Suspicious young minds: paranoia and mistrust in 8- to 14-year-olds in the UK and Hong Kong

Keri K. Wong, Daniel Freeman and Claire Hughes

Background
Research on paranoia in adults suggests a spectrum of severity, but this dimensional approach has yet to be applied to children or to groups from different countries.

Aims
To investigate the structure, prevalence and correlates of mistrust in children living in the UK and Hong Kong.

Method
Children aged 8–14 years from the UK ($n = 1086$) and Hong Kong ($n = 1412$) completed a newly developed mistrust questionnaire as well as standard questionnaire measures of anxiety, self-esteem, aggression and callous–unemotional traits.

Results
Confirmatory factor analysis of the UK data supported a three-factor model – mistrust at home, mistrust at school and general mistrust – with a clear positive skew in the data: just 3.4%, 8.5% and 4.1% of the children endorsed at least half of the mistrust items for home, school and general subscales respectively. These findings were replicated in Hong Kong. Moreover, compared with their peers, 'mistrustful' children (in both countries) reported elevated rates of anxiety, low self-esteem, aggression and callous–unemotional traits.

Conclusions
Mistrust may exist as a quantitative trait in children, which, as in adults, is associated with elevated risks of internalising and externalising problems.

Declaration of interest
None.

Paranoia (or excessive suspiciousness of others) is much more common than previously believed. A review of 14 epidemiological studies of Western samples ($n = 39\,995$) showed that 10–15% of young adults regularly experience paranoid thoughts[1] and a study of Chinese undergraduates ($n = 4951$) revealed similar (albeit slightly lower) rates of paranoid symptoms.[2] A recent study showed that the distribution of symptoms of paranoia in the adult British general population fit an exponential curve (i.e. most people have few paranoid thoughts, but few people have many paranoid thoughts).[3]

Although the nature and prevalence of paranoid thinking in childhood remain largely unknown, psychotic-like experiences (i.e. auditory hallucinations) in adolescence have been shown to predict later psychosis.[4] More attenuated instances of paranoia (e.g. suspiciousness or mistrust) may therefore also indicate vulnerability. Two different research groups have examined epistemic trust[5] and trust beliefs[6] in children, but researchers have yet to build on clinically oriented studies of paranoia in adults to examine the potential significance of childhood mistrust. That said, a systematic review of 19 studies of young people (14 questionnaire-based studies and 5 interview studies) showed that psychotic-like symptoms are reported more frequently in middle childhood than in adolescence (17% of 9- to 12-year-olds as compared with 7.5% of 13- to 18-year-olds).[7] Similar striking reports of psychotic symptoms are evident in two further surveys of children: in a London-based study, almost two-thirds of 8000 9- to 11-year-olds endorsed at least one of nine hallucination- and delusion-like symptoms[8] and 9% of 4000 7- to 8-year-olds in a Dutch study reported auditory vocal hallucinations, of whom 19% experienced considerable interference with thinking and 15% reported serious suffering.[9] Together, these findings suggest that younger children are more likely than older children to report feelings of mistrust. However, these epidemiological studies used very brief (typically single item) assessments that precluded both dimensional analysis and assessments of the structure of paranoia.

To our knowledge, there is no existing instrument for assessing childhood mistrust and so the correlates of mistrust in childhood have also yet to be examined. In adults, paranoia (i.e. extreme suspiciousness) is associated with a range of social, emotional and psychiatric problems. These include: insomnia,[10] social anxiety,[11,12] low self-esteem,[11,13,14] worry,[15] externalising problems,[16,17] poor emotion recognition (especially for anger),[18] neuroticism,[19] depression,[20–23] misuse of cannabis and alcohol,[15,19] impairments in specific cognitive abilities such as theory of mind[24] and low socioeconomic status, urban residence and experiences of victimisation.[19,25] What is not yet known is whether these associations are evident earlier in development.

We report findings from two studies that together address three aims. Our first aim was to construct a developmentally appropriate dimensional index of mistrust in middle childhood, to examine the structure of paranoia in this age group (8- to 14-year-olds). Our second aim was to administer this scale in a second country, Hong Kong, using a sample of children attending English-speaking schools to obviate problems associated with item translation, to examine measurement invariance across these cultural groups. Our third aim was to test associations (in both countries) between mistrust and both internalising problems (anxiety and self-esteem) and externalising problems (aggression and callous–unemotional traits), and to assess the replicability of findings.

Method

Participants

Children aged 8–14 years from the UK (mean = 11.28 years, s.d. = 1.63) and Hong Kong (mean = 11.46 years, s.d. = 1.68) schools completed a battery of questionnaires in 50-minute class sessions. Graduate students with at least a Master's degree administered the questionnaires and were present for the entire session. The 15 UK schools sampled encompass relatively diverse economic catchment areas in Cambridgeshire. All eight Hong

Kong schools were private and all primary teaching was conducted in English. To maximise participation we adopted a method of informed passive consent in which schools acted *in loco parentis* but parents were given opportunities to decline their child's participation. The final sample consisted of 1086 UK and 1470 Hong Kong children, excluding those who opted out from the study (UK, $n = 23$; Hong Kong, $n = 31$) or had a diagnosed intellectual disability or struggled with English (UK, $n = 16$; Hong Kong $n = 1$).

Measures

Social Mistrust Scale (SMS)

The 12 items (see Appendix) in this newly developed questionnaire are each rated on a 'No' (0)/'Sometimes' (1)/'Yes' (2) scale such that overall scores provide a dimensional scale from trust to mistrust (from 0 to 24). Parallel items refer to children's experiences at home and at school. Examples of mistrust items include: 'Do you feel like a target for others at home/school?', 'Do you think others try to harm you at home/school?' and 'Do you ever think that someone is following you or spying on you at home/school?' General trust items are reverse-scored so that a higher score corresponds to higher *mis*trust: 'Is there someone whom you can trust at home/school?' and 'Is there someone whom you cannot trust at home/school?' Evidence of construct validity was obtained by correlations (in the expected direction) with other variables in the study and peer-reported scores of least- and most-trusted/liked ($rs > 0.14$, all $P < 0.01$). Based on the adult literature, we predicted that childhood mistrust would show a positively skewed distribution for both countries.

Social Anxiety Scale for Children – Revised (SASC-R)

This standardised scale is appropriate for middle childhood and includes 18 items on a 5-point Likert scale ranging from 'Not at all' (1) and 'Sometimes' (3) to 'All the time' (5) (as well as four filler items, excluded from analyses).[26] Scores on the SASC-R were normally distributed in both countries.

