demonstrate this case, displaying differences in the views of a policy maker and a citizen on housing policy in Germany (Schröder, Huck, and Haan 2011). Conversely CAMs could support the design of policies that have a higher chance of public acceptance, e.g., by identifying different existing viewpoints in the targeted population before initiating a new public program. Further, one can investigate whether individuals have different interpretations of the same reality (e.g., differing estimates of the expected costs of war or benefits of a climate agreement) or different types of motivations for doing the same thing (e.g., going to war).



**Figure 4:** A government expert's representation of housing in Germany (CAM by Tobias Schröder, Post-doctoral researcher, University of Waterloo).



Researchers interested in democratic theory could explore the similarities and divergences between the CAM of individual voters and their elected representatives, or between those of major political donors and the recipients of the donations.

### 4.3. Collective Views

A collective CAM depicts concepts and beliefs that are shared by all members of a certain group and are therefore relevant sources of meaning and shared identity for the collective, e.g., members of an NGO regarding the purpose of the organization, citizens of a country regarding their national identity (Mock 2012), or parties to an international agreement regarding the rights and obligations the treaty contains.

A collective CAM can also depict a policy, legal statute or even a constitution, a judgment of a court or a government's foreign policy stance. While these are all examples of 'products', i.e., the results of political processes, CAMs can also be used to analyze processes that created these outcomes during which collective beliefs might have changed. Mapping deliberative interventions at different points in time and their effects on the participants can help track successful ideas and arguments as well as failed attempts to influence group opinion.

Research can contrast and compare group perspectives (e.g., the negotiation positions of two or more countries) in order to identify room for agreement or sources for conflict. It can also explore differences among sub-groups within a larger group (factions), identifying cognitive elements that they all hold in common and those that keep them apart. The content and structure of ideologies as sets of ideas about the given or desirable political and social-economic system shared by many people is another interesting area of research. CAMs can help investigate the nature and variants of ideologies, change of ideological content and the role that ideologies play in collective decision-making. When applied in practical settings, CAMs of collective views can potentially contribute to the resolution of conflicts (Homer-Dixon et al. forthcoming) or the facilitation of negotiations (Findley and Thagard forthcoming).

#### 4.4. Relationship between the Individual and Collective

The most interesting but also the most challenging questions for cognitive research concern the relationship between the individual and the group. How can one theorize about group cognition given that only individuals have brains and therefore the capacity to think (i.e., have mental representations)? How do shared views emerge from communication among individuals? Can the group 'communicate' with the individual, or can all communication be reduced to individuals? Why do individuals often treat the group as if it had a mind or use the metaphor of a group mind to develop their own thoughts?

Interesting research questions concerning the individual-group relationship concern the overlap and differences between individual views and shared beliefs: what is the smallest common denominator on which the group can agree? How much maneuvering room do individuals have when their beliefs differ from those of the majority of the group and at what point do they lose group membership due to their cognitive differences?

CAMs can help explore questions of group identity, which are central for studies of nationalism, citizenship, (ethnic) conflict or partisanship. What defines the group, which concepts and meaning systems are central for the existence of the group, and to what extent do the group members share them?

