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Comments on Sonali Bhatt Marwaha & Edwin C. May: Informational Psi: Collapsing the Problem Space of Psi Phenomena

Hartmut Grote[1]

A Brief Commentary on IΨ

The article from May and Marwaha presents ideas and hypotheses aimed at reducing the multitude of psi phenomena in order make them potentially explicable under the paradigm of information flow from "distant points in space-time" to an observer.

While simplification seems welcome under the idea of underlying unifying concepts, I am not too sure of the hypothesis that science always evolves towards simplicity in general. Particle physics with its zoo of fundamental particles may be an example to the contrary. Of course a search for a simpler underlying model is going on in particle physics as well, but it seems fair to say the outcome of that is unknown.

The term of "IΨ" is proposed for the underlying unifying process, and while a new name can be helpful for a new concept, I wonder if this name does not also evoke the contrary notion, namely that there then also have to be other forms of psi different from IΨ.

Leaving the name question aside I would agree with the authors that an "influence" of observers or agents onto physical systems (other than by the motor-system of the body) seems unlikely given the history and findings of the field. The example of the experiment the authors cite in this context is convincing. I find less convincing though how DAT can operate in making an agent make fine-tuned decisions in choosing, for example, the right time when to press a button to start a random sequence of events, while this type of fine tuning was excluded by arguments about neurology in the former cited experiment.

I also do not follow the logic about how the DAT protocol can be incorporated into any research protocols that use randomization and inferential statistics. The point is correct, but it is not a point to support DAT in particular. The same would also be true for a causal-psi model, where an agent may actively "influence" the randomization process. This process is not specific to DAT.

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The authors suggest that IΨ, as they understand it, may be split into the physics and neurology domains, and that all laws of physics have to be obeyed. Obviously, all physical laws have to be obeyed by a viable explanation of psi, but it may well be that physics needs to be extended to accommodate psi phenomena, if they exist. That current physics models are incomplete is long known and there are several puzzles in particle physics and cosmology that call for new physics beyond the standard model.

After all, I think its fair to say that none of the standard physics forces or fields are viable candidates to transport psi information, and I would assume the authors mostly agree with this.

Also in this context I was a bit surprised by the statement that the brain would not send out IΨ signals. If the signaling process is a physics-based one, then why would the brain (a physical system after all) not be able to send out psi information as well? Some remarks about how the "distant events in space-time" are different from processes in the brain may have been helpful here.

What I also miss in the article is a mention of alternatives to signal models, mainly theories that hypothesize entanglement correlations to explain psi phenomena. While perhaps not usable to transmit information, they would at least provide a possibility how to bridge space-like distances which otherwise cannot communicate to each other, being restricted by the finite speed of light.

And as a last remark, I find the term "collaps" for the reduction of the problem space slightly over the top. For my taste this analogy is too close to physics, like a conscious mind is observing the problem, and is has no choice other than to collapse. I would find a simple "reduction" of the problem space more adequate. But surely, a matter of taste.

Walter von Lucadou[2]

Neither Causal nor Information – Psi Always Slips Away and yet is Powerful

Since Hartmann Römer (see his comment in this issue) has already taken a detailed position from a theoretical point of view of the General Quantum Theory (GQT) and the Model of Pragmatic Information (MPI) in his comment on the article by Sonali Bhatt Marwaha and Edwin C. May: "Informational Psi: Collapsing the Problem Space of Psi Phenomena", I would like to restrict myself here to some empirical findings that the authors apparently disregarded in their presentation, although they should know them.

In September 1995, I have met Edwin May at the IGPP, at that time located at Eichhalde 12 in Freiburg, and discussed the IDS model—as he called it at the time—with him and explained my theoretical concerns as well as my experimental data to him in detail. Even then, I can't remember if he could not or did not want to say anything substantial about my arguments.

All psi experiments conducted according to the correlation matrix method (CMM) which started in 1982 until today (Kirmse, 2018; Lucadou, 1983, 2015b; Lucadou & Mischo, 1983) have shown that there are numerous significant correlations between psychological variables (questionnaires or behavioural variables) and the physical variables of the random process that do not appear in the equivalent matrix of the control runs, where the number of significant correlations usually does not differ very much from the expectation value. A recent meta-analysis (Lucadou, in press) of these experiments (10 independent studies with a total of 2,209 subjects) resulted in an alpha error of $1.0 * 10^{-8}$.

