

# Inducing Psychotic-like Experiences without Drugs using the Witches' Cradle

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**Abstract.** Various means of inducing unusual or anomalous experiences sharing similarities with psychosis have been proposed. In the present study, an 'altered states of consciousness induction device' (ASCID) or 'witches' cradle' was used to suspend 81 participants for a short duration. The Psychotomimetic States Inventory recorded an increase in a wide variety of experiences following the cradle when compared to baseline. Psychotic-like experiences were predicted by greater positive schizotypal trait scores. Anomalous proprioceptive perceptual input appears to be capable for some individuals of inducing psychotic-like effects over a short time period.

Keywords: Schizotypy, psychotomimetic, proprioception

Non-pharmacological means of inducing psychotic-like experiences in laboratory settings have recently received increasing attention (see Daniels and Mason [1], for review). The experimental conditions for these studies usually involve sensory restriction/deprivation, or unusual visual or auditory stimuli such as the use of Ganzfeld goggles or white/ pink noise. The majority of studies provide evidence that such unusual sensory input can lead to anomalous experiences that are akin to psychotic-like experiences (PLEs), with hallucinations perhaps most prominent amongst these. Where measured, schizotypal or psychosis-proneness traits have also been shown to be highly relevant, as not all participants report effects, and experiences are more frequent or marked in those scoring highly on measures of positive schizotypy in particular. Contemporary explanations of such findings suggest that these originate in differences in information processing that may underlie a risk for psychotic illnesses. Fletcher and Frith [2] have suggested that under unusual perceptual conditions such experiences result from the way top down priors (beliefs and expectations) act more strongly than bottom-up processing of perceptions – for some individuals who are unusually prone

to psychosis at least. Such an account is consistent with other, more clinically based, theories that psychotic symptoms such as hallucinations originate from problems discriminating between their inner thoughts and external events [3]. Overall, numerous studies across a range of experimental paradigms both in patients and schizotypal subjects suggest a tendency to erroneously allocate an external source to internally generated stimuli may underlie positive symptoms in schizophrenia (for review see Ditman and Kuperberg [4]).

## THE 'WITCHES' CRADLE' AND 'ALTERED STATES OF CONSCIOUSNESS INDUCTION DEVICE'

The use of a cradle to induce anomalous experiences is said to have originated from witchcraft persecutions in 15th century Europe when inquisitors apparently attempted to exhorted confessions by putting the accused in a bag which was then swung from a tree. It is said that those interested in magic and psychic phenomena then developed its voluntary use for inducing unusual states of mind and perceptions. Whether or not this is historically accurate, various devices have evolved for turning and swinging the recipient in a cradle or bound into a

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restrictive suit with the head covered in a number of cultural traditions. A proto-modern version dating from California in the late 1960s - the so-called ASCID (Altered States of Consciousness Induction Device) - was devised by Houston and Masters [5] using a metal swing in which the subject stands while blindfolded and wearing earplugs. Though few experimental accounts of its use have been reported in any detail, Randolph-Seng and Nielsen [6] more recently reported on its use to induce altered states of consciousness – probably its only contemporary use in research to date. In two separate experiments they found that reports of altered states of consciousness were influenced by a range of priming methods. In the present study, the ASCID differs somewhat from traditional cradles in that the subject either stands vertically, or lies horizontally, rather than contained in a sack or bag.

#### *Study aims*

This study aims to establish whether brief use of a traditional cradle can elicit psychotic-like experiences, and whether these are related to schizotypal personality traits. In order to measure psychotic-like experiences the study utilized an approach drawn from acute drug studies [7], and that has been used in studies of sensory deprivation [8, 9]. The Psychotomimetic States Inventory (PSI [7]) contains items tapping perceptual distortions, delusional thinking, anhedonia, mania, paranoia and cognitive disorganization. We hypothesised that short-term suspension in the cradle would lead to a range of psychotic-like experiences as assessed by the PSI, and that in addition, schizotypal traits would predict greater vulnerability to psychotic-like experiences when experiencing the cradle.

