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Unemployment, social isolation, achievement–expectation mismatch and psychosis: findings from the ÆSOP Study

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Abstract *Introduction* In this study, we aimed to establish: (1) whether social isolation modifies the effect of unemployment on first episode psychosis and duration of untreated psychosis (DUP); and (2) whether the *gap* between high employment expectations and perceived poor employment achievement is associated with first-episode psychosis; and (3) whether the relationship of this achievement–expectation gap and first-episode psychosis is strongest in the African-Caribbean population. *Method* All patients with a first episode of psychosis presenting to specialist mental

health services within tightly defined catchment areas in south-east London and Nottingham over a 2-year period were included in the study. A random sample of healthy participants living within the same catchment areas was also recruited. Data were collected on socio-demographic and clinical characteristics, DUP, social contacts, and perceived levels of employment achievement and expectation. Analysis was conducted on data of 546 participants (224 cases, 322 controls) from the ÆSOP study. *Results* The relationship between unemployment and risk of non-affective psychosis was moderated by social contacts (unemployed/low social contacts, OR 7.52, 95% CI 2.97–19.08; unemployed/medium social contacts, OR 3.27, 95% CI 1.66–6.47; unemployed/high social contacts, OR 1.36, 95% CI 0.47–3.93). Unemployed patients experienced a longer DUP when having reported lower levels of social contacts. Participants whose employment achievement was lower than their expectations were more likely to be cases than those in whom achievement matched or exceeded expectations (adjusted OR 1.84, 95% CI 1.13–3.02). This applied equally to both African-Caribbean and White British participants (the Mantel–Haenszel test for homogeneity of odds ratios, $\chi^2 = 0.96$, $P = 0.33$). *Conclusions* This study suggests that unemployment, social isolation, employment achievement and expectations are important environmental factors associated with risk of psychosis. More attention needs to be focused on interactions between environmental factors as well as subjective experience of those factors in future research on the aetiology of psychosis.

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Introduction

Many studies have shown an association between unemployment and mental health problems [23, 24].

In the case of schizophrenia, unemployment has been consistently identified as a correlate at first contact with mental health services [21, 22]. The risk of first admission with schizophrenia is increased by being unemployed as long as 15 years before admission, this risk steadily increasing for unemployed individuals towards the admission year [1]. However, how unemployment exerts this detrimental effect to increase the risk of psychosis is poorly understood.

While social isolation has been reported as a risk factor for psychosis [4, 5, 28] studies of the relationship between unemployment and mental health suggest that the opportunity for interpersonal contact may be an important contributing factor [36]. Twenty years ago, Warr [35] found a positive association between the amount of interaction with friends and levels of mental health in unemployed individuals. Kessler et al. [16] further suggested that this variable may act as an effect modifier for the relationship between employment status and mental health. Thus, as factors increasing the risk of psychosis, unemployment and social isolation may not only exert main effects but also interact with each other.

An often-neglected aspect of unemployment as a risk factor for psychosis is that occupational status does not tell us about an individual's subjective experience of his or her employment situation [34]. There is, therefore, a need to distinguish employment status as an objective rating from the subjective evaluation of employment achievement and to assess whether this subjective evaluation is also associated with first episode psychosis.

Mallett et al. [21] emphasized that understanding the psychological impact of poor achievements is complex, especially in multi-ethnic societies. In the United Kingdom (the UK), African-Caribbeans of the first and second generation are more likely to experience lower employment achievement than White British people [3, 25]. However, ethnic minority groups may have particularly high levels of goal striving as a consequence of their migration history and consequently experience a greater sense of failure and disappointment when this striving goes unfulfilled [19, 29]. Mallett et al. [21] hypothesized that this might in part explain the higher incidence rates of schizophrenia and other psychosis that have been reported for the African-Caribbean population when compared to White British and other ethnic groups [9, 17, 20, 32].

■ Aims of the study

The current study sought to elaborate this hypothesis further by investigating whether (1) social isolation modifies the effect of unemployment on risk of psychosis and DUP; (2) the *gap* between high employment expectations and perceived poor employment achievement is associated with risk of psychosis; and (3) whether this association is strongest among African-Caribbeans.