Nevertheless, the respective hit rates of all studies show no significant deviation from the expected mean-values. Due to the IΨ-model, this would not initially be expected, since a deviation from the expected mean was precisely the instruction for the subjects in these experiments. Of course, one could bring these results into agreement with the IΨ-model by certain post-hoc assumptions—but from such a point of view it seems to be rather unfalsifiable. However, it had been additionally shown with identical replications that even the most significant correlations never occur with the same psycho-physical variable pairs of the matrix, but "jump" to another matrix cell in strict replications. This behaviour is a direct consequence of the NT

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axiom (Lucadou, 2015a; Lucadou, Römer, & Walach, 2007) and thus a clear indication that the measured correlations are entanglement correlations and not a result of causal processes. Insofar it would be in agreement with one basic assumption of IΨ namely that psi effects cannot be explained by causal influences in the sense of a physical *causa efficiens*. On the other hand, in the IΨ model, one would expect that the underlying neuronal information processes leads to a more or less stable structure in the matrix, otherwise intrinsic information could not be reconstructed.

The clearest indication, however, that the IDS- or IΨ model cannot be correct is the fact that the comparison of different random generators REGs (Schmidt and Markow) revealed that the generator with the smaller scattering (Markow SD = $1/\sqrt{(n/12)}$, n = number of trials) produced clearer and stronger correlations than the Schmidt REG (SD = $1/\sqrt{(n/4)}$). From an information and entropy point of view one would expect the opposite.

I have published these facts over the years in several English-speaking peer-reviewed journals, so that the authors cannot claim to have known nothing about it—otherwise they didn't their homework properly. I wrote (Lucadou, Lay & Kunzmann, 1987): "Moreover, based on our data we can rule out the GESP-assumption of the IDS model. If the subjects could precognitively foresee fluctuations in a "prestabilized" sequence of random events which they then select for their own purpose by pushing the start-button in the right moment, it can be expected that random sequences which show large fluctuations at the display would be a better target that those with small fluctuations. Hence, the subjects should be more successful with the Schmidt runs than with the Markow ones. As pointed out above, we found the opposite." And further (Lucadou, 1987, 2006): "These findings raise a lot of theoretical problems concerning the so-called "observational theories". […] These correlations between psychological and physical variables are regarded as being non-local and they reflect the meaning (pragmatic information) of the display and the instruction given to the subjects. The assumption that the effect is due to precognition or intuitive data selection (IDS) is not supported."

Finally, it must be mentioned that on the basis of the GQT and the MPI it is not necessary to negate a large part of the spontaneous phenomena such as RSPK just because it does not fit the IΨ model. This shows that entanglement relationships (embodiment) can be quite powerful (Lucadou & Zahradnik, 2004, 2006).

One should at least expect that the authors of the article should discuss these well-known issues before they claim that "The varieties of psi phenomena discussed so far can be collapsed into and be considered as expressions of informational psi (IΨ)" and further: "[...] informational psi has the potential to address questions on the nature of time, causality, and information. This may be one of the biggest contribution" (Marwaha & May, 2019: 40, this issue).

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Assessing the Problem Space of Precognition: Can it be the Only Form of Psi? A Commentary on the Multiphasic Model of Informational Psi

Parapsychologists are typically concerned with unusual phenomena that do not easily fit into mainstream theories about the functioning of nature and the world. Hence, they are forced to develop new and often controversial theories to account for the observed phenomena. One of these theories developed by parapsychologists is the *multiphasic model of precognition* (MMPC; Marwaha & May, 2015a, b, c), which has been renamed by the authors to the *multiphasic model of informational psi* in the present publication without changing its basic structure and content (MMIΨ; Marwaha & May, 2019). In this model, *informational psi* (IΨ) is equated with precognition, and the MMIΨ rests fundamentally on the assumption that precognition is the only existing form of psi. Obviously, this is an unusual claim that challenges scientific researchers and theorists, especially parapsychologists. In fact, it is prone to running into several conceptual difficulties, especially when it builds on a reductionist physicalist world view like that promoted by Marwaha and May, in which mind/consciousness is regarded as a mere emergent phenomenon of brain chemistry that cannot have any effect on its environment. In the following, I will outline some of the difficulties with the MMIΨ, drawing from empirical findings of parapsychological research that Marwaha and May also seem to accept.

Scrutinizing the Central Axiom of the MMIΨ: Is Precognition the Only Form of Psi?

