

WHAT ARCHITECTURE DOES. AN EMBODIED APPROACH TOWARDS THE IMPACT OF THE BUILT ENVIRONMENT

MARGIT VAN SCHAİK

The user's space is lived—not represented (or conceived). [Henri Lefebvre]¹

INTRODUCTION

A recurring theme in the history of architectural and urban theory is the shaping role the built environment plays in the everyday lives of its users. Perhaps most famously illustrated by Winston Churchill's statement "We shape our buildings, and afterwards they shape us," both theorists as well as designers have frequently considered the designed environment as playing an active part in society and examined the relation between plans on the drawing table and their impact on people's lives in reality.² Although divergent in their outcomes, the ambitions of modernists like Le Corbusier, structuralists like Herman Hertzberger, and current architects who advocate the participation of end-users in their design processes converge in the belief that design can contribute to the production of a certain ideal society.

These same ambitions, however, have also led to projects in which people behaved differently or even completely opposite to the intentions of the designers. The efficiency and functionality that were at the basis of early twentieth century modernism were later part of the criticism on the living-conditions in buildings like Pruitt-Igoe in Saint-Louis or the Bijlmer-neighbourhood in Amsterdam.³ Alison Smithson expressed her disillusionment about the way residents behaved in Robin Hood gardens after she and her husband had designed it completely around their vision on an ideal collective society.⁴ In less extreme cases as well,

it seems the impact of the built environment is limited. Hope for creating an ideal social situation, such as strong communities shaped by collective spaces or gardens, often seems vain in retrospect and serve primarily as a good story to “sell” the design rather than a proper solution in reality. Luckily, the same principle applies vice-versa: even in poorly designed buildings, people seem to be quite flexible in making their environments work for whatever it is they want to do.

This observation has led some to observe, that the built environment is not as influential as designers themselves might like to think. According to architect and behavioural researcher Richard Buday for example, “environmental determinism’s failure showed leading architecture ... does not shape behaviour any better than secondary architecture,” and therefore one might even wonder if the architect’s profession is at all that relevant.⁵ The belief in this power of the built environment can even be dangerous according to Buday, as it neglects to acknowledge the impact of people’s own choices.

Regardless of how much or how little impact design has on people, we can nevertheless agree that one environment can be experienced as more pleasant, lively, beautiful or practical than another, even when such judgements might not be universal. *Underestimating* such impact might be just as dangerous as *overestimating* its power. Instead of trying to measure the share that can be ascribed to environmental design, this article therefore proposes an alternative route: instead of asking the quantitative question of how much impact the environment has on its users, it asks the generative question of how such impact arises. The first part of the article explores possible answers to this question. The second discusses issues that complicate the implementation of this knowledge into the design practice.

The theories of such philosophers as Edmund Husserl, Martin Heidegger and Maurice Merleau-Ponty, in the wake of recent developments in the fields of philosophy, psychology and neuroscience, and more specifically the research program of embodied embedded cognition, provide insights into the strong and dependent relations between the mind, the body and the environment.⁶ Supported by extensive scientific research over the last few decades, these insights dismiss a Cartesian view in which an immaterial and independent mind can think rationally about the physical world.⁷

As many architectural theorists, such as Harry Mallgrave, have shown, these insights offer strong potential for understanding architectural experience as well.⁸ Instead of considering subjects as relatively independent from the built environment they perceive, we can now understand how architectural experience is a physical consequence of the impact a building has on its users. To make this assertion clear, we will have a look at what is

called the enactive approach to perception, a theory that is part of the broader embodied embedded cognition movement. As Andrea Jelić, et al. have argued, this enactive view provides a particularly useful guide to studying architectural experience.⁹ Of particular interest is a paper by Evan Thompson and Francisco Varela, in which the connections between mind, body and world are explained as three “dimensions of embodiment,” or three different cycles of operation that integrate these three components:

1. Cycles of organismic regulation of the entire body.
2. Cycles of sensorimotor coupling between organism and environment.
3. Cycles of intersubjective interaction, involving the recognition of the intentional meaning of actions and linguistic communication.¹⁰

Although it falls beyond the scope of this article to describe these kinds of cycles in all their biological detail, they do provide an interesting framework with which we can explore the ways in which architecture influences its users. They describe the three levels at which body, brain and world are integrated with each other and therefore how connections between them are made, which provides an overview of how architecture has “access” to a human being.

In the latter part of the article, I will therefore consider each dimension separately and explore how it relates to the built environment to arrive at a tool with which the impact in specific cases can be analyzed. Besides this theoretical exploration, a specific case-study will be used in order to illustrate the theory and relate it to building practice. The chosen case-study is the plenary meeting hall of the Dutch Parliament, a design that holds a special relation to themes of publicity and power. Seating the 150 elected members of Parliament, it forms the physical realization of Dutch democracy and despite being an indoor space, the hall is arguably

one of the most public spaces in the country. In the first instance, both literally and physically public access to meetings in the hall is ensured at all times, overcoming complex issues such as security and wheelchair access. But access is ensured virtually as well, as the debates taking place in the room are shared through various media on a daily basis. Programmatically similar to the British House of Commons Chamber Churchill referred to in his famous statement, the impact of the hall's design is particularly relevant, since it may possibly influence policies that concern the entire country. It results in interesting relationships between the roles that are accommodated and how they have become physical in the design of the space, the furniture and other facilities. Drawings of this design will provide an illustration of the impact that can be discovered in each cycle.

ORGANISMIC REGULATION

Under organismic regulation we understand those unconscious processes that regulate the state of the organism. As Thompson and Varela explain, the “main basis is the autonomic nervous system, in which sensors and effectors to and from the body link neural processes to basic homeodynamic processes of the internal organs and viscera.”¹¹ The purpose of these cycles is to translate information about the environment to reactions within the body in order to keep the organism safe and healthy. Often, they remain unnoticed, as they occur unconsciously and more instinctively than intentional perception and action.