Subjects and methods

■ Recruitment

This research forms part of the ÆSOP (Aetiology and Ethnicity in Schizophrenia and Other Psychoses) study. ÆSOP is a multi-centre epidemiological study of first episode psychosis (F20-F29 and F30-F33 in ICD-10 [38]) initially conducted over a 2-year period. All patients with a first episode of psychosis, who presented to specialist mental health services within tightly defined catchment areas in south-east London, Nottingham and Bristol (UK), were screened for inclusion using the screening schedule for psychosis [12]. Each patient who screened positive was approached and informed consent sought. The data reported here relate to subjects, who had completed the employment schedule [36] in the London and Nottingham arms of the study. Cases in Bristol were recruited from only for over a 9-month period and we have subsequently excluded these from all analyses other than of incidence rates. More detailed information on the study design can be obtained from Morgan et al. [27].

A random sample of population-based comparison participants, aged 16–64, was also recruited using a procedure adapted from that used by the Office of Population and Census Statistics Psychiatric Morbidity Survey [13]. The small users Postal Address File (PAFile) was used as the sampling frame. For each case ascertained, 10 addresses within the same electoral ward were randomly generated from the PAFile. This ensured broad comparability between cases and controls by neighbourhood. Each address was contacted three times (morning, afternoon and evening); if an eligible control was not recruited the procedure was repeated with another set of 10 addresses. All adults in each household were invited to take part, and where more than one occupant was willing to participate a modified Kish grid was used to randomly select one member of the household. To ensure a sufficient number of Black Caribbean controls were recruited, we purposefully over-sampled this population by continuing recruitment for a longer period. The Psychosis Screening Questionnaire [2] was administered to all eligible controls; if screened positive the subject was excluded.

■ Measures

ICD-10 [38] diagnoses were determined using detailed symptomatic information gathered by interviews using the Schedules for Clinical Assessment in Neuropsychiatry (SCAN [37]). Diagnoses were made in consensus meetings involving one of the ÆSOP study's Principal Investigators (JL or RM in London and PJ in Nottingham) and other members of the research team. For the current analysis, patients were grouped into two categories: affective psychoses (ICD-10 F30-33) and schizophrenia and other non-affective psychoses (ICD-10 F20-29). Full details are available in Kirkbride et al. [17].

Data on age, gender, current employment status, employment status in past 12 months, educational level achieved, and ethnicity were collected by interview with patients or, for patients not interviewed, from case notes, using the MRC socio-demographic schedule (available from the authors). Where there was ambiguity in assigning participants to ethnic groups, a consensus rating was made by members of the research team; this always included those with long-standing expertise in the study of ethnicity and mental health.

Social interaction was assessed using a sub-scale of the employment schedule [36]. This subscale comprises eight items, which ask participants how much time they spend in a typical week on social contacts with family, friends, or others. Items are rated on a five-point scale ranging from never to most/all of the time. Lower scores indicate a lower amount of time spent on social contacts. A categorical score was computed using the 25th and 75th percentile as cut-off points to divide the score into low, medium, and high social contacts.

Data on date of the onset of psychosis were collected from interviews with patients, a close relative, and from clinical notes employing the personal and psychiatric history schedule (PPHS) [39]. DUP was defined as the period in weeks from the onset of psychotic symptoms to first contact with statutory mental health services. In accordance with Craig et al. [7], the onset of psychosis was defined as the presence for 1 week or more of at least one of the following psychotic symptoms: hallucinations, delusions, marked psychomotor disorder, marked thought disorder, and grossly inappropriate, bizarre and/or disorganized behaviour with a marked deterioration in function. The endpoint for DUP was contact with specialist mental health services. Inter-rater reliability of DUP ratings was satisfactory [26].

