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# 04

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## **Research Through Design and Transdisciplinarity: A Tentative Contribution to the Methodology of Design Research**

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Keywords	↳ methodology ↳ research through design ↳ terminology ↳ multi-, inter- & transdisciplinarity
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### *1. Some necessary clarifications*

*In our proposal, we stated that the purpose of the paper consisted in “a conceptual and methodological clarification of the so-called ‘research through design’ approach”. Furthermore, the title of our paper indicates that it is likely to be considered a contribution to the methodology of design research and that our argument will be based on the concept of transdisciplinarity. Our proposal also warns that the paper is not a report of a specific research project although, as we will see, its argument is strongly grounded in a study case. As a consequence, the paper is structured in the two following parts. Firstly, a long introduction where we found necessary to clarify our terminology and specify our conceptual background. Its general tone is therefore didactic and, inevitably, somewhat dogmatic. Secondly and in a much more narrative style, a short description of the early phases of a research project devoted to the contribution of design to the improvement of Alzheimer patients’ daily activities, where the principles discussed in the first part are implemented and illustrated.*

### 1.1 Methodology and the Epistemological Issue in Design Research

By “methodology” is meant the science of methods, *i. e.* the very general field of inquiry dealing with the identification, description, comparison, implementation, validation and criticism of methods. In this respect, the methodology of design research is the field of inquiry concerned with the methods susceptible to be used to conduct research projects in the field or discipline of design (in our terminology, the expressions “research *in* design” or, more plainly, “design research” are synonymous). Methodology of design research is not to be confounded with methodology of design *tout court*, *i. e.* of design practice, which is another important field of inquiry, at first sight quite unrelated to the former<sup>1</sup>.

Methodology of design research is a subset of the methodology of [scientific] research in general, and as such its statements, specifications, validation criteria, etc. should be consistent and congruent with the general principles of the latter, as accepted and discussed by the international scientific research community. The field of general [scientific] research methodology has grown so wide and dense that, in a research education context, it has become unthinkable to adequately deal with all the available and recommended methods and tools. In the literature of the so-called qualitative methods alone, there are currently more than fifty different methods listed. The spectrum is quite large and this variety has become necessary due to the epistemic characteristics and complexity of the diverse objects (or subject-matters) that constitute the target of the various existing scientific disciplines.

As an example, the objects of paleoastrophysics are very different from those of ethnobotany and for this single reason, one realizes that the method(s) used to observe their respective objects and frame them within a proper theoretical apparatus will be different. Such is indeed also the case for the objects of design, considered as a discipline (as is admittedly the case in academia)<sup>2</sup>. Since one of the main purposes of methodology is to identify the method(s) best fitted to carry out the research activity in a given field or discipline, and to justify that choice, what will interest us in this paper, and in design research more generally, is to identify the proper method(s)

to carry out our research task, *considering the specificity of our objects* and, one must add, the legitimate expectations of the design community in general (and not only the design *research* community, if such distinction is still meaningful or even desirable).

The construction of a consistent and coherent methodology of design research has been an ongoing concern of our – still young – research community. The program of our symposium is more proof that the field of design research methodology is currently in effervescence. We believe that this phenomenon is not foreign to the trends and drifts of the wave of methodologism that has been affecting the larger scientific community for roughly a generation. We further believe that this excess of focus on the search for the right or ideal method(s) is doomed to be unfruitful if not backed by a necessary, unby-passable, preliminary epistemological query. Unless we are clear about what exactly is the target of our research, there is no point in discussing, debating, arguing and contending about the right or ideal method. The epistemological issue in design research is far from being settled at the present time. We think this is so because there is a persistent confusion between the targets of the research and the design projects. Strange as it may seem, the central question as to what could or should be the target of design research is still on the agenda. It can be broken down into the following, recurring, set of questions<sup>3</sup>:

- What exactly are the objects of design considered as a scientific, academic discipline?
- What are the phenomena of the world we are interested in observing and understanding, that are not already the “property” of other disciplines?
- What do we intend to say about these phenomena that is not known yet and that other disciplines cannot know or at least that design claims to know better?

### 1.2 Research through Design as Project-grounded Research

With great reluctance we include an *n*<sup>th</sup> commentary on this topic. We understand that the Swiss design community has had an overdose of this “research *in, for, about* and *through*” stuff and we certainly do not want to worsen its case. However, since we have partly

contributed to this debate<sup>4</sup>, and since this typology of design research practices has received very diverse, sometimes contradictory, and not always helpful, interpretations, we feel compelled to clarify our definition once again<sup>5</sup>. Let us first recall that our definition of the method of “research *through* design” is derived from a methodological critique of the two most current methods practiced in the field: research *for* and *about* design. The argument we developed unfolds in the following manner.

### 1.2.1 Research for Design

*Research for design* is highly relevant for design practice, since its purpose is to make sure that the various parameters on which the output of the design process depends (technological, ergonomic, economic, aesthetic, psychological, etc.) are adequately handled, *i. e.* that the design project is properly and responsibly informed. It is however not considered scientifically acceptable for various reasons, such as:

- It usually draws on already available knowledge
- When new knowledge is produced (for instance, after interviews, field observation, comparative analysis, etc.), it is usually not done with the rigor expected by scientific standards, either because the ‘researcher’ does not have the necessary qualifications, or (and more often) since time constraints do not permit
- As we all know, it is mostly tacit and not meant to be published or discussed by the design research community; indeed, in many instances, it is even kept confidential<sup>6</sup>.