Fundamental problems of wave-based models of psi. Wave-base models of psi have a long tradition in parapsychology, but they have usually found only a few supporters. The MMIΨ belongs to the category of wave-based models because it rests on the postulate that IΨ must be loaded onto physical energy carriers such as gravity waves to be able to propagate backwards in time. Hence, the traditionally discussed problems for physicalist wave-based models also apply to the MMIΨ. These concern questions of how the percipients of extrasensory perception (ESP) are successfully selected among the millions of other potential percipients, how the often delicate timing of the ESP reception is accomplished, how mind/consciousness-related information including emotional content is loaded onto physical waves, and how this information is decoded to result in perceptions of events that mimic usual perceptions obtained via the normal

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sensory channels. None of these fundamental problems for physicalist wave-based models has been solved. As a consequence, wave-based physical models have, as mentioned above, always played a negligible role in parapsychological theorizing. Marwaha and May frankly admit that the postulated information carriers, potential mechanisms for loading information onto such carriers, and possibilities of their perception and the subsequent information decoding inside the brain are indeed not yet known. However, they don't mention the problems of percipient selection and timing, which are of at least similar importance, especially in collective and/or reciprocal ESP experiences. All these fundamental issues of psi theories are very difficult to account for in physicalist wave-based ESP models like the MMIΨ.

Varieties of extrasensory perception. Extrasensory perception is usually considered to include telepathy, clairvoyance and precognition. Interestingly, early psychical researchers had already noted that some of the gifted individuals they worked with seemed to be selectively gifted for one mode of ESP but not for another. An early example was provided by Sir William Barrett, who found that a girl he hypnotized was able to identify hidden targets correctly—but only when he knew the targets himself (Barrett, 1882–1883). Thus, telepathy seemed to work well with this girl, but not clairvoyance.[4] There are many more examples of such peculiar idiosyncrasies in the parapsychological literature. One of the best studied cases concerns the mediumship of Leonora Piper. After entering a state of deep trance, she often performed brilliantly with regard to retrieving information that was known to other living people who were present or absent (a telepathy condition), but she usually had great difficulty unearthing information that was not known to anybody alive (a clairvoyance condition. For a discussion of this aspect of Mrs. Piper's mediumship, see Moser, 1974). These idiosyncrasies pose difficulties for the MMIΨ. It should have been irrelevant for the hypnotized girl's and Mrs. Piper's supposed precognitive ability, be it based on direct precognition or on precognition relying on feedback, if other people knew the information to be gained at the time of the experiment, or not.

Moreover, drawing from the enormous amount of material on spontaneous cases but also certain experimental telepathy studies (e. g., Puharich, 1975), the following requirements have been identified as promoters for inducing a successful telepathic experience in which a "message" is conveyed (after Playfair, 2012):

4 Barrett regarded these phenomena as an example of "rapport", which, in its highest degree, has been described as the temporary unification of the minds of a mesmerized/hypnotized subject and the mesmerizer/hypnotizer. There are numerous fascinating and seemingly well-documented examples for rapport phenomena in the older literature of the 19th century, and they can be regarded as the highest form of telepathy (Moser, 1974). I believe some of them are difficult to explain with precognition, but space prohibits a more detailed discussion.

1. An emphatic bond between agent (sender) and percipient (receiver) greatly enhances the success of telepathic experiences; and the closer this bond is, the better.
2. The sender should be in an "adrenalized" or even frightened state, the receiver in a calm and relaxed state.
3. The sender must be faced with a fairly powerful emotional stimulus.

These conditions indicate that the mental state of the assumed sender can play a crucial role in successful telepathic events. Yet, the MMIΨ is exclusively concerned with the perceptions of the receiver, and it attributes them to precognition. As I understand the MMIΨ, an active sender of IΨ cannot even exist, and much less can a sender's emotions play a role as they merely belong to the emergent mind/consciousness and possess no objective properties that might affect the environment. The way in which an emotional bond between the two actors and the emotional state of one of these actors can promote the other's perception of IΨ that is presumed to arise from a future point in spacetime thus remains unexplained in the MMIΨ.