An amended version of the Achievement–Expectation Questionnaire [29], as employed in the previous study [21], was used to assess perceptions of employment achievement. Items were rated using a visual analogue of a ten-step staircase. Participants were asked to indicate which step best represented their current, and past, employment achievement and expectations. Median split was used to classify participants into categories of low- and high-perceived employment achievement and expectations. Mismatch between achievement and expectation was calculated by subtracting expectations from achievement. The mismatch between achievement and expectations ranged from 9 to –9; for the analyses, participants were divided into a category of lower achievement/higher expectation (score –9 to –1) and another category referring to the match of achievement/expectation as well as higher achievement/lower expectation (0 to 9), the first of these being the category of interest as it represents the participants' perception of having failed to live up to their prior expectations.

Data analysis

The associations between employment and other socio-demographic variables and case-control status were assessed using chi-square tests. Logistic regression analysis was used to examine the relationship between the key explanatory variables and case-control status, controlling for potential confounders. Univariate analyses were conducted with the data stratified by study centre and diagnosis to assess whether there were any marked differences between these groups.

The Mantel–Haenszel test for the homogeneity of odds ratios was used to initially investigate interaction effects. A logistic regression model was then built in several steps based on findings from logistic regression analysis and Mantel Haenszel tests. First, employment status was entered into the model, with case-control status as outcome variable. Second, in order to control for confounding, socio-demographic characteristics were successively added beginning with the variable most strongly associated with case status. A variable for study centre was always included to control for any confounding of study setting. Third, interaction terms, identified as significant at the 0.1 level using Mantel–Haenszel analyses, were added and likelihood ratio tests conducted to assess whether the interaction term significantly improved the model. Final models were refitted as sensitivity analyses including probability weights to account for over-sampling of Black Caribbean controls. The results of the sensitivity analyses (which did not alter the conclusions) are available from the first author on request.

We conducted survival analysis to assess associations of duration of untreated psychosis and other variables. Kaplan–Meier survival curves were constructed going upwards to represent the cumulative probabilities of contact with services over time, with the onset of psychosis as the entry point and contact with services as the end point. Log-rank tests were used to assess whether the probability of contact over time differed between groups. Cox regression was then employed to quantify univariate associations in terms of the hazard ratio, to adjust for potential confounders, and to formally assess interaction terms using likelihood ratio tests. A liberal value of $P < 0.1$ was used for assessing statistical signifi-

Table 1 Socio-demographic characteristics by case-control status using Pearson's χ^2 test

	Cases (<i>n</i> = 224) <i>n</i> (%)	Controls (<i>n</i> = 322) <i>n</i> (%)	Significance test	<i>P</i>
Gender				
Male	122 (54.5)	131 (40.7)	$\chi^2 = 10.1$, <i>df</i> = 1	<0.001
Female	102 (45.5)	191 (59.3)		
Age				
16–29	114 (50.9)	105 (32.6)	$\chi^2 = 18.4$, <i>df</i> = 1	<0.001
30–65	110 (49.1)	217 (67.4)		
Ethnicity				
White British	113 (50.4)	214 (66.5)	$\chi^2 = 34$, <i>df</i> = 5	<0.001
African-Caribbean	59 (26.3)	54 (16.8)		
Black African	24 (10.7)	11 (3.4)		
White other	11 (4.9)	34 (10.6)		
Asian (all)	12 (5.4)	6 (1.9)		
Others	5 (2.2)	3 (0.9)		
Diagnosis				
Non-affective psychosis	138 (61.6)	–	–	–
Affective psychosis	86 (38.4)	–	–	–

cance of interactions to ensure that potentially important effect modifiers were not removed from the analysis. Analyses were performed using SPSS release 12.0 [31] and STATA release 9 [33].

Results

Sample

Of the 781 participants (390 cases, 391 controls), 546 completed the employment schedule. Of these, 224 (57%) were cases and 322 (82%) controls.

Socio-demographic and diagnostic characteristics by case-control status are summarized in Table 1. Cases were more likely to be male and aged 16–29. There were significantly more cases than controls of African-Caribbean and Black African origin, and fewer cases than controls of White British origin, reflecting the higher rates of psychosis observed in these populations [9]. Most of the cases had a broad diagnosis of non-affective psychosis ($n = 138$, 62 %).

