Author's response

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Let me first reply to Peter Krøjgaard and Jens Mammen's commentary. Their commentary is the most critical one, I believe, however, that they got a few of my points from the article wrong. I would like to take the opportunity to hopefully clarify some of the ideas and my intentions.

According to Peter Krøjgaard & Jens Mammen, I do not treat cognitive psychology fairly; they are also of the opinion that I should have attempted to point out the 'rational core' of the position I am criticizing or rejecting. Peter Krøjgaard & Jens Mammen also maintain that 'mainstream cognitive psychology' may not be a very homogenous group. Let me say that I have no doubt that 'mainstream cognitive psychology' might be a somewhat inhomogeneous group and I am sure that, *from their point of view*, Peter Krøjgaard & Jens Mammen have to blame me for not focusing sufficiently on cognitive psychology. However, *from my point of view*, I am not really writing about cognition. This may sound odd in view of the fact that I have spent so much time trying to outline some basic general psychological ideas about a phenomenon that obviously seems to belong to the realm of cognition –thinking, that is. So, as I read their commentary they do not simply blame me for not treating mainstream cognitive psychology fairly, they probably also blame me for not treating thinking fairly as a phenomenon which should be conceived within cognitive psychology.

The pragmatically relevant human field

To clarify why I am reluctant to view thinking as a cognitive function (as opposed to functions that are not cognitive, whatever that is) I would like to refer to the work of Kurt Lewin and Alfred Schutz. Taken together, their respective ideas of a *field* and of *everyday life* may offer at least some opportunities to talk about thinking as a functional aspect of life rather than as a cognitive function.

Lewin's (1946) field theory offers a description of the psychological environment of humans, which helps understand how richly developed and how penetrated with motives and needs human life is. The psychological environment or *field* is:

"A totality of coexisting facts which are conceived of as mutually interdependent…" (ibid., p. 792), and he finds that psychology: "… has to view the life space, including the person and his environment, as one field" (ibid).

According to this definition of a psychological field (life space), person-environment relations are in general conceived of as a kind of expanding system. By which is indicated that a study of the person is a study of the life space of that person and that changes are changes in the system of the life space, not only changes in the person. More elaborately directed actions presuppose a correspondingly higher differentiation of the life space. Certain areas of the life space can have certain weights (potencies), and an individual can have a tendency to act in certain directions (forces). All of the time, the person is co-constituting self-in-life space in one continuing process like an (inner) relation that relates to (hence, expands) itself.

From the perspective of field theory it is less categorically distinct what 'belongs' to the person and what 'belongs' to the environment. The environment is rich and meaningful, expanded beyond the level of elements of 'things' and of 'moments'. The field includes relationships with others, dreams, ideals, fear, pleasure, goals, social relations, the atmosphere (friendly, tense, hostile), etc. According to Lewin, these experiences and social aspects of the psychological environment are empirical realities and scientifically describable facts. What I like about Lewin's ecology is that the individual (person) can be focused upon as a truly engaged, interested, feeling, experiencing agent who is dialectically and developmentally connected to his/her environments. From this point of view the specific 'cognitive aspects' of human life evaporate and are replaced by a global view on the dynamic complexities of human life. This does not rule out a focus on the individual or a focus on individual, psychological processes. But the term 'cognition' can hardly be isolated as a special psychological realm.

Alfred Schutz' (1971) term of *"wide-awakeness"* might be added here. Wide-awakeness describes the highest tension of consciousness originating in an attitude of full attention to life and its requirements. Schutz finds that only the performing and especially the working self is fully interested in life and, hence, wide-awake. It lives within its acts and its attention is exclusively directed to carrying its project into effect, to executing its plan. He says:

> "The concept of wide-awakeness reveals the starting point for a legitimate pragmatic interpretation of our cognitive life. The state of full awakeness of the working self traces out that segment of the world which is pragmatically relevant, and these relevances determine the form and content of our stream of thought: the form, because they regulate the tension of our memory and therewith the scope of our past experiences recollected and of our future experiences

> anticipated; the content, because all these experiences undergo specific attentional modifications by the preconceived project and its carrying into effect" (ibid., p.213f).

Despite his somewhat 'cognitive' terminology, it is possible to read Schutz' ideas as a suggestion to focus on relevancies of specific aspects of life for human agents; that is, how real persons experience life to be (or not be) meaningful to engage in.

Maybe those two theoretical contributions make it clearer why I did not write an article about mainstream cognitive psychology and why I did not really spend time on the possible diversity of that domain? My attempt has been a different one.

Anticipation – further considerations

Peter Krøjgaard & Jens Mammen further find that there may be reasons for dualism which we ought to understand before rejecting it. They refer to an article written by the one of the authors (Jens Mammen). Unfortunately, it is not spelled out in any detail what exactly Jens Mammen's argument *in favour of* a dualist position is. That certainly would have made it easier to write a reply and to examine possible agreements and differences of perspectives.

