FLATTENING THE HIERARCHY: A SOLUTION TO THE MALE PROBLEM OF BULLYING

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ABSTRACT

School bullying is a social problem that not only physically and psychologically affects victims but disrupts the normal process of teaching and learning in senior high schools (SHS). This predicament calls for effective anti-bullying strategies. We used an exploratory sequential mixed method design comprising a survey and a double-blinded experiment to study the role of dominance hierarchy as the primary mechanism of bullying to effectively design anti-bullying strategies. The sample size used in the survey to validate our previous work on the influence of dominance hierarchical structures on bullying was 79 students, while the experimental design to causally link dominance hierarchy to bullying contained a sample of 21 students. The dominance hierarchy is one in which bullying behaviour is exhibited as a means to rise a social hierarchy. The current study validated that the dominance hierarchy is the more prevalent form of bullying in Ghana. We also observed that while bullying behaviour sharply increases in SHS 3, bullying victimisation does the opposite. This allows us to allocate intensive anti-bullying strategies to the most affected groups. Finally, the highest percentage of bullied individuals in SHS 1 are those who have a high social status relative to their peers, and the students who bully most frequently in SHS 3 are those who have a lower social status in school compared to their peers. We demonstrated that flattening the hierarchy is an effective way of significantly decreasing bullying behaviour. Therefore, measures such as increasing senior-junior cooperation through leadership positions, which is largely absent in SHS, will be effective at substantially decreasing bullying behaviour in our schools.

Keywords: bullying, psychological behaviour, educational age, dominance hierarchy, senior high school education, Ghana

INTRODUCTION

In schools all over the world, bullying is an undeniably pervasive issue that students and teachers have to face constantly (Kennedy *et al.*, 2024; Martínez-Carrera *et al.*, 2024; Robson & Wittenberg, 2013). Almost half of the student population in the Eastern and Western African regions have experienced bullying, emphasising the need for a comprehensive solution to this canker (UNESCO, 2023). In Western countries like Ghana and Nigeria, the proportion of students who have experienced bullying is as high as 60% (Fenny & Falola, 2020; Olaoye, 2024) to 88% respectively (Afun, 2024). Furthermore, recent evidence suggests that bullying behaviour spreads like a "contagion" (Fei *et al.*, 2024) and this highlights the increased importance of finding solutions that can tackle this problem effectively from the onset.

However, although several articles have attempted to explain the feedforward behaviours and actions that lead to bullying behaviour, a clear foundation as to how bullying is propagated and the mechanisms that underpin the hierarchical structure, which is important for a solution to bullying is not well-established (Kuunibe *et al.*, 2023). As such, our study implores experimental design to isolate the key variable that drives bullying. In previous work, we suggested that this key variable is a dominance hierarchical structure and in our current work we have demonstrated that flattening this hierarchy significantly decreases bullying victimisation rates. This dominantdominance hierarchical structure follows from the previously defined dominance theory of bullying which maintains that bullying as a practice is a means by which individuals accrue social status (Subedi, 2020).

African scholars have written many scholarly works about the problem of bullying on the continent and worldwide. However, there is still a need for effective anti-bullying strategies (Hong *et al.*, 2022; Peprah *et al.*, 2023). One of the few studies that have proposed solutions includes a Southeast Asian study that recommends the introduction of an anti-bullying intervention such as "Project START (Stop Truancy and Recommend Treatment)" in which there is a collaboration between the courts, schools and communities to fight against bullying behaviours (D. N. Owusu *et al.*, 2022). In addition, they recommend establishing a "Check and Connect" mentorship program that pairs teachers with absentees to improve the inclusion of victims (D. N. Owusu *et al.*, 2022). Next, a separate South African study suggested training teachers on anti-bullying strategies and establishing systems that rely less on reports and more on observed bullying behaviour (Shiba & Mokwena, 2023). They also encouraged identifying students from dysfunctional households who are usually at high risk of being bullying victims (Shiba & Mokwena, 2023). This study is corroborated by cross-country studies that suggest that altering family life may be the best strategy for attenuating bullying behaviour (Abdirahman *et al.*, 2013; Dussich & Maekoya, 2007). Furthermore, a study on bullying in Sub-Saharan Africa recommended interventions like "peer educator network systems", in-person counselling and substance use-centred therapy to curb bullying behaviour (Aboagye, *et al.*, 2021). A global study by Owusu et. al. (2013) recommends targeting bullying from a legal level, specifically through policies, modelling an open and safe school environment, as well as improving access to trained professionals (Hong *et al.*, 2022). A study in Qatar recommends tackling bullying by increasing the supervision of students, especially in high-target areas (Kamal *et al.*, 2023; Man *et al.*, 2022). Additionally, they recommend incorporating anti-bullying modules into lessons (Kamal *et al.*, 2023; A.