Does this mean that the work of design practitioners has no value whatsoever, and that they should be considered second range after the scientists? Of course not, it just means that design practice and research differ in their respective aims, validation and assessment criteria, as well as public and contexts, and consequently that the one should not be evaluated with the other’s standards.

### 1.2.2 Research about Design

*Research about design* is normally performed by various disciplines, other than design, according to scientific standards. Indeed, the fact that it is published is, normally again, the proof of its rigor and accept-

ance by the scientific community. The problem we encounter with this kind of research is its relative lack of relevance for design. By “design” is here meant design practice, design education or design research. Why is that so? Well, because the research is carried out *about* design (*i. e.* about its objects, its processes, its actors and stakeholders, its meaning and significance for society, business, culture, etc.) by scientists (like anthropologists, archaeologists, historians, cognitive psychologists, management scientists, semioticists and many others) whose main goal is to contribute to the advancement of their own discipline, not particularly of design. More precisely, they have not been trained to figure out how and make sure that the knowledge they produce in their research is relevant for design, even if they sometimes hope so. It is in fact designers who are better placed to decide if such knowledge is relevant for them and, if such is the case, how it may be implemented in their respective practices<sup>7</sup>. A simple case tells it more boldly. A social historian conducting research in the history of medicine (or design, for that matter) is usually not expected by his/her research community to prove that his/her conclusions will contribute to the practice of medicine (or design) and to explain how. In contrast, a design researcher studying some aspect of the social history of design (for instance in the framework of a PhD) should<sup>8</sup>.

### 1.2.3 Research through Design

The previous observations leave us with two important criteria design research must satisfy: it must be *rigorous*, *i. e.* stand up to the usual scientific standards; it must be *relevant*, *i. e.* contribute to the improvement of design practice. *Research through design* is our answer. As such – and this is the critical point – it must be understood as having the virtues of *both* research *for* design and research *about* design. Contrary to many wrong interpretations, our position is not a “*neither one nor the other*” but a “*one and the other*” situation. Proper research *through* design could thence be defined as a kind of research *about* design [more] relevant for design, or as a kind of research *for* design that produces original knowledge with as rigorous [and demanding] standards as research *about* design. For reasons that are explained in the text we refer to [see footnotes 4 and 5], we call this approach project-grounded research (*recherche-projet*).

We trust these clarifications are helpful to settle our terminology and identify what we consider the key necessary conditions for a research that does justice to the specificities of the field or discipline of design. These led us to propose, not only one, but three domains where the conclusions of a design research project would be assessed. The first is common to any research project in any discipline: an original and significant contribution to knowledge, in our case to design knowledge. The second is: an expected improvement of design practice and consequently of user satisfaction. The third: some fruitful consequences for design education<sup>9</sup>.

Now that we have recalled the principles of what we define as research *through* design, namely project-grounded research, the following two additional reservations need to be made:

- i) The above conditions are necessary, but not sufficient. We still need to better define what this research *through* design actually consists of, how it is to be contrived and implemented. The operational concept for this, as will be argued shortly, is transdisciplinarity.
- ii) The above typology only includes three types of possible research in design. Are there other types one could or should consider? The two first types (“for” and “about”) result from an observation of actual practice of design research as it has been conducted roughly in the four last decades. The third one (“through”) has been constructed logically (our first published model is in 1997; Frayling’s famous typology dates back in 1993 and Archer’s in 1981). What we have witnessed since then is the following.

On one hand, the idea of research through design has gained sufficient credit to lead to actual research projects carried out along these lines. Also called “practice-based research”, “practice research”, “action research in design”, “clinical research”, or “project-grounded research” as we do, it still struggles for methodological soundness and scientific recognition. The relative dispersion of the semantic space indicates that interpretations of the idea and principles of research through design may diverge and that no real consensus has been arrived at yet<sup>10</sup>. We maintain that the main obstacle, here

again, is of epistemological nature. Most if not all promoters of the research through design method agree upon the fact that the design project should have its place within the research project but that the latter can and must not be confounded with the former. Where methodology scholars differ or are silent is on the [epistemic] *function* to be assigned to the design project within the research, *i. e.* within a process of rigorous and relevant knowledge production in design. This is indeed one of the most crucial questions in the design disciplines, and for that matter in all professional disciplines. Behind that question dwells the perennial philosophical riddle of the relationship between theory and practice. For it is one thing to claim that practice is important and necessary for theory building, but it is another, more challenging one, to explain *how* this contribution of practice to theory is to be contrived and operationalized.

On the other hand, another type of research is emerging and trying to find its place in academia: the so-called “creation-based research” (*recherche-création*). It is the scholars of the art disciplines who have been supporting and promoting, sometimes vehemently, this type of research. In the design research community, they are represented by colleagues who tend to dismiss the distinction between the design project and the research project, who therefore consider that design practice is in itself already a kind of design research and should be acknowledged as such. Although at first discredited for their poor or lack of epistemological and methodological argument in favour of their claims, they have recently strengthened their justifications<sup>11</sup>. We have already expressed our own reservations about the dominant rationale supporting this method and pointed out that, provided some basic methodological and argumentative precautions were secured, it could well be integrated into the previous methodological typology and toolbox<sup>12</sup>. In this respect, we consider that no special dispensation needs to be requested from the scientific research community any more in the name of the alleged highly specific and impenetrable originality of the art disciplines.