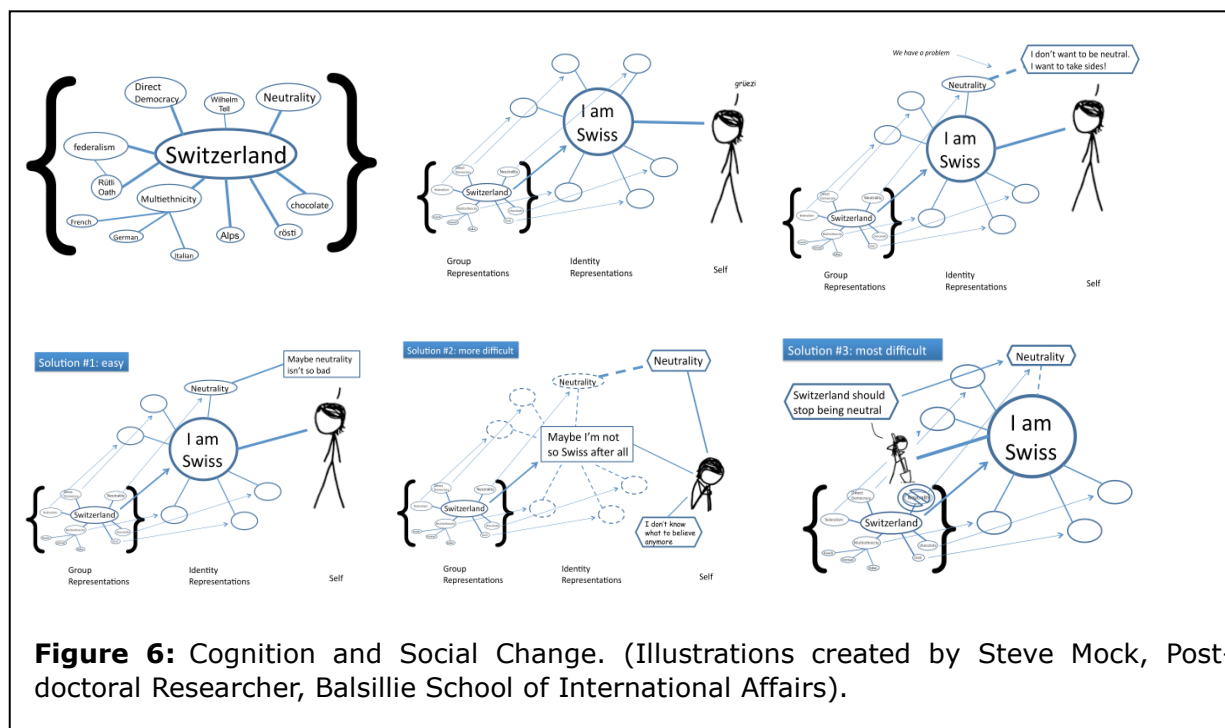
#### 4.5. Mental Dynamics

Comparing CAMs of the same individual or the same group at different points in time can reveal cognitive and emotional dynamics that are significant indicators for behavioural change and political outcomes. One can explore how an existing system of networked beliefs has changed (Thagard 1992; Mackie 2006): Have concepts been added or discarded? Are new clusters of concepts formed? Also, what happens when a previously central concept is cast aside? Observing cognitive change also provides insights into the characteristics of different 'basins

of attraction' or mental magnets. Which points of view are possible? Which one is chosen by an individual and why? Not every point of view on a certain subject is equally valid or equally popular, but what defines a particularly contagious set of opinions?

## 4.6. Processes of Social and Institutional Change

Combining insights from the various research directions outlined above has the potential to advance existing knowledge about the psychological, sociological and political processes involved in social change. Grappling with different dynamics taking place at various scales of social systems and their interactions (e.g., individual cognitive changes triggered by participating in a political debate), a cognitive approach to world politics opens up new space for theoretical, methodological and empirical research that is needed in a time of mounting global political challenges, such as that of climate change.



Policy-makers or community leaders who seek to trigger cognitive change in a certain population can use CAMs to explore the effects of different communicative interventions (e.g., scientific information campaigns, deliberative practices, public debates, news reports) on individual and collective beliefs. The analysis of the fit or (mis)fit between the message intended by the sender and the receptivity of the receiver's cognitive structure can help identify weak and/or powerful tools and

narratives for triggering a desirable change of mind (Hobson and Niemeyer 2011).<sup>9</sup>

Insights about cognitive change could make important contributions to the study of political mobilization and social movements, for the de-escalation of violence , the resolution of conflicts and many other fields that seek to understand why people change what they do.

#### 4.7. Computational Modeling of Social Change

Finally, based on their neural network foundation, CAMs can be used to inform the design of realistic computational models, especially agent-based models (ABM), that seek to simulate belief and social change through communication and the diffusion of ideas (Schröder et al., 2012). If the CAMs have a solid empirical foundation, they can offer realistic psychological input for such models that is superior to theory-based alternatives.

The last section of this paper briefly outlines how an ongoing research project on the role of cognition in global climate change politics deploys cognitive-affective mapping and what kinds of results this work can generate.

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<sup>9</sup> Hobson and Niemeyer use Q Method for the same purpose.

## Section 5: Cognition in Global Climate Politics

**C**limate change has presented humanity with a great puzzle. All global actors – state and non-state – share and have access to the same scientific data, but there are vastly different opinions on the appropriate political response to the identified problem. In some countries the validity of the science is still disputed, although this is mainly an artificially created debate funded by actors vested in the status quo, who seek to stall political action by sowing public doubt. Generally, governments around the world agree on the science, but disagree on what to do about it (mitigation, adaptation, geoengineering) and in what mix. How much of it should be done (350ppm or 450ppm, 2°C or 1.5°C)? In what time frame and who should do what (developed vs. emerging vs. developing) and how (mitigation targets vs. pledges, public vs. private funding, technology transfer, transparency and accounting)? Also why do it (e.g., to prevent harm to people today vs. people in the future, to preserve wealth in the rich world vs. allow wealth to be created in the poor world, to create a greener and cleaner economy or to rethink the existing economic paradigm, to protect national interests or to act in the interest of humanity)?

Are the possible viewpoints on the issue endless, or is there a limited state space of beliefs on climate change and international cooperation? Do all climate negotiators share a set of concepts or meta-concepts, e.g., climate change as a global problem, the economic costs of action, the need for climate justice? Do these shared concepts form the structural core of a climate related viewpoint (i.e., what is the consequence of attacking or removing one of them)? Does the diversity of perspectives allow for an international agreement? What in these belief systems motivates (global) action? If the current constellation of beliefs prevents agreement, is it possible to change minds? Whose minds? Can negotiations change minds? Should they?