Owusu *et al.*, 2011) and designing engaging programs for students to take part in during break periods as well as mentorship programs (Kamal *et al.*, 2023).

Taken together, the most common themes that are shared across all the solutions posited by all these scholars include measures like increasing adult supervision and establishing anti-bullying programs and modules in schools. While the former is labour-intensive and unfeasible for most institutions in Africa that usually have a shortage of teachers, the latter is too transient to have any lasting impact. A lasting solution will have to be student-driven and therefore, less labour-intensive all the while being sustained through time. These are core features of the solution we propose in this study, namely encouraging senior-junior cooperation through joint leadership positions.

To our knowledge, no other published work has investigated bullying mechanistically in Ghana through experimental designs therefore rendering our work with the unique ability to draw a causal connection between social hierarchy and bullying. In this study, we hypothesized that bullying operates under a dominance hierarchical framework and asserted that a proper solution will be one in which this hierarchy is flattened based on our previous work in which we first stipulated that the dominance social hierarchy may underpin bullying behaviour in senior high schools (Afun, 2024).

MATERIAL AND METHODS

We conducted the study to identify the factors that reduce bullying in Senior High Schools (SHS) in two stages. In the first phase, we validated the results of our previous work to establish if indeed a dominance hierarchical structure can explain the mechanism of bullying (Afun, 2024). Previously used survey questions (supplemental) were disseminated to Akosombo International School (AIS) SHS students to complete, unlike our original work which featured multiple SHS in Ghana (Afun, 2024). We received 79 responses; 42 of which were males (53%) and 37 were females (47%) (**Figure 1**).

In the second phase, we conducted a double-blind parallel-group randomised experiment on the AIS campus to demonstrate a causal influence between a dominance hierarchy and bullying behaviour. We randomly selected fourteen male students made up of ten SHS 1 students and four SHS 2 students and randomised them to either 1) an established hierarchy cohort characterised by SHS 2 seniors supervising SHS 1 juniors to complete a classroom arrangement task or 2) a flattened hierarchy in which SHS 2 seniors worked co-operatively with SHS 1 juniors (**Figure 2**). In the established hierarchy cohort, the seniors had clear supervisory roles. In this group, the SHS 2 seniors wore black hoodies which is an attire exclusively worn by seniors, while the SHS 1 juniors wore a white shirt which is an attire worn mainly by juniors. They also called the juniors "one-to-ones" which is a blanket term used by seniors to refer to juniors to deindividuate them and in so doing facilitate bullying (Bartels, 2015). In the flattened hierarchy cohort, seniors and juniors both wore white shirts, and the juniors were referred to by their names. In the established hierarchy cohort, there was a clear hierarchical structure, while in the flattened hierarchy cohort, there was no clear hierarchical structure.

