RUNNING TITLE: Adolescent paranoia

**Discrimination, minority group endorsement and paranoia in adolescents: the moderating role of loneliness**

Lyn Ellett1\*, Katarina Krkovic2, Brandon Gaudiano3,4, Elizabeth Thompson3, Jessica Kingston5

1School of Psychology, University of Southampton, Southampton, UK

2Department of Clinical Psychology and Psychotherapy, University of Hamburg, Hamburg, Germany

3Department of Psychiatry and Human Behavior, Brown University

4Psychosocial Research Program, Butler Hospital, Providence, RI, USA

5Department of Psychology, Royal Holloway, University of London, Surrey, UK

Corresponding Author: Dr Lyn Ellett, School of Psychology, University of Southampton, Southampton, UK. SO17 1BJ. Email: L.A.Ellett@soton.ac.uk

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**Abstract**

Paranoid thoughts are relatively common in adolescents, but little is known about the factors that predict and attenuate paranoia in this group. The current study examined the effect of everyday discrimination, minority group endorsement and loneliness on paranoia in an international sample (*n*=462) of adolescents from the UK and USA. We tested a moderation model to determine (1) whether minority group endorsement and severity of discrimination independently predict paranoia; (2) if discrimination and minority group endorsement interact to predict paranoia; and, if so, (3) whether the impact of this interaction varies depending on level of loneliness. Regression analyses revealed everyday discrimination independently predicted paranoia. Minority group endorsement did not interact with discrimination as expected, and instead had a significant, independent effect on paranoia. Loneliness independently predicted paranoia and moderated the effect of discrimination on paranoia. The findings highlight the impact of adverse social contexts on paranoia in adolescents.

*Keywords:* paranoia; discrimination; minority groups; loneliness; adolescents

**Introduction**

Paranoia describes the belief that others deliberately intend to cause harm (Freeman & Garety, 2000). It has been proposed that paranoia exists on a continuum with mild paranoid beliefs occurring in the general population through to persecutory delusions that form part of clinical presentations such as schizophrenia (Elhani et al., 2017; Strauss, 1969). Although paranoia can be adaptive, it becomes a clinical issue when it is excessive and impacts on functioning (Bebbington et al., 2013). Therefore, an implication of the continuum model is that understanding paranoid beliefs in nonclinical/general populations can also enhance our understanding of clinical delusions (Bebbington et al., 2013). Research indicates that pathways leading to the development of clinical persecutory delusions in adults may commence in youth (Dominguez et al., 2011). Supporting this, recent research examining paranoia in adolescents found prevalence estimates of weekly endorsement of paranoid items ranging from 7-32% (Bird et al., 2019), and higher endorsement rates found in help-seeking adolescents (Bird et al., 2021). Additionally, the frequency of paranoid thoughts is associated with increased distress and reduced well-being in adolescents (Kingston et al., 2022; Wigman et al., 2011), with distress from subclinical experiences being linked to increased risk for the development of psychosis (Nelson et al., 2022; Rekhi et al., 2019). Understanding the mechanisms that contribute to the formation and maintenance of paranoid beliefs in adolescents is especially important as this could disrupt pathways to the later development of psychosis (or other psychiatric conditions in adulthood), as well as informing potential preventative interventions and practical policy implications.

To date, the psychological understanding of paranoia in adolescents has been limited by lack of a conceptual framework to guide understanding and inform prevention and intervention strategies (Kingston et al., 2023). Adolescence is a unique developmental phase, characterised by significant changes in social, cognitive, behavioural and neurodevelopmental domains which differentiates it from other life stages. As such, relying on cognitive models from adult populations to understand paranoia in adolescents may overlook key developmental processes. Social evaluative concerns, thought to underpin paranoia (Freeman et al., 2005), typically peak during adolescence; peer acceptance is more central to identity and well-being than at earlier stages of development, and fears of being excluded by others have more emotional impact than at other life stages (e.g., Platt et al., 2013). Adolescents can therefore be conceptualised as a ‘critical developmental phase’ for paranoia (Kingston & Taylor, under review), especially in the context of interpersonal stressors, such as bullying and adverse life events (Kingston et al., 2023). Discrimination can be conceptualised as a pervasive interpersonal stressor, with significant implications for adolescent mental health and well-being (Benner et al., 2018).