### 1.3 Design Knowledge and Design’s Research Program

As previously mentioned, design knowledge is the concern of epistemology. “What is design knowledge about and after?” sums up the

issue. In order to orientate ourselves in this issue, we propose to turn back to the *purpose* of design research and to the three criteria we expect any research project in design will satisfy. Three “end-users” of design research are interested in its output: the design *research* community, the design *practice* community, and the design *education* community<sup>13</sup>. The type and part of knowledge relevant to and valued by each of these communities differ, therefore the necessity for design researchers to bear this in mind when constructing their protocols and writing their conclusions or final reports. Expressed in conventional terminology, the researchers’ community is interested in “fundamental” or “theoretical” knowledge, the practitioners’ community in “applied” and “useful” knowledge, and the educators’ community in “teachable” and “applicable” knowledge. This means in particular that there is no point carrying on design research if it does not end up improving the act of designing and consequently the lives of those addressed by the act, *i. e.* presumably all of us inhabitants of the world. Consequently, the purpose of design research is directly tied to the purpose of design *tout court*, which, in a nutshell, is: to improve or maintain the “habitability” of the world, in all its dimensions (physical, psychical, spiritual).

In the so-called “*Bremen Model*!”<sup>14</sup>, we showed that design knowledge dispatches itself along two main dimensions, corresponding to the ‘conception’ and ‘reception’ spaces of the design project. The latter concerns the description and understanding of the users’ act or, better said, project of “habitating” the world, *i. e.* more precisely the relationship between people and their environment (in all its dimensions: physical, psychical, spiritual), whereas the former focuses on the description and understanding of the act of improving or maintaining these relationships, *i. e.* the very act of designing.

Keeping in mind the structure of this model, we see that behind every design situation and project, there is potentially:

- i) An anthropological issue, meaning by that an issue related to the way an individual or a community inhabits or wishes to inhabit the world. In short, nothing that concerns the relationships between humans and their environments should be foreign to design in principle.

- ii) An opportunity to contribute to the already available knowledge about the design act. If conducted in a reflective manner, every design situation is an opportunity to reveal something new about what is at stake in design practice, or at least to confirm an aspect of the “designerly way of knowing” that has already been observed, described and theorized.

In other words, in project-grounded research, one should take the habit of looking beyond the immediate output of the design project (without for all that neglecting the latter). The challenge for design researchers and research teams is to “realize” the above two potentialities in the form of adequate and handy research problematics. In such a framework, there are of course innumerable potential research objects and projects available. Contextual circumstances will help determine which is or are the most appropriate for the planned research.

This is indeed a huge research program! Is such an ambitious claim acceptable? No, indeed, if design scholars pretend it is their own private turf. But yes, if design scholars believe they have a word to say in this very serious business of describing and understanding how we inhabit the world and how some pretend to improve it. Our task now is to characterize what this word could or should be, and how it is to be spoken, so that we have an idea of the feasibility and manageability of our ambition.

One possible entry into the puzzle is to realize that the two above potential issues are indeed not the private turf of design. It is a fact that almost no scientific discipline is completely foreign to our human condition and to the way humans, individually and collectively, relate to the world. If we adopt as wide a definition of design’s objects of knowledge as above, then we definitely share them with various other disciplines. To try to isolate a specific part of the world phenomena and appropriate it in the name of design’s scientific claims is maybe not the only possible way to secure a specific knowledge domain. We believe instead it is the *kind* of questions design asks about these phenomena that constitutes the originality of our discipline<sup>15</sup>.

Another possible entry into the puzzle is through the concept of transdisciplinarity. This is the second central concept and concern of the paper.

#### 1.4. Multi-, Pluri-, Inter- and Transdisciplinarity

It is not without serious hesitations that we venture into this chapter, being quite aware that there is a serious risk of indigestion. How many times have we not read about the difference between multi-, pluri-, inter- and transdisciplinarity? Too many, in all likelihood, and we shall therefore limit our argument to the strict necessary and proceed so-to-speak *more geometrico*.

##### 1.4.1 Multidisciplinarity vs Multiprofessionality

The issue of multidisciplinarity<sup>16</sup> in the professional disciplines requires a specific treatment, since in common language “discipline” refers to either the practical/professional or the theoretical/disciplinary (in the academic sense) aspect. Since confusion is too often the case, it becomes necessary to distinguish between multidisciplinarity and *‘multiprofessionality’*. In design, it is most often referred to the latter under the name of multidisciplinarity, as for example in the description and advertisement of numerous academic curricula in “Environmental Design”. These are actually most often about multiprofessionality. The problems raised by the cohabitation of various design professions (for example, city planning, architecture, landscape architecture, interior design, etc.) within a common design project or program are indeed real and deserve serious attention. But they are quite different from those raised by the cohabitation of various scientific disciplines within a common research project or academic program, which are quite as real and deserve due attention too. We could not insist more on the necessity – and fruitfulness – of this distinction.