Employment and social contacts

Cases were more likely than controls to be unemployed, to be educated to school or further level and significantly less likely to have been in work in the past 12 months. There was no evidence that odds ratios for employment status and psychosis differed by study site (in south-east London, unadjusted OR 2.86, 95% CI 1.72–4.75, $P < 0.001$; in Nottingham, unadjusted OR 2.19, 95% CI 1.34–3.56, $P = 0.002$). The relationship between employment status and non-affective psychosis was slightly stronger (unadjusted OR 3.02, 95% CI 1.99–4.57, $P < 0.001$) than that between employment status and affective psy-

Table 2 Unadjusted and adjusted odds ratios for case-control status using logistic regression

	Cases (<i>n</i> = 224) <i>n</i> (%)	Controls (<i>n</i> = 322) <i>n</i> (%)	Unadjusted OR	95% CI	<i>P</i>	Adjusted OR	95% CI	<i>P</i>
Employment status ^a								
Unemployed	135 (60.3)	121 (37.6)	2.52	1.78–3.58	<0.001	2.47	1.68–3.62	<0.001
Others	89 (39.7)	201 (62.4)	1.00			1.00		
Level of education ^b								
To school level	136 (60.7)	142 (44.4)	2.45	1.53–3.93	<0.001	2.08	1.23–3.52	0.006
To further level	56 (25.0)	96 (30.0)	1.50	0.88–2.53	0.13	1.19	0.67–2.12	0.546
To higher level	32 (14.3)	82 (25.6)	1.00			1.00		
Employment status in past 12 months ^a								
No work	85 (38.1)	88 (27.3)	1.00			1.00		
Work	121 (54.3)	221 (68.6)	0.57	0.39–0.82	0.003	0.58	0.38–0.87	0.008
Student	17 (7.6)	13 (4.0)	1.35	0.62–2.96	0.45	1.13	0.48–2.66	0.77

^aAdjusted for study centre, level of education, ethnicity, age, and sex

^bAdjusted for study centre, employment status, ethnicity, age, and sex

Table 3 Main and interaction effect for employment status and social contacts by case-control status

	Adjusted OR (main effects)	95% CI	<i>P</i>	Adjusted OR (with interaction term) ^b	95% CI	<i>P</i>
Social contacts categorical score ^{a,c,d}						
Low vs. high social contacts	2.79	1.60–4.87	<0.001			
Medium vs. high social contacts	1.72	1.04–2.85	0.036			
Unemployed vs. other ^a	2.71	1.82–4.03	<0.001			
Low social contacts				5.10	2.39–10.88	<0.001
Medium social contacts				2.48	1.41–4.36	0.002
High social contacts				1.49	0.65–3.38	0.34

^aAdjusted for study centre, age, sex, and ethnicity

^bInteraction term: employment status x social contacts, *P* = 0.086

^cBy study centre

London: low versus high social contacts, unadjusted OR 2.73 (95% CI 1.33–5.60, *P* = 0.006); medium versus high social contacts; unadjusted OR 1.19 (95% CI 0.62–2.28, *P* = 0.598)

Nottingham: low versus high social contacts, unadjusted OR 2.22 (95% CI 1.08–4.58, *P* = 0.030); medium versus high social contacts, unadjusted OR 1.96 (95% CI 1.01–3.79, *P* = 0.046)

^dBy diagnosis

Non-affective: low versus high social contacts, unadjusted OR 3.01 (95% CI 1.64–5.52, *P* < 0.001); medium versus high social contacts, unadjusted OR 1.85 (95% CI 1.04–3.26, *P* = 0.035).

Affective: low versus high social contacts, unadjusted OR 1.67 (95% CI 0.84–3.32, *P* = 0.142); medium versus high social contacts, unadjusted OR 1.14 (95% CI 0.61–2.15, *P* = 0.676)

chosis (unadjusted OR 1.91, 95% CI 1.18–3.09, *P* = 0.008) (Table 2).