The social defeat hypothesis proposes that feeling like an outsider or excluded from a majority group (and therefore by implication endorsing a minority group status) increases the risk for psychotic experiences, including paranoia (Selten & Cantor-Graae., 2005; Selten et al., 2013). In adult populations, perceived discrimination, particularly related to ethnicity, has been shown to be associated with paranoia (Shaikh et al., 2016), and this association has been found to be stronger than with other psychotic symptoms (Bardol et al., 2020). Research has also examined discrimination and minority group endorsement, with studies showing associations with increased rates of paranoia (Stickley et al., 2019; Wolny et al., 2023), including across geographically and culturally-diverse international sites in adult samples (Kingston et al., 2023). Furthermore, perceived discrimination in the context of identifying with multiple marginalized identities was associated with increased odds for experiencing paranoia (OR = 6.00) relative to discrimination in a singular domain (OR = 2.27) (Stickley et al., 2019). Likewise, discrimination across a variety of minority groups prospectively predicted delusional ideation (but not hallucinations) over a 3-year period in the general population (Janssen et al., 2003). Whilst this highlights an accumulating evidence base in the adult population, research on discrimination, minority group endorsement and paranoia in adolescents is relatively scarce. Research to date has shown that delusional ideation is higher in adolescents with ethnic minority identities in the UK (Eilbracht et al., 2015) and perceived (personal) discrimination is associated with an increased risk for delusional experiences (El Bouhaddani et al., 2019). However, any potential interaction effects of minority group endorsement and discrimination on paranoia in adolescents remains untested.

As well as examining discrimination and minority group endorsement as both independent and interacting predictors of paranoia, it is also important to identify what factors might be relevant to understanding the effect of discrimination and minority group endorsement on paranoia in adolescents. One candidate factor is loneliness, given existing research showing that adolescents who report loneliness are at an elevated risk of mental health problems (Matthews et al., 2023), experiences of discrimination increase loneliness in adults with psychotic disorders (Switaj et al., 2015), loneliness and paranoia are related (Lamster et al., 2017; Jaya et al., 2017; Chau et al., 2019), and tend to co-occur (Chau et al., 2022), and reducing loneliness has been shown to decrease paranoia (Lamster et al., 2017). Previous research has also shown that (sexual) minority groups are more likely to report loneliness (Gorczynski & Fasoli., 2021) and discrimination (Bostwick et al., 2014). Additionally, young adults in particular are a high-risk group for experiencing loneliness, perceived discrimination increases the risk of loneliness in young adults (Achdut & Refaeli, 2021). However, the role of loneliness in understanding relationships between discrimination, minority group endorsement and paranoia in adolescents specifically is currently unknown.

Therefore, the aim of the current study was to examine relationships between everyday discrimination, minority group endorsement, loneliness and paranoia in an international sample of adolescents from the xx and xx (locations masked for peer review). Based on the evidence reviewed above, we tested: (1) whether minority group endorsement and severity of discrimination independently predict variance in paranoia; (2) if discrimination and minority group endorsement interact to predict paranoia; and, if so, (3) whether the impact of this interaction varies depending on level of loneliness (moderated moderation).

**Method**

**Design**

The study was pre-registered (<https://osf.io/3z86n/?view_only=e3e289eb91864e848ca1c084af5758b6>), and used a cross-sectional, online survey design, with everyday discrimination and minority group endorsement as predictors, loneliness as a moderator and paranoia as the dependent variable. The study received institutional ethics approval in both the xx (Ethics ID xxxx) and xx (Ethics ID xxxx) (masked for peer review).

**Participants**

An online participant recruitment service (Qualtrics) was used to recruit adolescent participants (*n*=462) from xx (*n*=262) and xx (*n*=200). Quota sampling was employed to ensure a balanced gender and age (14/15 and 16/17) split. Apart from English language proficiency and adolescents’ age, no further inclusion or exclusion criteria were specified. The study is an analysis of an existing dataset, therefore no a-priori power calculations were undertaken.

**Measures**

**Everyday Discrimination Scale – Short Version (Sternthal et al., 2011)**

The EDS assesses everyday discriminatory experiences using 5-items to assess routine discrimination (e.g. ‘you are treated with less courtesy or respect than other people’) through to more chronic experiences (‘you are threatened or harassed’) on a 6-point scale with the following response categories: ‘*almost everyday’, ‘at least once a week’, ‘a few times a month’, ‘a few times a year’, ‘less than once a year’ and ‘never’*. Scores range from 0-25 with higher scores indicating higher discrimination. Participants who respond “a few times a year” to at least one of the five items are asked a follow up question - “what do you think is the main reason for these experiences” and are asked to indicate categories from a list of 14 (ancestry or national origins, gender, race, age, religion, height, weight, other aspects of physical appearance, sexual orientation, education or income level, physical disability, shade of skin colour, tribe, other). We summed the number of reasons endorsed to produce an index of minority group endorsement (range 1-14). Good internal consistency has been reported (α=0.77; Sternthal et al., 2011). Internal consistency in the current study was α=0.92.