Apparitions. Analyses and discussions of apparitions have a long-standing tradition in the history of psychical research as well. Thus, they also need to be accounted for in the MMIΨ. In this context, Marwaha and May (2019: 38) cite a statement from a publication by Richard Broughton (2006: 150) stating that "from the earliest days of psychical research there was an awareness, if not a consensus, that classic ghost experiences were essentially a product of the mind of the percipient—an hallucination composed of images taken or constructed from the experiencer's memory." By citing this sentence, Marwaha and May seem to say that apparitions cannot have intersubjective or even objective attributes, and that their appraisal would be in agreement with that of the authors alluded to, namely Edmund Gurney, Frederic Myers, and Frank Podmore (1886), as well as Henry Sidgwick et al. (1894). This, however, is at best only half of the truth because these authors included telepathy as a crucial and indispensable part of veridical apparitional experiences. For example, in cases of veridical crisis apparitions, the initial impulse was assumed to originate from the person undergoing the crisis (the agent or sender discussed in the previous section). In cases in which apparitions were collectively and congruently perceived, Gurney assumed that the original and telepathically received impulse was transferred further by the primordial percipient to the other percipients by means of telepathy. Myers (1903) even assumed that telepathically transmitted impulses of the deceased might play a part in the formation of apparitions of deceased individuals (for a brief overview of these theories, see Gauld, 1968). Hence, because Marwaha and May deny the existence of telepathy, the MMIΨ disagrees with the theories of the early psychical researchers in fundamental respects and the latter cannot be used to legitimize the MMIΨ. Rather, the MMIΨ must offer alternative hypotheses about how veridical (crisis) apparitions that have been collectively and congruently perceived from different visual angles by different percipients can be explained by

precognition alone. Such collective and veridical apparition sightings can also include animals as co-percipients, even as primordial percipients that perceive the apparition first, as in a noted case described by Sidgwick et al. (1894: 227; see Nahm, 2016, for a discussion). Classical studies of collective cases that should be considered are, for example, represented by Hart et al. (1956), Hart & Hart (1932–1933), and Mattiesen (1936–1939). For reasons of space limitation, I won't expound on theoretical possibilities to explain such collective apparition sightings via precognition, but it is obvious that creating plausible explanatory models is quite challenging for the MMIΨ. The same goes for reciprocal ESP experiences of two or more people.

Cases of the reincarnation type. Events that happened before a supposed ESP-percipient was born cannot be perceived or known by direct precognition because such events are already past and cannot enter the mind of the percipient from a future point in spacetime. Thus, in the MMIΨ, if events from a pre-birth past are perceived via ESP, they must be attributed to precognition of *feedback* arising, for example, from discussions about the past events in question. This constellation applies, among others, to typical cases of the reincarnation type (CORT). In rather a superficial attempt to explain CORT, Marwaha and May refer to Michael Sudduth (2016), who argued that all survival-related phenomena can be accounted for at least equally well by living agent psi (Marwaha & May, 2019: 35). Marwaha and May then equate IΨ with living agent psi. Yet, as in their discussion of apparitions, in which they simply skip telepathy, the move to equate IΨ with living agent psi is highly problematic. Living agent psi is often called *superpsi* to highlight the very high quantity and quality of telepathy and clairvoyance required in this model. As a consequence, and because *superpsi* implies rather convoluted streams of reasoning to account for all survival-related phenomena, most parapsychologists who have considered the multifaceted phenomenology of CORT *in detail* still lean towards a survivalist interpretation regarding the best cases. For example, Stephen Braude (2003) argued that the "crippling complexity" of such CORT would ultimately tilt the scales towards survival.

Consequently, the elimination of telepathy and clairvoyance from the *superpsi* approach, as in the MMIΨ, results in a kind of *super-precognition* of received feedback arising from discussions and investigations of the case by the subjects' contemporaries. In addition, the feedback information perceived in this manner from a future point in spacetime would have to be transformed in such a way that it causes the young children to identify themselves with the personality of the supposed previous life. Simultaneously, all traces of the actual feedback situations need to be eliminated, never to enter the consciousness of the affected children. This information transformation would then have to have a rather powerful effect on the affected child, often still a baby, that can lead to such a strong identification with the former personality that it elicits nightmares related to the other life, phobias, peculiar behavioral habits and (language) skills, correct descriptions of earthly events pertaining to the time of the intermission period between the two lives, and even affect non-verbal fetuses and trigger the formation of birthmarks and birth

defects (Stevenson, 1997). Regarding the future families of the subjects or the families of the previous personalities, CORT may also include announcement and departure dreams, as well as other complications (e. g., Nahm & Hassler, 2011). The MMIΨ must also be able to account for the question of why this assumed *super-precognition* of CORT subjects is exclusively limited to feedback concerning the life of one particular deceased person, and to nothing else. Obviously, trying to explain all these diverse CORT facets with *super-precognition* alone results in a drastic increase in theoretical complications and questionable ad-hoc assumptions—*a super-crippling complexity* that renders the MMIΨ barely tenable. But the worst for the MMIΨ is still to come.