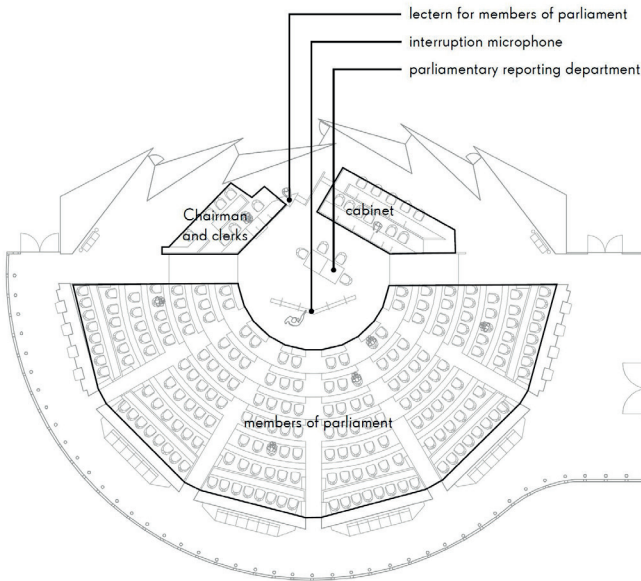


FIG.1: PI DE BRUIJN/
ARCHITECTENCIE,
ASSEMBLY HALL OF
THE DUTCH PARLIA-
MENT, THE HAGUE
1992, AN OVERVIEW
OF THE ROLES IN THE
PLENARY HALL AND
THEIR POSITION

Emotional states are the outcome of an interaction between, for instance, the central nervous system and visceromotor systems that regulate the organs. These emotional states can be understood as a first “gut feeling” about what is experienced. As Thompson and Varela explain “organismic regulation, because of its links with basic emotional operating systems ... has a pervasive affective dimension that manifests in the range of affective behaviours and feelings.”¹² In other words, when we experience architecture, organismic regulation controls our first reaction to a building.¹³

The autonomic nervous system, which is divided into the sympathetic and parasympathetic nervous system, responds to these emotional states.¹⁴ The sympathetic nervous system has an activating role, as it accelerates the heart rate in response to certain circumstances. Therewith it regulates our “fight-or-flight” response, as it can prepare the body for intense physical activity. The parasympathetic nervous system, however, calms the body. When circumstances suggest that the organism is safe, this system brings it to a state in which it can rest.

Here, we can draw a parallel to what Edmund Burke has called the Sublime and Beautiful as categories of aesthetic enjoyment.¹⁵ The former is based on a tensioning of the body, when for example we stand on the edge of a cliff, the latter is based on a relaxation when we observe something serene and controlled. From this we can understand organismic regulation as the process that on the one hand makes us say “wow” when for example observing imposing or monumental architecture, and on the other makes us feel comfortable when a space is small and shielded.¹⁶

This observation becomes more concrete when we consider the design of the Dutch plenary meeting hall. The hall is part of a building designed by Pi de Bruijn and realized in 1992, located at the Binnenhof in The Hague. It holds the plenary meetings of the parliament or the “Tweede Kamer”

“THESE
EMOTIONAL
STATES CAN BE
UNDERSTOOD
AS A FIRST
“GUT FEELING”
ABOUT WHAT IS
EXPERIENCED.”

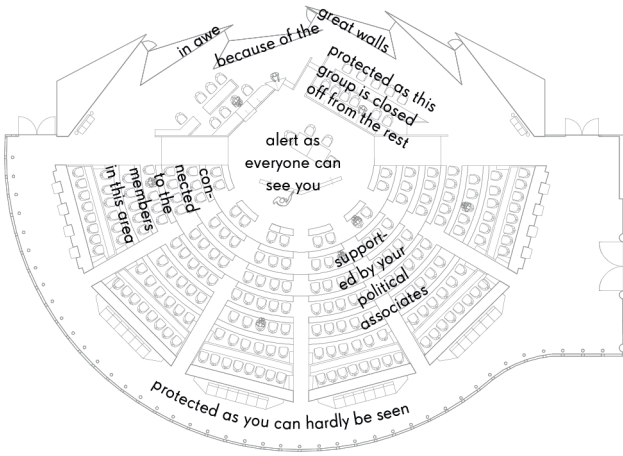
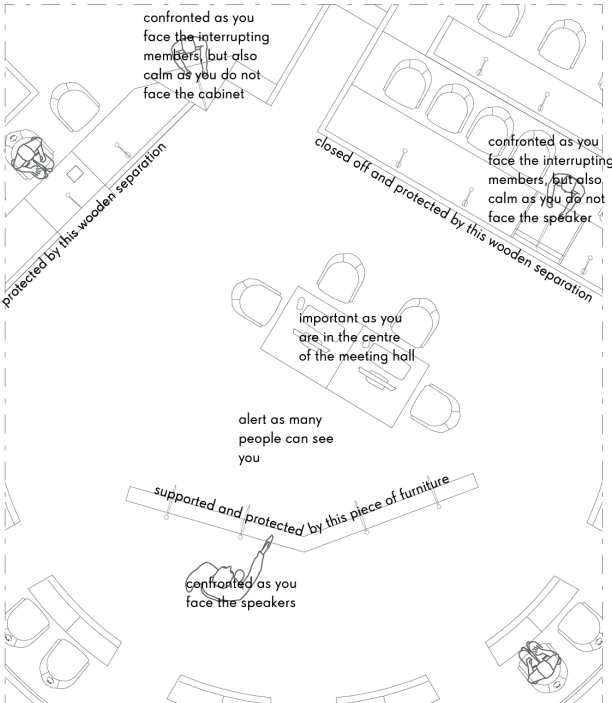


FIG.2: POSSIBLE EMOTIONAL STATES EVOKED BY THE GENERAL LAYOUT OF THE PLENARY MEETING HALL

FIG.3: POSSIBLE EMOTIONAL STATES EVOKED IN THE CENTER OF THE HALL



(second chamber), which has a comparable role to the House of Representatives in the U.S. or the House of Commons in Great Britain. The 150 members of parliament are seated in six segments, facing their Chair(wo)man and clerks on one side and the government (cabinet) on the other. [Fig. 1]

When entering, walking through and resting in the arena-scaled hall, different emotional states will probably arise, related to different parts of the space. [Fig. 2-6] In the centre of the hall for example, one is in the middle of a large space, with a high ceiling in which all other users of the room are facing you due to the orientation of their seats. These elements seem intended to evoke a reaction of alertness. In contrast, in the small hallway below the public stands, users are mostly shielded from the large room, because the lower ceiling provides a space that feels much more soothing. It is no coincidence that most actual compromises are made here, where politicians that might be enemies in the “arena,” can feel at ease and come together.¹⁷

When you are in the centre of the hall users face a collection of large natural stone walls that rise from behind the Chair(wo)man to which comments are addressed. These solid walls might very well evoke a sense of awe and are clearly meant to impress via their monumentality. At the same time the furnishings of the meeting hall are designed in such a way that people are often shielded from each other. “Vak K,” the part in which the Cabinet is seated, is completely surrounded by a low wooden wall, which makes them in a way protected from the rest of the people. The interruption barrier (for members who respond to or question members of the cabinet) is comparable, with the exception that in this case the wall starts at about 20 cm above the ground, so that the member’s feet remain visible.