***Revised Green et al. Paranoid Thoughts Scale (R-GPTS; Freeman et al., 2021)***

The R-GPTS is an 18-item self-report instrument that assesses paranoid thoughts during the last month on two dimensions: ideas of reference and persecution. Items are rated on a 5-point Likert scale from 0 = "Not at all" to 4 = “Totally". We used the 10-item persecution subscale as it better captures the perceived intentionality of paranoid ideation and relates more strongly to persecutory delusions (Freeman et al., 2021). The persecution subscale demonstrated excellent internal consistency in our sample (*α*= 0.96) consistent with Freeman et al. (2021).

***UCLA Loneliness Scale – Short Version (Neto, 1992)***

This is a 6-item version of the original 20 item UCLA loneliness scale. Each of the 6 items is rated on a 1 (never) to 4 (often) scale, yielding a total possible score of 6-24, with higher scores indicating higher loneliness. The internal reliability of the scale was reported as 0.77, and in the current sample, it was 0.94.

**Procedure**

Potential participants were identified and contacted by Qualtrics to participate in the study; parents provided consent first and only following parental consent were adolescents approached to take part and subsequently provide informed consent. Participants completed the questionnaires online via Qualtrics. All participants were debriefed at the end of the study and reimbursed by Qualtrics for their time.

**Data Analysis Plan**

We first report Pearson’s correlations for all variables. To test our hypotheses, we calculated a moderated moderation model using the PROCESS macro (Model 3) for SPSS by Hayes (2017). In the first step, two variables - severity of discrimination (variable X) and number of endorsed minority groups (variable W) – were included to test if these accounted for a significant amount of variance in paranoid thoughts (variable Y). To avoid potentially problematic high multicollinearity with the interaction term, the variables were centered around the sample mean. Next, the interaction term between severity of discrimination and minority group endorsement (X\*W) was added to the regression model. Finally, to test if the two-way interaction between severity of discrimination and minority group endorsement was conditional upon loneliness (variable Z), we added the 3-way interaction term to the model. Consistent with our pre-registration, in the case of significant moderation effects, we planned to probe the 3-way interaction between severity of discrimination, minority group endorsement and loneliness (X\*W\*Z) by applying the Johnson-Neyman technique (Hayes, 2017).

**Results**

**Participant characteristics**

Participants were recruited from both the xx (*n* = 262) and the xx (*n* = 200). Participants’ age ranged from 14-17 years old (*M* = 15.52, *SD =* 1.13), and consistent with the quota sampling, half were male (*n* = 230, 50%). Participant ethnicity was as follows: White (n=369, 80%), Black (*n* = 35, 8%), Hispanic (n = 28, 6%), Asian (n = 14, 3%), Mixed Race (n=12, 2%), Other (n=4, 1%). Participants reported having between 1 and 6 siblings (*M* 1.41, *SD* = 1.12). Participants self-reported SES was as follows: richer than friends (*n* = 50, 11%), about the same (*n* = 263, 57%), poorer than friends (*n* = 117, 25%) or don’t know (*n* = 32, 7%).

**Discrimination, minority group endorsement, loneliness and paranoia**

Overall, 302 participants (65%) reported experiencing at least one form of discrimination and 248 participants (54%) identified with one or more minority groups. Minority groups (reported in the EDS) endorsed were as follows: Ancestry/national origins (*n* = 19, 4%), gender (*n* = 60, 13%), race (*n* = 42, 9%), age (*n* = 109, 24%), religion (*n* = 15, 3%), height (*n* = 37, 8%), weight (*n* = 47, 10%), physical appearance (*n* = 58, 13%), sexual orientation (*n* = 24, 5%), education or income level (*n* = 36, 8%), physical disability (*n*=15, 3%), shade of skin colour (*n* = 29, 6%), your tribe (*n* = 8, 2%), other (*n* = 29, 6%). Total number of minority groups endorsed were as follows: 1 (*n* = 126), 2 (*n* = 50), 3 (*n* = 33), 4 (*n* = 22), 5 (*n* = 8), 6 (*n* = 2), 7 (*n* = 3), 8 (*n* = 1), 9 (*n* = 1), 12 (*n* = 1), 13 (*n* = 1). Table 1 shows descriptive statistics and relationships between variables, showing higher paranoia was significantly associated with severity of discrimination, minority group endorsement and higher loneliness.

