

UCSF

UC San Francisco Previously Published Works

Title

Changes in symptom content from a clinical high-risk state to conversion to psychosis.

Permalink

<https://escholarship.org/uc/item/41w8s5x6>

Journal

Early intervention in psychiatry, 13(2)

ISSN

1751-7885

Authors

Marshall, Catherine
Lu, Yun
Lyngberg, Kristina
et al.

Publication Date

2019-04-01

DOI

10.1111/eip.12473

Peer reviewed



Published in final edited form as:

Early Interv Psychiatry. 2019 April ; 13(2): 257–263. doi:10.1111/eip.12473.

Changes in Symptom Content from a Clinical High Risk State to Conversion to Psychosis

Catherine Marshall^a, Yun Lu^a, Kristina Lyngberg^b, Stephanie Deighton^a, Kristin S. Cadenhead^c, Tyrone D. Cannon^d, Barbara A. Cornblatt^e, Thomas H. McGlashan^f, Diana O. Perkins^g, Larry J. Seidman^h, Ming T. Tsuang^c, Elaine F. Walkerⁱ, Scott W. Woods^f, Carrie E. Bearden^j, Daniel Mathalon^k, and Jean Addington^{a,*}

^aHotchkiss Brain Institute, Department of Psychiatry, University of Calgary, Calgary, Alberta Canada

^bDepartment of Neuroscience, Faculty of Science, University of Calgary, Calgary, Alberta Canada

^cDepartment of Psychiatry, University of California at San Diego, La Jolla, CA, USA

^dDepartment of Psychology, Yale University, New Haven, CT, USA

^eDepartment of Psychiatry, Zucker Hillside Hospital, Long Island, NY, USA

^fDepartment of Psychiatry, Yale University, New Haven, CT, USA

^gDepartment of Psychiatry, University of North Carolina, Chapel Hill, NC, USA

^hDepartment of Psychiatry, Harvard Medical School, Boston, MA, USA

ⁱDepartments of Psychology and Psychiatry, Emory University, Atlanta, GA, USA

^jDepartment of Psychiatry & Biobehavioral Sciences and Psychology University of California at Los Angeles, Los Angeles, CA, USA

^kDepartment of Psychiatry, University of California at San Francisco and SFVA Medical Center, San Francisco, CA, USA

Abstract

Aim—There is an interest in the transition to psychosis for those at clinical high-risk of developing psychosis. This transition is typically determined by a change in severity of the attenuated symptoms as they reach a psychotic level. However, any concomitant change in the content of such symptoms has not been examined. The current study aimed to examine potential qualitative changes in the symptom content from a clinical high-risk state to a first episode of psychosis.

Methods—Sixty-seven individuals, who had been identified as meeting the Attenuated Psychotic Syndrome based on the Structured Interview of Psychosis Risk Syndromes and who later developed a full-blown psychosis were included in the study. Comprehensive clinical vignettes were written and raters were trained using the Content of Attenuated Psychotic Symptoms

*Corresponding Author: Dr. Jean Addington, 3280 Hospital Dr NW, Calgary, AB, T2N 4Z6, Canada, jmaddding@ucalgary.ca, Phone: 403.210.6379, Fax: 403.210.9182.

codebook to code for the presence of specific symptom content found within the attenuated psychotic symptoms of unusual thought content, suspicious ideas, grandiose ideas, and perceptual abnormalities.

Results—Two main changes in symptom content from baseline to conversion were observed. First, content that was vague and lacked intensity progressed to being more specific, concrete and severe. Second, new symptoms appeared whose onset occurred for the first time at conversion.

Conclusion—A change in symptom content should be monitored by clinicians, as changes in content may be indications of a possible transition to psychosis.

Keywords

Content analysis; Converters; Symptom appearance; Symptom progression

Introduction

In the psychosis literature, there is a major focus on the transition to psychosis from a clinical high-risk (CHR) state. Those at CHR of developing psychosis typically experience attenuated psychotic symptoms and the definition of a transition to a first episode of psychosis includes an increase in severity of one or more of these attenuated psychotic symptoms plus a strengthening of conviction (McGlashan, Walsh, & Woods, 2010). As the attenuated symptoms change to full-blown psychotic symptoms, the content of the positive symptoms may also change.