The need to distinguish between unknown information about the past and unknown information from the future. As mentioned above, young children who claim to remember a previous life in CORT cannot have obtained paranormally gained knowledge about the previous personality's life via direct precognition, but only via precognition of feedback received, for instance, via discussions about this previous personality. But where does the paranormally gained knowledge about the previous person's life come from in the first place? In the case of James Leininger, for example (Leininger & Leininger, 2009; Tucker, 2016; numerous alternative cases could be named), the parents and the other people involved in the unfolding of the CORT also had no knowledge about the previous person's life at first. They only started to collect information about the previous personality's life after the strange behavior and claims of little James motivated them to do so. Yet, in the parlance of the MMIΨ, one must assume that James first received precognitive information about the previous personality's life via feedback derived from his parents' activities. These activities, however, were in fact triggered by James' behavior, which must have already been influenced by the precognitively perceived information that should have been gained only later through the future activities of his parents.

At this point, the MMIΨ boils down to mere circular reasoning: A is presupposed to lead to B, but B is presupposed to lead to A. In this way, the true origins of A and B can never be explained. The issue to be explained always needs to be presupposed and is considered explained already. This is similar to the story of the Baron of Münchhausen who claimed to have drawn himself out of a swamp by pulling his own hair. This logical circle and unsolvable paradox is rooted in a grave conceptual problem of the MMIΨ.

This conceptual problem is that in explanatory models for precognition like the MMIΨ, which are based on an assumed entropy-driven linear time flow that runs from the past into the future in a physicalist macrocosm, it is of crucial importance to distinguish between unknown information from the past and unknown information from the future. Such a distinction is, however, not contained in the MMIΨ. Yet, it is important to understand that information gained precognitively from a future point in spacetime *principally cannot contain information from the past that is unknown to all individuals involved in the presently occurring precognitive*

affair (such as at the beginning of Leininger's CORT). The reason is that, from the perspective of the percipient(s) involved, such information is exclusively located in the "past light cone" (see Figure 3 of Marwaha & May, 2019: 18, this issue). And in the MMIΨ, information about an event that happened in an unknown past cannot transfer itself from the past light cone into the future light cone, and miraculously appear in there. The assumed entropy-driven precognitive information channel of the MMIΨ does not allow unknown past information to migrate into the future of a physicalist universe. Presently unknown information in the past light cone can thus also not be loaded onto gravity waves originating in the future light cone, and therefore also not travel backwards in time again to result in the assumed precognitive perception of this information in the present.

In other words: In the MMIΨ, retrocausation cannot be triggered by information from the past that is unknown in the present and at the future point in spacetime that is presumed to trigger the retrocausation that leads to the obtaining of this past information. Consequently, the origin of paranormally gained knowledge about the past in CORT, such as in Leininger's case, cannot, in principal, be explained by the MMIΨ, as this necessarily results in the demonstrated loop of circular reasoning.

However, if one still assumes that information from the past that is unknown to everybody involved in the unfolding of a CORT can somehow be perceived precognitively, as the MMIΨ implies, one cannot avoid introducing at least one more different ESP-like bypass or shortcut channel into the MMIΨ to render this information from the past light cone accessible in the future light cone. Then, however, the assumption that precognition is the only form of psi cannot be upheld in the MMIΨ, and it therefore needs to be refuted.[5]

5 The importance of distinguishing between unknown information about the past and unknown information about the future in precognition models like the MMIΨ cannot be overestimated. I would, therefore, like to elaborate a little further on this. Typical forms of precognition, such as the anticipation of accidents and precognition studied in laboratory settings or the *Star Gate* program, concern presently unknown information about the future. Thus, they match the conceptualization of the MMIΨ. ESP regarding unknown information about the past is, by contrast, usually not regarded as precognition, but as a retrocognitive form of clairvoyance. To regard retrocognition as precognition, as in the interpretation of CORT in the MMIΨ, necessarily results in the described paradox when it concerns information about the past that is unknown to the people involved.

This is also true for numerous other examples of ESP-mediated knowledge, such as all cases in which unknown veridical information from the past is obtained via afterlife communications, and certain data obtained in the context of mediumship research. A noted example is the case of Runki's leg (Haraldsson & Stevenson, 1975). Also here, the relevant information about Runki's life was not known to anybody involved in the unfolding of the case, and thus it cannot be accounted for by pure entropy-driven precognition. It can only be explained in the frames of survival or conventional concepts of living agent psi.