Rosenberg Self-Esteem Scale (RSES)

This widely used measure of self-esteem has 10 items scored on a 4-point Likert scale: 'Strongly agree' (1), 'Agree' (2), 'Disagree' (3) and 'Strongly disagree' (4).[27] The scale follows a Gaussian distribution and has been shown to have good test–retest (0.82–0.88) and internal reliabilities (0.77–0.88). Scores on the RSES were normally distributed in both countries.

Reactive–Proactive Questionnaire (RPQ)

This questionnaire measures reactive–provoked aggression (12 items) and proactive–instrumental aggression (11 items), with all items scored on a 3-point Likert scale: 'No' (0), 'Sometimes' (1) and 'Often' (2).[28] The RPQ has been administered to children[28,29] and twins,[30] similar in age to those in our sample. Total aggression scores were positively skewed for both countries.

Inventory of Callous–Unemotional Traits (ICU)

The ICU is a 24-item screening measure used to assess antisocial traits in children and has been shown to identify at-risk youths.[31] Antisocial traits such as lack of remorse and guilt are scored on a 4-point Likert scale: 'Not at all' (0), 'Somewhat true' (1), 'Very true' (2) and 'Definitely true' (3). ICU raw scores were normally distributed in both countries.

Verbal ability

This was assessed using the Word Reasoning Task ('Clues Game') from the Wechsler Intelligence Test for Children – Fourth Edition (WISC-IV) modified for group administration.[32] Twenty-four clues with increasing difficulty were listed on the page and children were asked to 'Write what they think the clues describe. If you cannot guess what the clue is about, just write "Don't know" in the space.' Children were asked to go in order of the list, where the test terminates after five consecutive 'don't know' (or blank responses). A sample item includes 'This is used to dry yourself after a bath'. A correct response receives 1 point (i.e. towel) and an incorrect response receives 0 points. Verbal ability raw scores were out of 24 and were normally distributed in both countries.

Family Affluence Scale (FAS)

This 4-item measure of family wealth was developed as part of a large World Health Organization (WHO) study of children's health and behaviour.[33] Children are asked: 'Does your family own a car, van, or truck?' ('No' (0); 'Yes, one' (1); 'Yes, two or more' (2)); 'Do you have your own bedroom to yourself?' ('No' (0); 'Yes' (1)); 'During the past 12 months, how many times did you travel away on holiday with your family?' ('Not at all' (0); 'Once' (1); 'Twice' (2); 'More than twice' (3)); and 'How many computers does your family own?' ('None' (0); 'One' (1);' Two' (2); 'More than two' (3)). Based on the authors' recommendation, three score ranges represent different levels of socioeconomic status (SES): low affluence (score 0–2), medium (score 3–5) and high (score 6–9). FAS scores were negatively skewed (with a ceiling effect towards the more affluent) in both countries.

Demographics

Each child reported their date of birth, gender, SES, ethnicity, languages spoken at home and family size (Table 1). Due to small numbers for some age bands, the two youngest and oldest age groups were combined: 9 (8 and 9 year olds), 10, 11, 12, and 13 (13 and 14 year olds). Few people were in the lowest of the three affluence bands, so in each country this bottom band was combined with the medium band.

Statistical analysis

Online Table DS1 shows the means, correlations, raw scores, factor scores, Cronbach alphas (α), and sample sizes (where appropriate) for all variables by country. To examine whether mistrustful and trusting children differed on other behavioural characteristics, those in the top 15% (i.e. one standard deviation from the mean, or a score $\geqslant 7$) were classified as 'mistrustful'. Similarly, children in the top 15% for anxiety, aggression and callous–unemotional traits were identified, as well as children in the bottom 15% for self-esteem; t-tests and logistic regressions were conducted to examine group differences between mistrustful and trusting individuals across variables. Non-normality of variables was assessed by Q-Q plots, kurtosis and skewness, where values outside of $-1.96 <$ (kurtosis statistic/standard error of kurtosis) $< +1.96$, indicated significant departure from the Gaussian distribution.

Exploratory and confirmatory factor analyses (EFA/CFA) were conducted using MPlus 6.2 for Windows[34] to examine the psychometric properties and initial factor structure of the SMS. Excluding those missing completely on all items, the full sample was used for modelling since only a small percentage of the sample was missing on more than half of the items (UK = 4.5% and Hong Kong = 2.87%). Due to partial missing data and categorical indicators in our model, the weighted least square parameter

Table 1 Participant characteristics and demographics		
	UK, %	Hong Kong, %
Family structure		
Two parent	87.60	93.02
Single parent	12.28	6.76
Neither	0.12	0.22
Non-parental adults		
Grandparent	60.87	22.87
Nanny	39.13	77.13
Siblings		
At least one	89.63	76.77
None	10.37	23.23
Ethnicity		
British	74.37	12.05
Irish	0.56	0.75
Chinese	1.11	51.68
Korean	0.56	2.60
Japanese	0.19	1.71
Asian British[a]	4.55	9.23
Black British African and Caribbean	1.19	0.21
Mixed[b]	3.25	8.70
Other[c]	14.11	13.07
Home language[d]		
English	91.17	60.22
French	0.19	0.48
German	0.38	0.28
Italian	0.09	0.28
Polish	0.95	0.28
Bangladeshi	1.14	0.00
Bengali	0.76	0.35
Indian	0.09	0.21
Mandarin Chinese	0.38	11.05
Cantonese	0.09	19.34
Russian	0.57	0.07
Korean	0.47	2.28
Hindi	0.09	1.31
Japanese	0.19	1.04
Urdu	0.19	0.14

a. Pakistani, Indian, Bangladeshi.
b. White and Black African, White and Black Caribbean, White and Asian.
c. Australian, American, Canadian, Irish, Polish.
d. Lists 97% of the languages spoken at home by both samples.

estimator (WLSMV) was used as it provides robust standard errors and a mean- and variance-adjusted χ^2 statistic that are unaffected by non-χ^2 or non-normal distributions.[35] Weighted factor scores are calculated for the full sample and should be interpreted as probit regressions.

Prior to cross-country comparison, measurement invariance using Multiple Indicators Multiple Causes (MIMIC) models was examined for the SMS. According to Brown, measurement invariance should satisfy the following, in order of importance: (a) equal factor structure, (b) equal factor loadings, (c) equal intercepts, and (d) equal indicator residuals. Satisfactory results for all the above indicates measurement invariance; although, satisfying the final criterion is rare and perhaps unnecessary for measurement invariance.[35] Model fit was assessed using five goodness-of-fit indices: χ^2 statistic, root mean squared error of approximation (RMSEA), comparative fit index (CFI), Tucker–Lewis index (TLI) and Akaike's information criterion (AIC)[36] calculated by $\chi^2 - 2$(degrees of freedom) allowing for comparison across nested models. High CFI (>0.90), high TLI (>0.90), low RMSEA (<0.06) and the lowest AIC among nested model comparisons indicate a good-fitting model.