SENSORIMOTOR COUPLING

The second category of ways in which body and the world are interwoven concerns more

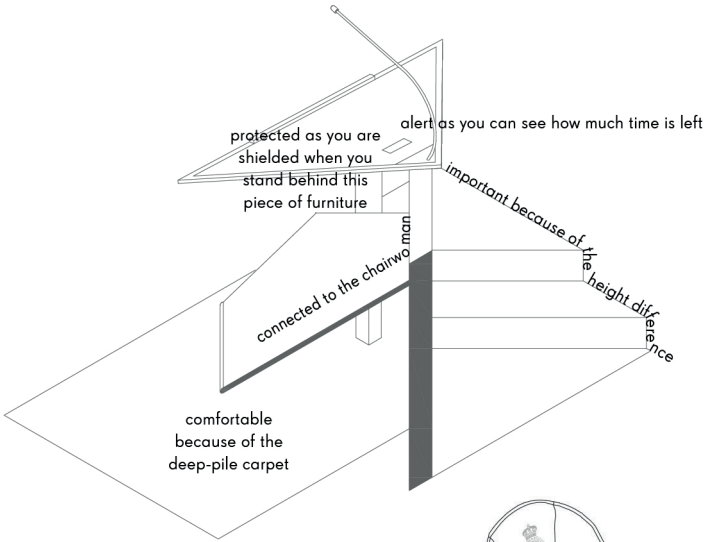


FIG.4: POSSIBLE EMOTIONAL STATES EVOKED BY THE LECTERN FOR SPEAKING MEMBERS OF PARLIAMENT

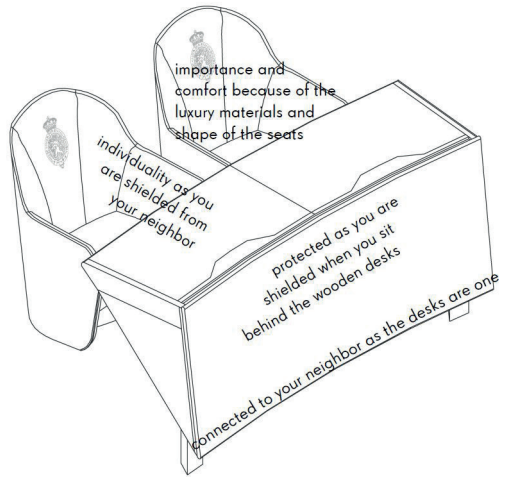


FIG.5: POSSIBLE EMOTIONAL STATES EVOKED BY THE DESKS AND SEATS OF MEMBERS OF PARLIAMENT

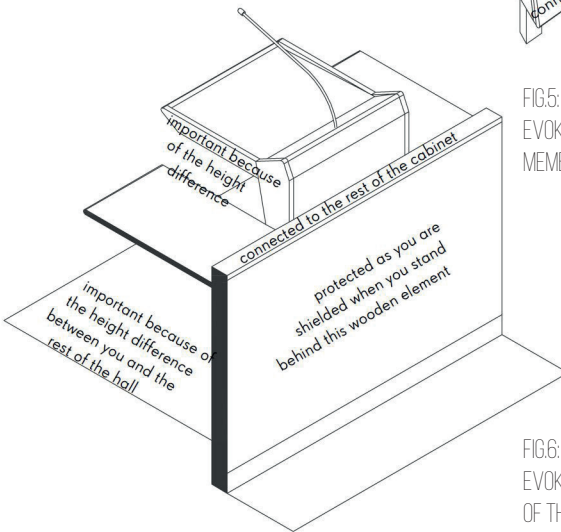


FIG.6: POSSIBLE EMOTIONAL STATES EVOKED BY THE LECTERN FOR MEMBERS OF THE CABINET

elaborate actions and movements through the environment. These movements are made possible by our so-called motor system, which is much more connected to perception than has previously been presupposed. As Susan Hurley explains in *Consciousness in Action*, following up on for example the work by Ulric Neisser, the generally assumed divide between the body and the mind has resulted in an input-output picture of perception.¹⁸ In that picture, perception forms the input from the world to the mind and action forms the output. The mind mediates between these two states: through thought it links the right input to the right output. However, discarding the Cartesian divide leads to the conclusion that perception and action are much more interwoven with each other than traditional views have acknowledged. Building on, amongst other theories, what has been called the *reafference principle*, Thompson and Varela explain, “situated activity takes the form of cycles of sensorimotor coupling with the environment. What the organism senses is a function of how it moves, and how it moves is a function of what it senses.”¹⁹

This point was already developed in the 1970s by James Gibson in his theory of affordances.²⁰ He argued that humans (and other animals) perceive the world through the actions that are possible within it. We encounter the affordances present in the environment, rather than perceiving the world through something like a photograph, in which all details are grasped at once. What the environment affords is what it offers, provides or furnishes an animal to do in it. A flat surface, for example, is seen as walk-on-able, a surface about 40 cm above the ground is sit-on-able, and round objects that can be grasped in the hand are throw-able and catch-able. Such affordances are different for each animal or person, related to their individual capabilities.

The theory of affordances means that the designed environment of architecture is perceived in the same way, through the actions that it affords.