Wormholes undermining the MMIΨ. It is somewhat ironical that Edwin May himself has explicitly added such compromising ESP-channels to the MMIΨ in collaboration with Joseph Depp (May & Depp, 2015). They suggested that IΨ might travel through wormholes in a hyperdimensional space. According to May and Depp (2015: 140), time as we know it does not exist in that hyperdimensional space, but "all events that have happened, are happening, or will ever happen in our spacetime exist simultaneously." In this hyperdimensional space, wormholes are assumed to function as shortcuts that connect "*any* two points in spacetime regardless as to where they are in that four-dimensional space" (May & Depp, 2015: 141; emphasis in the original). This means that these wormholes are thought to be able to mediate the flow of IΨ between all possible points in the past, present, and future spacetime. Concerning explanatory frames for psi phenomena, I sympathize with hyperdimensional models of the universe as well (Nahm, 2007). However, the above-mentioned properties of the supposed wormholes contradict the very essence of the MMIΨ: Obviously, real-time clairvoyance, retrocognition, and even telepathy (in case that people's brains are directly connected in real-time) must also then be allowed to exist in addition to precognition. Therefore, Marwaha and May's laborious attempts to substantiate that precognition must be regarded as the only form of psi are redundant and dispensable. In a hyperdimensional universe full of potential wormholes that can mediate the flow of information between all points in spacetime, precognition can only be regarded as one type of manifestation of ESP among others, just like in previous and more conventional models of ESP.

Concluding Comments

If one accepts the general veracity of the empirical findings of parapsychology considered in this article, precognition cannot be the only form of psi. Hence, if the conceptual implications of the MMIΨ for ESP are thought through to the end, the fundamental axiom of the MMIΨ must be regarded as refuted. Yet, that is not true for every aspect of the MMIΨ. For example, I am particularly intrigued by the possibility that the amount of entropy generated in a given situation might exert a decisive effect on the success of a precognition experiment. I can well imagine that this might indeed be the case, and would thus encourage further studies on this topic. A potentially related issue that could be addressed in precognition experiments concerns the question of whether occurrences that involve exceptionally intense emotions in large

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The same is true for a theoretical mediumistic case constructed by Marwaha and May (2016: 92). When the experimenter dies and takes the outcome of the experiment (which is known to nobody else) to his grave in this constructed case, this outcome becomes inaccessible information in the past light cones of all surviving individuals. Hence, it cannot be retrieved by these surviving individuals via an entropy-driven backward flow of information from within the future light cone, as assumed by Marwaha and May.

numbers of people would be more successful than trivial occurrences concerning only a few individuals. Such emotionally intense events often accompany increased physical entropy generation as well and it would be an interesting and challenging task to differentiate between the two possible triggers.

Moreover, I perfectly agree with Marwaha and May's notion that psi is a fundamentally unitary phenomenon that transcends the properties of our familiar spacetime. The available mass of parapsychological research results strongly suggests that ESP and also psychokinesis (PK) are best regarded as belonging to a phenomenological continuum of psi that manifests in different facets reflecting different poles or properties of it.[6] It might therefore well be that aspects of the MMIΨ, but also aspects of other theories and philosophical frameworks outlined, for example, by May & Marwaha (2015) and Kelly, Crabtree, & Marshall (2015) have their place in an encompassing theoretical frame that can account for the similarities and variances of different psi phenomena. However, one should be careful when regarding any of the more specific theories as potentially able to account for *all* reported psi phenomena. Although I regard psi to be a unitary phenomenon, it is also likely to be an utterly complicated affair that is very difficult to penetrate with our familiar logical thinking, which developed over the course of evolution to cope with the more reliably occurring macroscopic events within our small window of conventionally perceived spacetime. In addition, it is my impression that many of the more specific theories, such as the MMIΨ, stand largely separate and that a real constructive dialogue between the proponents of different psi models in parapsychology has so far not taken place. Marwaha and May have already offered a tentative comparison of other available models elsewhere (e. g., Marwaha, 2018; Marwaha & May, 2015c, d), and I hope that recent developments such as the presentation of some theories and possible relations to other models, as in a recent issue of the *Mindfield Bulletin* of the Parapsychological Association (issue 10/3, 2018), will trigger such a constructive dialogue. Only such dialogue can lead to a "Modern Synthesis" of psi theories, similar to the "Modern Synthesis" developed by 20th century evolutionary biologists in which several seemingly separate and disparate theoretical concepts were successfully united into an encompassing frame subsuming different sub-theories (Mayr & Provine, 1980). Should such a "Modern Synthesis" of psi theories be developed, it would require an active and vivid dialogue between the different protagonists in which seemingly negligible details of hypoth-