As shown in Table 2, three hypothesised measurement models were first tested in the UK sample (Study 1) then replicated in the Hong Kong sample (Study 2). These comprised:

a uni-dimensional model (mistrust); a two-factor model (mistrust at home v. school); and a three-factor model (home mistrust, school mistrust and general mistrust). Based on initial results, additional second-order models (mistrust (home and school) v. general mistrust) were tested to see whether a suspiciousness mistrust factor v. a general mistrust factor was a better fit to the data. Model improvements were based on justification between the item-factor relationship (i.e. freeing an estimate between items significantly improves AIC) and modification index suggested by MPlus. The largest modification index, a mathematically optimal parameter to be modified, was considered in turn and only included based on conceptual justification and whether modification led to significant improvement across model fit indices. The model was re-run after each modification and repeated on the second largest modification index if the largest modification index was not conceptually plausible, or if the standardised expected parameter changes (EPC) were small and not meaningful.[35] The final best-fitting model is supported by theory and is indicated by the lowest AIC (Table 2).

Results

Socioeconomic status

Children in our two samples were predominantly from highly affluent families in terms of the WHO definition: 76.1% (UK) and 81.1% (Hong Kong). In both countries, children from less affluent families showed more callous–unemotional traits than their highly affluent peers. In addition, there were several country-specific differences (in the expected directions) between children from less affluent and more affluent families. In the UK, this contrast was significant for mistrust, verbal ability and self-esteem, whereas in Hong Kong this contrast between children from less and more affluent families was significant for anxiety and aggression ($P<0.05$ for all). Socioeconomic status and verbal ability were controlled in all subsequent analyses.

SMS structure

Total mistrust scores were computed by summing all items (UK: $\alpha = 0.78$; Hong Kong: $\alpha = 0.75$) after reverse coding items for the general trust subscale. A three-factor model (mistrust at home, mistrust at school and general mistrust) with minor modifications showed an excellent fit to the UK data (χ^2(d.f.) $= 117.07(47)$, $P<0.001$, CFI/TLI $= 0.98/0.97$, RMSEA $= 0.04$ (90% CI 0.03–0.05), $P=0.99$, weighted root mean square residual (WRMR) $= 0.97$) and explained 55% of the total variance (Fig. 1). The same three-factor structure was replicated in the Hong Kong sample, showing consistent factor structure for the SMS (χ^2(d.f.) $= 160.67(46)$, $P<0.001$, CFI/TLI $= 0.98/0.96$, RMSEA $= 0.04$ (90% CI 0.04–0.05), $P=0.97$, WRMR $= 1.17$) (Fig. 2) and explaining 52% of the variance. All factors were significantly correlated to the same degree in both countries, with the strongest correlation ($r = 0.77$–0.80) between mistrust at school and mistrust at home. Raw scores and factor scores were computed for the full sample excluding those who did not complete any items on the SMS. Only the first step (equal factor structure) in the assessment of cross-cultural measurement invariance was established. For the second step (equal factor loadings), cross-cultural measurement invariance was supported for home mistrust ($\beta = 0.03$, $P=0.57$) but not school mistrust ($\beta = -0.11$, $P=0.01$) or general mistrust ($\beta = 0.10$, $P=0.03$). Given this lack of measurement invariance, mistrust will not be compared across sites but examined independently.

Table 2 Exploratory and confirmatory factor analysis models of social mistrust based on a full sample of both countries[a]

Model	χ^2 (d.f.)	CFI	TLI	RMSEA (90% CI)	P	WRMR	AIC (χ^2–2d.f.)
UK							
1. Single factor	511.51 (54)	0.81	0.76	0.115 (0.106–0.125)	0.00	2.21	403.51
2. Two factors Home *v.* school	450.45 (53)	0.83	0.79	0.109 (0.099–0.118)	0.00	2.01	344.45
3. Two factors Mistrust *v.* trust	263.78 (53)	0.91	0.89	0.079 (0.070–0.089)	0.00	1.58	157.78
4. Three factors Separate home, school and general mistrust	266.48 (51)	0.94	0.92	0.064 (0.057–0.072)	0.00	1.52	164.48
Model modifications							
M1. Three factors Q11h with Q11s	181.92 (50)	0.96	0.95	0.051 (0.043–0.059)	0.41	1.24	81.92
M2. Three factors Q8h with Q8s	157.11 (49)	0.97	0.96	0.047 (0.039–0.055)	0.74	1.15	59.11
M3. Three factors Q10h with Q10s	131.98 (48)	0.98	0.97	0.041 (0.033–0.050)	0.95	1.05	35.98
M4. Three factors Q5s with Q3s	117.07 (47)	0.98	0.97	0.038 (0.030–0.047)	0.99	0.97	23.07
Hong Kong							
1. Single factor	675.81 (54)	0.82	0.78	0.110 (0.102–0.117)	0.00	2.57	567.81
2. Two factors Home *v.* school	508.97 (53)	0.87	0.84	0.095 (0.087–0.103)	0.00	2.19	402.97
3. Two factors Mistrust *v.* trust	397.29 (53)	0.90	0.88	0.082 (0.075–0.090)	0.00	1.98	291.29
4. Three factors Home, school and general mistrust	365.01 (51)	0.93	0.91	0.066 (0.060–0.072)	0.00	1.83	263.01
Model modifications							
M1. Three factors Q11h with Q11s	297.34 (50)	0.95	0.93	0.059 (0.053–0.066)	0.01	1.65	197.34
M2. Three factors Q5s with Q3h	244.58 (49)	0.96	0.94	0.053 (0.047–0.060)	0.21	1.50	146.58
M3. Three factors Q8s with Q8h	201.18 (48)	0.97	0.95	0.048 (0.041–0.054)	0.71	1.35	105.18
M4. Three factors Q8h with Q9h	176.28 (47)	0.97	0.96	0.044 (0.037–0.051)	0.91	1.26	82.28
M5. Three factors Q5s with Q3s	160.67 (46)	0.98	0.96	0.042 (0.035–0.049)	0.97	1.17	68.67

CFI, comparative fix index; TLI, Tucker–Lewis index; RMSEA, root mean squared error of approximation; WRMR, weighted root mean square residual; AIC, Akaike's information criterion; M, modification indices model (e.g. M1 = modification indices model 1).
a. UK, $n = 1016$; Hong Kong, $n = 1412$.
$P < 0.01$ for all χ^2 statistic.