Peter Krøjgaard & Jens Mammen are correct in saying that I regard anticipation as a basic premise for a living organism (at least as long as we accept Engelsted's principle of auto-kinesis). The point following from this premise is the dialectical and developmental one that adaptation is an ongoing and never ending process rather than a finite state. Peter Krøjgaard & Jens Mammen accuse me of not offering any explicit definition of anticipation. They suggest that because the concept of anticipation is not sufficiently explicit and precise, the word 'anticipation' could easily be substituted with a range of other words, like 'imagination', 'ambivalence', 'doubt' and 'enthusiasm'. First, I want to say it may be correct that anticipation is not very explicitly defined. However, since the article is, to a great extent, concerned with how the phenomenon of anticipation is distributed in the life-world of living organisms, that ought to give the reader at least some idea of which issue is examined. Next, I agree that, under certain circumstances, all of the terms mentioned by Peter Krøjgaard & Jens Mammen might possibly be inserted as replacement of X in the sentence: 'X is the functional aspect of living and participating meaningfully in a world of resistance, ambiguities, and choices'. This is possible because, from the view of the life-world of individuals, all processes that psychology have chosen to label by means of certain names should be considered functional aspects. From that perspective, why stop with the 'cognitive' terms? One might even expand the list of words suggested by Peter Krøjgaard & Jens Mammen with words like 'feeling' or 'ignoring', 'loving', etc. Here I refer to the perspective just elaborated with the help of Lewin and Schutz. On the other hand, I would not agree that lower organisms with auto-kinesis necessarily unfold imagination, doubt, or enthusiasm. Those are 'cognitive' terms and such processes are probably an opportunity for higher organisms only (an issue I have no intention of elaborating here). In the article my ideas has only been to say that anticipation is a very general 'property' of the world and maybe organisms have 'utilized' the potentiality of anticipation in many different ways – humans having their species-specific ways of 'utilizing' the possibility of anticipation. Peter Krøjgaard & Jens Mammen refer to those developmental differences as a 'hierarchy'; I must say that I would not call it a hierarchy as this would suggest a structural perspective on dynamic developmental phenomena; rather, I would prefer to call it a genetic (developmental) view.

Defining versus exploring the concept of 'thinking'

Peter Krøjgaard & Jens Mammen find that my definition of the central term 'thinking' is not sufficient either; it only transcends the 'here and now' situation. They refer to Jerome Bruner's treatment of the concept according to which thinking is defined as the cognitive processes of going beyond the information given; according to Bruner's definition, thinking also has a goal, such as a solution, a decision, or a belief. So, because thinking is defined in textbooks as the cognitive process of going *beyond* the information given, Peter Krøjgaard & Jens Mammen argues that cognitive psychology (like Bruner) would not disagree. I am puzzled by Peter Krøjgaard & Jens Mammen's argument. On the one hand, I have not defined thinking sufficiently well. On the other hand, I seem to have said no more that the standard definition by Bruner (who, I assume, has defined thinking sufficiently well). My question to Peter Krøjgaard & Jens Mammen is how Bruner can know that thinking has a goal, such as a solution, a decision, or a belief? Conceptual work in psychology is not just a matter of defining sufficiently well. In their commentaries, Alan Costall, as well as Svend Brinkmann, warn psychology against making the part-whole failure to take the part for the whole. How can we know that Bruner has not done that with his criteria? In their general attempt to introduce terms from cognitive psychology, Peter Krøjgaard & Jens Mammen further criticize me for saying that 'script' and 'schemata' have no explanatory power. I say so because they are not neutral terms describing processes on a phenomenological level. They are theory-laden cognitive terms which ought to be examined themselves; not much explanation is offered by saying we think when we have thoughts (in our heads). But I agree that Bartlett's original understanding of the *process* is interesting, absolutely.

Peter Krøjgaard & Jens Mammen want to separate thinking from anticipation and do not like the *genetic* (not hierarchic as they say) idea that anticipation is the basis for thinking in humans. But if anticipation is the future-directedness of living beings in general, why would the

process of writing a commentary on a target-article be an exception? Would that not be a future-directed act after all? I would like to think so. Part of the process of writing a commentary, I assume, is to elaborate a discussion with oneself while writing, and asking oneself questions like 'did I get the basic idea in the target-article correctly', 'what would the author say to this critique of mine and would I have to revise it, then?', "how would the author have to revise her ideas based on my critique?". Etc. Why does that have nothing to do with anticipation?

Species-specific differences and mental structures?