##### 1.4.2 Multidisciplinarity in Design Research

Research in design is bound to be *multidisciplinary*, by nature so to speak. Why is that so natural? To answer this, we must recall that we considered the ultimate purpose of design to be the improvement of the “habitability” of the world, and deducted from that to know how humans do and project to “habitate” the(ir) world was to be one of

the central tasks of design research and target of design knowledge. Humans carry out their project through extremely varied and countless micro-experiences such as: going shopping, attending a design class, preparing dinner, worshipping a divinity, taking a vacation, etc. etc. The phenomenological observation and description of these activities show that they are conducted in a continuous stream of experience that takes no account of academic disciplinary frontiers.

As an example, going shopping is or may be *altogether and simultaneously* a physiological, psychological, sociological, economic, political, designerly, cultural, aesthetic, and/or spiritual activity. But for the person having the shopping experience, such distinctions are irrelevant; what is, is the primary intentionality, the shopping project, and its fulfilment. Being a human activity and despite all its sometimes pedestrian (...!) character, the act of shopping may be worth observing, understanding, and theorizing for and by more than one of the above mentioned scientific disciplines, including design.

Now, in design, we also claim to improve or help improve such experiences, don't we? Since we want to contribute to transforming a human experience into a preferred one (as Herbert Simon would have it), we have to know and understand exactly what we are about to fiddle with. And since we all expect designers to be responsible, we also expect them to know and understand as comprehensively as possible the human phenomenon/experience which is at stake in their project. This is why designers-researchers need the help of other disciplines. They need multidisciplinarity.

In professional situations, there is usually neither enough time nor sufficient budget for this kind of work: “[E]ach product is a rush job, and when it is nearing completion, well, the next ones are already underway” writes Donald Norman [see footnote 6]. A proper research environment is necessary to do justice to the complexity of the various human phenomena to be investigated.

##### 1.4.3 Multiprofessionality in Design

The same kind of reasoning goes for *multiprofessionality*. Design professions distinguish themselves by their end-products, most

conventionally by the scale of their objects: urban, architectural, territorial, bodily, domestic, etc... But here again, from a phenomenological perspective, human experience and intentionality unfolds itself in a stream of continuity quite unconcerned by these professional barriers. When going shopping for example, one passes from one scale to the other without experiential interruption: scale of the product (shopping bag or cart, bike or car or baby stroller, etc.), scale of interior space (apartment, bus, shop, etc.), architectural scale (single house, apartment building, shopping centre, etc.), urban scale (street, neighbourhood, market place, parking lot, etc.), virtual scale (e-shopping), symbolic 'scale' (street signs, advertisements, price labels, posters, etc.). On the contrary, if the experience was interrupted, it would be broken into pieces and lose its *Gestalt* and human meaningfulness. So here too, multiprofessionality is a must.

#### 1.4.4 Structuring the "multi"

Having settled the principle of a necessary multidisciplinary and multiprofessionality in complex design situations (human omnipresence in these situations renders them complex almost by definition), we now need to be more specific about the right configuration of the "multi-"; about how it is to be structured. Considering the context of this paper (the symposium of a design research community), we will only focus on the former, the multidisciplinary issue, holding up the latter for another occasion.

To ask what kind of multidisciplinary is relevant or necessary for design research is a two-fold question:

- i) Which are the disciplines one must invite to the table?
- ii) How will these disciplines join their efforts and work together so that the knowledge produced meets the three criteria identified above: relevance for knowledge, for practice, for education?

**1.4.4.1** The quick answer to the first question is of course: "As many disciplines as possible!", if one longs for perfection. This is of course not feasible, but we are also not sure it should systematically be recommended. On one hand, the phenomena at hand are not always that complex ('wicked') that it justifies such a display of intellectual (and budgetary) resources. On the other hand, to increase the

number of disciplinary perspectives on a single phenomenon is to risk blurring the picture and consequently render it difficult to grasp and operationalize in design terms. It may be sometimes wiser to limit the number of disciplines.

According to Herbert Simon, it is neither possible nor advisable to aspire to an optimal knowledge of a phenomenon or a situation (optimizing); knowledge that is adequate enough for making a decision, for acting, or for concluding will suffice (satisficing). The final choice of disciplines is of course not without consequence. The representation the research team will construct of its phenomenon is dependent on its choice of multidisciplinary, and such is also the visible and intelligible part they will reach of it. Every discipline carries with it philosophical and anthropological (in the philosophical sense) prejudices and a specific *Weltanschauung* which influences the way it beholds the world. What a multidisciplinary team of research composed of, for instance, a historian, a psychologist, an economist, and a designer, will reveal about the daily hygiene of teenagers is understandably quite different from what we will learn about the same phenomenon from a team composed of a sociologist, a philosopher, a nurse, and a designer. What is essential here is to be epistemologically awake in order to draw the right conclusions as to the consequences of our choice on the orientation and limits of the research, and on its expected and necessary relevance for design.

A kind of multidisciplinary can also be achieved within a single discipline. There is usually more than one paradigm at work in a discipline and, in some instances, it could be fruitful to invite researchers from the same discipline (for instance sociology) who defend different paradigms on the research team in order to confront their respective points of view on the phenomenon. Their conclusions may lead to very divergent plans of action, a situation usually propitious for addressing fundamental design issues.

A good scholarship in epistemology and updated knowledge of current advances in various sciences is highly recommended for this stage of the research process, combined with a very specific design competence: opportunism.

No further general recommendation can be given at this point, since the final decision is always situational: the specific phenomenon under inquiry is our best guide to tell us what facets of its complexity are the most relevant and promising for the specific research at hand.

