

# An Alternative View of Schizophrenic Cognition

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## ABSTRACT

An alternative view to the traditionally held view that schizophrenia is characterised by severely disordered cognition is presented. It is possible that apparently self-contradictory expressions of schizophrenics are well-formed communicative expressions of highly ordered cognitive systems. Building on the premise that behaviour is in general communicative, and using Gödel's Incompleteness Theorem from logic as a model, it is shown that the most characteristic symptoms of schizophrenia (namely apparently self-contradictory thought, delusions and hallucinations) may indicate truths that cannot be derived within highly ordered cognitive systems.

## TEXT

Schizophrenia is generally considered a mental illness characterised by severe cognitive dysfunction. This dysfunction may occur in the perceptual, thought, and/or linguistic processes of the individual diagnosed as schizophrenic. The general clinical goal concerning the apparently disordered cognition characteristic of schizophrenia has been the return of the schizophrenic's cognition to ordered functioning. In the 1950s, Bateson, Jackson, Haley, and Weakland<sup>2</sup> proposed that schizophrenic communication is characterised, and induced, by the double-bind, an apparently self-contradictory form of communication. The work of Bateson *et al.*, and the work that followed in the direction set by these researchers, emphasised the role of communication in understanding schizophrenia.

In this paper, the schizophrenic's communication that links him to the world is considered to reflect his cognitive process. The consideration of the schizophrenic's communication in this manner will lead to the conclusion that the cognition of the schizophrenic is not necessarily disordered. Instead, it will be shown that the cognition of the schizophrenic may manifest a highly ordered logical system and that it is the high functioning of that cognition that is expressed in the apparently self-contradictory communication discussed by Bateson and his colleagues. In order to demonstrate this point, it will be necessary to explore a theorem from the field of logic, namely Gödel's

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Incompleteness Theorem. This theorem will provide a framework from which the cognitive process of the schizophrenic can be understood.

### COGNITION AND LOGIC

Ordered cognition can be termed consistent, where the term *consistent* is borrowed from logic. In logic, the foundation of a logical system is a set of fundamental propositions or statements and rules to manipulate these fundamental propositions so that other propositions can be derived. A logical system is consistent when it is not possible to derive a proposition and its negation in the system. (A proposition derived in terms of the fundamentals of the system is called a theorem.) Importantly, a proposition derived in a consistent logical system is presumed to be true (*i.e.* it corresponds to ‘the way things are’). For example, if one has a consistent logical system describing arithmetic, then those theorems of the system would correspond to ‘the way things are’ as regards arithmetic. Similarly, ordered thought may be termed consistent when it does not allow a deduced thought and its negation to both be reasoned from a particular set of premises. A deduced thought in an ordered system of thought that is consistent is considered true, meaning that it corresponds to reality.

Relying on the field of logic, the argument can be made that the achievement of this consistency of thought has a price, namely that the logical structure characterising thought is incomplete.<sup>3-6</sup> In logic, a logical system is complete when all truths can be represented by theorems of the system. This system is incomplete when there exists at least one truth, indicating an element of ‘the way things are’, for which a corresponding theorem does not exist in the system. Applied to cognition, the term *incomplete* means that the logical system that can be used to characterise mature human thought is incapable of generating statements corresponding to all truths concerning those areas with which this thought is concerned.

Further, this logical system characterising thought is incomplete in a particular way, namely through a statement that comments on itself and, indeed, denies its own provability. It is Gödel who, in logic, provided the means for this self-referential possibility of a statement commenting on itself. This incompleteness is particularly intriguing because when a statement comments on itself, the notion of ‘the way things are’ can be applied to itself. There is a potential coincidence of ‘the way things are’ and the logical processes used to deduce ‘the way things are.’ This is in contrast to the common circumstance in

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which ‘the way things are’ refers to something external to the logical system and to which results obtained with the logical system apply.

It should be noted that while it is incorrect to equate any particular logical system from mathematics with cognition, the type of logical system that is the focus of Gödel’s Incompleteness Theorem encompasses many of the features of mature cognition found in Western culture. Less powerful logical systems might not be susceptible to the interesting form of incompleteness found in the systems with which Gödel is concerned, but our concern is with a system that can act as a model of mature cognition, a system of powerful reasoning. It should be noted that Gödel’s Incompleteness Theorem is concerned with arithmetic and its logical foundations. Arithmetic is a powerful system of reasoning, and yet individuals of at least normal intelligence possess the fundamentals of arithmetic and are quite facile with them.