Model fit indices

UK
$n = 1016$ (M = 54.3%)
χ^2 (df) = 117.072 (47), $P < 0.001$
CFI/TLI = 0.98/0.97
RMSEA (90% CI) = 0.038 (0.030–0.047), $P = 0.99$
WMR = 0.97
AIC = 23.07

Hong Kong
$n = 1412$ (M = 52.9%)
χ^2 (df) = 160.67 (46), $P < 0.001$
CFI/TLI = 0.98/0.96
RMSEA (90% CI) = 0.042 (0.035–0.049), $P = 0.967$
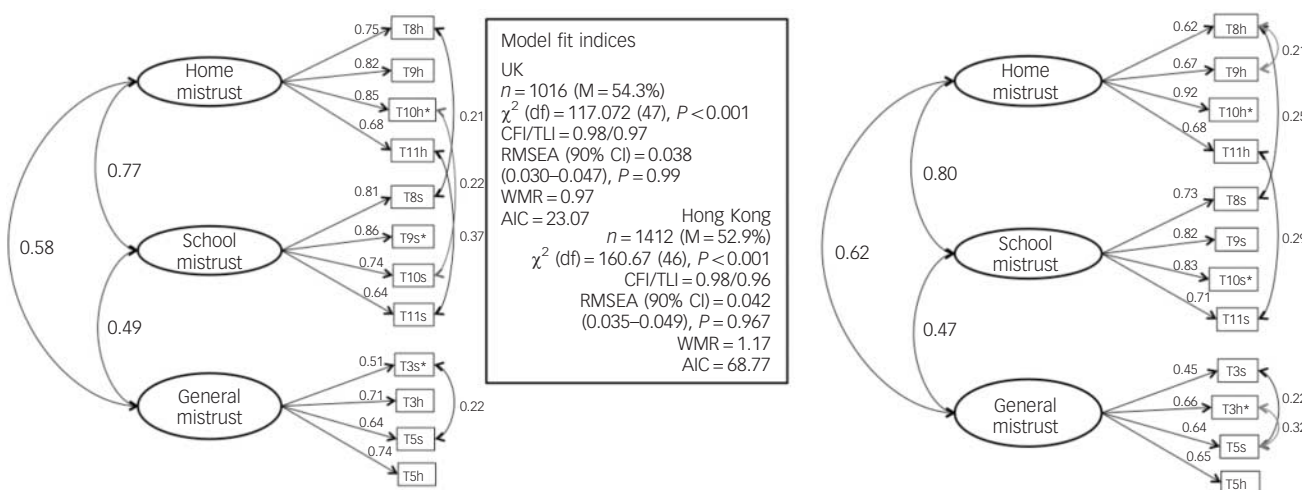WMR = 1.17
AIC = 68.77

Fig. 1 Three-factor model of mistrust with minor modifications in the UK and Hong Kong.

CFI, comparative fix index; TLI, Tucker–Lewis index; RMSEA, root mean squared error of approximation; WRMR, weighted root mean square residual; AIC, Akaike's information criterion.
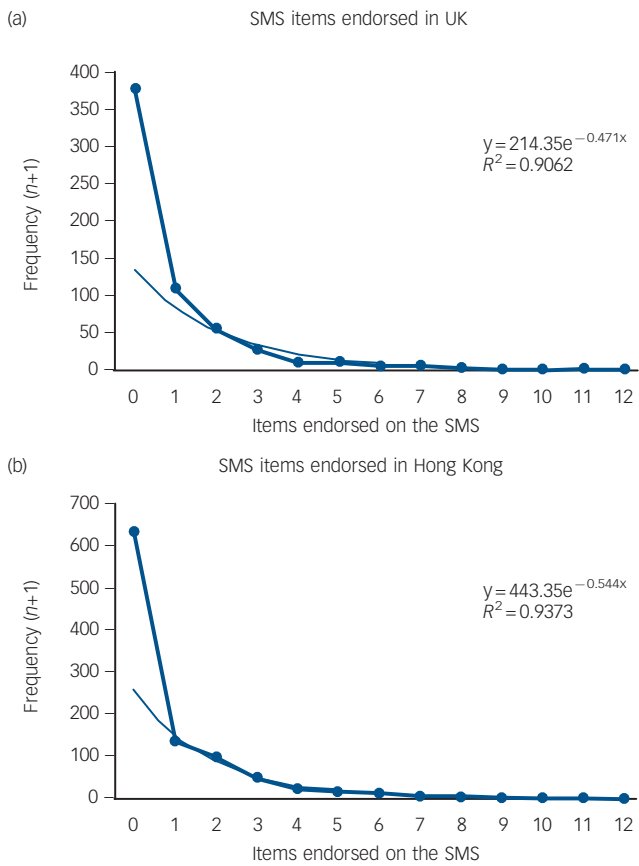*, represented anchor variable.

(a)

SMS items endorsed in UK

$$y = 214.35e^{-0.471x}$$
$$R^2 = 0.9062$$

(b)

SMS items endorsed in Hong Kong

$$y = 443.35e^{-0.544x}$$
$$R^2 = 0.9373$$

Fig. 2 Item endorsement for the Social Mistrust Scale (SMS) by country.

Frequencies plotted for data are $n+1$ because fitting an exponential approximation required non-zero values.

Prevalence of suspiciousness among 8- to 14-year-olds

Consistent with findings from the adult literature, total mistrust scores were positively skewed, with 50% of the children in each country scoring 3 points or less (Fig. 2) At the other end of the scale, participants scoring at least 7 points (i.e. one standard deviation from the mean, or top 15%) were classified as 'mistrustful' ($n_{UK} = 184$, $n_{Hong\ Kong} = 274$). The distribution of mistrust closely fitted an exponential curve, replicating findings in adult samples.[12]

Figure 3 and online Table DS2 show the prevalence of mistrust at the item level for both countries. A minority of children reported that there was 'No one whom they could trust at school' ($n_{UK} = 48$ (5.7%), $n_{Hong\ Kong} = 55$ (3.6%)) or '. . . at home' ($n_{UK} = 70$ (3.8%), $n_{Hong\ Kong} = 36$ (5.3%)). Rates of mistrust in the UK were highest on items pertaining to school mistrust: for example 'being a target at school' (17.5%), 'thinking that people are following you or spied on you at school' (11.6%) and 'others try to harm me at school' (8.4%). Comparable prevalence rates were found in Hong Kong, with 8–10.5% ($n = 113$–145) of children endorsing a school mistrust item. The percentage of children endorsing the item 'Others try to harm me . . .' was similar to the rates reported in two community studies of young adults aged 16 and above (8.2% to 9.1%).[15,19] Prevalence rates were significantly higher in the UK than in Hong Kong for two items: 'I feel like a target for others at home' (Q8h) and '. . . at school' (Q8s), but were significantly higher in Hong Kong rather than in the UK for 'I worry too much about others trying to get at me at School' (Q10s) (both $P < 0.05$).