**1.4.4.2** Let us assume the research team has been set up (with adequate budgeting)<sup>17</sup>. Its first task is to write down and submit a research proposal in the form of a research problematics. We all agree that a mere juxtaposition of various disciplinary outlooks does not constitute an adequate answer. Some coordination is necessary to reach a given degree of integration. A Cubist painting or collage is successful if its constituent elements or partial views are well chosen and if their number is not excessive [condition 1.4.1.1], and moreover if they are integrated into one whole [condition 1.4.1.2]. Otherwise, the resulting picture is too confused and confusing, and consequently meaningless and banal.

The juxtaposed situation we call pluridisciplinarity, the integrated one *interdisciplinarity*<sup>18</sup>. How is this integration to be achieved? Our study case will show an example of a possible method. Shortly stated, the primary task of interdisciplinary work is to construct a conceptual and theoretical framework for the research that is shared and acknowledged by all partners. Let us simply add that a good experience in complex modelling is a very helpful asset for such a task.

**1.4.4.3** Since project-grounded research always involves a design practice component, one should make sure the interdisciplinary knowledge produced at the preceding stage by the research team is also adequate for the delivery of an acceptable design output (product, system, service, environment, etc.).

“The knowledge must be ‘applicable’ in practice”: such is the conventional terminology, but the epistemological meaning usually given to the operation of ‘application’ we consider logically flawed and faulty. To describe this highly important operation in design and in professional disciplines in general, one needs to better understand what

this relationship of theory to practice, of knowing to acting, actually consists in. Contrary to the common view, it is not a deductive but an interpretive or hermeneutic operation. As Donald Norman rightly points out in his own coloured phrasing, “current academia is ill suited to the task, [...], the skills currently taught within the Universities are simply inappropriate to the needs of industry”, *i. e.* to the needs of decision making and acting [see footnote 6]. Knowledge delivered by the analytic-oriented scientific disciplines needs to be worked out (*trans*-formed) so that it can be “engaged” or “embedded” in action. We call the operation “pragmatization” of knowledge.

The design project provides ideal conditions for that, since knowledge must be “organised” towards the creation of a whole, for instance a car-sharing system for rural areas. The key is to construct the knowledge so that it is relevant *to the point of view of the end-user* (and not only to that of the scientific community). Designers are reputedly good at that, but as we all know, their competence is kept tacit. To hoist this specific know-how (Nigel Cross calls it the “designerly way of knowing”) to a more reflexive and explicit level is one of the tasks of design research. The hermeneutic transformation of knowledge into action, in our words the pragmatization of knowledge for design, is what *transdisciplinarity* is about. We found that a good understanding of the import of pragmatic philosophy for design was more than welcome for this other central competence of designers-researchers.

## 1.5 Concluding Remarks

We are now ready to conclude our long terminological journey. We have seen that the very nature of project-grounded design research implies a multidisciplinary approach to be adopted. In this respect, pluridisciplinarity, the mere juxtaposition of monodisciplinary perspectives is not satisfactory. In the problematization and knowledge production phase of the research, it is interdisciplinarity that is necessary. It requires the integration of the chosen disciplinary perspectives into a common problematics. Only then is it possible to set up the research protocols liable to yield the corresponding knowledge outputs. The contribution of interdisciplinary inquiry to project-grounded design research is two-fold:

- i) It allows, if properly transformed, the practical design part of the research to be conducted successfully
- ii) It realizes the necessary conditions for a significant contribution of the scientific disciplines, including design, to their respective fields.

Conversely, in the design phase of the research, we need transdisciplinarity. It requires adequate orientation or transformation of the knowledge produced in the former phase so that it can nourish the design project. The contribution of transdisciplinarity to project-grounded research is also two-fold:

- i) It provides the terrain of the research, its main field of observation
- ii) It eventually leads to the satisfaction of end-users' aspirations

In the literature on multidisciplinary, one usually reads that there is an increasing integrative complexity leading from monodisciplinarity to pluridisciplinarity to interdisciplinary to transdisciplinarity. Our model differs from this mainstream conception: pluridisciplinarity (degree 0 of multidisciplinary) branches out into interdisciplinary when knowledge production is the aim (problematization phase) and transdisciplinarity when user satisfaction is the aim (design phase, *mise-en-projet*). The difference is not in complexity, but in the thinking 'gesture'. We are dealing with two different kinds of logical operations, evolving in two distinct epistemological fields.

Have we left out multiprofessionality in this story? Yes and no. Yes since, as indicated above, there is no time here to address this issue. No, because the principles of transdisciplinarity hold for all design professions. If several design professions happen to be represented in the research team, then we are faced with the problem of which is the best prepared to take the lead of the design phase. However the comparison ends here since in the professional realm, specialization remains a must, so that the mere idea of 'transprofessionality' does not really make sense.

A general contractor is only as successful as the respective specialized sub-contractors. We should not encourage designers to become

Jack-of-all-trades and dream of a future profession of universal designers, even if this fantasy is part of our design mythology. This aspect definitely calls for a more thorough examination.

