

ATTENUATED PSYCHOTIC EXPERIENCES IN ADOLESCENTS

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The so-called subclinical or attenuated psychotic experiences are psychotic signs and symptoms which do not manifest themselves at a clinical level. It therefore consists of a group of symptoms similar to those of schizophrenia which can be present in the general population and distributed along a continuum of severity, at whose extreme end we find psychosis. The objective of the present study was to perform an exhaustive review of the literature related to the prevalence rates of psychotic experiences in nonclinical adolescent populations published in recent years. In addition, the frequency of these psychotic experiences in Spanish adolescents was examined. The results show that psychotic experiences are common and transitory phenomena in adolescence which are not necessarily associated with the presence of psychopathology or later risk for psychosis. Moreover, the data suggest that the psychotic phenotype goes beyond the frontiers proposed by the international classification systems. Future lines of research should examine and gain a deeper understanding of these types of experiences in adolescents.

Keywords: hallucination; delirium; subclinical adolescent psychotic experiences; schizotypy

Las llamadas experiencias psicóticas subclínicas o atenuadas son signos y síntomas psicóticos que no llegan a manifestarse a nivel clínico. Se trata por tanto de un conjunto de síntomas similares a los de la esquizofrenia, que pueden estar presentes en población general, y distribuidas a lo largo de un continuum de gravedad, en cuya parte más extrema se halla la psicosis. El objetivo del presente trabajo fue realizar una revisión exhaustiva de la literatura publicada en los últimos años relacionada con las tasas de prevalencia de las experiencias psicóticas en población adolescente no clínica. Asimismo, se examinó la frecuencia de estas experiencias en adolescentes españoles. Los resultados muestran que las experiencias psicóticas son un fenómeno común y transitorio en la adolescencia, que no se asocia necesariamente con la presencia de psicopatología o riesgo posterior de psicosis. Igualmente, los datos sugieren que el fenotipo psicótico se extiende más allá de las fronteras propuestas por los sistemas clasificatorios internacionales. Futuras líneas de investigación deberían examinar y profundizar en la comprensión de este tipo de experiencias en población adolescente.

Palabras clave: alucinación; delirio; experiencias psicóticas subclínicas; adolescentes; esquizotipia

The study of the psychotic phenotype in the general population has evoked great interest within the international scientific community. In the last decades, the research regarding the so-called *attenuated* or *subclinical psychotic experiences*, which refers to signs and symptoms that do not reach clinical levels, has played a predominant role (Johns and van Os, 2001; van Os, Hanssen, Bijl and Ravelli, 2000). It consists of a group of symptoms similar to those of schizophrenia which can be present in the general population and distributed along a continuum of severity, at whose extreme end we find psychosis (van Os, Linscott, Myin-Germeys, Delespaul and Krabbendam, 2008). However, attenuated psychotic experiences should not be considered a homogeneous group of symptoms but rather an aggregate of

experiences, among which we find magical thinking, paranoid ideation or odd perceptual experiences (e.g., hallucinations) (Nelson and Yung, in press). Likewise, these phenomena are not necessarily linked to discomfort or limitation, nor to a formal schizophrenia diagnosis or to any other type of medical condition; however, it is true that different studies have found a relationship between attenuated psychotic symptoms and the presence of psychopathology (e. g., dysphoria or depression) (Cella, Cooper, Dymond and Reed, 2008; De Loore et al., 2008; Fonseca-Pedrero, Muñiz, Lemos-Giráldez, García-Cueto and Campillo-Álvarez, 2007; López, Paino, Martínez, Inda-Caro and Lemos Giráldez, 1996; Yung et al., 2007).

The prevalence rates in the general population depend to a certain extent on the types of self-reports, sample and statistical criterion employed. In a recent meta-analysis by van Os and colleagues (2008), the mean prevalence rates for subclinical psychotic experiences is placed at 5%.