Next, five packaged plantain chips were distributed to each junior in the treatment groups. Then, the SHS 2 seniors of the respective treatment groups were told that they could take as many plantain chips as they wanted (or none) from the juniors. Concurrently, a separate negative control group was made. This group comprised 7 randomly selected students comprised of

five SHS 1 students and two SHS 2 students. The SHS 1 juniors in this group were also given five packaged plantain chips and the seniors were also instructed to take as many or as little plantain chips as they wanted. The outcome of the negative control was compared to the established hierarchy group to show that the established hierarchy models bullying that occurs naturally in SHS. Therefore, the bullying outcomes observed in the established hierarchy should in effect model the hierarchy that exists naturally (the control group).

Finally, bullying behaviour was measured by the fraction of the total number of packaged plantain chips taken from each individual. Following the collection of this data, R programming language was used to analyse the survey and experimental results. In R, the survey results were stratified by sex. Then, the sex-specific data was grouped and tabulated according to the reported bullying rates, ie. "Not at all", "Occasionally", "Often", and "Very Often". The tabulated results were then plotted as side-by-side bar graphs. The sex-specific measures of social status, i.e. "Not popular", "Somewhat popular", "Popular" and "Very Popular" were also grouped and tabulated in R. Subsequently, we used the "plot (x, y)" function in R to make a scatter plot of the relationship between age and bullying rates. We then generated p-values using the linear regression model function, "lm (y ~ x)". Finally, we used a line plot to represent the relationship between SHS grade and bullying rates.
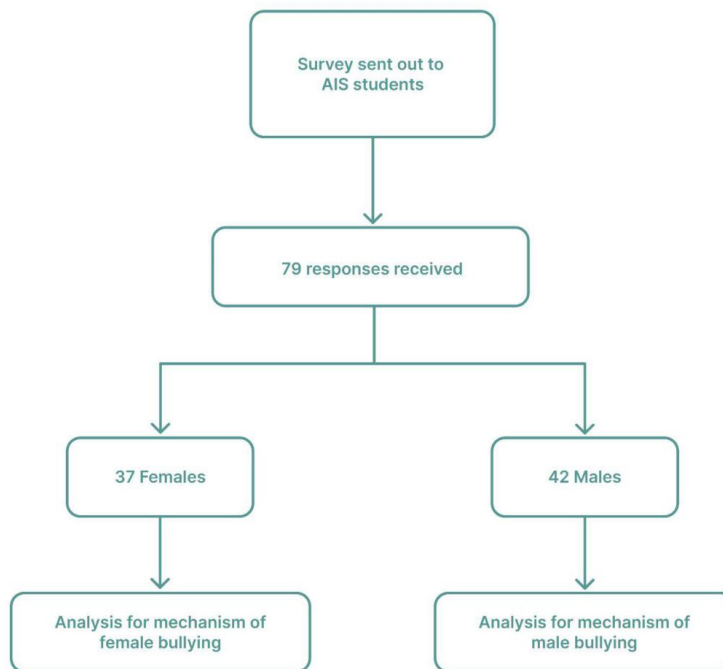

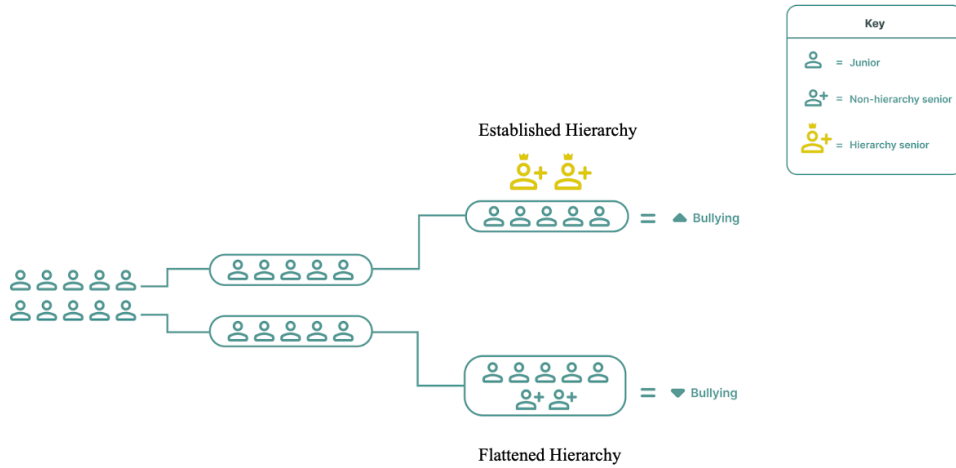**Figure 1.** Flow chart of the research study design.