Finally, Peter Krøjgaard & Jens Mammen find that it is worth defending the term 'mental structures'. They refer to a study by Warneken, Chen & Tomasello who have studied how chimpanzees and 18- to 24-month-old children interacted in four cooperative activities with an adult experimenter. After having witnessed a successful demonstration by two adult experimenters, it was scored whether the subject would attempt to get one of the adult experimenters to cooperate in the target activity. Whereas children made at least one attempt to reengage the adult experimenter in the target activity, none of the chimpanzees ever made any attempt to do so. Now my question is: to which extent does it serve as an argument *against anticipation* that chimpanzees do not engage like children in certain activities? I have no intention of claiming (and have not tried to do so in the article) that there are no species-specific differences. I do not claim that all we have to study is x unspecific 'organism' in x unspecific environment in a non-developmental way. That would neither be a very thoughtful nor a very ecological claim. As far as I can see, the experiments nicely show that there are species-specific differences and that the experiments fit better with the potentialities of human children than with the potentialities of chimpanzees. What I do not understand, however, is Peter Krøjgaard & Jens Mammen's jump to the conclusion that *because* we need to look at species-specific differences we also ultimately need to look at them as mental structures. Of course, one could always decide to define something as a mental structure, but is it a concept that explains anything? So, I completely agree with Peter Krøjgaard & Jens Mammen that the sources of anticipation are not exclusively to be found in-between the world and the single individual. Nor do I claim that there are no such phenomena like closing ones eyes while trying to recall the winning tennis serve from yesterday (or a baseball game, which would be my personal favorite). When I close my eyes, I am perfectly able to re-experience the day when I went to Fenway Park and watched The Boston Red Sox beat the Texas Rangers while the crowd was singing along when Neil Sedaka's "Sweet Caroline" was being played. My theoretical work is not an attempt to deny such phenomena and I would not be very thoughtful if I tried to deny that I can close my eyes and think of baseball. Let me again remind you about that which William James said (and I think others than radical empiricists should learn from that too): that to be radical, an empiricism must neither admit into its construction any element that is not directly experienced, nor exclude from them any element that is directly experienced. Imagining a baseball game is such an experience that people can have. So, I argue in favour of a *realist* position to psychological phenomena, meaning to view them from an ecological developmental (dialectical) perspective, I am *not* trying to argue psychological phenomena out of the field.

Several interpretations of the individual-environment relations

A major issue being addressed in all of the commentaries is the one of the 'inner' versus 'non-inner' nature of psychological processes. Here I avoid naming it *mental* processes since the term 'mental' is already heavily biased, while 'psychological', hopefully, still works as a relatively open term. The centrality of this 'inner' versus 'non-inner' issue should not surprise anyone who is occupied with an ecological scope for psychology, for two reasons: firstly, because ecological psychology, on an overall basis, is sceptical towards the 'inner' being the unit of analysis for psychology and, secondly, because this sceptical stance is only a somewhat defensive or negatively defined platform for possible productive alternatives – for what Alan Costall names *post-cognitive psychology*. Future theoretical developments can only to some limited extent be contra-defined by that which it finds problematic; the open and interesting question to ecological psychology is in fact *what should be meant by ecological psychology*. I really believe that given the history of psychology, one would expect a variety of ecological positions to see the light. *Ecological psychology* may mean a lot of things. The commentaries on this target-article already reveal some of the variety in their attempts to think productively beyond dualism.

In her commentary, Emily Abbey suggests an alternative interpretation of how post-dualism psychology should develop and on which foundational concepts it should be based. Emily Abbey explicitly insists on acknowledging idiosyncratic processes *in* the individual (named *internalization*) as well as the sign-based nature of humans' relation to the environment. She suggests that there may be two post-dualism alternatives when it comes to the individual-environment relations, one interpreting the individual-environment relation as being based on *mutuality* (claiming that this is my position), the other being based on *duality* (Emily Abbey's position inspired by Valsiner).

First, I want to say I believe that Emily Abbey is correct in pointing to the empirical reality of an experiencing phenomenological individual. A larger challenge to ecological psychology is, however, *how* to think dialectically about the individual-environment mutuality. Since it is a field for further discussion and theoretical development, I would like to just share some reflections concerning the possible *problematic* aspects of a mutualist position. I would like to

mention two examples of theories that try to get beyond dualism, though in different ways.

Mutualism and the attempts to get beyond dualism

The first theory is Jakob Von Uexküll's (1940/1982) point-contrapoint theory of meaning. This is truly a mutualist theory about the organism and its *Umwelt* – indifferent to whether we are dealing with humans or animals At a descriptive level it has a certain likeness to Gibson's (1966) basic ideas of how the environment "supports" an animal (that the terrestrial environment permits the animal to stand and walk, for instance, because of its rigidity). Similarly, von Uexküll presents examples of how an animal and its *Umwelt* is a fit that goes beyond the single individual and the single environmental objects. A spider and its web, for instance, is such a case of mutuality. Von Uexküll describes the web as a refined work of art that the spider has painted of the fly. The individual spider weaves its web before it is ever confronted with an actual fly. The web, he argues, cannot represent the physical image of a fly, but rather it is a representation of the archetype of a fly, which does not exist in the physical world. The meaning-utilizer (the spider) is attuned exactly to the meaning-carrier (the fly), so that one can designate the spider's web as an image of the fly. The rule of meaning that joins point and counterpoint is expressed in the action. In the case of the spider the web serves as the meeting-point – or sign – between the meaning-carrier and the meaning-utilizer. There is, so to speak, a fit between meaning-carrier and meaning-utilizer.