Mistrust by age and gender

In the UK, mistrust decreased significantly between 8 and 10 years and levelled between age 11 and 14 years old ($F(4, 1006) = 11.02$, $P < 0.001$, $\eta^2_p = 0.04$). In Hong Kong, a main effect of age was
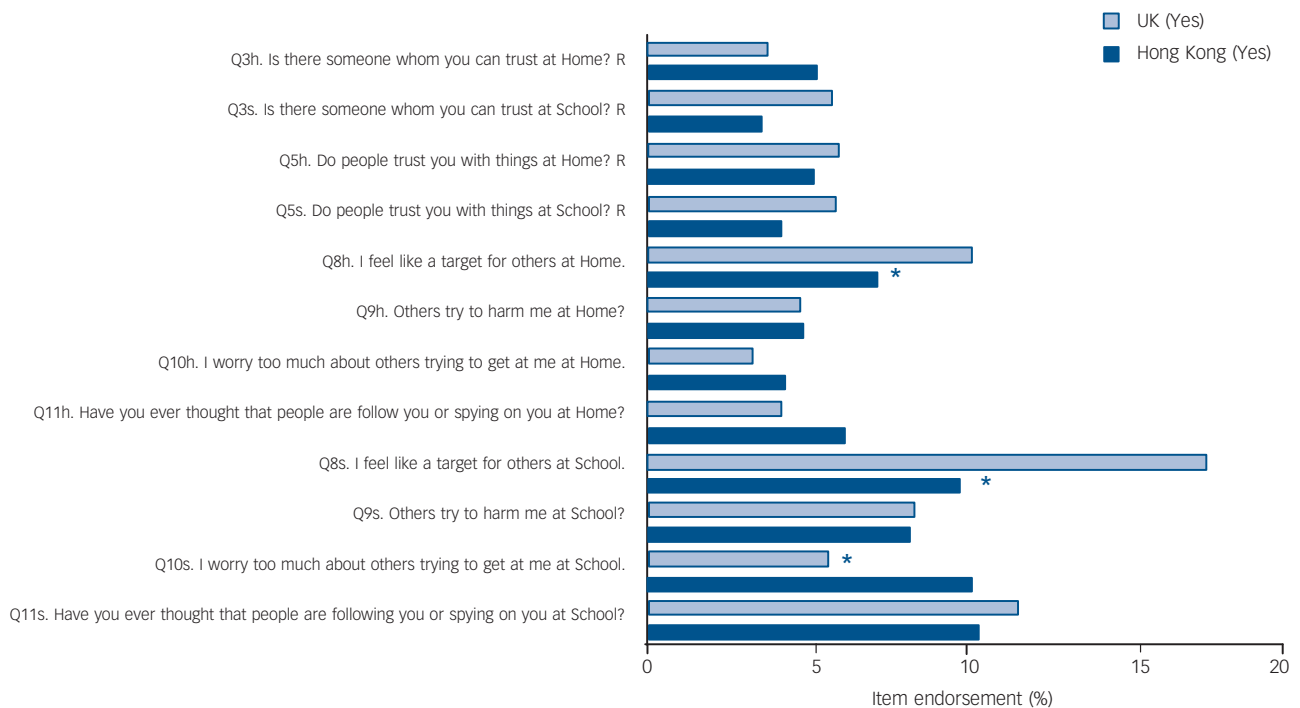
Fig. 3 Percentage of each sample answering 'Yes' to each Social Mistrust Scale item (or 'No' for reverse-coded (R) items).

R, reverse-coded items where a high score was given for a 'No' response. *$P < 0.05$.

observed, where mean levels of mistrust were significantly highest at age 8–10, but levelled off from age 11 onwards ($F(4, 1422) = 11.11$, $P < 0.001$, $\eta^2_p = 0.03$). No gender difference was found in levels of mistrust in the UK ($P = 0.63$) or Hong Kong ($P = 0.34$), but the UK data showed an interaction between age and gender. Specifically, among younger children, mistrust was more common in boys than girls, but this pattern was reversed in children aged 10 and above ($F(4, 1006) = 2.64$, $P = 0.03$, $\eta^2_p = 0.01$). A linear regression with both linear and exponential age variables as predictors of mistrust showed significant linear (both $P < 0.001$) and exponential relations for both the UK sample ($F(1, 1014) = 40.32$, $R^2 = 0.04$, $P < 0.001$) and the Hong Kong sample ($F(1, 1468) = 25.74$, $R^2 = 0.02$, $P < 0.001$).

Mistrust, internalising and externalising behaviours as outcomes

Tables 3 and 4 document the odds ratios (ORs) in both countries for associations between mistrust and both internalising problems (i.e. social anxiety and low self-esteem) and externalising problems (i.e. aggression and callous–unemotional traits). Group differences between individuals scoring above or below the 85th percentile on each mistrust subscale were examined with anxiety, self-esteem, aggression and callous–unemotional traits controlling for SES, verbal ability and other mistrust subscales. Our data indicated that mistrustful children were significantly more likely to display high levels of anxiety for school mistrust in the UK (OR = 5.9) and Hong Kong (OR = 4.9) and general mistrust in the UK (OR = 3). Both in the UK and Hong Kong, any form of mistrust (i.e. home, school, general) predicted low self-esteem by a factor of 2 to 3.8. Mistrust at home and general predicted high levels of aggression in the UK (OR = 2) and any form of mistrust predicted aggression in Hong Kong (OR = 2–2.5). In both countries, only general mistrust predicted callous–unemotional traits (OR = 3–4). It seems that subforms of mistrust (home, school or general) are also significantly associated with high levels of anxiety, low self-esteem, aggression and callous–unemotional traits.

Stability of mistrust

To examine whether mistrust is a state or trait construct we conducted a UK-based 1-month test–retest study (interval = 31.10 days), recruiting children aged 8 or 14 ($n = 251$, mean age = 12.14 years (s.d. = 2.27)) as these age groups corresponded to the lower and upper age range from the original sample. We computed an intraclass correlation coefficient (ICC) using a one-way random effects model[3,37] and Pearson product moment correlation coefficient for total mistrust ratings at two time points. Indicating that ratings of mistrust are reliable and consistent over time, we observed good reliability for a single rating (ICC(1,1) = 0.80, $P < 0.001$, 95% CI 0.75–0.84) and a high correlation coefficient of 0.80 ($P < 0.001$).