## **METHODS**

#### *Participants*

81 undergraduate students (73 females and 8 males; age range = 18–27,  $M = 19.43$ ,  $SD = 1.54$ ), were recruited from the University of Surrey consistent with University ethical approval, and completed the experimental procedure outlined below. 76.5% were White, 77.8% spoke English as their first language and were predominantly right-handed (91.4%). Participants were screened for any physical difficulties in using the apparatus and Participants confirmed that they had no history of a major psychi-

atric or neurological disorder and were not currently using recreational drugs.

#### *Measures*

The shortened Oxford-Liverpool Inventory of Feelings and Experiences (sO-LIFE [10]) is a 43-item Yes/No questionnaire with four subscales (Unusual Experiences, Cognitive Disorganisation, Introverted Anhedonia and Impulsive Nonconformity). It has been widely used to measure psychosis proneness ('schizotypy') in a variety of settings and populations.

The Psychotomimetic States Inventory (PSI [7]) consists of 48 items measuring 'psychosis-like' experiences and was developed initially for use in drug studies. Items are rated on a 4-point scale (from 0 = never to 3 = strongly), with some items being reverse scored. It is the most widely used measure of the psychotic-like effects of a range of pharmacological agents.

#### *Procedure*

Following informed consent, participants completed several demographic questions followed by the sO-LIFE. The cradle consisted of a hammock suspended from a single pivotal point on a free-standing pull-up bar at a height of 230 cm and hung approximately 60 cm above the ground, allowing participants to be cradled fully, without a solid support platform. Once settled in the cradle and allowed to settle into a comfortable position, participants were blindfolded. Usually small movements of the participant caused the cradle to swing and rotate under its own weight. The movements are relatively slow and subtle. An experimenter remained in the room at all times to assist if needed. Participants remained in the device for 20 minutes. Upon leaving the cradle, they then completed the PSI. After a ten-minute break the PSI was re-completed as a baseline measure. No adverse experiences were reported by healthy volunteers.

## **RESULTS**

All statistical analyses were conducted using IBM SPSS Statistics 25.0. There were no missing data or extreme outliers so all data were included for analysis. Descriptives for all scales are given in Table 1 including a PSI difference score calculated by subtracting Baseline PSI from scores under experimental conditions.

Table 1  
Descriptive Statistics ( $n = 81$ )

	Minimum	Maximum	Mean	SD
PSI Experimental	9	85	40.33	18.3
PSI Baseline	6	71	31.2	16.9
PSI Difference	-31	66	9.14	14.78
Unusual Experiences	0	11	5.04	2.39
Cogn. Disorganisation	0	11	5.79	2.64
Introvertive Anhedonia	0	10	1.83	1.99
Imp. Nonconformity	0	8	3.26	2.02

The total PSI score (and all sub-scales) was significantly greater in the cradle condition than at baseline ( $t = 5.36$ ,  $p < 0.001$ ,  $df = 80$ ) confirming the first hypothesis that psychotic-like experiences were triggered by use of the cradle. The second hypothesis concerned the relevance of schizotypal traits to the experiences induced by the cradle. Although a difference score between the two conditions was calculated, the PSI score under experimental conditions was preferred as drawbacks had become apparent with the baseline measurement as discussed earlier. A stepwise multiple regression was conducted to investigate the ability of sO-LIFE traits to predict the PSI score under experimental conditions. Inspection of the correlation matrix (see Table 2) suggested the inclusion of three O-LIFE scales. However, the final model only retained Unusual Experiences (Beta=0.40,  $t = 4.00$ ,  $p < 0.001$ ) and Impulsive Nonconformity (Beta=0.35,  $t = 3.53$ ,  $p < 0.05$ ) as significant predictors that together explained 37% variance ( $F(2, 78) = 23.1$ ,  $p < 0.001$ ,  $R^2 = 0.37$ ,  $R^2 \text{Adj.} = 0.36$ ).