In the early psychosis literature, little attention has been given to the content of psychotic symptoms such as delusions and hallucinations. Most of the work focusing on symptom content and psychosis has been done in relation to auditory hallucinations in those with schizophrenia. For example, the presence of different types of symptom content has been found to be important in differentiating between patient and non-patient voice hearers. Honig et al. (1998) found that patients were more likely to hear negative voices compared to voice-hearing non-patients. In addition, patients were significantly more likely to report that the voices commented on their thoughts and the thoughts of others compared to non-patients. Other studies have found significant relationships between the individual's personal life and symptom content. For example, some patients with schizophrenia report that they can identify their voices as the voice of someone they know (Anthony, 2004) or that the voice appears to be associated with a memory or past conversations (Johns, Hemsley, & Kuipers, 2002; McCarthy-Jones et al., 2014). In one study of individuals with schizophrenia that examined the content of visual hallucinations, it was found that 70% of the participants saw human-like figures with 55% reporting their visions contained supernatural content (Gauntlett-Gilbert & Kuipers, 2003). The experience of having a visual hallucination was used as important evidence for delusions in 55% of the sample. Furthermore, adverse life events, such as trauma, have been found to impact symptom content. For example, life events involving danger and humiliation, have been found to be strongly associated with depressive and grandiose delusions, respectively (Raune, Bebbington, Dunn, & Kuipers, 2006).

More recently, attention has been given to symptom content in the attenuated psychotic symptoms of those at CHR of psychosis. Adverse life events, in particular past trauma, has been given the most attention in CHR samples. Sexual trauma has been reported to lead to the presence of unusual sexual content (Thompson et al., 2010) past physical abuse has been associated with more severe suspiciousness and grandiose thinking (Velthorst et al., 2013) and having experienced a range of different traumatic experiences was associated with feelings of being watched or followed (Falukozi & Addington, 2012).

We have previously examined the prevalence of different symptom content in a CHR sample at baseline (Marshall et al., 2014). Being perplexed by reality, overvalued beliefs, and feeling a loss of control of content of thoughts were the most commonly reported unusual thoughts. Being thought of in a negative way, guardedness towards others and being harmed physically were the most common content in suspicious ideas. Hearing indistinct and distinct noises and voices were the most commonly reported auditory experiences and seeing vague shadows and figures, distortions, and faces and people were the most prevalent visual abnormalities.

However, only one study to date has examined changes in symptom content over time. McCarthy-Jones et al. (2014) examined the content of auditory hallucinations in a sample diagnosed primarily with schizophrenia, which included a retrospective account of auditory experiences prior to the onset of psychosis. Forty-eight percent of participants reported hearing a voice the first time they experienced an auditory hallucination and 33% heard a nonverbal sound (e.g. music). Most participants reported that the content of the voices did not change over time (McCarthy-Jones et al., 2014). Little, if anything, has been reported, for those at CHR, on the change in symptom content over time from the attenuated symptom phase to that of full blown psychosis.

Although recent work on the content of symptoms is limited, the notion of describing a phenomenological transition from attenuated or fleeting psychotic symptoms to what are progressively clearer and more externalized themes, has been previously described in some of the classical textbooks. For example, Jaspers talks about the attenuated stage as that of “delusional atmosphere” moving to a more concrete stage of delusion ideas (Maj, 2013). Kraepelin considered that the onset of a mental illness such as schizophrenia may have a very gradual onset with its development beginning perhaps in adolescence and possibly lasting many years, and often with the real beginning being hard to pinpoint (Klosterkotter, Schultz-Lutter, & Ruhrmann, 2008). This fits with the basic symptom concept first described in the sixties by Gerd Huber and reported on in several studies by Klosterkotter and colleagues (1996, 2001).

