

# Do Schizophrenics Experience Emotion But Differ In Expression?

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## Abstract

Emotion processing is an interesting area of neuropsychiatry research, especially in schizophrenia. The age-old concept is that schizophrenics are non-emotional personalities; because of the differences in the inner emotional feelings and its outward expressions (Bleuler and Kraepelin). So, there must be some dissociation between the emotional experience and expression. Electronic journal-database search followed by a systematic meta analysis of the recent nuclear imaging studies (Positron Emission Tomography or PET, Single Photon Emission Computed Tomography or SPECT, and fMRI or Functional Magnetic Imaging) studies reflecting schizophrenics also experience emotion alike normal persons but with some deficit of perception and usually with different expression of that perceived emotion. Disorders of limbic system could be the possible reason for such "split" between the emotional perception and expression.

## INTRODUCTION:

Schizophrenics are defined as persons with 'affective flattening' and 'split-personality' (Bleuler, 1911\1950, 362), while Kraepelin (1919, p74-75) defined schizophrenics as those who present with the "loss of inner unity of the activities of intellect, emotion, and volition". These two researchers put a 'stamp' on schizophrenics as if they are emotionally poor and that stamp serves as the prerequisite criteria of the schizophrenia-definition still now. Currently emotional processing in schizophrenics is a tantalizing area of research to find out whether inner emotional experience and its outward expression dissociates (is this the "split personality"?) and if so, stimulus for further study becomes manifold to understand the possible underlying mechanism of such split.

Functional and structural neuroimaging has gained tremendous popularity to localize brain-areas related to neuropsychiatry disorders, their metabolic status, drug-receptor docking etc. to evaluate the underlying emotional and cognitive processing and also to set relevant treatment plan in the concerned illnesses. PET, SPECT and fMRI are popular methods, practiced in psychiatric research either alone or in combination.

## AIM:

The present article is a Meta analysis of such imaging studies with an effort to find out a) how schizophrenics

experience emotion, b) are emotion processing deficit in them, c) any relevance of 'split personality' (could be the dissociation process) in reality and neurobiologically, d) possible reasons behind such dissociation in schizophrenics, e) implication of such imaging studies in the treatment and f) future research proposals to understand the psychobiology of emotion processing in detail.

## MATERIAL AND METHODS:

Literature search from relevant journal bank, available in the electronic database and libraries and in the Web (MEDLINE, MEDSCAPE, Pub Med, PsychLit, PsychINFO etc.) followed by Meta analysis of relevant studies using PET, SPECT and fMRI in the normal and schizophrenic brains to evaluate emotional processing and expression in them.

Studies showing structural and functional pathologies are correlated with the emotional processing in the schizophrenic and normal brain are included. Other psychiatric illnesses, autistic disorders, studies with neurophysiological dissociations are excluded from the study because of the scarcity of the sample and difficulty in putting altogether as a single variable.

## DISCUSSION:

This section describes the present state of detail literature survey in the following sections:

### **A. EVIDENCES THAT SCHIZOPHRENICS EXPERIENCE EMOTION AS NORMAL PERSONS:**

PET studies are important in chemical and physiological brain imaging as it can detect in-vivo brain metabolism, disturbances in cerebral blood flow and glucose metabolism (McClure et al, 1998). Selective PET studies of recent past have shown that alike normal subjects in schizophrenics, orbitofrontal cortex, amygdala, right temporal pole are activated during processing sadness but no activation of amygdala while viewing angry faces (Blair et al, 1999), fear is processed in the central gray matter of midbrain, bilaterally in the hypothalamus, thalamus, left striatum, right and left anterior cingulated and right prefrontal cortex (Fischer et al, 2000), pleasant emotion is processed in the ventral striatum, midbrain, amygdala, orbitofrontal cortex, and ventral prefrontal cortex (Blood et al, 2001).

Functional Magnetic Resonance Imaging (fMRI) is another useful technique to analyze the cerebral areas at the cellular level, their interconnectivities, blood-oxygen level dissociation, drug paradigms, and intermediate phenotypes in search of genes involved in the underlying mental illnesses (Callicott and Weinberger, 1999). Studies using fMRI has found that auditory emotions (e.g. threat word listening) in the right handed subjects involve the left posterior cingulated gyrus (Maddock et al, 1997), facial recognition memory for known faces are processed in the right middle temporal gyrus and left prefrontal cortex, for unknown faces right middle occipital cortex, for happy faces limbic structure as a whole are activated and no activation for sad face viewing (Philips et al, 1998).

Combined studies using PET and fMRI have found that during emotional processing, medial prefrontal cortex is principally activated in the schizophrenic brain alike normal subjects (Phan et al., 2002).