6 I abstained from commenting on PK in this Commentary, but one remark seems apt. One might already regard telepathy as a special form of PK, thus emphasizing the unitary nature of all psi phenomena. At least, if the mental state of one person can affect the mental state of another, this results inevitably in accompanying changes of the correlated neurophysiological processes in the latter's brain. A particularly promising method for investigating these phenomena further consists of applying physiological measurements in experiments with identical twins who share a close empathic bond (Jensen & Parker, 2012; Parker & Jensen, 2013; Playfair, 2012, 2017).

eses and theories would also have to be considered. Moreover, these discussions should be guided and shaped by an objective assessment of available empirical data from parapsychological research and a thorough acquaintance with them, not on preconceived assumptions that determine *a priori* which phenomena are allowed to occur and which are not. This process would be expected to involve controversial discussions, but after all, such discussions in which the strengths and weaknesses of particular theoretical approaches are meticulously carved out are necessary for real progress in theorizing about psi. I hope that my criticism of the MMIΨ will be received in this constructive spirit.

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Dean Radin[7]

Yes, But What is New?

Marwaha and May's (M&M) physicalist model of "informational psi" aims to unify the various ways that psi experiences manifest, offering the promise that descriptive terms of apparently different experiences, like telepathy, clairvoyance, precognition, psychokinesis and survival phenomena, can ultimately be collapsed into a single phenomenon. The urge to identify commonalities among apparently different phenomena is laudable because when successful, it can lead to a much deeper understanding of the underlying mechanisms.

Readers unfamiliar with M&M's previously published articles may find elements of this single target article insufficiently detailed, but even without the full details the point of their proposal is clear. To paraphrase, psi is conceived as a unitary psychophysical phenomenon involving the transfer of nonlocal information carried via signals, which are perceived by unknown processes in the brain.

This proposal is straightforward enough, but it is not a new idea. That is, as M&M mention in their article, the idea that telepathy and clairvoyance might be a unitary process was discussed by J. B. Rhine in 1945 (Rhine, 1945), and a year later R. H. Thouless and B. P. Wiesner (Thouless & Wiesner, 1946) proposed thinking about different psi phenomena "not as effects of different paranormal capacities (telepathy, clairvoyance, and precognition) but rather as manifestations of one single paranormal capacity […]" (p. 107), adding that "psychokinesis […] is probably to be regarded as a phenomenon of the same order and it may be considered

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as the motor aspect of psi" (p. 116). Similarly, the idea of applying informational concepts to understanding psi was proposed over a half-century ago (Cadoret, 1961), and psi as a type of signal was used metaphorically over a century ago by Mark Twain in a series of experiences he described as "mental telegraphy" (Twain, 1891).

This is not to say that the proposal is wrong. But what makes M&M's article unsatisfying is that it provides no new answers to the key questions that have been discussed without resolution for many decades. The only accepted physical theory that allows for the kinds of nonlocal connections required by M&M's proposal is quantum mechanics (QM), but in its orthodox form QM disallows any form of signaling. In addition, no clues are provided for what processes in the brain might be able to receive nonlocal signals, nor are there any hints about the source of such signals.

Proposing a physical theory for psi is understandable, and even desirable, because it would provide an explanatory framework for the ample empirical evidence for psi without challenging the prevailing scientific worldview. That in turn might allow psi to become mainstreamed more easily. However, even if the problem of transmission and reception of nonlocal signals were solved, the proposal still fails to solve an important problem raised by J. Beloff (1970):

> For all their ingenuity, such [physicalist] theories are really nonstarters. They concentrate on the energetics of the psi process while ignoring its even more intractable informational aspects. For the crux of the problem, as I see it, lies, not so much in specifying what kind of energy might surmount spatial and temporal distances or material barriers, but rather in explaining how it comes about that the subject is able to discriminate the target from the infinite number of other objects in his environment. Perhaps my point can best be illustrated with the help of an analogy: Imagine that sound waves were no longer attenuated with distance. It would follow that every conversation going on for miles around would be equally audible to you. But by this very fact, every conversation would be equally unintelligible. (p. 138)

In the above quote, Beloff's use of the term "informational aspects" was not meant in the entropic sense, but rather in the sense of meaning. If we reside in a spacetime with a potentially infinite number of nonlocal signals floating about, how can one focus on the one signal of interest? M&M appropriately noted this as an unsolved question, but this problem has been repeatedly asked for a long time with no clear resolution in sight. One conceivable answer is that the brain can only perceive its own future state, perhaps because of the presence of time-symmetry in the elementary particles that compose the brain. If that were the case, one could argue that all forms of psi must involve the brain acting in some sort of temporal resonance with its own future state. An earlier formulation of M&M's (2015) theory proposed something like this, but perhaps that idea was dropped because precognition experiments indicate that precognition

can operate at many orders of magnitude longer than the sub-nanosecond time frame where time-symmetry exists in the sub-atomic realm.