Basic symptoms, originally assessed with the Bonn Scale for the Assessment of Basic Symptoms (BSABS) are subtle, subclinical self-experienced disturbances in drive, stress tolerance, affect, thinking, speech, perception and motor action which are phenomenologically clearly distinct from psychotic symptoms. Over the last 15 years or so a great deal of research that focused on basic symptoms and the BSABS evolved into identifying which basic symptoms were more likely to predict the onset of psychosis and to the development of a specific measure, the Schizophrenia Proneness Instrument (SPI-A;

Schultze-Lutter, 2007). Basic symptoms are phenomenologically different from the attenuated psychotic symptoms of the SOPS/SIPS or the CAARMS as they are not necessarily observable by others in the same way that odd thinking or formal thought disorder are. They are thought to originate in the person and do not primarily affect thought content. Since basic symptoms focus on more subtle and subclinical disturbances, they are thought to be the earliest possible indication of psychosis risk with the attenuated psychotic symptoms of the CHR criteria being a later state of the development of psychosis (Klosterkotter, Schultze-Lutter, & Ruhrmann, 2008). This has been supported in more recent studies (Schultze-Lutter, Ruhrmann, Berning, Maier, & Klosterkotter, 2010). What is important about identification of characteristic basic symptoms is that it is possible that by the time they progress to the attenuated psychotic symptom state that the onset of psychosocial deficits has already begun (Klosterkotter et al., 2008). Thus, understanding the development and change in these early symptoms may add to our efforts of early detection.

However, to the best of our knowledge, no studies have explored the prospective qualitative changes in symptom content for those at CHR, in particular the change in symptom content from the CHR state to full-blown psychosis. The aim of this study is to explore how symptom content changes over time in those who transition to a first episode of psychosis.

Methods

Sample

All participants were recruited as part of the North American Prodrome Longitudinal Study 2 (NAPLS 2), a consortium consisting of eight research sites (Emory University, Harvard University, University of California Los Angeles, University of California San Diego, University of North Carolina, University of Calgary, Yale University and Zucker Hillside Hospital). Participants at each site signed informed consent approved by each local institutional review board. Specific details about ascertainment and inclusion and exclusion criteria has been described in detail elsewhere (Addington et al., 2012).

In the NAPLS-2 sample of 764 CHR youth, 86 individuals made the conversion to psychosis. Since, we were unable to collect symptom content data on 19 participants due to detailed vignettes at conversion being unavailable (n=14) or conversions being based on disorganized communication and thought disorder (n=2) or dangerous and disorganized behavior (n=3), only 67 of those who made the transition were included in the current study. These 67 participants met Attenuated Psychotic Symptom Syndrome (APSS) criteria or APSS plus another Criteria of Psychosis-Risk Syndromes (COPS) criteria at baseline. The baseline data for forty-four of these participants has been previously published and described as part of a larger sample (Marshall et al., 2014).

Measures

Clinical rating scales—The Structured Interview for Psychosis-Risk Syndromes (SIPS) was used to determine CHR criteria. The positive symptoms including unusual thought content, suspiciousness, grandiosity, perceptual abnormalities, and disorganized communication, were evaluated using the Scale of Prodromal Symptoms (SOPS; McGlashan

et al., 2010). Raters demonstrated excellent reliability on the SOPS using a “gold standard” post-training agreement. The kappa for the individual SOPS positive symptom items ranged between 0.92 and 0.96 (Addington et al., 2012).

Vignettes—Comprehensive clinical vignettes were written at baseline and conversion. Vignettes contained a detailed description of participants' background, clinical symptoms and functioning. Baseline and conversion vignettes were presented on a weekly consensus diagnostic call to determine study entry and conversion to psychosis. We have presented an example of these vignettes as Supplementary Material 1.

Content of attenuated psychotic symptoms codebook—The content of participants' attenuated psychotic symptoms were assessed and scored based on the guidelines outlined in the Content of Attenuated Positive Symptoms Codebook (CAPS; Marshall, Falukozi, Albertin, Zhu, & Addington, 2011). The CAPS codebook was designed and developed to provide a systematic means of assessing four of the attenuated positive symptoms, unusual thought content (P1), suspicious ideas (P2), grandiose ideas (P3) and perceptual abnormalities (P4). Disorganized communication (P5) is not discussed in the CAPS codebook, since this positive symptom is based on the severity of a behavioural disturbance demonstrated by the individual and is not based on symptom content.

Each positive symptom domain is further divided into specific content items which includes a description and examples of the specific items. The full explanation of the CAPS procedure and symptom content items are described in greater detail in Marshall et al. (2011) The specific content items were coded as either 0 (absent in the vignette) or 1 (present in the vignette). The vignettes were coded by two trained raters that were familiar with the protocols outlined in the CAPS codebook (Marshall et al., 2014). Specific content items that received conflicted ratings were sent to a third rater (CM) who provided a consensus rating for that item. The rating system described above has produced ‘acceptable’ reliabilities for 83.33% of the CAPS specific content items, with Krippendorff's alpha ranging from 0.09 – 1.00 for the baseline vignettes (Marshall et al., 2014). For conversion vignettes, 84.71% of the items had ‘acceptable’ reliabilities and Krippendorff's alpha ranged from 0.30 – 1.00.