As can be seen in Table 3, findings on social contacts and psychosis showed that the odds of being a case increased as levels of social contacts decreased independent of study centre, employment status, age, sex and ethnicity. The odds were equally elevated whether a low number of social contacts were reported with family (adjusted OR 1.72, 95% CI 1.02–2.90, *P* = 0.043) or friends (adjusted OR 2.65, 95% CI 1.53–4.58, *P* < 0.001). Further, the relationship between unemployment and case status varied according to levels of social contacts. An interaction term for employment status and social contacts was added to the previous main effects model. This interaction significantly improved the model (likelihood ratio test $\chi^2 = 4.85$, *P* = 0.086). In short, the more socially isolated unemployed participants were the higher their odds of being a case. Univariate analysis conducted

with the data stratified by diagnosis suggested that cases with non-affective psychosis were more likely to experience lower levels of social contacts (see Table 3). No significant relationship could be observed for social contacts and affective psychosis. Findings on social contacts and non-affective psychosis held when odds ratios were adjusted for study centre, employment status, age, sex and ethnicity (low vs. high social contacts, adjusted OR 3.84, 95% CI 1.91–7.71, *P* < 0.001; medium vs. high social contacts, adjusted OR 2.10, 95% CI 1.10–3.98, *P* = 0.024). Also, the test for interaction of unemployment by social contacts was significant with non-affective psychosis as outcome variable (likelihood ratio test $\chi^2 = 5.94$, *P* = 0.051). The odds ratio for non-affective psychosis among the unemployed compared to those in any form of work or education was 7.52 (95% CI 2.97–19.08, *P* < 0.001) for participants with low level of social contacts, 3.27 (95% CI 1.66–6.47, *P* = 0.001) for

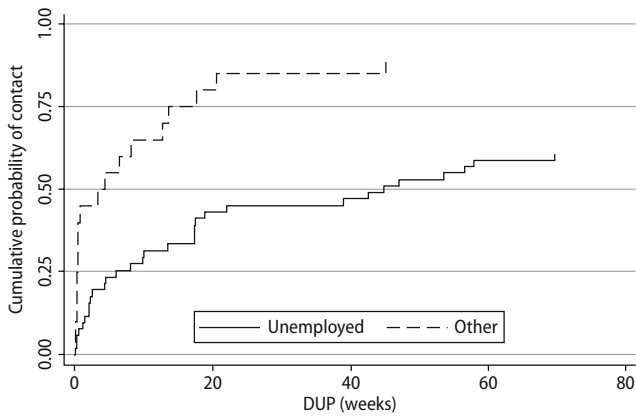


Fig. 1 Survival curves for employment status by low social contacts

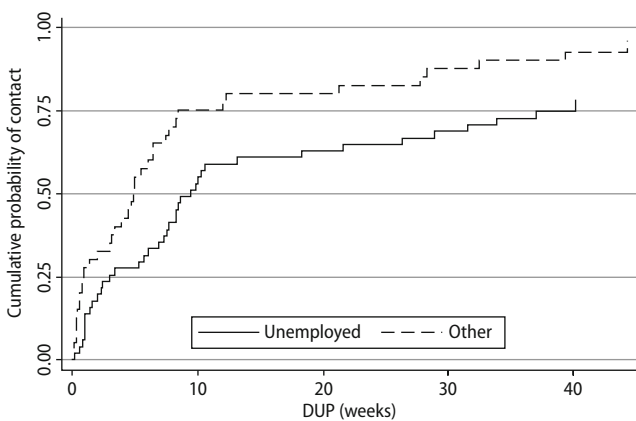


Fig. 2 Survival curves for employment status by medium social contacts

those with medium social contacts, and 1.36 (95% CI 0.47–3.93, $P = 0.565$) for subjects with high levels of social contacts.

Findings on employment status and social contacts were further examined with regard to duration of untreated psychosis (DUP). There was evidence from Kaplan–Meier survival curves that, compared to those working or in education, unemployed subjects were more likely to experience longer periods of untreated psychosis when reporting low (log-rank test $\chi^2 = 16.18$, $P < 0.001$, see Fig. 1) or medium (log-rank test $\chi^2 = 8.90$, $P = 0.003$, see Fig. 2) number of social contacts. No such difference could be observed for those with high social contacts (log-rank test $\chi^2 = 0.28$, $P = 0.60$, see Fig. 3).