According to von Uexküll, nothing is left to chance in nature. Thus, meaning *is* those infinite amounts of point-counterpoint mutuality found in nature. It *is not* something created by an individual mind by means of ordinary scientific programs. Because of the contrapuntal nature of meaning, he finds that no human knowledge that can be obtained through experience. The actions themselves are conditioned by a transsensual knowledge that is timeless. In every instance a very intimate meaning rule joins the animal and its medium – they are united in a duet, in which the two partners' properties are contrapuntally made for each other. These displays appear in the Umwelt of other animals and so they are transformed into perceptual signs. The plan (meaning) is realized in the individual and its *Umwelt* and the specifics of the environment (signs) are found to be meaningful to the individual because of this (transsensual) plan. This is why von Uexküll makes a distinction between *environment* (meaningless to the individual) and *Umwelt* (meaningful to the individual).

His theory of meaning echoes phenomenological thinking in psychology and highlights how perceiving means *interested* perceiving or perceiving *from a perspective*. The essential and very important point in his theory of meaning is that meaning should not be found either inside the subject or outside the subject. Meaning is the mutuality of that relation and grows out of processes that continuously relate the two. This point clearly makes his thinking ecological. Based on his romantic and anti-evolutionist (Emmeche, 1990) conceiving of the *Umwelt*, on the other hand, his thinking is not the least ecological, despite its phenomena-nearness. At least not if by *ecological* one values a concept that includes a notion of change and development. After all, living beings change their lives and their environmental conditions of life continuously. The overall point is that the term *ecological* should not only embrace mutuality but, more specifically, mutuality in a dialectical and developmental sense.

Another mutualist position can be found in the actant-network theory of Bruno Latour. Latour (1999) does not want to distinguish between ontology and epistemology. He is keen to avoid the dichotomy between the organism (the subject) and the environment (the object). Rather, he finds that there is a *symmetrical* (which could be regarded as his interpretation of 'mutual') relation between what he calls 'actant' and 'actor'. To illustrate this relation, let me refer an example of his. In one of his essays he discusses the two contradictory slogans "guns kill people" versus "guns don't kill people; *people* kill people" (ibid., p. 176). The first is a (materialist) slogan of those people who try to control the unrestricted sale of guns, while the other is the (sociological) slogan supported by the National Rifle Association as a reply. To the latter, a gun is a tool and a neutral carrier of human will; the gun does nothing in itself or by virtue of its material components. In the first slogan guns seem to add everything to shooting, while in the last slogan it adds nothing. In the last slogan, what matter is who you are and not what you have.

Latour's example serves to illustrate his idea of *symmetry* between the gun and the individual. The individual is different when the gun is in his hand, and the gun is different when an individual is holding it. The individual, as well as the gun, are different because of entering a relationship with each other. The gun is no longer the gun-in-the-drawer, for instance, or the gun-in-the-pocket. Thus, he argues that the mistake of the materialists and the sociologists is to start with essences, those of subjects and those of objects. But if the gun and the citizen are studied as *propositions* instead of essences, neither subject nor object seem to be fixed; articulated propositions continuously turn into new propositions.

In Latour's thinking, his attempts to avoid subject-object dichotomies lead him to abandon each part of the dichotomy and consider them 'essences'. Alternatively – and that is his 'solution' – is to not acknowledge any clear boundary between the human agent (actor) and the nonhuman agent (actant). Action is not a property of humans but an *association of actants*. Following this actor-actant symmetry it is neither people nor guns that kill; rather, responsibility for action must be shared among the various actants that continue to make up the actor-actant symmetrical relation (proposition). In general, he finds that we encounter hundreds or more of absent makers who are remote in time and space yet simultaneously active and present. Latour calls this zone *articulation*. And he finds that there is nothing that we can define as an object by itself. Purposeful action and intentionality are neither properties of objects nor of humans. It is the *collective history* that allows us to judge the relative existence of a phenomenon. To define an entity, one will not look for an essence but for a list of

associations into which one element enters. This non-essentialist definition, he finds, will allow for a considerable range of variations, just as a word is defined by its list of usages. The length of the associations and the stability of the connections through various substitutions and shifts in points of view constitute what he finds should be meant by *existence* and reality.