Figure 2. Schematic of the experimental paradigm.

RESULTS

Sex differences in bullying behaviour were observed. While in SHS 1, there was no difference between male and female bullying victimisation and bullying behaviour (**Figure 3A-B**), a sex difference emerged in later years. In SHS 2, 86% of male students as opposed to 54% of female students were bullied (**Figure 3C**). Contrastingly, while 24% of male students bullied others in SHS 2, only 8% of female students became bullies in SHS 2 (**Figure 3D**). Finally, in SHS 3, 48% of male students and 17% of females bullied others (**Figure 3E**).

A

B
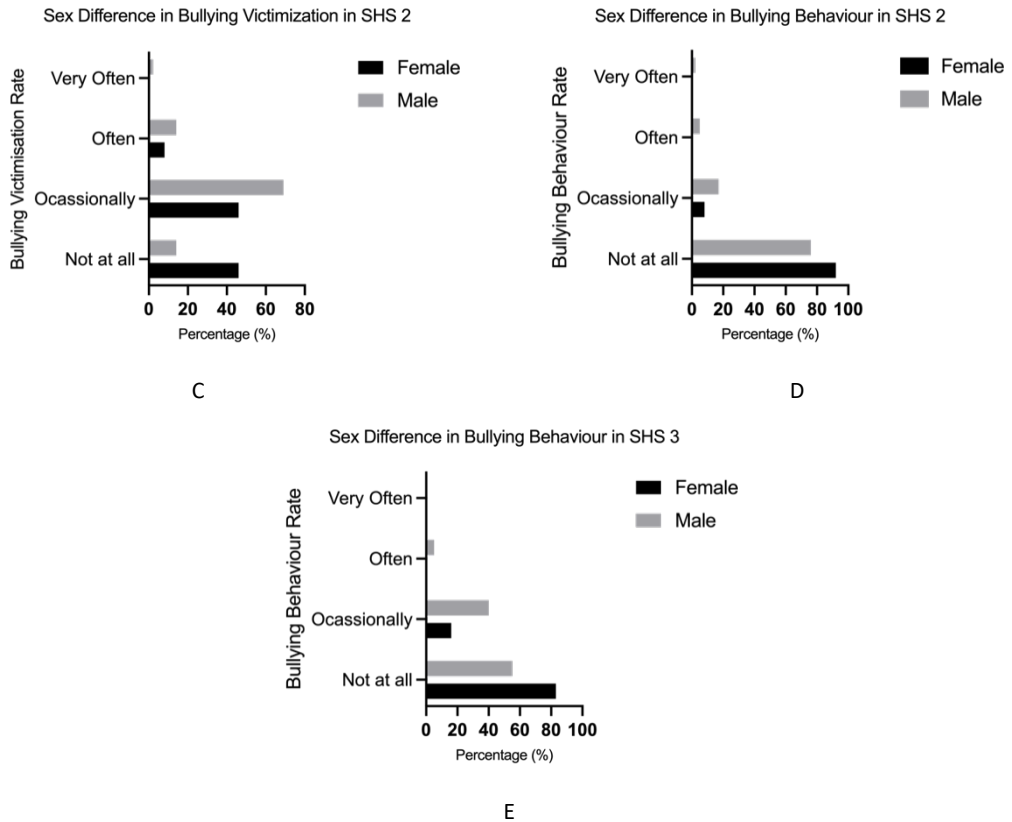
Figure 3. Male students experience more bullying and are more likely to be bullies than their female counterparts.