What is new however, and this is no fantasy, is the arrival of a new generation of actors on the design scene, the designers-researchers. We like to call these newcomers the generation of 'enlightened' designers. Designers-researchers must learn to wear two hats and know which is appropriate for a given stage of project-grounded research. At the Dessau Bauhaus, Walter Gropius hoped that the professional and social distinction between the *Formmeister* and the *Werkmeister* characteristic of the Weimar beginnings would disappear, since these two competencies were to merge within one person, the *Jungmeister*. Our current situation is somewhat analogous. There is no doubt that the arrival of all those PhD-holding designers will profoundly affect the design, not only the academic, world.

Have we left out the relevancy of design research for the educators' community? Yes and no. Yes, since we have not mentioned how design knowledge initiated through interdisciplinary research is to be devised for this purpose. But no, because this remains the task of design educators themselves. And that is really another story indeed. Let us just remind that, from a research education standpoint, the future design researchers need to develop the following competencies: a general epistemological scholarship and the correct handling of specific questions raised by its application to design knowledge; an overall familiarity with the spectrum of scientific disciplines that might be invited to collaborate in a design research team; a practical experience in complex modelling; a sensitiveness to the frame of mind of pragmatic philosophy and its consequence for the conduct of project-grounded method.

## 2. A Study Case: Design and Alzheimer's Disease

In the fall of 2006, a geriatrist from the Hôpital Local d'Uzès (a small city of 8000 inhabitants) contacted the Design Department of the University of Nîmes about a possible design project meant to improve Alzheimer patients' daily activities. The hospital already had

some years of experience with so-called “nonpharmaceutical” approaches to Alzheimer’s disease. Its day-care facility was providing various supportive environments (multi-sensorial rooms, multimedia workshop, conversation groups, handicraft studios, etc.) to patients from the surrounding region that were still in the early phases of the disease and therefore still living at home. The idea of the medical team in care of this unit was that designers should undoubtedly be capable of devising some sort of “something” that could help their patients carry out their daily activities with the maximum of autonomy. The doctor further added that digital technologies, combined with the creativity and the aesthetic sensibility of designers, would constitute a more than appropriate mix in this respect.

*The situation described above is paradigmatic of the way design research projects are liable to start out: a question posed in the form of a commission, or a design brief.* Three practising/teaching designers and three teachers/researchers from the University attended this first meeting, the latter with backgrounds in architecture and engineering. The geriatrist gave us quite detailed descriptions of the kind of obstacles and difficulties patients were struggling with in their daily activities, followed by the corresponding diagnoses expressed in sometimes specialized medical and neuropsychological terms. A didactic PowerPoint helped us understand this complex phenomenon.

“How about asking the patients themselves to express their difficulties in their own terms?” was our next question. A long silence followed, with frowned forehead. After a short but dense conversation, the design team made the following proposition: “Yes indeed, we designers have the necessary competencies to address your query and answer the brief. However, the problematics seems quite complex and we would need an extra week to give you a more specific answer”. The underlying idea was the following: how do we know that the way the medical staff frames the problem is adequate for design?

This may seem very arrogant indeed, especially in such a highly specialized and economic, social as well as political strategic field as

Alzheimer’s disease today. Arrogance? Naivety? Not at all, just plain epistemic precaution. Despite our ignorance of the phenomenon and its underlying factors, we felt design as a discipline may also have something original to say, and eventually contribute, to this already extremely solicited issue.

*What is critical at this point is the transformation of a problem expressed in design terms into a problematics expressed in research terms.* The following week, our design team answered that it would be interested in turning the design problem into a research project, and that it would be ready and happy to look for additional contributors to form a research team. The answer of the hospital authorities was that they were of course interested in yet another research project in this area, but also worried about how to immediately handle their day-care policy and make sure their patients could maintain their autonomy as long as possible. In other words, their conception of scientific research was such that they were convinced that their first concern, the design brief, would be put aside in favour of the usual concern of research teams: grants, publications, conferences, seminars, etc.

It did not take too long to the design team to convince its commissioners and future partners that the project-grounded research method would satisfy both: the design project with its immediate end-users and the research project with the corresponding scientific communities. As a result, a research team was constituted and in the fall 2007, it held its first meeting. The following disciplines were represented: cognitive psychology, neuropsychology, geriatrics, cognitive ergonomics, and design. The following professions were also around the table: clinical neuropsychology, industrial design, architecture, hospital management, education. The decision was taken to apply for a major national grant under the directorship of the cognitive psychology colleague, followed by appeals to local governmental institutions (*département*, region) and other possible partners in the Alzheimer ‘community’.

*Now comes the phase of problematization, of interdisciplinary work. The general argument of our proposal could be summed up in the*

following terms. Alzheimer's disease is characterized by a loss of cognitive faculties and of the sense of orientation in time, in space, and in one's identity<sup>19</sup>. Although no remedy is currently available to cure or prevent the disease, it has been observed that in some circumstances its evolution may be slowed down, sometimes substantially. Besides the medical and pharmaceutical treatments currently available, other so-called "nonpharmaceutical" treatments have also been seriously considered recently. These involve the "supportive" character of the environment of the patients and therefore its design. Whereas research in the medical and pharmaceutical domains is indeed receiving the larger part of public and private subsidies as well as of public attention, increasing interest has recently been granted to research possibilities in the latter. This is indeed where our research proposal positions itself<sup>20</sup>.

If we follow our previous argument and principles [§1.4.4.1], the first question to ask is: "Is this multidisciplinary and multiprofessional adequate?" One could think that the additional contribution of disciplines like ecological psychology, semiotics, psycho-sociology, communication science, HCI and professions like interior design and electronic engineering would have been ideal. Indeed, but just remember: satisficing, not optimizing! In this respect, one should not forget another, apparently trivial asset in research: geographical proximity of research partners.