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Classic epidemiological studies (Eaton, Romanoski, Anthony and Nestadt, 1991; Kendler, Gallagher, Abelson and Kessler, 1996; Tien, 1991) and others which are not so classic, find that these pseudopsychotic symptoms are psychological phenomena which are fairly frequent in community samples (Johns, Nazroo, Bebbington and Kuipers, 2002; Mojtabai, 2006; Scott, Chant, Andrews and McGrath, 2006; Scott, Welham et al., 2008; van Os, Hanssen, Bijl and Ravelli, 2000). In the same way, said experiences have also been found in primary care patients (Olfson et al., 2002), in non-psychotic psychiatric patients (Hanssen et al., 2003) and in genetic (Johnstone, Ebmeier, Miller, Owen and Lawrie, 2005) and clinical high-risk subjects (Yung et al., 2006; Yung et al., 2003). These data show that the frontiers of the psychotic phenotype go beyond the limits traditionally proposed by international classification systems, suggesting a psychopathological continuity between the clinical and subclinical states of the psychotic phenotype.

On the other hand, longitudinal studies have shown that the presence of attenuated psychotic experiences can increase the future risk of evolving toward a serious psychological disorder. Thus, in the general population, it has been ascertained that individuals with high scores on self-reports for the assessment of aspects such as magical thinking, perceptual aberrations or delirant ideation, have a greater future probability of developing a schizophrenia-spectrum disorder (Chapman, Chapman, Raulin and Eckblad, 1994; Hanssen, Bak, Bijl, Vollebergh and van Os, 2005; Kwapil, Miller, Zinser, Chapman and Chapman, 1997; Poulton et al., 2000). Nevertheless, there are also results that indicate that participants with high scores on these types of self-reports do not necessarily evolve toward the development of psychotic-type disorders but rather toward affective problems or substance abuse (Dhossche, Ferdinand, Van der Ende, Hofstra and Verhulst, 2002; Verdoux et al., 1998). Likewise, when genetic and clinical high-risk individuals are analyzed together, the attenuated psychotic symptoms are also found to be a good predictor in these samples of future transition to schizophrenia-spectrum disorders (Johnstone, Ebmeier, Miller, Owen and Lawrie, 2005; Mason et al., 2004; Morrison et al., 2006; Yung et al., 2003).

As occurs in schizophrenia patients, subclinical psychotic symptoms have been associated to different socio-demographic variables such as gender and age (Maric, Krabbendam, Vollebergh, De Graff and Van Os,

2003; Spauwen, Krabbendam, Lieb, Wittchen and van Os, 2003). Females have a tendency to report a higher number of hallucinatory psychotic experiences or positive symptoms in comparison to males (Johns et al., 2004; Paino, Fonseca-Pedrero, Lemos-Giráldez and Muñiz, 2008; Preti, Bonventre, Ledda, Petretto and Masala, 2007; Scott et al., 2008), although some studies have not found such an association (Scott, Chant, Andrews and McGrath, 2006); however, the tendency shown by males to score higher than females in the denominated negative symptoms appears consistently in the literature (Fonseca-Pedrero, Lemos-Giráldez, Muñiz, García-Cueto and Campillo-Álvarez, 2008; Fonseca-Pedrero et al., 2007; Maric et al., 2003). Age has also been linked to attenuated psychotic symptoms (Stefanis et al., 2004), with younger participants showing a greater rate of attenuated psychotic experiences in comparison with older participants (Kendler, Gallagher, Abelson and Kessler, 1996; Scott et al., 2006; Scott, et al., 2008; van Os et al., 2008).

ATTENUATED PSYCHOTIC EXPERIENCES IN ADOLESCENCE

There is no doubt that adolescence is a period of special interest for the study of possible psychosis-risk markers (Keshavan, Diwadkar, Montrose, Rajarethinam and Sweeney, 2005) for several reasons: 1) the temporal proximity of this developmental stage to the onset of schizophrenia, with the most commonly accepted age range for the onset of schizophrenic symptomatology being between 15 and 35 years (Gottesman, 1991); 2) the diversity of changes that take place during these ages at maturational, hormonal, cerebral, cognitive and/or social levels, which can be considered environmental stressors that increase the risk for the development of schizophrenia-spectrum disorders (Feinberg, 1982; Harrop and Trower, 2003; Keshavan, Gilbert and Diwadkar, 2006; Walker and Bollini, 2002); 3) the possibility of studying symptoms similar to those of schizophrenia without the secondary effects frequently associated to this disorder (e.g., medication, stigmatization or deterioration due to the illness); 4) the existing evidence that stressful vital events and trauma at an early age are linked to an increased proneness toward psychotic-type disorders (Berenbaum et al., 2008; Hepgul et al., 2008; Holmes and Steel, 2004; Myin-Germeys et al., 2007; Myin-Germeys and van Os, 2007; Olin, Raine, Cannon, Parnas and Mednick, 1997; Startup,