Establishing changes in symptom content—First, baseline and conversion vignettes were reviewed for participants who converted with a rating of a 6 on the SOPS for one or more of the following attenuated psychotic symptoms unusual thought content, suspicious ideas, grandiose ideas, and perceptual abnormalities. All vignettes for unusual thought content and grandiose ideas were read by CM and suspicious ideas and perceptual abnormalities were read by YL. Both CM and YL are senior-level clinical raters, each with over five years of experience in CHR and psychotic populations.

A summary of the symptom content that was present at baseline and conversion was recorded for each participant under each of the positive symptoms. Next, notes were made regarding symptom content that was new and appeared for the first time at conversion, in that it had not been previously mentioned at baseline. In addition, the progression of symptom content was recorded; for example, the presence of being hypervigilant at baseline

progressing to feeling watched at conversion. These observations were then compiled into main themes that were present across participants until saturation was met. The number of participants who endorsed each theme was then used to determine which themes were most common. The first and second author met throughout the process to ensure agreement on the content selected and the chosen themes. All themes were reviewed and agreed upon by JA.

Results

Sample

The average age of this sample of 67 participants was 18.02. The majority of participants were male (n=41), Caucasian (n=36) and single (n=65).

Conversion

Conversion occurred on average 234 days (SD = 170.7; range 19-707) from baseline. Fifty-seven participants reached psychotic level intensity on unusual thought content, 29 on suspicious ideas, 9 on grandiose ideas and 31 on perceptual abnormalities.

Changes in symptom content from baseline to conversion

Two main changes emerged. First, content that was vague and lacked intensity progressed to being more specific, concrete and severe. For example, symptom content at baseline often contained a degree of uncertainty, where participants were unsure as to why they were having certain thoughts or experiences. However, at conversion participants were convinced about both the causes of their experiences and that they were happening. The second change was that new symptoms appeared for the first time at conversion.

With respect to progression four themes emerged for unusual thought content, three themes for suspicious ideas, one theme for grandiosity and six themes for perceptual abnormalities. These 14 themes with examples of each are presented in Table 2.

For the appearance of new symptoms six themes emerged for unusual thought content, four for suspicious ideas, one for grandiosity and one for perceptual abnormalities. These 12 themes with examples are presented in Table 3.

Discussion

This paper is describing a phenomenological transition from attenuated or fleeting psychotic symptoms to what are progressively clearer and more externalized themes, and thus changes in the original content first described. As acknowledged above this has been previously described in some of the classical textbooks (Maj, 2013). However, one of the strengths of this report is that it is prospective in that we have clear descriptions of the content of the attenuated symptoms of a large sample of young people at CHR of psychosis (Marshall et al., 2014) and then later as a proportion made the transition to full blown psychosis we were able to compare the content of the attenuated and later full blown psychotic symptoms.

To our knowledge this is the first study to prospectively examine the changes in symptom content from attenuated psychotic symptoms to conversion to psychosis. Two main changes

occurred including the progression or worsening of symptom content and the appearance of symptom content at conversion. Overall, the progression of symptoms could be summarized into three types. First, symptom content became more intense with an apparent disruption between self and other. Second, content that was vague or uncertain became more crystalized and participants often attributed specific causes to their experiences that were psychotic in nature and, with this, conviction increased. Third, symptom content became more formed and complex. Content that appeared at conversion was not mentioned at baseline.