[Insert Table 1 here]

PROCESS Model 3 was used to examine whether individual variables (discrimination, minority group endorsement and loneliness) and interaction terms predicted paranoia. We ran analyses both with and without controlling for site (UK/USA) and there was no difference in the findings and therefore we report here the findings without controlling for site.

Severity of discrimination (*b*=.32, *SE*= .06, *t*=5.59, *p*<0.001), minority group endorsement (*b*=.90, *SE*=.30, *t*=3.00, *p=.003*) and loneliness (*b*=.68, *SE*=0.08, *t*=8.64, *p*<0.001) were all independent significant predictors of paranoia. Contrary to prediction, the severity of discrimination\*minority group endorsement interaction did not predict paranoia (*b*=-.02, *SE*=0.03, *t*=-.62, *p=.54*). However, the severity of discrimination\*loneliness interaction did predict paranoia (*b*=.07, *SE*=0.01, *t*=6.98, p<.001). Examination of conditional effects indicated that when loneliness is low, there is no effect of discrimination on paranoia (*b*=-.03, *SE*=0.07, *t*=-.44, *p=.66*). However, when levels of loneliness are either moderate (*b*=.38, *SE*=0.05, *t*=7.55, *p<.001*) or high (*b*=.79, *SE*=0.07, *t*=10.26, *p<.001*), there is a significant effect of discrimination on paranoia (See Figure 1).

[Insert Figure 1 here]

**Discussion**

The aim of the study was to examine the associations between everyday discrimination, minority group endorsement and loneliness with paranoia in an internationally representative sample of adolescents in the UK and USA. We found that severity of discrimination and identification with minority groups were both independently associated with paranoia, suggesting that paranoia is higher with increasing endorsement of minority groups and with experiences of discrimination. This is consistent with findings in the adult literature, highlighting the impact of adverse social contexts on paranoia in adolescents (Kingston et al., 2023) and supports existing theoretical models in adults identifying the link between adverse experiences and paranoia (Bentall et al., 2001; Freeman et al., 2002). Our study adds to the literature by showing that this link extends to adolescents, with similar patterns of association at lower severity levels of the paranoia continuum, providing additional support for common mechanisms across the continuum of experience in adolescents (Bebbington et al., 2013; Kingston et al., 2023).

Interestingly, and against prediction, minority group endorsement did not interact with discrimination to predict paranoia in our adolescent sample. Whilst this finding needs to be replicated in future research before any definitive conclusions are drawn, a more fine-grained analysis examining how endorsement of specific minority groups might interact with different types of discrimination to predict paranoia would be useful (we did not conduct these analyses in our study as we did not have the statistical power to do so). Future research examining discrimination as a form of bullying or as a particular type of traumatic experience could also provide a more comprehensive understanding of how discrimination contributes to paranoia in adolescents.

Our findings also suggested that minority group endorsement had a significant, independent effect on paranoia. This is an important finding as it suggests that identifying with minority groups is associated with paranoia independent of experiences of discrimination. There are several reasons why minority group endorsement might independently contribute to paranoia. For example, it might be that feeling different from the majority is sufficient to trigger paranoia; alternatively, this finding could reflect the fact that those in minority groups are often subjected to more harm from others, or might be due to third variables that are also related to minority group endorsement, such as social economic status. It will be important for these competing explanations to be examined in future research, alongside research into potential mechanisms, which could include social isolation, stigma, shame and social rank.

We also examined, for the first time, loneliness as a potential factor that might be relevant to understanding the relationship between discrimination and paranoia in adolescents. Our findings suggest that loneliness was both independently associated with paranoia and also moderated the effect of discrimination on paranoia in our adolescent sample. This suggests that the effect of discrimination on paranoia is particularly potent for those with either moderate or high levels of loneliness. These findings are consistent with the broader adolescent literature showing that adolescent loneliness results in an elevated risk of mental health conditions (Matthews et al., 2023). Furthermore, these results are aligned with previous studies in adult populations showing the importance of loneliness in the context of both paranoia and discrimination experiences (Lamster et al., 2017, Achdut & Refaeli, 2021), and that paranoia and loneliness co-occur (Chau et al., 2019). The current study adds to this by showing effects translate to adolescents, although future research is needed to understand how loneliness exacerbates paranoia, for example through mechanisms such as social isolation, lack of peer support, heightened sensitivity to social threats or a reduced sense of belonging. The findings also highlight the intriguing possibility that interventions designed to reduce loneliness might also attenuate the effect of discrimination experiences on paranoia for adolescents. Additionally, preventative approaches in settings such as schools could also be useful, though this would need to be established in future research.