Our next step consisted in writing the research proposal and therefore transforming pluridisciplinarity into interdisciplinarity [§1.4.4.2], in other words in rising from degree zero to a higher integration of our efforts and respective scholarships. This was achieved through the following, highly recommendable, exercise. Each partner was invited to present, first in a fairly narrative form but progressively in a more strongly founded and justified problematics, the perspective in which his/her own discipline views the issue at hand.

If we had stapled these texts together in a single document, we would have merely reached the pluridisciplinary level. Interdisciplinarity started when each partner was invited to reframe the whole thing into a single general problematics, after having read and un-

derstood his/her partners' respective texts. This requires focusing on the thoughtful understanding, not only of the substance of the texts, but also of the epistemological standpoints, the methodological specificities, the anthropological and philosophical worldviews, and the conceptual and terminological jargons, proper to each discipline. Not only is this work necessary to understand the texts, but it is also important to grasp their relevance, coherence, argument, and limits. And this is a very tough exercise!

The last step towards true interdisciplinarity consisted in agreeing upon the final, unique and common text. No less than five to six rounds of writing were necessary. *It is only once this effort of disciplinary 'decentering' is achieved that each partner can turn back to his/her own scientific community and accomplish what it will recognize as being the specific and relevant contribution of its discipline to the research project. Specific, since it will draw on the expertise of each, and relevant, since the global contextual background of the research problematics will have been properly assimilated by each.*

The transdisciplinary step is different. The situation that requires it is not that of a project of knowledge (observation, description, interpretation, understanding, etc.) of the world, but that of its transformation. The perspective is projective/creative and requires knowledge to be engaged in the project. In other words, the aim is not so much to contribute to the corpus of knowledge of Alzheimer's disease, although this will undoubtedly also be the case, but to come up with actual design propositions intended to maintain Alzheimer patients' functional independence and enhance their feeling of well-being as well as that of the persons in their immediate surrounding. In so doing and at this point, the concern of research partners of a project-grounded design research is not to address their respective scientific communities, but the community of their end-users and stakeholders in the first place. Notice that the transdisciplinary attitude is more uncomfortable than the interdisciplinary one, since it exposes researchers to situations of uncertainties they are not necessarily used to but that are familiar to designers. That explains why experts sometimes tend to shy away from practical situations and are reluctant to be assessed by criteria not conventionally con-

sidered as belonging to the scientific domain, like usefulness, relevancy, economic value, ascribability, ethical consequences, etc.

As indicated in our abstract, we are not ready to report on this stage in the present, very early, state of our project. Needless to say, we look forward to observing how our research team will manage the necessary “pragmatization” of its knowledge, and how it will react to one of the central pragmatist maxims of transdisciplinary epistemology: “If thou wantest to really understand the world, put it into project”.

#### References and Endnotes

1. If we accept Ranulph Glanville's serious argument that scientific research processes are but a subset of design processes, then the field of design methodology also includes that of design research methodology. See Glanville, R., “Researching Design and Designing Research”, *Design Issues*, XV, 2, Summer 1999, 80–92.
2. The problem with design, as we shall see, is that it is not sure what its objects are and in which measure those are shared with or borrowed from other disciplines.
3. As stated at the beginning of this paper, our argument is mainly didactic. In this respect, we do not want to suggest that the epistemological issue has not been tackled at all in the design research community. Numerous distinguished colleagues have indeed taken this issue at the centre of their concerns. Even a cursory look at the records of our main research societies or at the archives of our journals on this topic will yield a more than sufficient harvest.
4. Findeli, A., “Die Projektgeleitete Forschung: Eine Methode der Designforschung”, in R. Michel (ed.), *Swiss Design Network – Erstes Design Forschungssymposium*, Basel, HGK Basel, 2004, 40–51. French version available at [[www.din.umontreal.ca/findeli.html](http://www.din.umontreal.ca/findeli.html)] under the title: “La recherche-projet: une méthode pour la recherche en design”, 21 pp.
5. Our most discriminate description of the “research through design” method, which we name “project-grounded research”, is to be found in Findeli A. & Coste, A. “De la recherche-création à la recherche-projet: un cadre théorique et méthodologique pour la recherche architecturale”, *Lieux communs*, 10, 2007, 139–63.
6. “Publication isn't relevant: shipping a product is” is Donald Norman's most incisive catchphrase in his discussion on applied science and design. In “Applying the Behavioural, Cognitive, and Social Sciences to Products”, he insists upon the sharp difference between the respective needs, aims, contexts, etc. of the scientific and design communities. [http://www.jnd.org/dn.mss/applying\\_the\\_be.html](http://www.jnd.org/dn.mss/applying_the_be.html), p.3. Retrieved 04.28.08.
7. The problem, writes Norman, is that “the relevant scientific fields have made no attempts to package their findings in this way”, *i. e.* in “[stressing] the practical implications of the findings” and “methods for making use of them”, *ibid.*, p. 9.
8. Of course, it would be quite different if the social history of medicine project were conducted with an action-research method. But that is exactly what research *through* design is about.
9. Actually, all students in the *Design & Complexity* research Master's program of the University of Montreal are expected to outline and critically discuss, in the final chapter of their thesis, what the import of their conclusion is for 1) design knowledge, 2) design practice, and 3) design education. See [[www.gradient.umontreal.ca/desco/pmwiki.php](http://www.gradient.umontreal.ca/desco/pmwiki.php)].
10. Available literature is currently overabundant on these topics. The most quoted sources are the UK Arts and Humanities Research Council (AHRC), the UK Research Assessment Exercise (RAE), and the UKCGE paper on Practice-based Doctorates in the Creative and Performing Arts and Design. The PhD-Design list has hosted numerous threads on this highly recurrent but now overexploited topic. In the Wikipedia “Screen media practice research” article, one reads that “practice as research (PAR) and practice-based research (PBR) – and ‘research through practice’, ‘research by practice’, ‘performance as research’ – are contested terms that resist close definition. Practice as research and practice-based research are frequently used interchangeably to suggest a relationship of research between theory and practice”. [http://en.wikipedia.org/wiki/Screen\\_media\\_practice\\_research.html](http://en.wikipedia.org/wiki/Screen_media_practice_research.html), p. 2. Retrieved 04.28.08.