The finding of symptom content becoming more intense and a disruption between self and other occurring, appears to be supported by the suggestion that as psychosis begins to emerge a sense of self-disturbance may also co-occur (Nelson, Whitford, Lavoie, & Sass, 2014). This sense of self-disturbance may include difficulties with acknowledging an experience as one's own, which may be the case with the progression from reading of thoughts to thought insertion, ideas of reference from the media to delusions of reference directly related to the participant, familiar people and/or surroundings seeming strange progressing to nihilistic ideas, as well as hearing violent content directed towards the self at conversion. Cannon (2015) has suggested that the earliest neural disruptions are in circuits involved in referencing experiences according to time, place, and agency, which may result in a failure to recognize particular cognitions as self-generated or to constrain interpretations of the meaning of events based on prior experiences, providing the scaffolding for faulty reality testing. According to this model, over time, more elaborate beliefs – such as alien control of thought, ideas of reference, and systemized persecutory delusions – may be built up as explanations of the faulty source attributions and generalized sense of foreboding, and skepticism in these explanations may erode as an increasing proportion of experience salient in memory is subject to source confusion.

Our findings of symptom content becoming more crystalized appears to be consistent with that found within the literature. Suspicious ideas moving from a sense of hypervigilance and ideas of reference to persecutory ideas appears to be supported by the 'hierarchy of paranoia' proposed by Freeman et al. (2005). In that proposed model, attenuated psychotic symptoms begin as social worries and ideas of reference which then transpose into less common persecutory thoughts involving severe harm, thus suggesting that more severe paranoia builds on more common concerns (Freeman et al., 2005). The progression of a desire for status to a belief of being famous may provide support for the hypothesis proposed by Smith, Freeman, and Kuipers (2005) that initial positive beliefs about the self or desires may provide the foundation for future grandiose delusions. Content becoming more crystalized at conversion, also involved participants attributing specific causes to their experiences that were psychotic in nature. Such attributions may be the result of externalizing appraisal biases, where an individual incorrectly interprets the cause of an event (Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001).

At conversion, it was also found that symptom content progressed to become formed and complex compared to baseline. Our findings of participants progressing from hearing a single word or muffled voices to hearing full sentences and hearing their own thoughts progressing to the voice of others, is consistent with findings by McCarthy-Jones et al.

(2014) where 48% of their population recalled the first auditory experience they had as being a voice. Woods, Jones, Alderson-Day, Callard, and Fernyhough (2015) found that approximately 35% of their sample retrospectively reported experiencing a change in the number and presence of voices over time. Nayani and David (1996) found that auditory hallucinations became more complex over time, including the addition of more voices and extended dialogue. Together these findings appear to suggest that as auditory experiences progress along the spectrum of psychosis their formation becomes more specific and their complexity increases.

In the current sample of converters, there was symptom content that appeared for the first time at conversion. Some of this content such as “being controlled by an outside force” was unique. However, other items, such as being suspicious of electronics, that appeared for the first time in this sample had been observed to be present in the larger NAPLS sample at baseline in our earlier publication (Marshall et al., 2014). The appearance of such items at conversion maybe explained by the suggestion that more improbable and bizarre content is unique to psychosis (Freeman et al., 2005).

There are other possible explanations for the appearance of specific symptom content at conversion. These CHR individuals are help-seeking (Addington & Heinssen, 2012). Since at baseline there are several different and distressing experiences occurring simultaneously, they may not all be mentioned. A person may decide to share enough to obtain help, but refrain from sharing potentially embarrassing or alarming content. Common types of concerns, such as worries the person might be losing their mind, may not be included by the clinical rater, when in fact that type of concern may be a precursor to more bizarre content.

There are several limitations to this study. First, the sample is small which is a limitation in exploring changes related to conversion since only a small proportion of any CHR sample make the transition to psychosis. Although we were able to examine prospective changes in symptom content through the use of detailed vignettes, the vignettes used were not written for the purpose of a symptom content analysis. It is possible that less salient content may have been omitted by the clinical raters. Thirdly, we were unable to track changes in symptom content between baseline and conversion. As a result, it may be that the symptom content that seemed to appear at conversion was actually present in between the two-time points.