A) There was no sex-dependent difference in bullying behaviour and B) victimisation in SHS 1. C) Male students were the largest proportion of students bullied in SHS 2 D) In SHS 2 male students as opposed to female students were more likely to exhibit bullying behaviour. E) In SHS 3, more male students than female students exhibited bullying behaviour. n = 79.

There was no relationship between age and bullying victimisation rate as evidenced by the behaviour experiments (**Figure 4A-B**) and the self-reported surveys. (**Figures 4C-D**).

 After establishing that age is not a variable that predicts bullying victimisation or bullying behaviour as suggested by the educational age hypothesis (Afun, 2024), we determined the association between rates of bullying and student grade level. As predicted by the hypothesis, there is a strong relationship between the grade an individual is in and their likelihood of being bullied and being a bully. Specifically, when juniors are in SHS 1, the bullying victimisation rate is the highest (80%) and this decreases to 71% in SHS 2. However, in SHS 3, bullying victimisation has a marked decrease to 5% (**Figure 4E**). Conversely, bullying behaviour was the lowest in SHS 1 (11%) and increased by 6% in SHS 2. However, inversely there was a large 18% increase in bullying behaviour by SHS 3, with 35% of students reporting that they identified as bullies (**Figure 4E**).

A

B

C

D

E
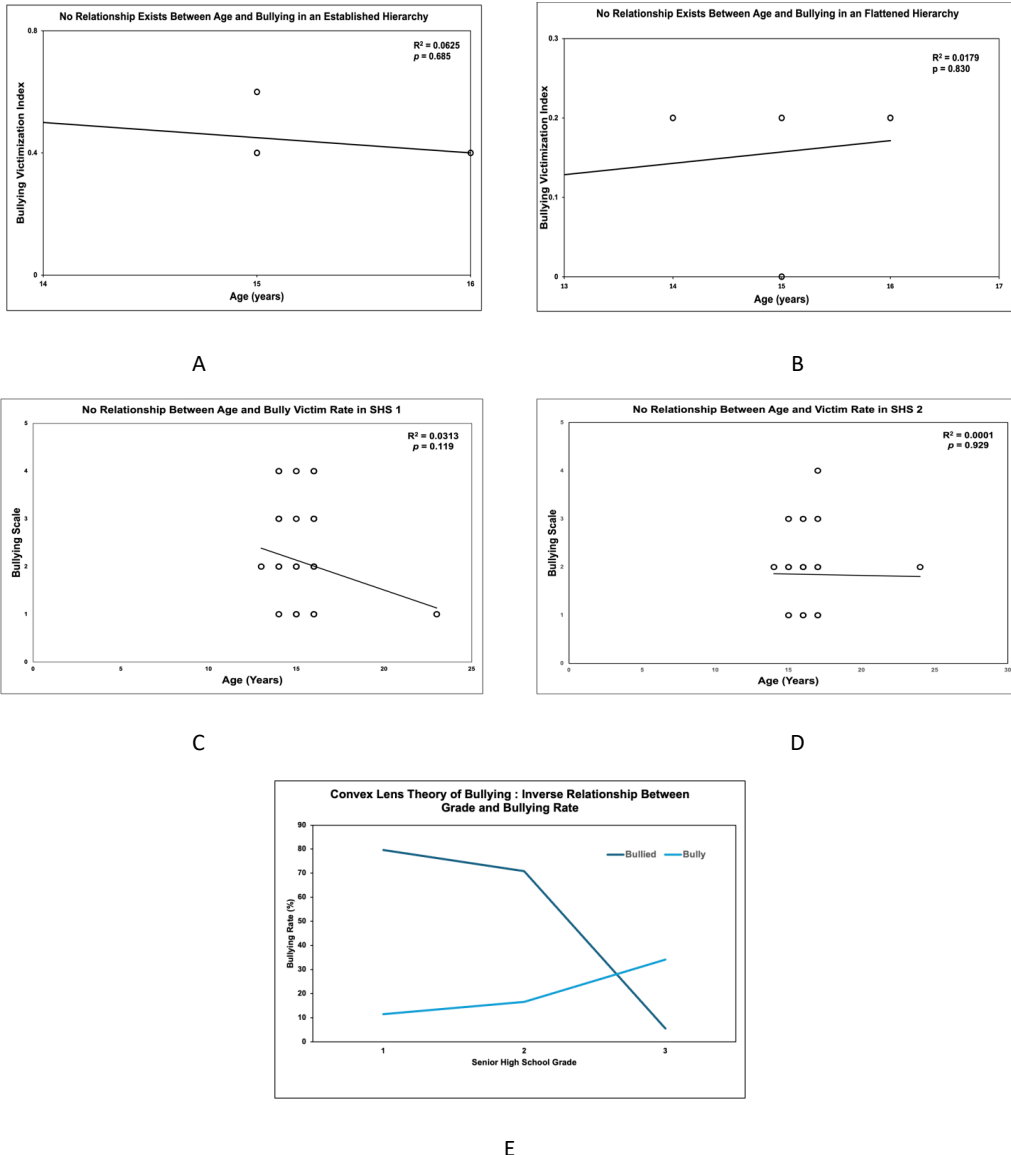
Figure 4. Bullying is independent of age but dependent on grade level.