1999); and 5) the possibility of finding cognitive, motor, behavioral, neuropsychological and other types of alterations during childhood and adolescence, prior to the development of the psychotic disorder itself (Bearden, Meyer, Loewy, Niendan, & Cannon, 2006; Cannon et al., 2002; Cannon et al., 1999; Welham et al., in press). All these questions, besides suggesting the existence of a potential alteration during neurodevelopment (early or late) (Keshavan et al., 2006), open the possibility of examining possible vulnerability or risk markers prior to the clinical expression of the disorder, with a view to improving early detection strategies and the implementation of prevention programs.

Consequently, the study of psychotic experiences in adolescence and their relation to the subsequent risk for schizophrenia spectrum disorders has become an area of interest in the current research (Welham et al., in press). The epidemiological studies seem to prove that the psychotic symptoms themselves are a common phenomena within this age group (Horwood et al., 2008; McGorry et al., 1995; Scott et al., 2008). The prevalence rates in adolescents and young adults found in previous investigations are presented in *Table 1*. The strict comparison between studies is limited by the type of instrument employed as well as by the characteristics of the samples used. As can be observed in the review, the prevalence rates vary a great deal. Hence, Yoshizumi and colleagues (2004), using a sample of 761 Japanese children, found that 21% of these reported some hallucinatory experience. Similarly, Scott et al. (2008) found that 8.4% of Australian adolescents reported having experimented some visual or auditory-type hallucinatory experience. On their part, Horwood and colleagues (2008), using a sample of 6,455 English adolescents, found that 38.9% of these scored on more than one item related to psychotic experiences. Finally, Spauwen et al. (2006a), in an analysis of a German-adolescent sample, found that 16% obtained positive scores on at least one item related to hallucinatory and/or delirant experiences.

Similar to what occurs in the general population, different longitudinal studies have pointed out that those children or adolescents who present some type of psychotic experience during this developmental period have an associated greater risk for the later development of psychosis (Poulton et al., 2000; Welham et al., in press) or other types of disorders (Dhossche et al., 2002). For example, it has been observed that, similar to what

occurs in adult populations, the presence of hallucinatory experiences is associated with high levels of anxiety, depression or dissociative experiences (Altman, Collins and Mundy, 1997; McGee, Williams and Poulton, 2000; Scott, et al., 2008; Yoshizumi, Murase, Honjo, Kanedo and Murakami, 2004). Along these lines, Poulton and colleagues (2000), in a 15-year longitudinal study, found a temporal continuity of psychotic experiences from childhood to adulthood; the children who reported hallucinatory and/or delirant experiences at the age of 11 had a higher risk for the subsequent development of a schizophreniform disorder at the age of 26. Welham et al. (in press), also conducted a longitudinal study where they obtained information from both the parents and the adolescents at different times; they found that the presence of auditory hallucinatory experiences was related to a greater risk of subsequent non-affective psychosis 14 years later, although a high percentage of the adolescents who had reported the presence of auditory hallucinatory experiences did not necessarily evolve toward a psychotic disorder. Similarly, Loore and colleagues (2008) examining a sample of 1,903 adolescents, found that 2 years later the psychotic experiences persisted in 28.7% of the cases who had reported such experiences in the basal period (5.3% of the adolescents). All these data point out, on the one hand, that most psychotic experiences are common and transitory phenomena which are not invariably linked to a psychopathological alteration and, on the other hand, that only in a reduced group of adolescents are these experiences maintained in a persistent manner or take on a disfavoured course over time; thus confirming that the possible developmental paths toward psychotic disorders can be heterogeneous and diverse.