Our examination of symptom content has allowed us to look more closely at the different kinds of content that often with the use of measures like the SIPS and the CAARMS is all subsumed under one symptom label. This fits with the notion of the progression put forward by Klosterkotter et al., (2008) that there is a progression from the basic symptoms to the attenuated psychotic symptoms and eventually to full-blown psychotic symptoms. Based on the current findings, we have demonstrated that there are different changes that occur as symptoms move from what could be seen as a basic symptom to the attenuated psychotic level to a first episode of psychosis. Typically, the focus is on monitoring severity but the current findings suggest that the presence of specific content may also be relevant. A clustering of such changes in close proximity to one another may be an indication of a possible transition to psychosis.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Financial Disclosures: This work was supported by the National Institute of Mental Health (grant number U01MH081984) to JA; (grant numbers U01MH081928, P50MH080272; Commonwealth of Massachusetts (grant number SCDMH82101008006) to LS; (grant numbers R01MH60720, U01MH082022, K24MH76191) to KC; (grant number P50MH066286) to TC and CB; (grant number U01MH082004-01A1) to DP; (grant number U01MH081988) to EW; (grant number U01MH082022) to SW; and (grant number UO1MH081857-05) to BC. The National Institute of Mental Health had no further role in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the paper for publication. Yun Lu was funded through the Novartis Chair in Schizophrenia Research held by Dr. J Addington.

References

- Addington J, Cadenhead KS, Cornblatt BA, Mathalon DH, McGlashan TH, Perkins DO, Cannon TD. 2012; North American prodrome longitudinal study (NAPLS 2): overview and recruitment. *Schizophr Research*. 1-3:77–82.
- Addington J, Heinssen R. 2012; Prediction and prevention of psychosis in youth at clinical high risk. *Annual Review of Clinical Psychology*. 8:269–289.
- Anthony D. 2004; The cognitive neuropsychiatry of auditory verbal hallucinations: an overview. *Cognitive Neuropsychiatry*. (1-2):107–123. [PubMed: 16571577]
- Aschbrock Y, Gavey N, McCreanor T, Tippett L. 2003; Is the content of delusions and hallucinations important? *Australasian Psychiatry*. 3:306–311.
- Cannon TD. 2015; How schizophrenia develops: cognitive and brain mechanisms underlying onset of psychosis. *Trends in Cognitive Sciences*. 12:744–756.
- Falukozi E, Addington J. 2012; Impact of trauma on attenuated psychotic symptoms. *Psychosis*. 3:203–212.
- Freeman D, Garety PA, Bebbington PE, Smith B, Rollinson R, Fowler D, Dunn G. 2005; Psychological investigation of the structure of paranoia in a non-clinical population. *The British Journal of Psychiatry*. 5:427–435.
- Garety PA, Kuipers E, Fowler D, Freeman D, Bebbington P. 2001; A cognitive model of the positive symptoms of psychosis. *Psychological Medicine*. 2:189–195.
- Gauntlett-Gilbert J, Kuipers E. 2003; Phenomenology of visual hallucinations in psychiatric conditions. *The Journal of Nervous and Mental Disease*. 3:203–205.
- Honig A, Romme MA, Ensink BJ, Escher SD, Pennings MH, Devries MW. 1998; Auditory hallucinations: a comparison between patients and nonpatients. *The Journal of Nervous and Mental Disease*. 10:646–651.
- Johns LC, Hemsley D, Kuipers E. 2002; A comparison of auditory hallucinations in a psychiatric and non-psychiatric group. *British Journal of Clinical Psychology*. 1:81–86.
- Klosterkotter J, Ebel H, Schultze-Lutter F, Steinmeyer EM. 1996; Diagnostic validity of basic symptoms. *European Archives of Psychiatry and Clinical Neuroscience*. 246:147–154.
- Klosterkotter J, Hellmich M, Steinmeyer EM, Schultze-Lutter F. 2001; Diagnosing schizophrenia in the initial prodromal phase. *Archives of General Psychiatry*. 58:158–164.
- Klosterkotter J, Schultze-Lutter F, Ruhrmann S. 2008; Kraepelin and psychotic prodromal conditions. *European Archives of Psychiatry and Clinical Neurosciences*. 258:74–84.
- Maj M. 2013; Karl Jaspers and the genesis of delusions in schizophrenia. *Schizophrenia Bulletin*. 39:242–243. [PubMed: 23314191]
- Marshall C, Denny E, Cadenhead KS, Cannon TD, Cornblatt BA, McGlashan TH, Addington J. 2014; The content of attenuated psychotic symptoms in those at clinical high risk for psychosis. *Psychiatry Research*. 3:506–512.