The epistemic agent

Though in different ways, within different areas (biology and science studies), and formulated in different historical periods of times, the two theories share the idea of mutualism that threatens the position of the individual as an *epistemic* agent. I mention this similarity between the theories because I want to make clear that in my view the epistemic agent should *not* be erased within a mutualist position. In that respect my position is less radical since I only try to discuss how such an agent should be approached ecologically and developmentally. For that purpose, further ontological considerations seem to be needed and this is what I have tried to say in the article. This position differs from von Uexküll's idea of transsensual knowledge as timeless; and it differs from Latour's idea actant-actor symmetry. I suggest that psychology give up its attempt to conceive an epistemic agent within an epistemological agenda but *not* that psychology in that process give up the epistemic agent. Still, there is an individual (organism, person) who is able to experience his or her life-world, to influence it and to change it. Psychology still is about that.

So, when Emily Abbey states that my position assumes organism-environment mutuality rather than duality, I have to respond with a "yes" and a "no". "Yes" because a shift to ontology means that psychological processes are not inner subjective entities (for instance, 'thought' as an entity), and because psychology should not study psychological processes 'in the head' of an individual. What does it mean that something is idiosyncratic, for instance? It seems to be a circular explanation if idiosyncratic experiences are said to be 'something in the head' of an individual– opposed to what is outside the head of the individual, like public? "No" because, as stated above, the shift to ontology does not rule out the epistemic agent. As a term, I agree that "duality" has an advantage of acknowledging the epistemic agent, but beyond that I mostly find it a somewhat abstract and general notion.

Fringe experience – an example

Of course, no last word has been said about how to conceive psychological processes ecologically. 'Mind' itself is a difficult term to use in this connection. However, I would like to briefly mention an attempt to approach psychological phenomena from a kind of a mutualist position. I think here of the contribution from Eleanor Rosch (1996) concerning the so-called 'fringe experience'. Rosch still suggests the term 'mind', but the fringe *may* be considered a kind of subjective experiential pole of an individual's connectedness to a very rich and dynamic world.

An essential point in Rosch's analysis of fringe experience is that:

> "…if mind and environment are viewed as analytically inseparable, one would expect awareness to mirror this connectedness in some way – perhaps as in the fringe experience" (ibid.).

Rosch finds inspiration in the work of William James and his notions of knowledge and attention/awareness. Individuals always have to perceive the meaning of things along with the things themselves and therefore a double attention seems to be what is demanded when living in human environments. According to James, one should distinguish between two different aspects of attention. 1) Attention can be considered as a clear nucleus or focus, and 2) attention can be a fringe to that experience. The attention or awareness of an individual is not only that which the individual clearly focuses upon. The fringe includes different types of experience, such as 1) feelings of familiarity, 2) feelings of knowing, 3) feelings of relation between objects and idea, 4) feelings of action tendency, 5) feelings of expectance, 6) feelings of rightness or being on the right track. Also the feelings of meaningfulness and of metaknowledge should be mentioned. Rosch puts it this way:

> "Perhaps the most pervasive fringe feeling is that of meaningfulness, that one knows the larger context of any given moment of focal attention although that context is not a part of the content of attention" (ibid., p. 10).

In Rosch's terms, the fringe experience is a way of presenting<, in summary form, the contexts of relations that give meaning to discrete items present in the focus of awareness.

Fringe experiences may be part of the subjective phenomenological experience of being connected with the fully expanded nature of the environment, as suggested in my discussion above. Individuals do not have atoms of experiences linked together into mental constructions, human environments consist of atomic elements, and time is not just temporally segregated sequences. The phenomenological experience of temporality, for instance, might not be regarded a mental construct out of endless atomic 'nows'; rather, it may be considered an experience of continuity and discontinuity in its own right. Continuity and discontinuity are forms of existence of the world and, thus, of the individual-environment mutuality that can be picked up by an individual tuned to that environmental feature. As Rosch puts it, a mind that is part of its environment (and not separated from it) is the subjective pole of attention in a subject-object field and should have *much broader attentional capacities* than a mind defined as separate.

The part-whole problem

Svend Brinkmann is accurate when saying that the target article attempts to present a synthesis of ecological psychology and dialectics in the form of an "ecological ontology". Also, I agree with Svend Brinkmann's characterization of the "epistemological tradition", that is, how it may be problematic to work with a premise of knowledge being a "correct representation of an independent reality" and thinking as a process of manipulating inner representations. As put forward by Svend Brinkmann, from this perspective it is the job to study the normative laws of correct thinking in disciplines such as logic, and psychologists will spend their time studying how humans *de facto* think. Further, I agree with Svend Brinkmann that it is important to avoid committing the "mereological fallacy". Part-whole relations are complicated, and one should not ascribe (psychological) properties to a *part* of the living human being (the brain or the mind, for instance).