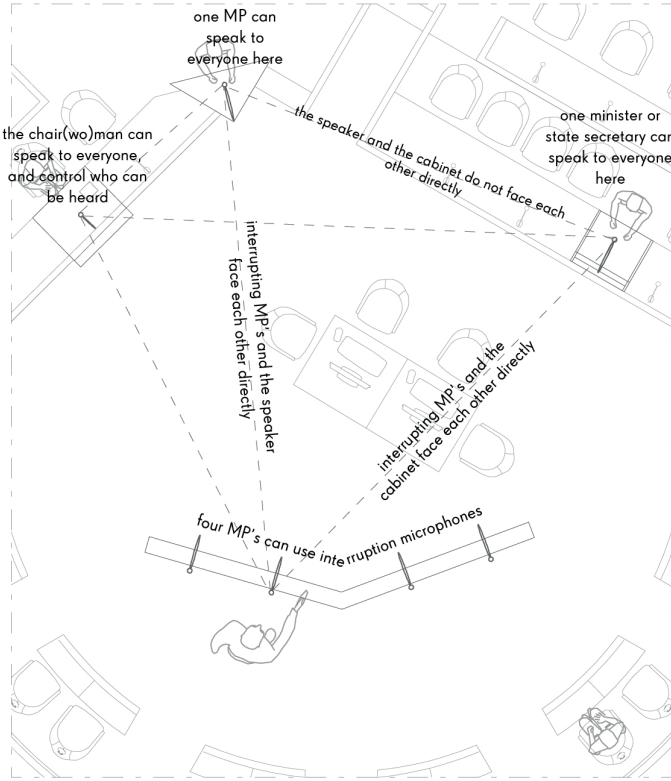


FIG.7: ACTIONS OF SPEAKING AFFORDED IN THE CENTER OF THE HALL

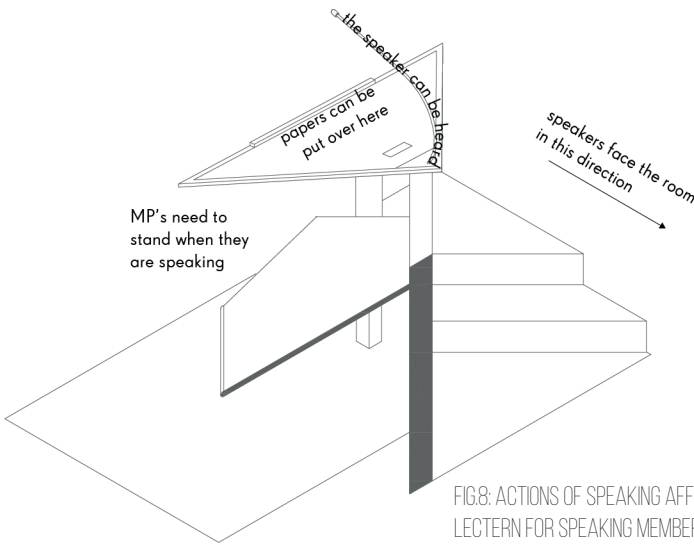


FIG.8: ACTIONS OF SPEAKING AFFORDED BY THE LECTERN FOR SPEAKING MEMBERS OF PARLIAMENT

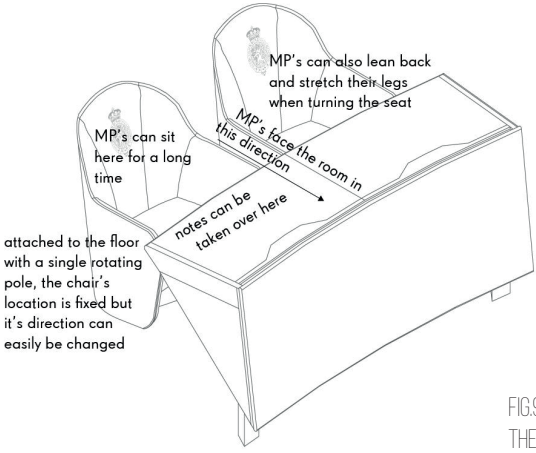
In the description of a relatively simple process of getting milk from a store nearby, architectural theorist Sarah William Goldhagen shows how these processes continually take place, mostly unconsciously, leaving room for thoughts about plans for the weekend.²¹ It shows how the built environment is continuously used as a means to something else, rather than being observed as a neutral object.

Stairs are perceived as providing the possibility to ascend, arcades are perceived for the possibility of walking through, and windows invite you to look outside. They do not determine the user to undertake any of these actions, but through the processes by which we perceive the environment and instrumentalize it for our actions, they do provide us with countless invitations which we do or do not act upon. The impact of an affordance therefore does not lie in the determination of a person's actions (so I agree with Buday, the idea of "environmental determinism," is problematic), but in the invitation it offers.²²

Furthermore, although the environment cannot determine what actions a user will undertake, it does often constrain the way in which actions can be performed.²³ Stairs do not determine you to ascend, but they dictate where you will enter the next floor if you do. Arcades do not determine you to walk through them, but they do influence which rooms are the most accessible. And a window does not determine you to look through it, but it does influence what you will see if you do.

In case of the plenary meeting hall, the affordances offered by the design are effectively endless, continuously inviting the users in the room to undertake certain actions. On a most basic level the room therefore both expresses and invites the activities it is designed for: a composition of seats, desks and microphones shows the purpose of using the room for Plenary meetings by the parliament. [Fig. 7-11] Some of these affordances

“STAIRS DO NOT DETERMINE THE USER TO UNDERTAKE ANY ACTIONS, BUT ... THEY DO PROVIDE US WITH COUNTLESS INVITATIONS WHICH WE DO OR DO NOT ACT UPON.”



attached to the floor with a single rotating pole, the chair's location is fixed but it's direction can easily be changed

FIG.9: ACTIONS OF OBSERVING AFFORDED BY THE SEATS OF MEMBERS OF PARLIAMENT

FIG.10: ACTIONS OF WALKING AFFORDED BY THE CENTER OF THE HALL



have clear consequences for how the debates usually take place. Consider for example the position of lecterns relative to each other: they determine how the different users are facing one another when they speak. Members of Cabinet always face the Members of Parliament that respond to them using the interruption microphone, but they are standing parallel to the ones that are presenting a longer story. Furthermore, the lecterns often presuppose their users to be standing up, otherwise the microphone cannot be reached. This same microphone makes sure its users are facing the centre of the meeting hall, as they are positioned in a certain way. The Chair(wo)man can control who is allowed to speak, as he or she can turn microphones on and off.

The arrangement of seats in the room forms the basis for how members of parliament are sitting in relation to the Cabinet and the Chair(wo)man during the plenary meetings. The seats provide room for 150 Members of Parliament, who are divided into six segments of 25 members. Some of these members are therefore closer to the debate than others, and might be quicker to use the interruption microphones than the so-called “backbenchers” behind them.²⁴ The different parties are spread among the segments, so that members of a party are not necessarily sitting together in one group, and often mix with other parties. Walking paths between the segments make it possible to walk to the centre of the room or the hallway under the public stands, but they also provide space for members to discuss matters with each other between different debates. These are just a few examples of the long list of affordances offered by the meeting hall, that show what kind of impact they might have on the way in which daily activities take place.