In the experimental groups, the rate at which male students were bullied in the A) established hierarchy (p=0.685) and the B) flattened hierarchy did not depend on their age (p=0.830). n = 5. The bullying index was calculated as a fraction of the snacks taken from the SHS 1 juniors by the SHS 2 seniors. There was no relationship between the age of the student and the likelihood of being bullied in C) SHS 1(p=0.119). and D) SHS 2 (p=0.929). The bullying scale was determined by assigning ordinal values to the bullying victimisation rate reported by students through the survey. n = 79. E). However, bullying victimisation drops from 80% in SHS 1 to 71% in SHS 2 and drops to 5% in SHS 3. Oppositely, bullying behaviour increases from 11% in SHS1 to 17%

in SHS 2 before rising to 35% in SHS 3. The sample contained both male and female students. n = 79.

Male bullying operates according to a dominance hierarchy. From our self-reported survey data, we observed that the highest percentage of male students bullied in SHS 1 (87.5%) and SHS 2 (93.7%) were the "popular" male students (**Table 1**). Concurrently, the least bullied group for SHS 1 males were those that were "very popular" (25%), while the least bullied group for SHS 2 males were those that were "not popular" (28.5%). On the other hand, the male students that bullied others the most in SHS 1 and SHS 2 were those that were "Somewhat popular" (23.5%) (**Table 1**) followed by those that were "not popular" (14.3%). Furthermore, the greatest proportion of SHS 3 male bullies was

evenly split between the "not popular" (50%) and "somewhat popular" male students (50%). Surprisingly, the "popular" male students who were the most bullied in SHS 1, SHS 2 and SHS 3 were consistently among the least likely to bully others. Additionally, although the "very popular" students were among the least bullied students in SHS 1, SHS 2 and SHS 3, unlike the "not popular" male students, they were least likely to bully others in SHS 2 and SHS 3 grades.

For female students the trend was different. In SHS 1, the "very popular" female students were bullied the most (100%) (**Table 2**). Like the male students, the "popular students" were bullied the most in SHS 2 (62.5%). However, unlike the male students, the female students who bullied others the most were either "popular" or "very popular".