So, on the one hand, I find that the ecological ontology that I speak for is very much in agreement with Svend Brinkmann's concern about the part-whole confusion that takes the part for the whole. One the other hand I find that it may be misleading to formulate the 'brain', the 'mind', or the 'inner representations' problem as a part-whole problem. If, for instance, we consider thinking to be a process of manipulating inner representations, those inner representations are implicitly considered to be 'elements' or 'entities' to be manipulated. Similarly, if the brain or the 'mind' is considered within the part-whole agenda, the brain or the mind are still considered 'elements' or 'entities'. I believe that the part-whole agenda suggested by Svend Brinkmann may be misleading to an ecological ontology.

In my opinion, it is only a problem to ascribe thinking to an individual if in fact we deal with a part-whole problem. If we accept the part-whole agenda (which I do not), Svend Brinkmann may be correct criticizing my view for not being sufficiently radical and that the article rests on an inner contradiction when it is claimed that a) thinking is a functional aspect of human life, and at the same time concluding b) that the subjective act of thinking is a process in the individual. If, however, we do *not* accept the part-whole agenda, I cannot realize why it is a problem at all to consider thinking to be a process in the individual? Thinking as *doing*, as Svend Brinkmann suggests; but still, individuals *experience* their doings; they imagine, feel, etc.

Thinking as polymorphous

According to Svend Brinkmann, thinking is something humans *do* in factories, trains, offices, toy stores, etc. I agree very much with that view. However, following the ecological ontology suggested in the article, I find it dubious to claim that thinking is deeply polymorphous and that there are varieties of thinking. I need to repeat myself by replying that 'polymorphous' and 'varieties' are problematic terms leaving the impression that thinking is an entity or an element (or more entities or elements – really, the plural form does not add much to resolving the theoretical problem). I do not state that thinking is one thing rather than another; I have only stated that anticipation seems to be an essential feature in the processes that is usually called 'thinking' within the field of psychology. In itself, this simple claim ought to open up for unlimited studies of contextual processes – not as a matter of studying thinking-categories but as a matter of studying carefully the *general* as well as the *specific* conditions of human life. Svend Brinkmann refers to Bennet & Hacker who suggest many varieties of thinking: (1) Thinking as attending to a task at hand, (2) thinking as intelligently engaging in an activity, (3) thinking as intelligent speech, (4) thinking as judging, (5) thinking as associating, (6) thinking as conceiving, (7) thinking as meaning something and (8) thinking as reasoned problem solving. Agreed, the list is impressive, but I would like to know in which ways it adds to resolving a theoretical problem? Mentioning a variety of examples rarely adds anything, and it is always possible to add more examples – probably an endless number of examples. The examples are abstract categories removed from a *concrete* analysis; further, as a next step one easily ascribes them to individuals or to specific human 'cultures'. That step, however, would be a step into business as usual for psychology.

My concern about thinking as 'polymorphous' and 'diverse' also is a reply to Alan Costall who shares a reflection similar to Svend Brinkmann's. Alan Costall is concerned about what post-cognitive psychology should understand by thinking. He seems to hesitate when I refer to thinking as 'this process' as if it were just one 'thing'. Also, Alan Costall seems to imagine that I regard anticipation as the definitive example of thinking in general. Following my reflection concerning Svend Brinkmann's commentary, I would like to add that I do consider anticipation as definitive, but not as an example. Svend Brinkmann refers to the examples mentioned by Bennet & Hacker, but I do not find anticipation to be just one more example in that line. Rather, by referring to Engelsted's analysis, I have tried to argue why anticipation is definitive, even when it is not cognitive. So, I do not suggest anticipation to be just one out of a whole range of quite diverse psychological functions. However, I agree with Alan Costall's statement that ecological psychology needs to seriously reconsider what could be meant by 'environment'. I would like to add that ecological psychology also needs to reconsider what could be meant by 'context', 'situation', or 'culture', to mention but a few of the terms psychology takes for granted. According to Alan Costall, I underplay the importance of developing an alternative 'ontology' as a basis for a non-dualist, ecological alternative to standard cognitivist theory. I get into detail too soon before taking note of Gibson's wider project. I agree with Alan Costall that we will need to do a lot of ground clearing before we can establish a well-founded naturalistic and developmental psychology of human psychological life (so far, I prefer not to call it 'the higher mental functions').

Alan Costall would like to have learned more about my views on how such animals engage with the future, and the

continuities and differences between a protozoan searching for food and a child planning to buy a present and imagining the reaction of a friend. He asks if we have to assume that lower organisms, too, must be engaging in 'thinking' and 'representation'? To start with the last part of his question, the logical consequence of Engelsted's ideas is that those simple organisms probably are not engaged in 'thinking' or 'representation'. The idea on which the article rests is quite the opposite – anticipation is a general and widespread possibility for a variety of organisms in the world and it should not be regarded as just another word for 'thinking'. In fact, my argument is that thinking emerges out of the general possibility-capability of anticipating, not the other way round. If that idea makes sense I believe that further developmental studies should be made concerning how different animals engage with the future as well as with the ongoing continuity-discontinuity of life.