INTERSUBJECTIVE INTERACTION

The third category of “cycles of operation” concerns things that are active in social cognition and help humans understand each other. These

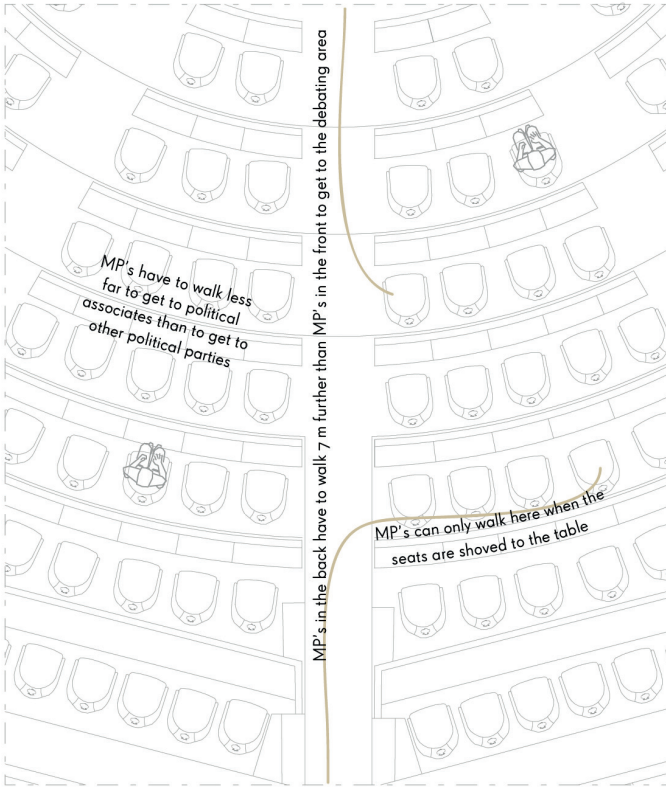


FIG.11: ACTIONS OF WALKING AFFORDED BETWEEN SEATS OF MEMBERS OF PARLIAMENT

cycles make it possible to interpret others, and reason about their intentions, their desires and their emotions. Intersubjective interaction involves both structures that are also important to emotion as well as sensorimotor coupling and more specifically the use of mirror-neuron systems. In the 1990s a team of scientists discovered so-called mirror neurons that fire not only when we perform particular activities, but also when we see someone else performing that activity.²⁵ This discovery has led scientists to believe that these neurons play a role in the understanding of emotions, actions and intentions of others (when these are already part of our own repertoire).²⁶ For example, when we see someone else feeling sad, we virtually mirror this expression (although we do not carry out the actual movement) and by “observing” our own feelings arising from this expression, we understand the other is sad. So, we use ourselves as a kind of

simulator, mirroring others, in order to make sense of the world.

This process is generally known as empathy. According to Vittorio Gallese, one of the discoverers of mirror neurons, we use this process constantly.²⁷ Mirror neurons are active not only when we perceive other human beings, but also in the observation of inanimate objects. Recent fMRI studies have shown that neurons activated when we are being touched, fire when we perceive someone else being touched, but also when we perceive objects touching one another, such as when we see raindrops falling on the leaves of a plant.²⁸ We not only use ourselves to simulate the actions and emotions of other people, but also to simulate our environment. This has led Gallese to replace the word “empathy” with “embodied simulation,” and argue that “the sense we attribute to our lived experience of the world is grounded in the affect-laden relational quality of our body’s action potentialities, enabled by the way they are mapped in our brains.”²⁹

Remarkably enough, when the first theories of empathy originated at the end of the nineteenth century, they were part of a philosophical theory on aesthetics, not of how we socially engage with other people. The German theorist Robert Vischer published *On the Optical Sense of Form*, in which he distinguished between *Sehen* as a relatively passive form of visual perception, and *Schauen* as a more active one.³⁰ Aesthetic experience, with which reality is “grasped,” is based on the latter kind. During this aesthetic experience, we go through a process of *Einfühlung*, by which we “feel ourselves into” or simulate what we encounter. The environment is “reflected in certain vibrations and—who knows what—neural modifications” that make the experience possible.³¹ Vischer’s theories were followed by Theodor Lipps, whose *Ästhetik*, published at the start of the nineteenth century, explored the analysis of empathy in aesthetic experience further.³² He argued that everything we

“REMARKABLY ENOUGH, WHEN THE FIRST THEORIES OF EMPATHY ORIGINATED AT THE END OF THE NINETEENTH CENTURY, THEY WERE PART OF A PHILOSOPHICAL THEORY ON AESTHETICS, NOT OF HOW WE SOCIALLY ENGAGE WITH OTHER PEOPLE.”

experience is permeated by our own life. The experienced object is the result of both what has been given by the environment and the activity of the observer. For Lipps, aesthetic experience arose from the feeling or movement that an object evokes in us. For example, a great hall evokes a movement of expansion, and from that we understand its greatness. In the case of the Dutch parliament, which is itself a great hall, the aesthetic experience could include this same greatness both in the height of the ceiling as well as in the large tapestries on the wall. It can also include the appreciation of the clean shapes of pearwood in the furniture or the craftsmanship that must have been involved making it, although this interpretation of *Einfühlung* involves much more elaborate systems than simply mirror-neurons.³³

Furthermore, it has been suggested that mirror systems play an important role in language as well. Neuroscientist Michael Arbib hypothesizes that the ability to recognize manual actions in others provided a bridge via pantomime and imitation for the human capacity for both sign and spoken language.³⁴ Following this, intersubjective interaction enables us to interpret and make sense of our environment. So, it is through this system and its integration with other systems that we can talk about concepts or messages that are communicated by architecture, based on their physical composition and the actions, both practical and emotional, that they make possible.

Following Giacomo Rizzolatti and Michael Arbib in linking our mirror system to the highly evolved neural and social systems that enable us to use language and other forms of symbolic abstraction, it is through this last cycle that we understand the symbolic meaning provided by architecture. In the case of the Dutch Parliament, one can interpret the coat of arms printed on the seats of Members of Parliament as referring to the Dutch nation. Furthermore, we might interpret the hierarchy of different roles played in the debates through the differences in how luxuriously each seat is designed, through subtle height differences and through accents in the composition of desks such as the higher one or the Chair(wo)man.