In sum, despite the shortcomings in M&M's proposal, it is useful to periodically repeat proposed models of psi in the hopes that someone not familiar with the earlier literature will encounter the challenge afresh and offer a novel solution. For those who do know the relevant literature, it is interesting to see how difficult it has been to move beyond established concepts, which in turn suggests that a conventional physicalist model may simply be inadequate. However, there is one interesting clue that is very briefly mentioned in M&M's paper: Evidence that changes in entropy seem to be correlated with psi performance. That provides a constructive clue because a similar relationship is observed in the ordinary senses, thus supporting the idea that psi is processed like an ordinary sensory system. Such similarities are discussed in theories like J. Carpenter's *First Sight*, indicating that maybe some aspects of brain processing are involved in psi perception. This possibility does not solve the signaling problem, but it's a start.

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Hartmann Römer[8]

Remarks on Informational Psi

The main message I infer from reading the paper of Sonali Bhatt Marwaha and Edwin May published in this issue is twofold:

1. Psi effects cannot be explained by causal influences in the sense of a physical *causa efficiens*.
2. All psi phenomena can be reduced to precognition which, in turn, is due to a physical entropic mechanism of information flow from the future and localisation in a perceptional apparatus.

While I fully agree to the first statement I have strong reservations with respect to the second one.

- There may in principle be a way to insist on reducing all psi phenomena to precognition, but it seems to be very hard to reconcile this view with observed phenomena (see e. g the comment by M. Nahm, 2019, in this issue).
- A decidedly physicalist-reductionist world-view forces the authors to employ Shannon's notion of quantified information, stripping off from information any aspect of meaning. On the other hand, multiple experience with psi phenomena points to a crucial importance of meaning and emotion.
- Physical mechanisms for the transfer of information from the future are not established and have to be very unusual and speculative if not bizarre.
- Even if such a mechanism were identified, it would be very difficult both to reject causal influences and to keep information flow.
- It is not clear how a receiver's mind would tune in to filter and capture very specific signals from the future and to reconstruct their meaning.

Searches for stable and reliably usable signals in psi research were consistently frustrated. Even the big and extensive *Star Gate* project, in which one of the authors played a leading role did not identify a clear, unambiguous and unanimously accepted psi signal. This accumulated

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negative evidence should leave one prepared seriously to consider the notion of *synchronicity* as envisaged by C. G. Jung and W. Pauli, according to which psi phenomena should not be understood as causal influences or informational signals but rather as meaningful coincidences, i. e. as merely constellational holistic features of some systems. Admittedly, a physical reductionist does not tend to be sympathetic with such a view, but countless examples show that such situations undeniably exist. For instance, the correlations between angles or lengths in a triangle are meaningful but certainly not a result of causal influences or transmission of information. Moreover, they are completely unrelated to time.

The models of Pragmatic Information (MPI) (Kornwachs & Lucadou, 1982; Lucadou, 2015a) and Generalised Quantum Theory (GQT) (Atmanspacher, Römer & Walach, 2002; Filk & Römer, 2011) are attempts to cast the idea of synchronicity into a more concrete and workable form. GQT is not a physical theory but rather some kind of a general non-commutative system theory. MPI can be understood as a special case of GQT. Just like synchronistic correlations, the entanglement correlations of GQT are unrelated to time and neither causal nor informational in their nature (Lucadou, Römer & Walach, 2007). The impossibility to transmit controllable causal actions or informations by entanglement correlations is expressed as an "Axiom NT" in GQT. In spite of its negative formulation it has several positive consequences in accordance with many observations:

- What looks like a causal or informational signal at first sight is in danger to be wiped out in the sequel by "decline" or "evasion" (shift and reappearance at unexpected places).
- A reciprocity of effect size and reliability of psi effects is predicted.
- "Matrix" strategies for efficient psi experiments can be developed on the basis of GQT. (Lucadou, Römer & Walach, 2007; Lucadou, 2015b, in press)

In contrast to this, informational psi (IΨ) does not seem to offer a good explanation for the smallness and elusiveness of psi effects. Moreover, the above-mentioned theoretical difficulties of IΨ are absent in synchronistic "no signal" theories. In this sense, IΨ is not the unchallenged sweeping theoretical breakthrough and one wonders, why apparently viable synchronistic alternatives are not mentioned by the authors.

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