In addition, it is reiterated that the apparently self-contradictory nature of schizophrenic communication does not negate the possibility that schizophrenic cognition is highly ordered. Indeed, the particular nature of this apparently self-contradictory communication indicates that schizophrenics may possess a highly ordered cognitive structure. Also, the fact that schizophrenics often express what are generally considered lucid thoughts that clearly reflect powerful reasoning is an additional indication that the focus of concern ought to be a powerful cognitive system.

At first look, *Principia Mathematica*<sup>7</sup> and related logical systems with which Gödel was concerned in general appear capable of the consistency and completeness one would ideally like to find characterise mature thought. Gödel showed that in order to maintain consistency of such a system, the system is incomplete. Similarly, the consistency and completeness generally assumed to characterise highly ordered cognition may also not be the case.

Consistency and completeness are two prized characteristics of a logical system. The need for completeness is evident. As for consistency, it can be shown that if one well-formed proposition and its negation can both be derived in a logical system, then for any well-formed proposition that can be derived in the system, its negation can also be derived. The system then cannot be relied on to produce true propositions (*i.e.* propositions that correspond to ‘the way things are’).

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### INCOMPLETENESS

Consider the following well-formed proposition in a logical system like *Principia Mathematica* (*i.e.* a proposition obeying certain guidelines for its formation but which is not necessarily a theorem) and which is similar to the proposition used by Gödel:  $G$  (where  $G$  is a well-formed proposition in the logical system) is not a theorem of the logical system.

Engaging in a typical procedure in logic for determining whether or not a proposition is true, assume that  $G$  is indeed a theorem. Then  $G$  corresponds to ‘the way things are’ and expresses a truth. If  $G$  is a theorem, then what  $G$  states is true. What  $G$  states is:  $G$  is not a theorem of the logical system. Thus, when  $G$  is true,  $G$  is not a theorem of this system. This line of reasoning is inconsistent.

Now, assume that  $G$  is not a theorem of the logical system, that ‘the way things are’ is that  $G$  is not a theorem. This means that  $G$ ’s assertion that  $G$  is not a theorem in the logical system is true. Thus  $G$  expresses a truth when it is not a theorem in the logical system. That  $G$  is not a theorem and yet is a well-formed statement in the system and true appears odd. But this circumstance only indicates that true, well-formed propositions are not invariably theorems, even in a system as apparently reasonable as the *Principia Mathematica*. It seems all the more surprising because the true, well-formed propositions in the case at hand are concerned with theorems in the logical system. One would expect that a powerful logical system would be consistent and complete with regard to itself.

Assuming that  $G$  is or is not a theorem and following up on the consequences of these assumptions with regard to whether  $G$  is true constitutes reasoning outside the logical system of which  $G$  is a well-formed proposition. Further, as  $G$  is true, the negation of  $G$  is false. The negation of  $G$  asserts that  $G$  is a theorem of the logical system. (It seems an odd result that the negation of  $G$  is false since  $G$  is true and, as noted, would be expected to be derivable in the logical system.) Thus, the consistency of the logical system of which  $G$  is a well-formed proposition is not undermined by  $G$ . Reasoning outside the system,  $G$  has been found to be true and the negation of  $G$  has been found to be false. The logical system of which  $G$  is a well-formed proposition, though, cannot demonstrate its own consistency because it cannot derive  $G$  or  $\neg G$  (*i.e.* the negation of  $G$ ).  $G$  is not a theorem of the logical system (and thus cannot be derived) since  $G$  is true. The negation of  $G$ , namely that  $G$  is a theorem of the logical system (and is thus derivable), is not true (and thus cannot be

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derived) because G is true. Thus, within the system, G is an undecidable proposition.

### SCHIZOPHRENIA AND G\*

This result can be applied to the logical system characterising mature thought. There may exist propositions of the type G (call them type G\*) that indicate that this thought is incomplete. G\* is a statement that meets minimal grammatical standards and reflects a certain recognisable cognitive form, though the cognitive element expressed in this statement does not need to correspond to 'the way things are.' G\* can be called a well-formed communicative statement. Schizophrenic statements, and often the statements of 'normal' family members related to a schizophrenic, express G\* most clearly. In the following quote, Searles attempted to show that a 'normal' individual's behaviour can appear to be self-contradictory in the same way as can that of a schizophrenic. As Searles noted, this example is also very likely an accurate portrayal of the schizophrenic individual discussed as regards the apparently self-contradictory nature of his communication. Although the focus in the present paper is on the apparently self-contradictory nature of the schizophrenic's communication, the same basic analysis can be applied to the 'normal' family member's communication.