Ecologizing time

In his commentary, Richard Schmidt addresses the continuity-discontinuity issue as a question of how past and future might be present in each moment of human action and perception. More specifically, he discusses how Gibson's theory of perception can be extended to accommodate the more cognitive aspects of knowing required by an ecological theory of thinking. I find his discussion very stimulating (even though I am reluctant to use the terms 'cognitive' and 'cognitive aspects') and to a large extent I would say that it presents an attempt to conceive an epistememic agent on the basis of ontological considerations. Richard Schmidt addresses the issue of what is *present* in a global situation and what it means to perceive the present. Clearly, the notion of the present is not limited to material entities such as persons and furniture in a room, or a cup in the hand of a man. The past and the future are present and perceivable as well. This statement is an ontological one in that past and future (which - as Richard Schmidt says - traditionally has been considered as absent from occurring stimulation) is now regarded an aspect of the global situation of perceiving (it would have been an epistemological statement if Richard Schmidt would have claimed that past and future are nothing but mentally added 'glue' or representations that connect one perception with another). However, according to Richard Schmidt the ontological existence of *higher-order event information or transformational invariants (…) specify the past actualities and the future possibilities.* Further, he finds that this *tonic perception* of the environmental change form the epistemological context for the more traditional phasic perception of the environment that is the traditional domain of perception and action.

Richard Schmidt attempts to explain what he calls *transformational invariants*. I agree with Richard Schmidt that the notion of time needs to be ecologized and I find his notion of transformational invariants very interesting. I get a little confused, though, when Richard Schmidt claims that ecological time does not exist except in terms of a sequential order of meaningful events that make up an organism's existence. The notion of 'time' seems to be a general one, hence not restricted to any specific 'sequential order of meaningful events', though bound to it. I would suggest that an ecologized notion of time include the ontology of 'sequential order' as the basis for experienced sequence and experienced order. In that respect 'time' might be the culturally developed notion of 'change' and 'movement' - ontologically given information to be picked up. Once invented as institutionalized practices, 'time' becomes a social reality among humans, but it would be a mistake for an ecological perspective to regard time as a socially constructed abstraction with no reference beyond institutionalized practices and invented words. So, my suggestion is to consider time as the ontological reality of dynamic changes.

Enemies and friends – the war metaphor in psychology

Niels Engelsted has entitled his commentary 'Is your enemy's enemy always your best friend?' This title suggests that the realm of theoretical development in psychology be a kind of academic battlefield where enemies and friends fight with or against each other. And more than that; friends should be wary of trusting each other too much because trust might make one unaware of the potential enemy in the friend. If that is the case, I must say that theoretical psychology lives in a cold and hostile world, I must say. However, I would very much like to stress that to me an essential intention with the paper was to invite not obviously harmonious voices and bring serious problems in psychology up for discussion. I have brought them together to see how elaborate my analysis would become by means of these ideas. Thus, I have attempted to focus on theoretical problem solving by means of ideas, rather than by trying to construct a completely consistent theoretical end-lösung. This is why I want to maintain that my article should be regarded as a *suggestion* (intuitive or not). A suggestion is open-ended, though sketching possible ideas that need to be elaborated and explored in the future. Of course, one may agree or disagree with this theoretical method, and one may or may not feel a need to base an analysis of a specific issue in psychology (such as 'thinking' and 'anticipation') on an a priori established unitary theory. As I see it, developing a general theory, on the one hand, and getting into theoretically detailed analysis of some specific issue, on the other hand, are inseparable processes; one intention merges with the other constantly. Of course, in such an open-ended process one may feel a need for solid ground under one's feet. A 'jump into positions' may feel comfortable, a secure base, but does it really contribute to theoretical development, I have to ask? It reminds me of the fairytale in which the princess sits on her throne and rejects one suitor after the other with the words "he is no good". Niels Engelsted apparently finds that several of the theories that I have invited to speak in the paper are 'no good'.

Whereas some of the commentaries would want me to draw even more on Gibson than is already the case in the paper, he seems to find Gibson's position to be somewhat dubious – in NE's view Gibson is a false 'friend' and I have made the wrong alliance on the battlefield. Even though Niels Engelsted does admit Gibson a meaningful place on the historical shelf of psychology (next to Skinner), he mostly raises a critical voice. Niels Engelsted even calls Gibson a 'culprit and seducer' and he expresses the suspicion that the seduction is due to the fact that Gibson is the enemy of my enemy. Am I seduced to think that he is my best friend? Is this really the case? I would say no. I am quite aware of the potential limitations and problematic aspects of Gibson's theory and have discussed the issue with ecological psychologists on several occasions. My reason for including Gibson's work is not due to some naive process of seduction. In my article I tried to use Gibson's direct realism and his idea of how invariants are picked up as a way to reframe *knowing about the general* (Hegel's term). I shall not repeat the discussion from the paper here, but I would like to quote the passage where I try to make James, Gibson and Hegel meet:

"Thinking is not the third link in some process of knowing and it is not distanced from the world and from sensuous life. Neither is the situation that of a particular individual *meeting* (watching) particulars of the world. If so, thinking would be the only source for the general and the general would be regarded solely as conceptual constructions. It would be impossible to agree with others about conceptual understandings, because every individual would have to construct those relations by an individual mind. Thus, knowing is not primarily a process of counting and putting things into formal categories, that is, of mentally *creating* abstract categories on the basis of sensed particulars. Such an idea is just reproducing the idea of anticipation as a solely mental process.