11. Since creation-based research is addressed specifically in this symposium, it will not be developed further. See Lechot-Hirt L., "CreaSearch – Methodologies and Models for Creation-based Research Projects in Design" (in Track 2 of the program).

12. See reference in footnote 5, paragraph titled "La recherche-création".

13. The primary addressees are of course the very users of design products, systems, services, interfaces, environments, etc. As will be argued in the paper, they are included in our general theory of the design project. They may as well be considered as direct participants of the design practice community.

14. The so-called "*Bremen Modell*", first presented at the Bremen EAD Conference in 2004, embraces all dimensions of design knowledge, in both the conception and reception spaces of the design project. It may therefore be considered and used as a general theory of the design project. Findeli A. & Bousbaci R., "L'éclipse de l'objet dans les théories du projet en design (The Eclipse of the Object in Design Project Theories)", *The Design Journal*, VIII, 3, 2005, 35–49.

The issue of design knowledge has of course been thoughtfully addressed by various design scholars. One example amongst others: Michael Bigg's editorial of volume 2 (2002) of the *Working papers in art and design*, titled "The concept of knowledge in art and design"

(<http://www.herts.ac.uk/artdes/research/papers/wpades/vol2/intro02.html>, last retrieved 04.01.07), as well as his "Rigor and Practice-based Research", *Design Issues*, XXIII, 3, Summer 2007, 62–69.

15. Although we have already gathered substantial and convincing evidence in support of this hypothesis, its thorough exploration is not in order here. This will actually be the central theme of a coming conference to be held in Berlin next October 2008 under the initiative of the Germany-based Design Research Network (DRN). Conference website: [www.designresearchnetwork.org/drn/thought/441](http://www.designresearchnetwork.org/drn/thought/441).

DRN website: [www.designresearchnetwork.org/drn/](http://www.designresearchnetwork.org/drn/).

The originality of design's scientific positioning is to be explored somewhat differently depending on whether one looks at the conception or the reception phase of a design situation or project. Concerning the former, a good methodological starting point could be the comparative analysis delivered by Bolan R.J. & Collopy F. in their *Managing as Designing*, Stanford University Press, 2004 (why wouldn't design scholars achieve the same type of work?). See also the whole issue of *Design Issues*, XXIV, 1, Winter 2008. Concerning the latter, we recommend the fine study made by Ingram J., Shove E. & Watson M.: "*Products and Practices: Selected Concepts from Science and Technology Studies and from Social Theories of Consumption and Practice*", *Design Issues*, XXIII, 2, Spring 2007, 3–16.

16. In the present context, "*multidisciplinarity*" is but a generic concept without further meaning as to how the "*multi-*" is structured. When differentiation becomes necessary, we will use the prefixes "*pluri-*", "*inter-*", or "*trans-*". It follows that all three of them are to be considered a species of *multidisciplinarity*.

17. In the case of a PhD research project, the team is usually reduced to the candidate, who is the one actually actively conducting the research (notwithstanding the supervisor's and advisory committee's contributions of course). The issues of multidisciplinary are then raised within the capacities of a single individual rather than spread among a research team. Individual inter- and transdisciplinarity are extremely difficult stages to achieve, but there could be no better initiation for a reflective designer-researcher.

18. Our argument is tempered by our wish to be as concise as possible and we therefore avoided all referencing in the wide field of multidisciplinary. We do however hold the following work paradigmatic of what inter- and transdisciplinarity, as defined in this paper, could mean in a design context. We consider the authors' insistence on the term "integration" and their definition of it totally to the point and opportune in the context of our paper. Tress B., Tress G., Fry G. & Opdam P., *From landscape research to landscape planning: aspects of integration, education and application*, vol. 12, Wageningen (NL), Wageningen UR Frontis Series, 2005. Downloadable at [http://library.wur.nl/frontis/landscape\\_research/index.html](http://library.wur.nl/frontis/landscape_research/index.html). Also available in book form.

19. Brouillet D. & Syssau A., *La maladie d'Alzheimer*, Paris, PUF, coll. Que sais-je?, 2005 (3rd rev. and compl. ed.).

20. The research proposal is currently (May 2008) still in the reviewing process, and therefore somewhat confidential. Only a brief outline may be given at this point.