It is also through this cycle that we might interpret the green carpet, the grey ceiling and the tulip-shaped seats as representations of the Dutch landscape, as explained in a brochure on the “meaning” of de Bruijn’s design.³⁵ Users however need quite some information to understand this connection. While people who have foreknowledge might indeed associate these symbols with what they represent, others not armed with such cultural apparatus will be unlikely to understand it that way.

As stated above, Thompson and Varela mention the involvement of processes of the first and second cycles in the third.³⁶ Processes important

to emotions are also part of recognizing emotions in others, and mirror neurons are themselves part of sensorimotor systems. And the intertwining goes still further: evoked emotional states are probably also dependent on the affordances and messages one recognizes, and the perceived affordances are related to a person's mood or their interpretation of the function of the room. The purpose of the framework is therefore not so much to separate each kind of impact but rather to show the elaborate range of impacts that are possible within one design.

The implication of the theories as laid out above is that, without impact to the form of some physical change in the body there is no experience. Architectural experience therefore *only exists through this impact*. Still, such impact does not *determine* the behaviour of a building's users. The two following remarks offer partial explanation in this regard.

A NETWORK OF ACTORS

Firstly, this impact is spread throughout an endless network of little impacts that each play their own small yet significant role. The three kinds of cycles of operation reveal an elaborate and complicated range of endless modes of exchange between the world and the body, as the case-study has shown as well. Relations originate at different levels and in different ways at the same time and are therefore hardly ever observable as a one-to-one relationship between a design decision and a (behavioural) change.

How this works has previously been laid out by the so-called 'Actor-Network-Theory', conceived by sociologists and philosophers, of which Bruno Latour, John Law and Michel Callon are the best-known examples.³⁷ One of their basic claims is that in social processes, objects can play a role similar to that of human beings. Both animate and inanimate objects participate in our social lives significantly, together forming a large network of countless "actors" that each play a role. One design decision

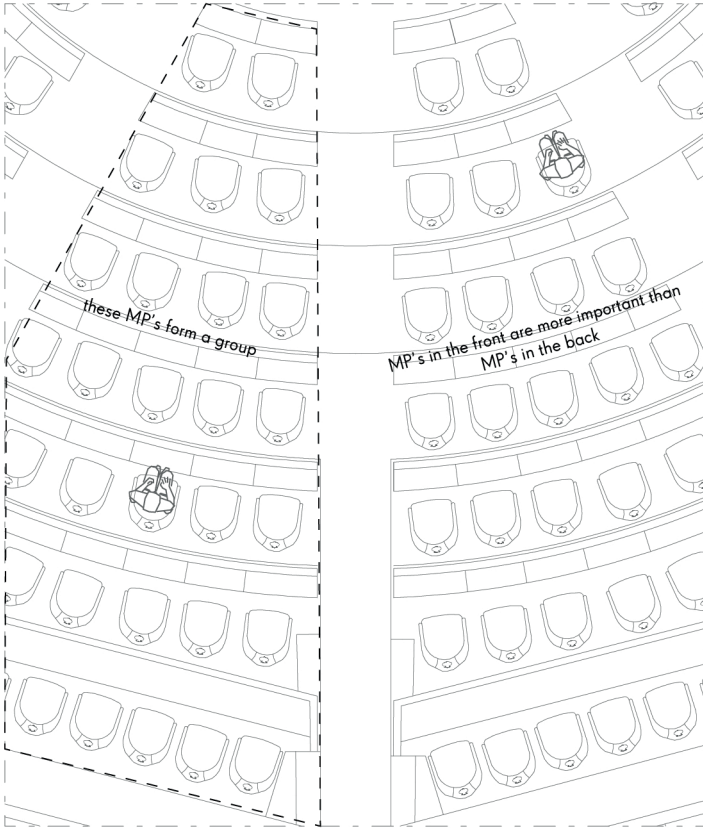


FIG.12: POSSIBLE MESSAGES CONVEYED THROUGH THE ARRANGEMENT OF SEATS IN SEGMENTS

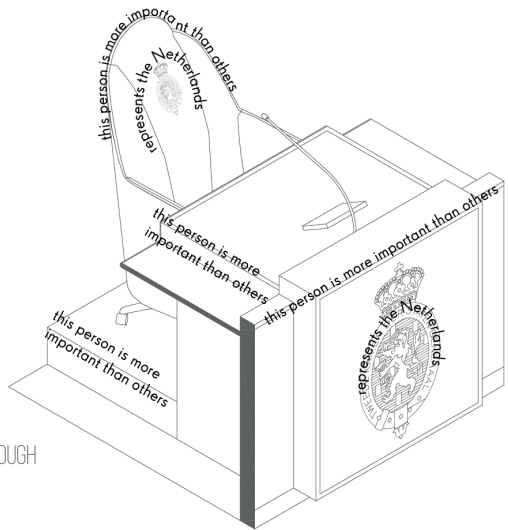


FIG.13: POSSIBLE MESSAGES CONVEYED THROUGH THE FURNITURE OF THE CHAIR(WOMAN)

can be seen as a drop in an ocean of actors, only some of them related to the designed physical environment. Pedestrians' experience of a street, for example, can be seen as the sum of decisions like the general proportions, the plasticity of facades or the position of windows, etc., forming only a piece in a larger network of other determining factors, like recent events in the pedestrian's life or her his general mood that day.

Some attempts have been made to show determinant relations between design decisions and their effect on users. Take, for instance, research on the layout of hospital rooms in relation to the healing process, or educational environments in relation to learning processes.³⁸ Or, closer to our case-study, consider how research in 2018 showed a relation between the voting behaviour of parliament members and their position relative to each other in the room.³⁹ However useful such studies may be, they should always be interpreted with regard to the specificity of the case-studies on which they were based. In another situation the conditions might very well be different, so that the same design decisions could lead to different results.

DETERMINISM AND FREE WILL

Secondly, it is worth considering the compatibilist view of philosopher Daniel Dennett, who argues that a deterministic universe does not rule out free will.⁴⁰ He distinguishes between things in what he calls the *scientific image* on the one hand and the *manifest image* on the other. The first group consists of things like neurons, atoms and DNA, things that we know mostly from scientific research. The second group consists of things that we encounter in our everyday lives: colours, euros and promises, etc. These things have no location or substance and scientifically speaking they are not what people generally consider them to be. Free will is part of this latter group, so according to Dennett, free will is just as real as the colours, euros and promises that

play a significant role in everyday life. Scientifically speaking, one fact necessarily leads to another, however the endless number of causes and effects are impossible to sort-out in the lived-world of manifest images.