Discussion

In this first detailed investigation of mistrust in middle childhood, a new self-report questionnaire revealed remarkable consistency in children's ratings of mistrust (and assessments were also made of internalising and externalising problems) in two very different countries: the UK and Hong Kong. Specifically, in each country our results showed the same three-factor solution (for both boys and girls), and for all children (i.e. boys and girls, older and younger, UK and Hong Kong) mistrust showed robust associations with both internalising and externalising problems, even when covarying effects of SES were controlled. Moreover, the data from each country showed a similar age-related decline in suspiciousness. Longitudinal research is needed to elucidate this perhaps unexpected relationship between age and mistrust. Overall, however, the distribution of mistrust in the children replicated the findings in adult groups, with many children having a few mistrustful thoughts and a few children having many.

Table 3 Logistic regressions showing odds ratios of mistrust subscales by internalising and externalising problems controlling for verbal ability and socioeconomic status in the UK

	n	B	s.e.	P	OR	95% CI	χ² (d.f.)	Cox & Snell R²	Nagelkereke R²
Anxiety									
SES	568	−0.07	0.08	0.40	0.94	0.80–1.09	55.13 (5)	0.09	0.16
VA		0.03	0.04	0.48	1.03	0.96–1.10			
H		−0.21	0.37	0.56	0.81	0.40–1.65			
S		1.78	0.32	**<0.001**	5.90	3.18–10.95			
G		1.11	0.31	**<0.001**	3.04	1.65–5.63			
Low self-esteem									
SES	598	0.25	0.07	**<0.01**	1.28	1.11–1.48	58.53 (5)	0.09	0.16
VA		0.00	0.03	0.92	1.00	0.94–1.07			
H		0.77	0.32	**<0.05**	2.16	1.16–4.02			
S		1.05	0.30	**<0.001**	2.86	1.59–5.17			
G		0.91	0.30	**<0.01**	2.47	1.39–4.43			
Aggression									
SES	621	−0.04	0.07	0.53	0.96	0.84–1.09	26.81 (5)	0.04	0.07
VA		−0.03	0.03	0.35	0.97	0.92–1.03			
H		0.80	0.30	**<0.01**	2.23	1.23–4.04			
S		0.32	0.31	0.30	1.38	0.76–2.51			
G		0.70	0.29	**<0.05**	2.01	1.14–3.52			
CU traits									
SES		−0.12	0.08	0.12	0.89	0.77–1.03	32.42 (5)	0.06	0.11
VA		−0.05	0.03	0.14	0.95	0.89–1.02			
H	500	0.41	0.36	0.25	1.51	0.75–3.04			
S		−0.36	0.39	0.35	0.70	0.33–1.49			
G		1.39	0.31	**<0.001**	4.00	2.19–7.31			

OR, odds ratio; SES, socioeconomic status; VA, verbal ability; H, home mistrust; S, school mistrust; G, general mistrust; CU, callous–unemotional; ns, non-significant at $P = 0.05$ level. Bold values are significant at $P < 0.05$.

Table 4 Logistic regressions showing odds ratios of mistrust subscales by internalising and externalising problems controlling for verbal ability and socioeconomic status in Hong Kong

	n	B	s.e.	P	OR	95% CI	χ^2 (d.f.)	Cox & Snell R^2	Nagelkereke R^2
Anxiety									
SES		−0.04	0.06	0.47	0.96	0.85–1.08			
VA		0.02	0.03	0.36	1.02	0.97–1.08			
H	949	0.41	0.25	0.11	1.51	0.92–2.48	79.44 (5)	0.08	0.13
S		1.59	0.23	<**0.001**	4.90	3.12–7.67			
G		0.36	0.24	0.13	1.44	0.90–2.30			
Low self-esteem									
SES		0.03	0.06	0.58	1.03	0.92–1.16			
VA		0.02	0.02	0.48	1.02	0.97–1.07			
H		0.46	0.25	0.07	1.58	0.97–2.57			
S	947	0.91	0.25	<**0.001**	2.49	1.54–4.02	85.69 (5)	0.09	0.14
G		1.32	0.22	<**0.001**	3.76	2.45–5.76			
Aggression									
SES		0.08	0.07	0.21	1.09	0.96–1.23			
VA		−0.01	0.03	0.84	1.00	0.94–1.05			
H		0.91	0.25	<**0.001**	2.49	1.52–4.09	58.37 (5)	0.06	0.10
S	989	0.77	0.25	<**0.01**	2.16	1.32–3.54			
G		0.59	0.24	<**0.05**	1.80	1.12–2.88			
CU traits									
SES		−0.08	0.06	0.16	0.92	0.82–1.03			
VA		−0.03	0.03	0.18	0.97	0.92–1.02			
H		−0.03	0.28	0.90	0.97	0.56–1.68	32.00 (5)	0.04	0.06
S	943	0.44	0.27	0.11	1.55	0.91–2.62			
G		1.01	0.24	<**0.001**	2.76	1.74–4.38			

OR, odds ratio; SES, socioeconomic status; VA, verbal ability; H, home mistrust; S, school mistrust; G, general mistrust; CU, callous–unemotional; ns, non-significant at $P = 0.05$ level. Bold values are significant at $P < 0.05$.

Limitations

Before discussing each of the above findings, we outline the limitations of the current study. In particular, to recruit a large sample it was necessary to adopt self-report measures of mistrust and both internalising and externalising problems; this reliance on a single informant is likely to have inflated the strength of relationships. To address this issue, we applied partial correlations to examine whether the associations between mistrust and anxiety/aggression remained significant when corresponding variation in self-esteem/callous–unemotional traits was taken into account. These partial correlations showed that all the correlations remained significant, with one exception: the link between mistrust and callous–unemotional traits fell below significance once variation in aggression was taken into account ($P > 0.05$). A second sacrifice that was necessary to obtain a large sample was the reliance on survey data. It would obviously be useful both to assess the extent to which children's suspicions were unfounded and to understand why children felt that others were spying on them/trying to harm them. To these ends, future work using individual interviews would be valuable. A third limitation of the current work was its cross-sectional design: given that our sample included children at both primary and secondary schools, it would be informative to explore the age contrasts identified in these studies in more detail by monitoring children's suspiciousness across the transition to secondary school.