- Marshall C, Falukozi E, Albertin M, Zhu H, Addington J. 2011; The development of the content of attenuated positive symptoms codebook for those at clinical high risk of psychosis. *Psychosis*. 3:191–202.
- McCarthy-Jones S, Trauer T, Mackinnon A, Sims E, Thomas N, Copolov DL. 2014; A new phenomenological survey of auditory hallucinations: evidence for subtypes and implications for theory and practice. *Schizophrenia Bulletin*. 1:231–235.
- McGlashan, T, Walsh, B, Woods, S. *The psychosis-risk syndrome: handbook for diagnosis and follow-up*. New York: Oxford University Press; 2010.
- Nayani T, David A. 1996; The auditory hallucination: a phenomenological survey. *Psychological Medicine*. 1:177–189.
- Nelson B, Whitford T, Lavoie S, Sass L. 2014; What are the neurocognitive correlates of basic self-disturbance in schizophrenia?: integrating phenomenology and neurocognition. Part 1 (source monitoring deficits). *Schizophrenia Research*. 1:12–19.
- Raune D, Bebbington P, Dunn G, Kuipers E. 2006; Event attributes and the content of psychotic experiences in first-episode psychosis. *Psychological Medicine*. 2:221–230.
- Schultze-Lutter, F. *Schizophrenia proneness instrument, adult version (SPI-A)*. Giovanni Fioriti Editore; 2007.
- Schultze-Lutter F, Ruhrmann S, Berning J, Maier W, Klosterkötter J. 2010; Basic symptoms and ultra high risk criteria: Symptom development in the initial prodromal state. *Schizophrenia Bulletin*. 36:182–191. [PubMed: 18579555]
- Smith N, Freeman D, Kuipers E. 2005; Grandiose delusions: an experimental investigation of the delusion as defense. *The Journal of Nervous and Mental Disease*. 7:480–487.
- Thompson A, Nelson B, McNab C, Simmons M, Leicester S, McGorry PD, Yung AR. 2010; Psychotic symptoms with sexual content in the “ultra high risk” for psychosis population: frequency and association with sexual trauma. *Psychiatry Research*. (1-2):84–91.
- Velthorst E, Nelson B, O'Connor K, Mossaheb N, de Haan L, Bruxner A, Thompson A. 2013; History of trauma and the association with baseline symptoms in an ultra-high risk for psychosis cohort. *Psychiatry Research*. 1:75–81.
- Woods A, Jones N, Alderson-Day B, Callard F, Fernyhough C. 2015; Experiences of hearing voices: analysis of a novel phenomenological survey. *The Lancet Psychiatry*. 4:323–331.

Table 1
Demographic characteristics (n=67)

| Demographics | |
|--------------------------------|---------------|
| | <i>M (SD)</i> |
| Age in years | 18.02 (3.52) |
| Education in years | 11.00 (2.42) |
| | <i>n (%)</i> |
| Sex | |
| Male | 41 (61.19) |
| Female | 26 (38.81) |
| Race | |
| Caucasian | 36 (53.73) |
| Asian | 10 (14.93) |
| Interracial | 10 (14.93) |
| African American | 4 (5.97) |
| Central/South American | 4 (5.97) |
| Other | 3 (4.47) |
| Marital Status | |
| Single, never married | 65 (97.01) |
| Cohabit with Significant Other | 2 (2.99) |
| Employment | |
| Full-time | 3 (4.47) |
| Part-time | 9 (13.43) |
| Current student | 53 (79.10) |

Table 2
Themes of progression of symptom content from baseline to conversion to psychosis