PET, SPECT and fMRI combined study by Kucharska et al, (2001) have observed that posterior temporal cortex, orbitalfrontal cortex, amygdaloid nucleus and insula are the chief areas of emotional processing in the schizophrenic as well as normal brain.

Therefore from the above evidences it seems that schizophrenics experience emotion alike normal persons. Though further research is awaited for confirmation.

### **B. EVIDENCES OF DEFICIT IN EMOTIONAL**

### **PROCESSING:**

Morrison et al, (1988) observed that schizophrenics show less capacity to perceive emotion (especially vocal and facial) and this decreased capacity to process emotion is the constant finding in schizophrenics (Addington and Addington, 1998). Expressed emotion processing (deficit) could also be found in the relatives of schizophrenics as a trait and not a state (Ran et al, 2003).

Thus schizophrenics, though experience emotion alike normal persons, may show some deficit in perceiving them. More research could be necessary for further corroboration.

### **C. EVIDENCES OF DISSOCIATION OF THE EMOTIONAL EXPERIENCE AND THE EXPRESSIONS:**

Kring et al (1993) and Kring and Neale (1996) studied chronic older male schizophrenics and normal control of same sex and same age group showing film clips and their expressions were rated using FACES (Facial Expression Coding System) and PANAS (Positive and Negative Affect Schedule). They found that schizophrenics were less facially expressive matched with control, though they experience emotion alike the control. Earnst and Kring (1999) again studied older schizophrenic males (19 deficit, 22 non-deficit and 20 control) using film clips to manipulate the mood; further, schizophrenics and control, both were allowed to undergo self-rating of their emotional feelings using FACES. They concluded that the deficit patients were less expressive though did not differ much for ratings of emotional modulations. These are however the indirect evidences.

### **D. TENTATIVE CAUSES OF DISSOCIATION IN SCHIZOPHRENIA:**

A gross neuronal dysfunction or abnormality in the limbic tissue in the schizophrenic brain is thought to be the main cause of dissociation between experience and expression of emotion in schizophrenia. A study of Gur et al, (2002) depicted that altered activation of the limbic system could also be one of the reasons of such dissociation in schizophrenics.

Apart from this, the dissociation in schizophrenia is also could be due to disconnection of the neuronal circuitry; alogia, the poverty of speech is suspected to be due to such disconnections, postulated by Bullmore et al, (1997).

In continuation with disconnection theory of dissociation and some tissue-level structural or functional defects, the

present article thus postulates that as limbic system is connected structurally with the association cortex and phylogenetically with the old hypothalamus as well as the brain stem system, dysfunction of it due to any cause reflects the total abnormality and a concomitant process and therefore the expression of emotion is different than what is conceived in the brain in schizophrenics.

### E. POSSIBLE IMPLICATIONS OF DISSOCIATION IN SCHIZOPHRENIA:

'Dissociation' itself could be a torchbearer in the schizophrenia treatment. A double-blind-control study could be done for testing the drug-effects in schizophrenics to see how far the drug is able to format the desired expression, matched with the emotional experience.

Dissociation rating could be another important criteria to look at it in a prognostic significance.

### F. GAP IN THE LITERATURE

Until now the studies done using nuclear imaging techniques show the following fallacies:

1. Paucity of the number of study,
2. No direct evidence of dissociation of experienced emotion and its expression,
3. No specific nature of dissociation has been evaluated from the studies,
4. Expressions are measured using self-rating scales (to be filled up by schizophrenics) so its validity is questionable; because the patients may not have insight at all,
5. Social constructs, familial influence, educational level are important influencing variables in schizophrenics and these are not considered during the study,
6. No typological paradigm of schizophrenia related to emotion-dissociation have been evaluated,
7. Possible existence of sample bias (as no studies have been included other than schizophrenia), and
8. Effect of anti psychotic medications on emotional processing need to be clarified.

### G. FUTURE DIRECTIONS

1. Paired neurophysiological study with

schizophrenic brain along with functional neuroimaging for evaluating the dissociation at the several affective levels,

2. Use of sophisticated data acquisition with the best analyzing tools,
3. Eliminating the central drug effects while making the inference,
4. Consideration of other influencing variables (age, sex, acute/chronic, typology, facial expression types, stimulus used, cultural and social constructs) double-blind studies using normal control could be more effective to adjudge the emotional response in schizophrenics, and
5. Studies partaking other psychiatric illnesses (e.g. obsessive compulsive disorders, mood disorders, personality disorders) could be important to note any difference in emotional experience, deficit and expression compared to normal and schizophrenics.

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