## DISCUSSION

As predicted use of the cradle appeared to temporarily increase the likelihood of psychotic-like experiences, though perhaps to an attenuated extent when compared with other drug and non-drug (sensory deprivation) contexts in that the elevation of scores above baseline was more muted [7–9]. While

the PSI score under experimental conditions was similar to those seen in sensory deprivation and when using cannabis recreationally, the baseline PSI score was somewhat elevated when compared to baseline measurement in other studies. As a consequence, the rather smaller effect seemed to stem from an elevated baseline which may have resulted from an insufficient interval following the experiment, or absence of a control condition as the sample was on average no more schizotypal than many other studies. Nevertheless, a state effect as recorded by the PSI was clearly indicated. Furthermore, the degree of psychotic-like experience as indexed by the PSI in the cradle was strongly predicted by two schizotypy scales; Unusual Experiences and Impulsive Nonconformity. These two scales, and Unusual Experiences in particular, most clearly index positive schizotypy. The findings are broadly in keeping with other paradigms that alter perceptual circumstances experimentally deprivation [8, 9], and extend them to a largely proprioceptive form. Though the setting was quiet, and a blindfold was used, this was not a full deprivation of sensory experiences: the experiences seem to be provoked by the disorienting movement in space while confined by the cradle, and while receiving no other feedback about one's position in space.

Reflecting on the putative origins of the cradle, just as for other forms of sensory deprivation/disorientation, it is plausible that sustained involuntary use would have highly aversive, even psychotic, consequences. But as for a range of magical and spiritual practices, it is perhaps unsurprising that its use in voluntary and supportive circumstances led to a variety of perceptual, emotional and cognitive consequences that are phenomenologically similar to psychosis in some ways. Another aspect in considering its cultural use, is whether the device is swung and/or rotated gently or more vigorously – only very small movements occurred in the present study, but it may be that more deliberately vigorous movement has more pronounced effects.

Table 2  
Correlations ( $n = 81$ )

	1	2	3	4	5	6	7
Unusual Experiences (1)	1	0.16	0.08	0.39**	0.52**	0.48**	0.10
Cogn. Disorganisation (2)	0.16	1	0.38**	0.41**	0.35**	0.36**	0.02
Introvertive Anhedonia (3)	0.08	0.32**	1	-0.02	0.15	0.08	0.10
Imp. Nonconformity (4)	0.39**	0.41**	-0.02	1	0.49**	0.27*	0.30*
PSI Experimental (5)	0.52**	0.35**	0.15	0.49**	1	0.65**	0.50**
PSI Baseline (6)	0.48**	0.36**	0.08	0.27*	0.65**	1	0.32*
PSI Difference (7)	0.10	0.02	0.10	0.30*	0.50**	0.32*	1

\*\*  $p < 0.01$ , \*  $p < 0.05$ .

### *Limitations*

It should be noted that there are several limitations to the study in addition to the elevated baseline measurements. There was no control group, or control condition, and the baseline was not taken independently of the experimental testing session (for example at the same time on a different day or testing occasion). A second testing occasion was not feasible due to time and testing constraints, and testing using the questionnaire prior the experimental condition is known to be affected by expectancy effects given the unusual testing situation. Other psychological variables such as state/trait anxiety, fantasy proneness and suggestibility were not assessed, although it should be noted that these have been examined in other deprivation studies using the PSI deprivation [9] and excluded – though of course this may not be the case here. Though the sample was of an acceptable size, it comprised almost entirely of female psychology students who may not have been entirely naïve participants. Gender and age could not be investigated due to this limitation of sampling.

### *Conclusions*

Elevated self-reported psychotic-like experiences as measured by the PSI were seen following a short period of containment in a traditional witches' cradle. These were predicted by greater psychosis proneness traits as indexed by the Unusual Experiences and Impulsive Nonconformity scales of the sO-LIFE. Anomalous proprioceptive perceptual input appears to be capable for some individuals of inducing psychotic-like effects over a short time period.

## **ETHICAL COMPLIANCE STATEMENT**

### *Funding*

None.

### *Compliance with ethical standards*

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee

and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

## **CONFLICTS OF INTEREST**

The author declares that they have no conflict of interest.

## **INFORMED CONSENT (WHEN APPLICABLE)**

Informed consent was obtained from all individual adult participants included in the study.

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