The structure of mistrust

The findings from this large-scale study indicate that childhood suspicions are: (a) measurable and relatively common (especially in the context of school); and (b) related to, but distinct from, general mistrust. It is worth noting that our opt-out consent design enabled us to avoid problems of recruitment bias that often plague studies of sensitive topics such as trust. Extending previous work on hallucinations and persecutory delusions in young

people,[7] our results suggest that dimensional models of paranoia in adults are also likely to apply to children. Ratings of suspiciousness at home and at school included items such as 'People want to harm me/are spying on me/are targeting me' and so can be viewed as on a continuum with paranoia; individual differences in scores on these two scales were strongly inter-correlated ($r = 0.77–0.80$) but somewhat distinct from scores for general mistrust (mean $r = 0.50$). Given that labelling a child as suspicious could have negative consequences, three points regarding the current research deserve particular mention. First, several (reverse-coded) items in the SMS focus on trust; in this way we hope to avoid negative labelling. Second, although it was not possible to demonstrate full measurement invariance across cultures (UK and Hong Kong), the results from each country showed the same three-factor structure, supporting the overall reliability of the SMS as an instrument for measuring suspiciousness in children. Third, the correlations between SMS scores and self-reported internalising/externalising problems highlight the value of adopting a more fine-grained approach to measuring childhood suspiciousness, in that the social context of children's suspicions appeared significant, at least for children in the UK, as described below.

The correlates of mistrust

Our results from both the UK and Hong Kong showed no significant main effects of gender, but mirrored previous findings for psychotic symptoms[38] in demonstrating a significant age-related reduction in suspiciousness. Across all age groups, however, suspiciousness was robustly correlated with both internalising and externalising problems. Interestingly, these correlations were partly context dependent. Specifically, in both countries, suspiciousness at school was not only more prevalent than suspiciousness at home, but also showed particularly strong associations with anxiety. In contrast (in the UK at least),

suspiciousness at home was particularly strongly associated with aggression. These findings remained significant when we controlled for SES and verbal ability.

Implications

Although paranoid ideation in adults has been linked with significant emotional and social problems, recognising similar links in childhood is important in addressing the developmental gap – in both theory and available assessment tools – to inform the next generation of prevention interventions for children. We hope that the scale developed for this study will offer future researchers a tool to identify and support children at risk of negative long-term outcomes. More broadly, we hope that this study helps in initiating an understanding of paranoia from a developmental perspective.

Keri K. Wong, MA, Department of Psychology, University of Cambridge; **Daniel Freeman**, PhD, DClinPsy, FBPsS, Department of Psychiatry, University of Oxford; **Claire Hughes**, PhD, Department of Psychology, University of Cambridge, UK

Correspondence: Keri K. Wong, Centre for Family Research, Psychology Department, Free School Lane, Cambridge CB2 3RF, UK. Email: kkyw3@cam.ac.uk

First received 15 Jul 2013, final revision 25 Mar 2014, accepted 28 Mar 2014

Appendix

Social Mistrust Scale (items)

General mistrust

Q3s – Is there someone whom you can trust at School?
Q3h – Is there someone whom you can trust at Home?
Q5s – Do people trust you with things at School?
Q5h – Do people trust you with things at Home?

Home mistrust

Q8h – I feel like a target for others at Home.
Q9h – Others try to harm me at Home?
Q10h – I worry too much about others trying to get at me at Home.
Q11h – Have you ever thought that people are following you or spying on you at Home?

School mistrust

Q8s – I feel like a target for others at School.
Q9s – Others try to harm me at School?
Q10s – I worry too much about others trying to get at me at School.
Q11s – Have you ever thought that people are following you or spying on you at School?

References

1 Freeman D. Delusions in the nonclinical population. *Cur Psychiatry Rep* 2006; **8**: 191–204.

2 Chan RCK, Li X, Lai M-k, Li H, Wang Y, Cui J, et al. Exploratory study on the base-rate of paranoid ideation in a non-clinical Chinese sample. *Psychiatr Res* 2011; **185**: 254–60.

3 Bebbington PE, McBride O, Steel C, Kuipers E, Brugha T, Radovanovic M, et al. The structure of paranoia in the general population. *Br J Psychiatry* 2013; **202**: 1–9.

4 Linscott RJ, van Os J. An updated and conservative systematic review and meta-analysis of epidemiological evidence on psychotic experiences in children and adults: on the pathway from proneness to persistence to dimensional expression across mental disorders. *Psychol Med* 2013; **43**: 1133–49.

5 Corriveau K, Harris PL. Young children's trust in what other people say. In *Interpersonal Trust During Childhood and Adolescence* (ed. KJ Rotenberg): 87–109. Cambridge University Press, 2010.

6 Rotenberg KJ, Fox C, Green S, Ruderman L, Slater K, Stevens K, et al. Construction and validation of a children's interpersonal trust belief scale. *Br J Dev Psychology* 2005; **23**: 271–92.

7 Kelleher I, Connor D, Clarke MC, Devlin N, Harley M, Cannon M. Prevalence of psychotic symptoms in childhood and adolescence: a systematic review and meta-analysis of population-based studies. *Psychol Med* 2012; **42**: 1857–63.

8 Laurens KR, Hobbs MJ, Sunderland M, Green MJ, Mould GL. Psychotic-like experiences in a community sample of 8000 children aged 9 to 11 years: an item response theory analysis. *Psychol Med* 2012; **42**: 1495–506.

9 Bartels-Velthuis AA, Jenner JA, van de Willige G, van Os J, Wiersma D. Prevalence and correlates of auditory vocal hallucinations in middle childhood. *Br J Psychiatry* 2010; **196**: 41–6.

10 Freeman D, Brugha T, Meltzer H, Jenkins R, Stahld D, Bebbington PE. Persecutory ideation and insomnia: findings from the second British National Survey of Psychiatric Morbidity. *J Psychiatr Res* 2010; **44**: 1021–6.

11 Barrowclough C, Tarrier N, Humphreys L, Ward J, Gregg L, Andrews B. Self-esteem in schizophrenia: relationships between self-evaluation, family attitudes, and symptomatology. *J Abnorm Psychol* 2003; **112**: 92–9.

12 Freeman D, Gittins M, Pugh K, Antley A, Slater M, Dunn G. What makes one person paranoid and another person anxious? The differential prediction of social anxiety and persecutory ideation in an experimental situation. *Psychol Med* 2008; **38**: 1121–32.

13 Berry K, Wearden A, Barrowclough C, Liversidge T. Attachment styles, interpersonal relationships and psychotic phenomena in a non-clinical student sample. *Pers Individ Dif* 2006; **41**: 707–18.