One deeply schizophrenic young man's mother, a very intense person who talked with machine-gun rapidity, poured out to me [Searles] in an uninterrupted rush of words the following sentences, which were so full of *non sequiturs*, as regards emotional tone, that they left me momentarily quite dazed: "He was very happy. I can't imagine this thing coming over him. He never was down, ever. He loved his radio repair work at Mr. Mitchell's shop in Lewiston. Mr. Mitchell is a very perfectionistic person. I don't think any of the men at his shop before Edward lasted for more than a few months. But Edward got along with him beautifully. He used to come home and say (the mother imitates an exhausted sigh), 'I can't stand it another minute!'" (Searles, pp. 3-4)

Here, the statements of concern by the son, as related by his mother, are the implicit statement, (1) "I am happy working at Mr. Mitchell's shop," and the explicit statement (2) "I can't stand it another minute!" Another way of stating (2) is "I am miserable working at Mr. Mitchell's shop."

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If one questions whether such apparently contradictory statements such as (1) and (2) taken together can ever be considered a well-formed communicative statement of a highly ordered cognitive system, Gödel showed in logic that a similar statement (of type G) is not necessarily characteristic of what would generally be considered a severely disordered logical system. Indeed, (1) and (2) can be a well-formed statement of a highly ordered cognitive system.

It should be noted that this does not mean that G\* necessarily indicates the presence of highly ordered cognition in all individuals diagnosed as schizophrenic. Schizophrenia is a diagnostic category applied to individuals manifesting a wide variety of symptoms and who have had widely varying life experiences prior to the development of their particular symptoms. But for those schizophrenics who show evidence of highly ordered cognition in addition to their apparently self-contradictory behaviour, this discussion provides a theoretical framework in which this seeming incongruity between order and disorder makes sense.

Instead of dismissing the implicit and explicit statements of the schizophrenic son, as related by the mother, as simply a manifestation of severely disordered thought, the statements together can be considered the statement G\*. Like G, G\*, made up of (1) and (2), is self-referential in that (1) and (2) each refer to the other and do so due to having a common subject, namely the son. In considering (1) and (2) together as G\*, G\* *comments* on itself, namely that it is not the result of an ordered cognitive process. Schizophrenic cognition may indicate that an ordered cognitive system cannot demonstrate all truths, in particular where these truths are concerned with thought itself.

In order to clarify the nature of G\*, consider an individual who makes the statement, "I am lying." Reference here is *not* made to the well-known liar paradox, where the contradictory statements are not hierarchical and thus cannot comment on one another. Rather, "lying" here refers to a *comment* regarding the derivability of an individual's *communication* in accord with his cognitive system. The statement "I am lying", like all statements used for communication, only makes sense for a listener (*i.e.* is conveyed to the listener) if the speaker is assumed to be telling the truth. The statement, "I am lying", is a well-formed communicative statement. The implicit statement on the speaker's part, namely "I am telling the truth," is generally considered to mean, "This communication has been developed in accord with my reason and I

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maintain corresponds to ‘the way things are.’” (The implicit statement, “I am telling the truth”, and the statement, “I am lying”, make up G\*, the speaker’s communication.)

If the speaker’s *communication* expresses the results obtained with his reason (that this is ‘the way things are’), then the content of the communication must also have this quality. And when the content of the communication (*i.e.* the speaker’s explicit statement) refers to the communication itself, then the communication itself must also have the qualities found in the content. In the context of the implicit statement, “I am telling the truth,” if the content of the communication is “I am lying,” then I am lying. As the negation of the statement “I am telling the truth,” the statement “I am lying” means, “This communication has not been developed in accord with my reason.” And because I am lying, the statement is ‘the way things are.’ If ‘the way things are’ is that the communication has indeed been developed in accord with my reason, then how can ‘the way things are’ also be that this communication has not been developed in accord with my reason? There is a contradiction. Similar to G, G\* represents a potential coincidence of ‘the way things are’ and the reasoning processes used to indicate ‘the way things are.’