This project seeks to answer some of the questions raised above by combining two methodological instruments to reveal individual (CAM) and collective (Q Method) cognitive patterns that shape and possibly impede global efforts to create an effective climate regime. The central goal of the project is to identify distinct belief systems regarding international cooperation on climate change among participants in the UNFCCC negotiations in order to assess to what extent mental content and structures influence the search for cooperative solutions. In the course of the project, roughly 50 CAMs are being generated based on semi-structured interviews with various participants in the climate negotiations (diplomats, NGO and business representatives). Each CAM visualizes one study participant's existing beliefs and mental structures regarding international cooperation and climate change. An example of such an individual-level CAM is included below.





The "Climate Change" node at the center is a possible starting point for reading and interpreting this CAM. Several clusters of concepts are linked to this node: concepts related to science on top, concepts related to impacts on the right hand side or concepts related to the UNFCCC on the left.

Many aspects of this CAM offer interesting material for analysis, but the person's views on the nature of the problem (the bottom part of the image) provide interesting insights. This person perceives climate change mainly as a conflict of ideas, a fight between a neoliberal ideology in the developed world and a more Marxist worldview in the developing countries. The idea that climate change negotiations are essentially an ideological battle between the global North and the global South is connected to the science cluster and the notion of climate justice via the concept "Emissions."

Emissions are important to understand responsibility (those who emitted in the past) and vulnerability (those who did not emit in the past). In that sense, historical emissions are the source of the North's moral obligation to both mitigate the problem and provide resources to the South for mitigation and adaptation. These are concepts central to the definition of climate justice. But in this view, the moral responsibility does not stop there. Addressing climate change is not enough. Instead, the moral responsibility of the developed countries extends to addressing development and the eradication of poverty in the developing world. The negotiations cannot be allowed to save future generations by forsaking the needs of people living today. There must be trade-offs between the two goals.

Seen in that light, Durban was an abysmal failure. The Durban Platform might be beneficial for the climate problem, but it completely fails to address the justice-related issue of development. Instead of addressing existing global inequity based on historical patterns of exploitation, it equalizes responsibility for climate change.

Comparing multiple CAMs provides insights into the structural but also substantive similarities and differences among the views of study participants. Based on this comparison, one can not only identify areas of agreement that are as yet unexplored, but can also begin to understand the different value and belief systems that feed into, but need to be distinguished from, formal negotiation positions. It is conceivable that parties with strongly opposing negotiation positions share a significant set of beliefs and values. This kind of insight could provide the foundation for different negotiation dynamics or alliances, potentially increasing the possibility of finding agreement in the long run.

Further, it might be possible to identify meta-concepts (e.g., related to agency, identity and justice) contained by all CAMs, and the more general cognitive and emotional characteristics displayed by different views on this complex global issue. Using the notion of a state space (Etkin 2010), this research can reveal some of the spaces in the limited universe of possible sets of beliefs that are currently occupied by negotiation participants, what these cognitive 'basins of

attraction' have in common, but also whether there are yet unexplored or unoccupied spaces that negotiation parties could move to.

This latter issue is connected to the question of how one can change minds. Existing theories of cognitive change distinguish between incremental processes of belief revision (e.g., adding or deleting individual elements), and systemic theories of cognitive reorganization in the sense of a gestalt switch or threshold (Thagard 1992; Mackie 2006). While the point analysis conducted for this project does not provide any useful data to answer the question of how climate negotiators change their minds, it does identify the starting conditions for any attempt to intervene in the cognitive status quo of climate negotiations.

In addition to identifying existing viewpoints among actors in global climate negotiations, the project also explores whether climate change is a unique problem that poses special (maybe unprecedented) cognitive challenges for these actors. Are there any problem characteristics (other than existing power asymmetries) that make it particularly difficult for humans to deal with climate change? And what is the cognitive response to this challenge?

While this research might result in a couple of quick wins for the climate negotiations, such as the discovery of yet-unexplored areas of agreement among the different actors, the immediate benefits in terms of creating an effective multilateral agreement are limited. The goal of this project is not to improve the design of negotiation strategies or to develop proposals for the future regime design, but to get to the cognitive-affective roots of persistent global disagreement over climate governance. Scoping the cognitive landscape of climate negotiations could be a starting point for revising our understanding of the main drivers of the political process – the mental-emotional mirrors of material and social reality, distorted and cracked. Equipped with such an understanding, the insights and cognitive research tools can be deployed to support climate policy-making and negotiations at various political levels, e.g., developing and testing the effects of different negotiation frameworks (e.g., burden vs. benefit sharing, various equity conceptions), devising strategies to mobilize different groups for climate action (e.g., conservative voters in the U.S.), or designing policies with a high probability of generating desirable behavioural change or innovation diffusion.

Given that this type of research is in its very early stages, no serious policy recommendations can be offered at this point in time. Instead, the arguments and questions presented here, and the increasing availability of analytical tools such as cognitive-affective mapping, show the potential value of fostering substantial research in this field. Such research should operate at the intersection of science and policy, be designed on the basis of the most urgent needs formulated by political actors at all relevant scales, and be capable of translating its findings into policy advice almost in real time.

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