| Attenuated Psychotic Symptom | Themes (<i>and examples</i>) | n (%) |
|-------------------------------------|---|-------------------------|
| Unusual Thought Content | Reading of thoughts to thought insertion – <i>wondering if someone might be able to read her thoughts and then believing an outside force was putting thoughts into her head</i> | 12 (21.05) ^a |
| | Ideas of reference from the media to delusions of reference directly related to the participant - <i>wondering if advertisements might have a special meaning for him, then believing graffiti he saw in was about him</i> | 11 (19.30) ^a |
| | Familiar people and/or surroundings seeming strange to nihilistic ideas - <i>feeling as if things around her seemed unreal and then feeling like she was foreign and did not exist</i> | 5 (8.77) ^a |
| | Possible religious messages to religious attributions – <i>worried demons might be in his house, then believed the devil was putting thoughts into his head to harm his family.</i> | 3 (5.26) ^a |
| Suspicious Ideas | Possible suspiciousness or hypervigilance to ideas of persecution – <i>feeling mistrustful of others because he thinks they do not like him, then believed his neighbours developed a website focused on him being a terrible person</i> | 21 (72.41) ^b |
| | Suspicious ideas about familiar people to ideas of persecution by famous people or agencies - <i>worrying his parents might be spying on him, then believing the government was tampering with his medication</i> | 9 (31.03) ^b |
| | Ideas of reference to ideas of persecution - <i>feeling as if strangers on the bus were talking negatively about him, then believing a friend online had circulated images of him viewing sexual content.</i> | 7 (24.14) ^b |
| Grandiose Ideas | Desire for status to belief of being famous – <i>thinking he might have the ability to become rich and famous then believing he was the prince from a science-fiction movie.</i> | 3 (33.33) ^c |
| Perceptual Abnormalities | Hearing one's own thoughts to hearing voices of others - <i>hearing voices inside his head that he thought were his own thoughts, then heard the voices of several other people coming out of the wall</i> | 12 (38.71) ^d |
| | Hearing a single word or muffled voices to hearing full sentences - <i>hearing muffled, indistinct voices then hearing a clear voice telling her she would be harmed.</i> | 6 (19.35) ^d |
| | Hearing negative comments to hearing violent content directed towards the self - <i>hearing a voice calling him a 'prick' and 'paranoid', then hearing voices commanding him to cut out his brain</i> | 5 (16.13) ^d |
| | Seeing unformed or mis-seeing things to seeing formed figures – <i>seeing shadows, then the shadows appeared as men with long hair and gray beards</i> | 3 (9.68) ^d |
| | Unknown reasons for perceptual abnormalities to delusional attributions for the experiences - <i>feeling something on her back but not knowing what it was, then believing it was a demon</i> | 3 (9.68) ^d |
| | Content in only one or two sensory modalities to several – <i>seeing shadows she thought might be ghosts, then smelling blood and feeling people grab her when seeing these images</i> | 8 (25.81) ^d |

Note:

^a percent of 57 who converted on unusual thought content,

^b percent of 29 who converted on suspicious ideas,

^c percent of 9 who converted on grandiose ideas,

^d percent of 31 who converted on perceptual abnormalities

Table 3
Themes of symptom content that newly appeared at conversion

| Attenuated Psychotic Symptom | Themes (and examples) | n (%) |
|-------------------------------------|--|------------------------|
| Unusual Thought Content | Somatic concerns – <i>believing one of her arms was not a part of her body, which led to mild self-harm</i> | 8 (14.04) ^a |
| | Reading of thoughts – <i>believing patients and doctors on the unit could read his thoughts</i> | 7 (12.28) ^a |
| | Religious content - <i>believing God was sending him a message and that the devil was trying to convince him he was an anti-Christ</i> | 6 (10.53) ^a |
| | Feeling guilty or the need to be punished - <i>believing she deserved to be punished for not preventing negative events in the world</i> | 6 (10.53) ^a |
| | Sexual content – <i>believing his family members were having sexual relationships with one another</i> | 4 (7.02) ^a |
| | Being controlled by an outside force - <i>believing she was a puppet, controlled by an outside force</i> | 4 (7.02) ^a |
| Suspicious Ideas | Ideas of persecution involving the Internet or television – <i>believing his friend started a website filled with all of the bad things he had done and shared it with everyone</i> | 4 (13.79) ^b |
| | Persecutory conspiracy theories - <i>believing the hospital staff were working with Hitler to harm her</i> | 4 (13.79) ^b |
| | Belief one's food is being poisoned - <i>believing her mother and the doctor were poisoning her food</i> | 3 (10.34) ^b |
| | Religious content – <i>believing the devil was watching her with the intent to harm her</i> | 3 (10.34) ^b |
| Grandiose Ideas | Religious content - <i>believing he was the reincarnation of Jesus Christ</i> | 3 (33.33) ^c |
| Perceptual Abnormalities | Tactile experiences - <i>believing she could feel electricity in her head and bugs crawling on her skin</i> | 9 (29.03) ^d |

Note:

^a percent of 57 who converted on unusual thought content,

^b percent of 29 who converted on suspicious ideas,

^c percent of 9 who converted on grandiose ideas,

^d percent of 31 who converted on perceptual abnormalities