ATTENUATED PSYCHOTIC EXPERIENCES IN NONCLINICAL SPANISH ADOLESCENTS

As has been observed, the subclinical expression of psychosis during adolescence is a matter of great interest. The prevalence rates of attenuated psychotic experiences, as well as their distribution, have been scarcely investigated in Spanish adolescent populations. Our research group has recently become interested in psychotic experiences in this age group. The review carried out regarding psychotic experiences in adolescence (see *Table 1*) seems to point out that the distribution and proportion of these can vary considerably as a function of the measurement instrument employed.



TABLE 1
PREVALENCE STUDIES OF ATTENUATED PSYCHOTIC EXPERIENCES IN ADOLESCENTS

Study	Type	Sample	Measurement Instrument	Prevalence/results
(Pearson et al., 2008)	T	N= 250 M= 14-15 years English	HQ	73.1% responded positively to at least one item on the questionnaire
(Scott et al., 2008)	T	N= 1261 M= 14.8 (1.2) years Australian	CBCL; YSR; DISC-IV	8.4 % of the adolescents experienced visual and/or auditory hallucinatory experiences
(Scott et al., 2008)	T	N= 2441 M= 19.9 (0.9) years Australian	PDI-21; CIDI	10.5% responded to a delirant-related item 9.2 % responded to an item regarding hallucinatory experiences 2.2% responded to more than three items
(De Loore et al., 2008)	L	N= 1903 M= 13-14 years Dutch	SDQ	5.3% inform at base line of hallucinatory experiences and of these 28.7% persist after 2 years.
(Horwood et al., 2008)	T	N= 6455 M= 12.9 years English	12 items Hall. Exp. DISC-IV	38.9% reported one or more psychotic symptoms 13.7% evaluation of symptoms with an observer 7.3% reported auditory hallucinations
(Laurens et al., 2007)	T	N= 548 M= 9-12 years English	SDQ; DISC-IV; + 5 items	58.9% reported some psychotic experience 29.9% reported auditory hallucinations
(Spauwen et al., 2006a)	L	N= 918 M= 15.1 (1.1) years German	M-CIDI; SCL-90-R	16% responded affirmatively to at least one item on the M-CIDI
(Spauwen et al., 2006b)	L	N (t2)= 2524 M= 21.7 (3.4) German	M-CIDI; SCL-90-R	17.5% reported a psychotic symptom at t2 7.3% reported two or more psychotic symptoms at t2 3.4% reported three psychotic symptoms at t2
(Yung et al., 2006)	T	N= 883 Australian Adolescents	CAPE	99.1% responded "sometimes" to items assessing psychotic experiences
(Henquet et al., 2005)	L	N= 2437 M= 18.3/21.8 years German	M-CIDI; SCL-90-R	17.4% cumulative incidence for psychotic symptoms 7.1% responded affirmatively to 2 items or more on the M-CIDI
(Yoshizumi et al., 2004)	T	N= 791 (380) M= 11-12 years Japanese	<i>Ad hoc</i> Questionnaire Hall. Exp.	21.3% reported some hallucinatory experience 9.2% reported auditory hallucinations 5.5% reported visual hallucinations 6.6% reported both hallucinatory experiences
(Spauwen et al., 2004)	L	N (t2)= 2548 M= 21.7 (3.4) years German	M-CIDI	17.3% (n=441) reported a psychotic experience
(Ferdinand et al., 2004)	L	N(t1)= 908 M=11-14 years N(t2)= 987 M=15-18 years Dutch	CBCL; YSR; AYSR	10.9% (n=99)(11-14 years) and 9.2% (n=91)(15-18 years)
(Spauwen et al., 2003)	L	N (t2)= 2548 M= 21.7 years German	M-CIDI (15 items)	17.5% accumulative incidence of psychotic symptoms 15.7% reported a delirant experience 4.6% reported a hallucinatory experience