On the basis of these findings, we assessed whether the relationship between unemployment and DUP varied according to low or medium when compared to high levels of social contacts using Cox regression. Table 4 shows that unemployed subjects with low or medium social contacts experienced longer periods of psychosis than those with high social contacts (adjusted hazard ratio 0.47, 95% 0.23–0.98). The likelihood ratio test for assessing whether this interaction

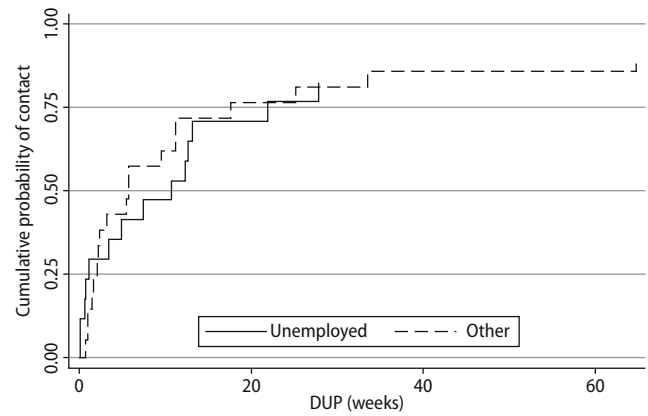


Fig. 3 Survival curves for employment status by high social contacts

improved the previous adjusted main effects model was significant (likelihood ratio test $\chi^2 = 3.95$, $P = 0.047$).

■ Employment and the achievement–expectation gap

Table 5 presents odds ratios for psychosis by participants' perceived employment achievement and expectations, and mismatch between the two, as independent variables. Cases were more likely than controls to perceive their achieved employment level to be low, to have expected to have been in a better job and to have lower employment expectations. Furthermore, those reporting lower achievement and higher expectations were more likely to be cases than those where expectations and achievement matched or those where achievement exceeded expectations.

■ Employment and ethnicity

African-Caribbean cases and controls were more likely to be unemployed than their White British counterparts (unadjusted OR 2.15, 95% CI 1.39–3.33). Unemployment was associated with psychosis in both groups to a comparable degree (see Table 6).

The associations of achievements and expectations with case status varied by ethnicity (see Table 7). White British cases were significantly more likely than White British controls to report low expectations and low achievement. In contrast, a significantly greater percentage of African-Caribbean cases reported having had high employment expectations (67%, 35/52) than either the African-Caribbean controls (50%, 24/48) or White British cases (44%, 43/98) (Mantel–Haenszel test for homogeneity of odds ratios, $\chi^2 = 6.59$, $P = 0.01$). This was reflected in a greater percentage reporting an achievement–expectation gap (84%, 38/45) than the White British cases (71%, 56/79) al-

Table 4 Main and interaction effect for employment status and social contacts

	Adjusted hazard ratio (main effects)	95% CI	<i>P</i>	Adjusted hazard ratio (with interaction term) ^b	95% CI	<i>P</i>
Social contacts categorical score ^a						
Low/medium vs. high social contacts	0.92	0.62–1.36	0.66			
Unemployed vs. others ^a	0.51	0.37–0.70	<0.001			
Low/medium vs. high social contacts				0.47	0.23–0.98	0.044

^aAdjusted for study centre, age, sex, ethnicity, and diagnosis

^bInteraction term: employment status × social contacts, *P* = 0.047

Table 5 Odds ratios for perceived employment achievement and expectations by case–control status