We can apply this way of thinking to what we have encountered in this article: at a scientific level, the impact of the built environment on the user is a prerequisite for any environmental experience and this impact is part of a large network of different actors. In the practical world of manifest images, however, this network cannot possibly be understood in its entirety and therefore the effect of design decisions remains unpredictable to a certain extent. This means that in the lived-world of any subject experiencing the environment, the shaping role of design can only be more or less present and recognizable. Furthermore, the design process itself largely takes place at this practical level too, which makes it unlikely for a designer to foresee all the consequences of the countless design decisions he/she must make, either consciously or unconsciously.

EMPATHY

From the first part of this article we could conclude that claiming design decisions have no impact is problematic. From the second part we can add that claiming causality between design decision x and result y is equally problematic, as the full breadth of the network in which this impact is integrated cannot be understood from the practical level of our lived world and the design process. To conclude, I would like to draw attention to the skill of empathy being employed by the architect during the design process, which is of special relevance in this regard. During this process, in which the designer imagines himself or herself to be part of the environment he or she is designing, it is possible to assess many aspects at once, instead of focussing on the “drop in the ocean” of a single design decision. It offers the possibility to be receptive to what the environment has to offer instead of considering it solely in light of the conceptual ideas it was built on.

Furthermore, we can see empathy as a skill that can be enriched: the aforementioned studies on healing environments, for instance, may be too specific to be implemented directly into other designs, but they provide insights that can be integrated into empathic processes, as do the theories on cognitive science of architectural experience. Moreover, these processes can be further enhanced in light of the plurality of identities of the future users. Knowledge of the identity of different end-users, or participatory processes in which contact between the designer and the end-user is established, improve the possibility of the designers’ capacity to understand the experience of other identities.

In this way, the skill of empathy can enrich the designers' understanding of the effects their designs are likely to have and then to help align their decisions with their renovated understanding of users' experiences. Empathy can contribute to an environment that finds a balance between its facilitating role in our lived-world daily processes while being receptive both to the plurality and the freedom of its users.

ACKNOWLEDGEMENTS

With special thanks to the reviewers and Michael Arbib for their helpful comments on an earlier version of this article.

ILLUSTRATIONS

The drawings and analyses are based on the following literature:

Tweede Kamer der Staten-Generaal. *The House of Representatives at work*. August 2015. <https://www.houseofrepresentatives.nl/how-parliament-works/house-representatives-work>.

ProDemos. *Politics in the Netherlands* (The Hague: ProDemos, 2013)

Herman Tjeenk Willink, 'Verval van de democratische rechtsstaat en de rol van de pers.' *Het Expertisecentrum Journalistiek*. 21 September 2015. <http://www.expertisecentrumjournalistiek.nl/slot-toespraak-herman-tjeenk-willink-verval-van-de-democratische-rechtsstaat-en-de-rol-van-de-pers/>.

Joris Luyendijk, *Je hebt het niet van mij, maar...: Een maand aan het Binnenhof* (Amsterdam: Podium, 2010)

The drawings are also based on the following two interviews:

“WE CAN
SEE EMPATHY
AS A SKILL
THAT CAN BE
ENRICHED.”

Alexander Pechtold, interviewed by the author. *An interview on the role of the interior design of the Second Chamber in the debating culture* (7 September 2016)

Herman Tjeenk Willink, interviewed by the author. *An interview on possible strategies for the Dutch political system* (28 October 2016)

Complemented with research conducted in the architectural archive of The New Institute, Rotterdam and the personal archive of Pi de Bruijn.

ENDNOTES

1. Henri Lefebvre, *The Production of Space* (Hoboken: Wiley, 1992), 362
2. Simon Richards, *Architect Knows Best: Environmental Determinism in Architecture Culture from 1956 to the Present* (Milton Park, Oxfordshire: Routledge, 2012).
3. See for example the introduction in Charles Jencks, *The Language of Post-Modern Architecture* (London: Academy Editions, 1991), 23; Marlies Buurman, 'Stadsgezichten: Kleiburg en de Bijlmer.' *Het Parool*, (21 January 2011).
4. Alison Smithson, 'The Violent Consumer, or Waiting For the Goodies' *Architectural Design*, No.5 (1974).
5. Richard Budoay, 'We Shape Buildings, But Do Buildings Really Shape Us?' *Common Edge* (April 13, 2017) <https://commonedge.org/we-shape-buildings-but-do-buildings-really-shape-us/> (Accessed October 18, 2021); Note also the counterreaction to this article by Robert Lamb Hart: Robert Lamb Hart, 'How Buildings Shape Us.' *Common Edge* (September 21, 2020) <https://commonedge.org/how-buildings-shape-us/> (Accessed August 23, 2022).
6. Robert A. Wilson, and Lucia Foglia. 'Embodied Cognition.' *The Stanford Encyclopedia of Philosophy* (Winter 2016), <http://plato.stanford.edu/archives/win2016/entries/embodied-cognition>.
7. For a discussion on this, see note 6. On the other hand, some important research has tended to stress both the anti-dualist elements in Descartes himself, and the uptake of those elements in some twentieth-century phenomenology, especially by Maurice Merleau-Ponty. See for example Sara Heinämaa, 'Merleau-Ponty's dialogue with Descartes: The living body and its position in metaphysics.' In: Dan Zahavi, Sara Heinämaa and Hans Ruin (eds.) *Metaphysics, Facticity, Interpretation: Phenomenology in the Nordic Countries*, by (Dordrecht: Kluwer, 2003), 23-48.
8. Harry Francis Mallgrave, *Architecture and Embodiment, the Implications*

of the New Sciences and Humanities for Design (Abingdon: Routledge, 2013), 111.