TABLE 1 (CONTINUACIÓN)
PREVALENCE STUDIES OF ATTENUATED PSYCHOTIC EXPERIENCES IN ADOLESCENTS

Study	Type	Sample	Measurement Instrument	Prevalence/results
(Dhossche et al., 2002)	L	N (t1)= 914 M=14 (2.1) years N (t2)= 783 M=23.1 (2.0) years Dutch	YSR; AYSR; CID1	6% of adolescents reported hallucinatory experiences 3% of young adults reported hallucinatory experiences
(Poulton et al., 2000)	L	N= 711 M= 11 years New Zealander	DISC (5 items)	At age 11, 13% responded affirmatively to an item which evaluated psychotic symptoms and 15 years later had an increased probability of developing a schizophreniform disorder
(McGorry et al., 1995)	T	M= 657 N= 16.5 years Australian	RPMIP Adaptation	51% answered to items related to magical ideation 45.6% reported odd perceptual experiences

Note: the instruments which directly inform about the prevalence rates of psychotic experiences are shown
T: Transversal; L: Longitudinal; t1: First measurement; t2: Second measurement; Hall Exp.: Hallucinatory Experiences; HQ: Hallucination Questionnaire; SDQ: Strengths Difficulties Questionnaire; PDI-21: Peters et al. Delusion Inventory-21; CBCL: Child Behavior Checklist; YSR: Youth Self Report; AYSR: Young Adult Self Report; M-CIDI: Munich-Composite International Diagnostic Interview; DISC-IV: Diagnostic Interview Schedule for Children; CAPE: Community Assessment of Psychotic Experiences; SCL-90-R: Symptom Checklist-90-Revised; RPMIP: Royal Park Multi-Diagnostic Instrument for Psychosis

Consequently, in the present review of international research on this matter, we have conducted two studies analyzing some specific items on both self-reports used to measure these types of symptoms.

Firstly, we carried out an analysis of 10 items included in the Cuestionario Oviedo para la Evaluación de la Esquizotipia (COEE) (Oviedo Questionnaire for Schizotypy Assessment) (Fonseca-Pedrero, 2009), in a sample of 1,653 students, 794 males (48.0%), belonging to 41 different high schools and 95 different classes in the Principality of Asturias, selected using a stratified random sampling by conglomerates. The mean age was 15.94 years (SD=1.23), ranging from 14 to 19 years. The COEE (Fonseca-Pedrero, 2009) is a questionnaire of recent construction which evaluates schizotypal personality traits in adolescents. It is based on the diagnostic criteria included in the DSM-IV-TR (American Psychiatric Association, 2000) and on the schizotaxia-schizotypy model proposed by Meehl (1962). It consists of a total of 51 items in a Likert-type response format with 5 categories (1: *completely disagree*; 5: *completely agree*) distributed along 10 empirically endorsed scales, namely: Referential Ideation, Magical Thinking, Odd Perceptual Experiences, Odd Thought and Speech, Paranoid Ideation, Physical Anhedonia, Social Anhedonia, Abnormal Behavior, Lack of Close Friends and Excessive Social Anxiety. The number and percentage of participants who gave an “I agree quite a bit” (4) or “completely agree” (5) answer to 10 items in the COEE

are presented in *Table 2*. As can be seen, between 5.5 and 10.7% of the adolescents reported symptoms related to magical thinking (items 1 to 3); between 3.3 and 11.1% reported odd perceptual experiences (items 4 to 7); finally, between 2.7 and 17.4% of adolescents were found to report paranoid ideation symptoms (items 8 to 10).

Our research team conducted a second study where items 40 (“I hear things that nobody else seems to hear”) and 70 (“I see things that nobody else seems able to see”) of the *Youth Self Report* (YSR) (Achenbach and Edelbrock, 1987) were analyzed in a sample of 4,868 adolescents (M=14.7; SD=1.6) (2,315 males) enrolled in different Secondary Education Centers and cycles of Vocational Training in the Principality of Asturias. The YSR items have been previously used in other studies for the assessment of hallucinatory psychotic experiences in adolescents, finding them associated to an increased later risk of psychosis development (Ferdinand, Van der Ende and Verhulst, 2004; Welham et al., in press). The criterion for the selection of participants who presented hallucinatory experiences was considered a score of 1 or more on the YSR response options. The data showed that 11% of the sample (n=535) obtained these scores on item 40. As a function of gender, 11.7% of males (n=270) and 10.4% of females (n=265) were observed to report an auditory verbal-type hallucinatory experience. However, when item 70 was analyzed, 11.9% of the sample (n=580) was found to report a visual-type hallucinatory experience. As