	Cases, <i>n</i> (%)	Controls, <i>n</i> (%)	Unadjusted			Adjusted for confounders		
			OR	95% CI	<i>P</i>	OR	95% CI	<i>P</i>
Perceived current employment achievement ^a								
Low	106 (54.1)	113 (38.3)	1.90	1.32–2.74	0.001	1.62	1.09–2.41	0.016
High	90 (45.9)	182 (61.7)	1.00			1.00		
Prior expectations regarding employment level reached by now								
Low	97 (49.5)	134 (45.4)	1.00					
High	99 (50.5)	161 (54.6)	0.85	0.59–1.22	0.38			
Expected to have a better job than the current one ^a								
Yes	93 (54.4)	107 (61.6)	1.92	1.30–2.82	0.001	1.71	1.13–2.59	0.011
No	78 (45.6)	172 (38.4)	1.00			1.00		
Lowered job expectations ^b								
Yes	102 (65.4)	86 (54.1)	1.60	1.02–2.53	0.042	1.86	1.11–3.11	0.018
No	54 (34.6)	73 (45.9)	1.00			1.00		
Achievement–expectation mismatch ^a								
Low achievement/high expectation	119 (73.5)	131 (51.2)	2.64	1.72–4.04	<0.001	2.31	1.47–3.65	<0.001
Others	43 (26.5)	125 (48.8)	1.00			1.00		

^aAdjusted for study centre, age, ethnicity and level of education

^bAdjusted for study centre, age and ethnicity

though this was not reflected in a significantly stronger relationship of achievement–expectation gap and case–control status in African-Caribbean subjects (Mantel–Haenszel test for homogeneity of odds ratios, $\chi^2 = 0.96$, *P* = 0.33).

As would be expected, employment status at the onset was closely associated with perceived achievement (OR adjusted for age and sex 4.85, 95% CI 3.27–7.19, *P* < 0.001) although this was not reflected in employment expectations (OR 1.21, 95% CI 0.85–1.72). Furthermore, unemployed participants were significantly more likely to report lower achievement/

higher expectations (adjusted OR 3.54, 95% CI 2.31–5.42). This effect remained after adjustment for age. When the mismatch between achievement and expectation was added to the final model, the overall regression model remained highly significant (likelihood ratio test, $\chi^2 = 80.65$, *P* < 0.001) but the odds ratio for employment status was reduced from OR 2.71 to OR 2.20 (95% CI 1.36–3.56), at the expense of a strong and significant main effect of the achievement–expectation difference (OR 1.85, 95% CI 1.13–3.03, *P* = 0.014). This suggests that the association of unemployment and psychosis is partly mediated by a

Table 6 Ethnicity (White British and African-Caribbean only) and psychosis, by employment status

	Cases, <i>n</i> (%)	Controls, <i>n</i> (%)	Unadjusted OR	95% CI	<i>P</i>
White British					
Employment status					
Unemployed	63 (55.8)	72 (33.6)	2.49	1.54–4.01	<0.001
Others	50 (44.2)	142 (66.4)	1.00		
African-Caribbean					
Employment status					
Unemployed	43 (72.9)	25 (46.3)	3.12	1.37–7.07	<0.001
Others	16 (27.1)	29 (53.7)	1.00		

Mantel–Haenszel test for homogeneity of odds ratios $\chi^2 = 0.22$, *P* = 0.64

Table 7 Ethnicity (White British and African-Caribbean only) and psychosis, by employment achievement, expectation, and achievement–expectation mismatch

	Cases, <i>n</i> (%)	Controls, <i>n</i> (%)	Unadjusted OR	95% CI	<i>P</i>
White British					
Perceived employment achievement					
Low	58 (59.2)	70 (34.7)	2.73	1.64–4.56	<0.001
High	40 (40.8)	132 (65.3)	1.00		
African-Caribbean					
Perceived employment achievement					
Low	23 (44.2)	21 (43.8)	1.02	0.46–2.26	0.96
High	29 (55.8)	27 (56.3)	1.00		
Mantel–Haenszel test for homogeneity of odds ratios $\chi^2 = 4.32$, <i>P</i> = 0.04					
White British					
Employment expectations					
Low	55 (56.1)	88 (43.6)	1.00		
High	43 (43.9)	114 (56.4)	0.60	0.37–0.99	0.04
African-Caribbean					
Employment expectations					
Low	17 (32.7)	24 (50.0)	1.00		
High	35 (67.3)	24 (50.0)	2.06	0.90–4.71	0.08
Mantel–Haenszel test for homogeneity of odds ratios $\chi^2 = 6.59$, <i>P</i> = 0.01					
White British					
Achievement–expectation mismatch					
Lower achievement/higher expectation	56 (70.9)	86 (48.6)	2.58	1.44–4.61	<0.001
Other	23 (29.1)	91 (51.4)	1.00		
African-Caribbean					
Achievement–expectation mismatch					
Lower achievement/higher expectation	38 (84.4)	23 (53.3)	4.72	1.62–13.80	0.002
Other	7 (15.6)	20 (46.5)	1.00		
Mantel–Haenszel test for homogeneity of odds ratios $\chi^2 = 0.96$, <i>P</i> = 0.33					