The synthesis of the particular and the general *is* the physical world being dynamic; it forms a source of picking up information about dynamic processes. Gibson grasped this with his concepts of direct perception, affordance, and invariants, and Hegel's dialectics contributes to conceiving this idea by pointing to the pick-up of general-particular unity and of being-and-nothing. I have tried to argue that a synthetic view on the world and on dynamic processes also forms the basis for an ecological approach to anticipation as well."

Even though these formulations sound very abstract and theoretical, they try to address *empirical* questions: Where do general concepts come from? After all, they do not leap out of the forehead of the individual. Dual*ism* as an 'ism' (and not just as a *distinction* between subject and object – the 'ism' is not identical with the distinction as Niels Engelsted seems to assume) is argued back into psychology if general concepts/knowing are explained as a result of a mental act, a mental construction. Where does the mental act/the mental construction come from? And what does it mean that something is a 'mental act', how should that be conceptualized? Are concepts mental 'entities'? - Etc. As for intentionality, it may serve as part of an explanation. But where does intentionality come from? I find that with his analysis of auto-kinesis Niels Engelsted himself has offered an interesting contribution to the psychology of intentionality. In fact that is why I found the analysis useful in my paper. But to me it does not rule out other contributions (such as Gibson's or James'). Why should it – unless, of course, theoretical development in psychology is considered a strictly rational and deductive enterprise. Questions like the ones above have made me want to include for instance James and Gibson in the paper; in my view their contributions facilitate a more specific understanding of the dual*ism* problem. One may agree or disagree with my attempt at making theories work together and with the theoretical suggestions I have outlined. However, the questions asked above are all *empirical* questions and theoretical answers to those questions should be concerned about dual*ism* (as an 'ism'). Also, in the search for theoretical alternatives one should assume psychological processes to be *developmental* rather than *a priori* abstract principles mysteriously embedded in mind.

The aim of my paper has been theoretical problem solving by help of theoretical tools. On a very general level, and when I ignore this aim, I agree with Niels Engelsted that one should be aware of, for instance, panpsychism. I admit that panpsychism may glue to the notion of 'mutuality'. However, my hope is to reveal, by discussing that notion earlier in my reply, that I do not consider myself a supporter of panpsychism. So, why am I criticized for sins that I have no intentions to commit and do not find that I do commit? The most obvious reason is that my argumentation and discussion is difficult to understand. A connected reason may be that of a false syllogistic logic: If I agree with some theoretical viewpoints I accept them all; a kind of fetishism where the part is identified with the whole. Conclusion: because I have chosen the 'wrong friends' such as James and Gibson, I let them speak myself into panpsychism and closet-behaviorism. I admit the confusion created by myself here, but since I am no panpsychist or a closet-behaviorist, such conclusions must rest on the false logic that the part (what they are invited to contribute with) rules the whole (including unclear or problematic theoretical ideas). Those conclusions are drawn on false premises. Nevertheless, the logic occurs to me to be quite an ordinary one in theoretical exchanges and a rich source for mutual misunderstandings. It follows from such a false syllogistic deduction that one should be very aware of which friends to play with. The wrong friends make you go wrong.

In my article I attempted to *suggest* a possible theoretical scenario for psychology given that a) psychology is a domain for scientific study which, b) includes phenomena such as 'thinking', but c) has major theoretical problems which must be resolved (and not just formulated), d) by help of empirical studies and theoretical tools (ideas) that – due to the *process character* of theoretical development – must be negotiated along the way. If this scope is accepted for general psychology, theories should not be considered ready-made and fixed positions; they themselves are explored and co-develop as the psychological phenomenon in question is explored. This is how I think when I found inspiration in Gibson's work, for instance. The paper is not a discussion of Gibson's work (or James' or any other's) but an attempt to see where theoretical development of 'thinking' goes when theoretical ideas are

taken seriously as a source of inspiration. While general psychology can have as the one criterion for a 'friend' whether this friend fits clearly with a specific theoretical positions or not, general psychology also can have the criterion whether theoretical ideas may be found productive or not in relation to some issue. Academic exchanges are often a mix of those two criteria and it may create a lot of confusion about the intentions of 'the other'. Unfortunately, it may even turn the playground into a battlefield.

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