a function of gender, it was found that a total of 288 males (12.4%) and 292 females (11.4%) had a score of 1 or more on item 70. Of the 4,868 adolescents, 5.2% (252 participants) experienced both types of hallucinatory phenomena.

The comparison between the percentages of psychotic experiences reported by the adolescents on both self-reports revealed similar prevalence rates. For example, item 4 on the COEE (*“Being alone at home, I have had the odd feeling that somebody was talking to me”*) showed a proportion of answers near 11%, similar to those found on both YSR items; however, when item 5 (*“I hear voices that nobody else can hear”*) and 6 on the COEE (*“When I am alone I have the feeling that*

somebody is whispering my name”) were analyzed, the proportion decreased to 3.3-3.8% of the total sample, being rates slightly inferior to those found on the YSR (10.4-12.4%).

The results found in our studies on Spanish adolescents converge with findings referred to in previous literature. Thus, Scott et al. (2008), also using items 40 and 70 on the YSR, in a sample of 1,262 Australian adolescents, found that 8.4% of the adolescents reported some visual or auditory hallucinatory experience. Likewise, Ferdinand and colleagues (2004) or Dhosseche et al. (2002), employing the same items found, respectively, that between 10.9% and 9.2% and 6% of the adolescents, reported having experienced some hallucinatory-type phenomena. Similarly, Spauwen et al. (2006a) using the *Munich-Composite International Diagnostic Interview (M-CIDI)* (Wittchen, Lachner, Wunderlich and Pfister, 1998) in a sample of German adolescents, found that 16% scored positively on at least one item related to hallucinatory and/or delirant experiences. On their part, Henquet and colleagues (2005), also utilizing the M-CIDI in a sample of Australian adolescents and young adults, found an accumulative incidence of psychotic symptoms of 17.4%. Nevertheless, it is pertinent to mention that the temporal persistence of these phenomena during the stages of adulthood (Hanssen, Bak, Bijl, Vollebergh and van Os, 2005) and adolescence (De Loore et al., 2008; Rössler et al., 2007) is more or less reduced; around 10-25% of these subclinical psychotic experiences are persistent, being able to interact in a synergic or additive manner with other environmental (e.g., consumption of cannabis, urbanicity, etc.) and/or hereditary factors, deriving with time in a psychotic-type disorder (Cognard et al., 2007; van Os, et al. 2008).

CONCLUSIONS AND FUTURE PERSPECTIVES

The review of the literature on the prevalence rates of psychotic experiences in adolescent populations and the data found in our studies suggest that: a) psychotic symptoms are frequent psychological phenomena in this age group related to the maturational processes of development; b) these are not necessarily related with a psychopathological alteration or with an increased risk for later schizophrenia-spectrum disorders; c) most of the experiences have a transitory and discontinuous character, although it is true that such experiences, in a percentage of individuals, persist or evolve negatively with time; d) psychotic symptoms are distributed along a

TABLE 2
PERCENTAGE OF PARTICIPANTS WHO HAD A SCORE OF FOUR OR FIVE ON TEN ITEMS IN THE CUESTIONARIO OVIEDO PARA LA EVALUACIÓN DE LA ESQUIZOTIPIA (OVIEDO QUESTIONNAIRE FOR SCHIZOTYPY ASSESSMENT)