There are some limitations of the study that warrant consideration. Although we recruited adolescents with balanced gender and age splits, we did not collect data on migrant status or measure other potentially important variables such as personality traits. Our sample was predominantly white and we therefore did not achieve good levels of ethnic diversity in our sample, which is a significant limitation given the study’s focus on discrimination and minority group endorsement, which limits generalisation of our findings. Similarly, although participants were recruited from two countries (xx and xx), potential cultural differences were not measured which could have affected the study findings, such that it is not clear whether the findings generalise cross-culturally and to samples in low- and middle-income countries. The cross-sectional design limits inferences regarding causality, limiting the ability to establish directionality of effects, therefore further longitudinal studies are needed to examine relationships over time. The age range of our sample (14-17 years) also limits the extent to which our findings might be applicable to younger adolescents or pre-adolescent children. We measured minority group endorsement using the 14 supplied groups in the Everyday Discrimination Scale, to ensure we captured minority group endorsement as a broad construct, rather than focusing a priori on specific areas of difference (e.g. ethnic or sexual minority groups). Endorsement of supplied minority groups is fairly typical and is consistent with previous studies (Stickley et al., 2019; Kingston et al., 2023). Nonetheless, we acknowledge that a limitation of using the minority groups specified in the EDS is that some categories might arguably be less relevant to adolescents, such as age and education or income level. Future research might usefully incorporate patient and public involvement (PPI) to guide decision-making in relation to measurement of this variable. Finally, recruiting a nonclinical population means that our findings are silent about any potential implications for adolescent clinical samples. Future research is needed to understand how mistrust and paranoid beliefs develop in younger children and identify and test risk and protective factors. Qualitative studies might also usefully be undertaken to understand individual experiences of paranoia in adolescents.

The findings point towards some interesting areas for future research. It will be important in larger scale studies to determine whether specific types of minority group endorsement (e.g. racial/ethnic and sexual minoritisation) and types of discrimination experiences are more or less strongly associated with paranoia, the results of which could identify specific intervention targets. Additionally, it will be important to identify and assess potential mechanisms that might explain both the effect of minority group endorsement on paranoia, and how this interacts with discrimination to predict paranoia in adolescents, using longitudinal designs with multiple measurement points, or in the flow of daily life using experience sample methodology. Future research is also needed to test psychological interventions for adolescent paranoia and to test potential preventative strategies which could then lead on to important recommendations for policy changes.

In conclusion, everyday discrimination, minority group endorsement and loneliness all independently predict paranoia in adolescents. Loneliness was a significant moderator, suggesting that the effect of discrimination on paranoia is particularly potent for adolescents with moderate or high levels of loneliness. These findings highlight the intriguing possibility that interventions that target loneliness might reduce paranoia in adolescents.

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Notes on Contributors:

Lyn Ellett is a Professor in Psychology and Mental Health who specialises in paranoia

Katarina Krkovic is a Research Associate and CBT Psychotherapist who specialises in psychosis

Brandon Gaudiano is a Professor who specialises in psychosis-spectrum disorders.

Elizabeth Thomson is an assistant professor who specialises in psychosis-spectrum disorders in adolescence

Jessica Kingston is a Senior Lecturer in Clinical Psychology who specialises in adolescent paranoia.

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**Table 1.** Descriptive statistics and relationships between variables.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Mean (SD) | Range | 1 | 2 | 3 | 4 |
| 1. Discrimination | 5.71 (7.11) | 0-25 | - |  |  |  |
| 2. Minority group endorsement | 2.13 (1.72) | 1-13 | .07 | - |  |  |
| 3. Loneliness | 12.06 (5.18) | 6-24 | .30\*\* | .04 | - |  |
| 4. Paranoia | 6.23 (9.51) | 0-38 | .40\*\* | .23\*\* | .53\*\* | - |

\*\*p<.001

**Figure 1.** Discrimination and paranoia at different levels of loneliness.