mismatch between high expectations and low achievement.

Discussion

To our knowledge, this is the first study to suggest that the relationship of non-affective psychosis and unemployment is even stronger in those who are socially isolated. Further, the more socially isolated unemployed patients, the longer were the periods of untreated psychosis these patients experienced prior to first contact with mental health services.

Findings on the detrimental effects of unemployment were also reflected in participants' appraisal of their employment situation. Those who viewed their employment achievement as low having held high expectations of success were at greater risk for psychosis. This mismatch between achievement and expectation partly mediated the relationship between unemployment and psychosis. This indicates one possible mechanism by which unemployment may increase risk of psychosis.

When taking participants' ethnicity into account, White British cases were more likely to perceive their employment achievement and expectations as low when compared to White British controls, whereas African-Caribbean cases were more likely than their healthy counterparts or White British cases to have high employment expectations. There was some indication that these high employment expectations of

African-Caribbean cases fail to be met by subsequent achievement. This trend is in line with the hypothesis that the disappointment resulting from the gap between high expectations and low achievement is relevant to African-Caribbean people with psychosis and supported by evidence on perceived discrimination and disadvantage as factors explaining the excess of psychosis among African-Caribbean people living in the UK [6, 10]. However, in accordance with Mallett et al. [21], the difference between ethnic groups falls short of statistical significance and is insufficient to account for the higher incidence in this population.

Some limitations and methodological issues have to be considered when interpreting the findings of the current study. While some authors suggest that social isolation is a feature of the prodrome [11], Morgan et al. [28] found that long-standing indicators of social isolation relate to psychosis in a dose–response fashion. The present paper adds to this latter finding from the AËSOP study, in that a dose–response relationship could be also observed for unemployment and social isolation. This relationship was restricted to non-affective psychosis, a finding that may be viewed in context of the Camberwell Collaborative Psychosis Study [14], in which premorbid social deterioration was found to be specific for schizophrenia. However, since social contacts were assessed asking participants to indicate the time they spent in a typical week with others, we cannot finally distinguish whether low amount of social interaction was an immediate consequence of or preceded the first episode of psychosis

or even the prodromal syndrome. While confounding by study setting was controlled for in all multivariate analyses, our data did not allow for taking into account that potentially important environmental risk factors may vary at the local level within environments [18]. This paper did also not report findings on participants' satisfaction with the amount of social interaction they have in a typical week. This would have yielded additional information on individuals' subjective experience of social isolation and how this relates to psychosis. Furthermore, cause and effect remain indistinguishable with regard to the relationship between perceived employment achievement and psychosis. Additionally, the absence of statistical significance for the association between ethnicity and the mismatch between employment achievements and expectations may reflect low statistical power.

In relation to DUP, our findings suggest that unemployment and social isolation may interact in shaping prolonged periods of untreated psychosis. While some previous studies have reported a link between social determinants such as poor social integration [8] or social support networks [15, 30] and long DUP, we were able to take the next step in testing how social determinants may interact in predicting long DUP. A challenging question for future research is whether such interactions also increase the detrimental effects of DUP on outcomes.

The analyses presented in this paper highlight a number of important aspects of how social risk factors such as unemployment may translate into psychosis. Future research into the interaction of environmental factors as well as the subjective experience of social risk factors in the aetiology of psychosis in vulnerable individuals may help clarify some of these issues further.

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