items	Total (n=1653) n (%)	Males (n=794) n (%)	Females (n=859) n (%)
1. "I believe that the things that are on the radio or television have a special meaning to me, that my friends don't understand"	90 (5.5)	54 (6.8)	36 (4.2)
2. "I think that there are some people who can read other people's minds"	177 (10.7)	79 (9.9)	98 (11.4)
3. "I believe there are people who can control the thoughts of others"	103 (6.2)	50 (6.3)	53 (6.2)
4. "Being alone at home, I have had the feeling that someone was talking to me"	176 (10.2)	78 (9.8)	98 (11.4)
5. "I hear voices that others can't hear"	54 (3.3)	35 (4.4)	19 (2.2)
6. "When I am alone, I have the feeling that someone is whispering my name "	62 (3.8)	29 (3.6)	33 (3.8)
7. "I have thoughts which are so real that it seems as if someone was talking to me"	183 (11.1)	92 (11.5)	91 (10.6)
8. "I think that someone is planning something against me"	159 (9.6)	86 (10.8)	73 (8.5)
9. "Somebody has it in for me "	288 (17.4)	142 (17.9)	146 (17)
10. "My classmates are against me"	44 (2.7)	25 (3.1)	19 (2.2)



severity *continuum*, with psychosis at its most extreme end; and e) the psychotic phenotype seems to go beyond the frontiers proposed by the international classification systems, indicating that only a part of it is represented by the “clinical” cases.

Consequently, it should not be ignored that the presence of the subclinical phenomena analyzed in this paper can be understood as an expression of the fantastic nature (egocentrism, unrealistic optimism, feelings of indestructiveness, singularity) and the common problems of adolescence (the emotional turbulence associated to development, particularly if distancing from parents and mates exists) and is not necessarily an indication of a real risk of developing a relevant psychological disorder (Harrop and Trower, 2003).

Regarding the expression of psychotic disorders in adolescent populations, this normally occurs through changes in their capacities, personality or behavior, especially when those in their more immediate surroundings alert that he/she “is not the same person”. Taking into consideration that these disorders are manifested in the form of thoughts, feelings and odd behaviors, as well as social disinterest and difficulties in experimenting pleasure, it is necessary to pay attention, in addition, to a possible gradual deterioration in school or sport activities, in social relationships and in personal care and hygiene. On the other hand, we avail of information obtained from standardized schizotypy assessment instruments, together with the coexistence of other early signs at these ages, among which stand out: clear social withdrawal with severe difficulties in making and maintaining friendships; loss of belongings or forgetting things; extreme and sudden preoccupation with religion or the occult; sleep disturbances; suspicion and mistrust; odd behaviors or postures; at an emotional level: incapacity to express happiness or to cry (inexpressive face), inadequate laughter, depressive emotional state, abrupt mood swings, pronounced anxiety and fear, extreme reactions to criticism and unexpected irritability and hostility; diverse cognitive deficits, namely: a marked decrease in attention and concentration, nonsense writing, or use of peculiar words or language structure; and thought alterations such as: irrational comments or beliefs, tendency to confuse dreams with reality, confusion of what appears on television with reality, confused and disorganized thought and eccentric ideas (Lemos Giráldez, 2001). The apparition, during the juvenile years, of other even more elaborate and conspicuous

signs and symptoms, would recommend a preventative clinical intervention.

In short, there is no doubt that adolescence is an developmental period of great interest for the study of attenuated psychotic experiences, not only for its temporal proximity to the onset of psychosis but also for the diversity of affective, social and neurodevelopmental changes that take place during this period (Feinberg, 1982; Harrop and Trower, 2003; Walker and Bollini, 2002). In addition, it permits the investigation of possible risk markers with the aim of identifying, detecting, preventing and/or delaying the possible transition toward psychotic disorders. Future studies, and in accordance with Nelson and Yung (in press), should determine what group of psychotic experiences (e.g., magical thinking, paranoid and referential ideation) may be of greater importance or increment to a greater extent the risk for later schizophrenic psychosis, as well as examine their relationship with other measures of psychosis proneness (Fonseca-Pedrero et al., 2008). Finally, since depressive symptomatology is a phenomenon intimately related to the ontogenesis of schizophrenia (Birchwood and Trower, 2006; Freeman and Garety, 2003), we should gain a deeper understanding of the role that depressive symptomatology plays in psychosis and in the possible increase of the future risk for this disorder (Köhler et al., 2007; Krabbendam et al., 2005; Yung et al., 2003).

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