14 Rotenberg KJ, Boulton MJ, Fox CL. Cross-sectional and longitudinal relations among children's trust beliefs, psychological maladjustment and social relationships: are very high as well as very low trusting children at risk? *J Abnorm Child Psychol* 2005; **33**: 595–610.

15 Freeman D, McManus S, Brugha T, Meltzer H, Jenkins R, Bebbington PE. Concomitants of paranoia in the general population. *Psychol Med* 2011; **41**: 923–36.

16 Natsuaki MN, Cicchetti D, Rogosch FA. Examining the developmental history of child maltreatment, peer relations, and externalizing problems among adolescents with symptoms of paranoid personality disorder. *Dev Psychopathol* 2009; **21**: 1181–93.

17 Johnson JG, Cohen P, Smailes E, Kasen S, Oldham JM, Skodol AE, et al. Adolescent personality disorders associated with violence and criminal behavior during adolescence and early adulthood. *Am J Psychiatry* 2000; **157**: 1406–12.

18 Combs DR, Michael CO, Penn DL. Paranoia and emotion perception across the continuum. *Br J Clin Psychol* 2006; **45**: 19–31.

19 Johns LC, Cannon M, Singleton N, Murray RM, Farrell M, Brugha T, et al. Prevalence and correlates of self-reported psychotic symptoms in the British population. *Br J Clin Psychol* 2004; **185**: 298–305.

20 Birchwood M, Iqbal Z, Upthegrove R. Psychological pathways to depression in schizophrenia: studies in acute psychosis, post psychotic depression and auditory hallucinations. *Eur Arch Psychiatry Clin Neurosci* 2005; **255**: 202–12.

21 Vorontsova N, Garety P, Freeman D. Cognitive factors maintaining persecutory delusions in psychosis: the contribution of depression. *J Abnorm Psychol* 2003; **122**: 1121–31.

22 Chadwick P, Trower P, Juusti-Butler T-M, Maguire N. Phenomenological evidence for two types of paranoia. *Psychopathology* 2005; **38**: 327–33.

23 Mills A, Gilbert P, Bellew R, McEwan K, Gale C. Paranoid beliefs and self-criticism in students. *Clin Psychol Psychother* 2007; **14**: 358–64.

24 Shryane NM, Corcoran R, Rowse G, Moore R, Cummins S, Blackwood N, et al. Deception and false belief in paranoia: modelling Theory of Mind stories. *Cog Neuropsychiatry* 2008; **13**: 8–32.

25 Kendler KS, Gallagher TJ, Abelson JM, Kessler RC. Lifetime prevalence, demographic risk factors, and diagnostic validity of nonaffective psychosis as assessed in a US community sample. The National Comorbidity Survey. *Arch Gen Psychiatry* 1996; **53**: 1022–31.

26 La Greca AM, Stone WL. Social Anxiety Scale for Children – Revised: factor structure and concurrent validity. *J Clin Child Psychology* 1993; **23**: 17–27.

27 Rosenberg M. *Society and the Adolescent Self-Image* (revised edition). Wesleyan University Press, 1989.

28 Raine A, Dodge K, Loeber R, Gatzke-Kopp L, Lynam D, Reynolds C, et al. The Reactive-Proactive Aggression Questionnaire: differential correlates of reactive and proactive aggression in adolescent boys. *Aggress Behav* 2006; **32**: 159–71.

29 Tuvblad C, Raine A, Zheng M, Baker LA. Genetic and environmental stability differs in reactive and proactive aggression. *Aggress Behav* 2009; **35**: 437–52.

30 Baker LA, Raine A, Liu JH, Jacobson KC. Genetic and environmental influences in reactive and proactive aggression in children. *J Child Abnorm Psychol* 2008; **36**: 1265–78.

31 Frick PJ. *Inventory of Callous–Unemotional Traits*. University of New Orleans, 2004.

32 Wechsler D. *The Wechsler Intelligence Scale for Children – Fourth Edition*. Pearson Assessment, 2004.

33 Boyce W, Torsheim T, Currie C, Zambon A. The family affluence scale as a measure of national wealth validation of an adolescent self-report measure. *Soc Indic Res* 2006; **78**: 473–87.

34 Muthén LK, Muthén BO. *Mplus User's Guide*. Muthén & Muthén, 1998–2011.

35 Brown TA. *Confirmatory Factory Analysis for Applied Research*. Guilford Press, 2006.

36 Akaike H. A new look at the statistical model identification. *IEEE Trans Autom Control* 1974; **19**: 716–23.

37 Shrout PE, Fleiss JL. Intraclass correlations: uses in assessing reliability. *Psychol Bull* 1979; **86**: 420–8.

38 McGraw KO, Wong SP. Forming inferences about some intraclass correlation coefficients. *Psychol Methods* 1996; **1**: 30–46.

EXTRA CONTENT ONLINE

---

psychiatry and sacred texts

Arjuna and Job: depression relieved by submission to gods

John Scott Price, Russell Gardner Jr

In the Bhagavad Gita, the hero Arjuna is in a bad situation in that he is required to fight an army composed partly of his mentors, relatives and friends. He has a panic attack and becomes depressed. Krishna advises him to fight, but he will not take Krishna's advice. After 16 chapters of dialogue, Krishna appears to him in his divine form whereupon Arjuna submits to Krishna, and proceeds to fight bravely in the battle.

In the Book of Job, the protagonist is in a bad situation because Satan has killed off his ten children and brought other misfortunes on him. Job becomes depressed and expresses anger at God for treating him unjustly. God then speaks to Job and shows himself, whereupon Job submits to God and his children are restored to him.

These two stories illustrate how submission to a deity may alleviate depression. The story of Job is also of interest because it can be read in two ways. He can be depressed in response to real misfortune, or his misfortunes may be delusional. In favour of the latter, less popular, view is the fact that his comforters do not offer condolence on the deaths of his children and that his children are restored in exactly the same ratio as they were before, suggesting recovery from delusion rather than new births. The speeches of Job's comforters are of interest as examples of how not to comfort the depressed patient.

Arjuna's panic attack is the first description of this pathology in the literature. In Stephen Mitchell's translation:

' ''As I see my own kinsmen, gathered here, eager to fight, my legs weaken, my mouth dries, my body trembles, my hair stands on end, my skin burns, the bow Gandiva drops from my hand, I am beside myself, my mind reels. I see evil omens, Krishna; no good can come from killing my own kinsmen in battle. I have no desire for victory or for the pleasures of kingship'' . . . Arjuna sank down into the chariot and dropped his arrows and bow, his mind heavy with grief . . . '

The speeches of the two gods are probably the finest examples of verbal dominance displays in the literature. Even so, they are not effective in inducing submission, which requires the actual sight of the god in both cases.