9. Andrea Jelić, Gaetano Tieri, Federico De Matteis, Fabio Babiloni and Giovanni Vecchiato. 'The Enactive Approach to Architectural Experience: A Neurophysiological Perspective on Embodiment, Motivation, and Affordances.' *Frontiers in Psychology*, No.7 (2016), 481.
10. Evan Thompson and Francisco J. Varela. 'Radical embodiment: neural dynamics and consciousness.' *TRENDS in Cognitive Sciences*, Vol.5, No.10 (2001), 418-425.
11. Ibid.
12. Ibid., 425.
13. Mallgrave, *Architecture and Embodiment*, 111
14. Laurie Kelly McCorry, 'Physiology of the Autonomic Nervous System,' *American Journal of Pharmaceutical Education*, Vol.71, No.4 (2007), 78.
15. Edmund Burke, *A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful*. (1757). An interesting study in this regard can be found in the dissertation of Dmitri Kormanov, which shows evidence that the sympathetic nervous system is indeed activated when experiencing sublime landscapes. Dmitri Kormanov, *Feeling the landscape: Six Psychological Studies into Landscape Experience* (Wageningen: Wageningen University, 2009).
16. Mallgrave, *Architecture and Embodiment*, 112-113.
17. Joris Luyendijk, *Je hebt het niet van mij, maar...: Een maand aan het Binnenhof* (Amsterdam: Podium, 2010).
18. Susan L. Hurley, *Consciousness in Action* (Cambridge, MA: Harvard University Press, 1998); Ulric Neisser, *Cognition and reality: Principles and Implications of Cognitive Psychology* (San Francisco: W.H. Freeman, 1976).
19. Thompson and Varela, 418-425; The refference principle has been coined by Erich von Holst

- and Horst Mittelstaedt, 'Das Refferenzprinzip.' *Naturwissenschaften*, No.37 (1951), 464-476.
20. James Jerome Gibson, *The Ecological Approach to Visual Perception*. (Boston: Houghton Mifflin, 1979). The key idea of affordances was already present in Jakob Uexküll, *Umwelten*: "A stroll through the worlds of animals and men: a picture book of invisible worlds." In: Clair H. Schiller, *Instinctive Behavior: the Development of a Modern Concept* (New York: International Universities Press, 1957), also in *Semiotica*, No.89, 319-391. Originally appeared as Jakob von Uexküll *Streifzüge durch die Umwelten von Tieren und Menschen* (Berlin: Springer, 1934).
 21. Sarah Williams Goldhagen, *Welcome to your world. How the Built Environment Shapes Our Lives* (New York: HarperCollins Publishers, 2017), 52-54.
 22. Buday 'We Shape Buildings, But Do Buildings Really Shape Us?' (Accessed October 18, 2021).
 23. As Gibson notes in a later essay, "affordances do not cause behaviour but constrain or control it". James Gibson, *Reasons for Realism* (edited by Edward Reed and Rebecca Jones) (Hillsdale: Lawrence Erlbaum Publishers, 1982), 411.
 24. Luyendijk, *Je hebt het niet van mij*, 53.
 25. G. di Pellegrino, L. Fadiga, L. Fogassi, V. Gallese, and G. Rizzolatti, 'Understanding Motor Events: A Neurophysiological Study,' *Exp Brain Res*, Vol.91, No.1 (1992), 176-180; See also Giacomo Rizzolatti, Leonardo Fogassi, and Vittorio Gallese, 'Mirrors in the Mind.' *Scientific American*, Vol.295, no.5(2006), 54-61.
 26. For a discussion of this, see Michael Arbib, *When Brains Meet Buildings: A Conversation between Neuroscience and Architecture* (New York: Oxford University Press, 2021), 306-311.
 27. Vittorio Gallese, 'Embodied Simulation: From Neurons to Phenomenal Experience.' *Phenomenology and the Cognitive Sciences*, Vol.4 (2005), 23-48.
 28. S.J. Ebisch, M.G. Perrucci, A. Ferretti, C. Del Gratta, G.L. Romani, and V. Gallase, "The Sense of Touch: Embodied Simulation in a Visuotactile Mirroring Mechanism for Observed Animate or Inanimate Touch." *Journal of Cognitive Neuroscience*, Vol.20, no.9 (2008).
 29. Vittorio Gallese, Alessandro Gattara, 'Embodied Simulation, Aesthetics, and Architecture: an Experimental Aesthetic Approach.' In: Sarah Robinson, Juhani Pallasmaa (eds.), *Mind in Architecture: Neuroscience, Embodiment, and the Future of Design*, (Cambridge, Massachussets: The MIT Press, 2015), 161-179; For a further discussion on this, see Arbib, *When Brains Meet Buildings*, 330-335.

30. Robert Vischer et.al, *Empathy, Form and Space: Problems in German Aesthetics, 1873-1893*, Harry F. Mallgrave and Eleftherios Ikononou (Introduction and Translation), (Santa Monica/Chicago: The Getty Center for the History of Art and the Humanities, 1994), 89-123.
31. Ibid., 90.
32. Theodor Lipps, *Ästhetik; psychologie des schönen und der kunst* (Hamburg: Voss Verlag, 1903).
33. For a discussion of the process of empathy in appreciating craftsmanship see Gallese and Gattara, 'Embodied Simulation, Aesthetics, and Architecture: an Experimental Aesthetic Approach,' 161-179. For a further discussion on the primacy of mirror neurons in aesthetic experience, see Arbib, *When Brains Meet Buildings*, 336-349.
34. Michael Arbib, *How the Brain Got Language: The Mirror System Hypothesis* (New York: Oxford University Press, 2012).
35. Tweede Kamer der Staten-Generaal, 'Tweede Kamer in Beeld,' *Tweede Kamer* (November 2013), https://www.tweedekamer.nl/sites/default/-files/field_uploads/Tweede%20Kamer%20in%20Beeld_tcm181-210466_0.pdf.
36. Thompson and Varela, 'Radical embodiment' 418-425.
37. See for example: Bruno Latour, 'Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts,' in: Wiebe E. Bijker and John Law (eds.), *Shaping Technology / Building Society: Studies in Sociotechnical Change* (Cambridge, MA: The MIT Press, 1992), 225-258; Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005); John Law, 'Notes on the Theory of the Actor-Network: Ordering, Strategy and Heterogeneity.' *Systems Practice*, No.5 (1992), 379-393; Michel Callon, 'Techno-economic networks and irreversibility,' In: John Law (ed.), *A Sociology of Monsters: Essays*

on Power, Technology and Domination, London: Routledge, 1991), 132-165.

38. Goldhagen, *Welcome to your world*.

39. Alessandro Saia, 'Random interactions in the Chamber: Legislators' Behavior and Political Distance.' *Journal of Public Economics*, (2018), 225-240.

40. Daniel Dennett, 'Free Will is as Real as Colors, Promises and Euros.' Lecture at the Radboud University Nijmegen, The Netherlands, March 12, 2016.