If, on the other hand, it is maintained that the implicit statement, “I am telling the truth,” only appears to indicate that the speaker’s communication reflects the ordered functioning of his cognition, but does not actually do so, then the statement “I am lying” relates a truth. (Remember that “I am lying” asserts that the *communication* is not derived in the cognitive system.) This truth is, “My communication does not indeed reflect the ordered functioning of my cognition.” There is no contradiction between ‘the way things are’ in this instance and the communication of the speaker. As the original assumption that G\* reflects the speaker’s ordered cognition leads to a contradiction and the assumption that G\* is not the result of the speaker’s ordered cognition does not, the conclusion is justified that the speaker’s statement “I am lying” relates a truth when the speaker’s communication is not a result of his highly ordered cognition. *The truth expressed is that the speaker’s communication does not reflect his ordered cognition.*

As concerns the schizophrenic son, statement (1), “I am happy working at Mr. Mitchell’s,” corresponds to the implicit statement, “I am telling the truth,” and statement (2), “I am miserable working at Mr. Mitchell’s,” corresponds to the explicit statement, “I am lying.” As noted, (1) and (2) make up G\*. The analysis that has just been presented for the explicit statement “I

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am lying” is now applicable to the schizophrenic son’s statement, “I am miserable working at Mr. Mitchell’s shop.” As noted,  $G^*$  is self-referential and denies its own ability to be derived as a product of highly ordered cognition. If ‘the way things are’ is that  $G^*$  is such a product, the result is an inconsistency. If  $G^*$  is not such a product, then  $G^*$  is found to express a truth which is not derived in the highly ordered cognitive system of which  $G^*$  is a well-formed statement.

Assuming that  $G^*$  is or is not the result achieved in a highly ordered cognitive system and following up on the consequences of these assumptions with regard to whether  $G^*$  is true constitutes reasoning outside the logical system of which  $G^*$  is a well-formed communicative statement. In addition, as  $G^*$  is true, the negation of  $G^*$  (namely, that  $G^*$  is the result of a highly ordered cognitive process) is false. (It seems an odd result that the negation of  $G^*$  is false since  $G^*$  is true and would be expected to be derivable in the cognitive system.) Thus,  $G^*$  does not undermine the consistency of the cognitive system of which  $G^*$  is a well-formed communicative statement. The cognitive system of which  $G^*$  is a well-formed statement, though, cannot demonstrate its own consistency because  $G^*$  or  $\neg G^*$  cannot be derived in the ordered cognitive system. The assumption that  $G^*$  is a result of an ordered cognitive system leads to an inconsistency. The negation of  $G^*$ , namely that  $G^*$  is a result of the ordered cognitive system, is not true (and thus cannot be derived in an ordered cognitive system) because  $G^*$  is true. Thus, within the system,  $G^*$  is an undecidable proposition.

### DELUSIONS AND HALLUCINATIONS

Essentially the same analysis applied to the explicit statements of the schizophrenic that are intended for verbal communication can be applied to other aspects of his behaviour, in particular well-organized delusions and hallucinations. Delusions and hallucinations are a needed element in a psychological theory incorporating an absolute view of the world, a view in which the world is one way and exists independently of the experiencing individual.<sup>9</sup> In more traditional terms, a delusion is generally considered a belief that does not correspond to ‘the way things are,’ and a hallucination is a perception that does not correspond to ‘the way things are.’ Delusions and hallucinations often have very sophisticated structures which can be called ‘well thought out’ and yet do not correspond to what ‘normal’ individuals maintain are ‘the way things are’. For ‘normal’ individuals, this lack of correspondence is considered a reflection of the schizophrenic’s disordered cognition. If there



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is a correspondence between belief and perceptions on the one hand and ‘the way things are’ on the other, as is presumed for ‘normal’ individuals, the correspondence is considered to reflect the ordered cognition of these individuals. Delusions and hallucinations, then, have to do with the derivability of beliefs and perceptions in an ordered cognitive system.

Traditionally, delusions and hallucinations are simply considered evidence of severely disordered cognition. Consider, instead, that schizophrenic function is based on a significantly ordered cognitive system. (Remember Gödel’s Incompleteness Theorem indicates that very odd results can be obtained from a highly ordered and powerful logical system.) Then delusions and hallucinations would correspond to a statement, “I am lying” in the above development of  $G^*$ . What  $G^*$  indicates in this case, is that there is a truth, namely the expression of a delusion or hallucination, that apparently reflects ordered cognition (is “well-formed”) but does not actually do so.

### CONCLUSION

Using Gödel’s Incompleteness Theorem as a model, it has been shown that schizophrenic cognition does not necessarily have the severely disordered character that it is traditionally considered to have. It is very possible that some of the apparently self-contradictory expressions of schizophrenics, including delusions and hallucinations, are well-formed communicative expressions of highly ordered cognitive systems and indicate truths that cannot be derived within such systems. The alternative model presented is supported in part by the generally acknowledged frequent occurrence of lucid and powerful thought in many of those diagnosed schizophrenic in addition to their apparently severely disordered thought.

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