Table 1. Relationship between social status and being a bully or a bullying victim in male students

|	Bullied in SHS 1 (%)	Bully in SHS 1 (%)	Bullied in SHS 2 (%)	Bully in SHS 2 (%)	Bullied in SHS 3 (%)	Bully in SHS 3 (%)
Not Popular	85.7	14.3	71.5	28.6	0.0	50.0
Somewhat Popular	82.4	23.5	82.4	37.5	7.1	50.0
Popular	87.5	6.2	93.7	18.7	0.0	40.0
Very Popular	75.0	20.0	80.0	0.0	0.0	25.0

Table 2: Relationship between social status and being a bully or a bullying victim in female students

	Bullied in SHS 1 (%)	Bully in SHS 1 (%)	Bullied in SHS 2 (%)	Bully in SHS 2 (%)	Bullied in SHS 3 (%)	Bully in SHS 3 (%)
Not Popular	66.7	0.0	44.4	44.4	0.0	0.0
Somewhat Popular	70.6	0.0	52.9	52.9	12.5	12.5
Popular	75.0	14.3	62.5	71.4	14.3	28.6
Very Popular	100.0	25.0	50.0	50.0	0.0	50.0

Next, we conducted an experiment to see the effects of flattening the hierarchy on bullying behaviour. The outcome of the experiment that was used to determine bullying behaviour/victinmisation was the number of packaged plantain chips confiscated as a fraction of the total number of packaged plantain chips distributed to each male SHS 1 junior (referred to as the bullying behaviour/victimisation index). The bullying behaviour/victimisation index is a measure that is directly proportional to bullying behaviour (which measures actions perpetrated by bullies) and bullying victimisation (which measures bullying as experienced by victims). As expected, we observed that the bullying behaviour in the negative control was not significantly different from the established hierarchy. This confirmed our understanding that the established hierarchy is an accurate representation of the type of bullying behaviour present ordinarily in most SHS. Profoundly, after flattening the hierarchy by making the seniors and juniors work cooperatively as opposed to the seniors playing a supervisory/dictatorial role, the bullying index decreased by 64% (*p*=0.001).
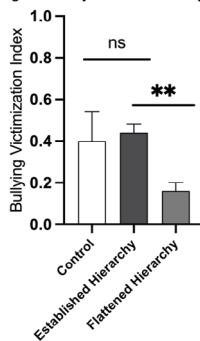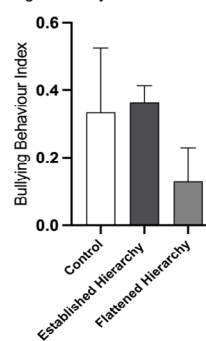
Figure 5: Flattening hierarchies in senior high Schools in Ghana diminishes bullying victimization and behaviour.

A) There was no statistically significant difference between bullying victimisation in the negative control group and the established hierarchy group. When seniors and juniors played a cooperative role in completing the task as is the case in flattened hierarchies, there was a statistically significant three-fold decrease in bullying victimization rates compared to the established hierarchy group (p=0.0011). n_J =5 per group, where n_J = number of seniors. B) Furthermore, there was a non-statistically significant decrease in the average bullying behaviour by seniors in the flattened hierarchy compared to the established hierarchy and control groups. n_{SR} = 2 per group, where n_{SR} = number of seniors. Statistical significance was determined using an unpaired t-test. ns = not significant, **p <.001. n_J = number of juniors, n_{SR} = number of seniors.

DISCUSSION

Bullying operates within a dominance hierarchical framework where seniors who bully their juniors do so to rise this hierarchy. The age of the juniors does not play into how frequently they are bullied. However, the grade level they are in predicts how often juniors are bullied and how often they will go on to bully others. Specifically, between SHS 1 and SHS 3 students are bullied at a decreasing rate, whereas inversely, the same students begin to bully at an increasing rate. Interestingly, in flattening the dominance hierarchy that exists between seniors and juniors we observe a three-fold decrease in bullying victimisation.

The greatest predictor of becoming a victim of bullying or exhibiting bullying behaviour is not age, but the grade level of the student. This is contrary to what has been previously supported by other studies (Smith & Gross, 2006; Olweus, 1991; Q'Moore *et al.*, 1997). According to the "educational age hypothesis", bullying is determined by the grade that one is in rather than one's age (Afun, 2024). In our study (surveys) and experiment, we failed to reject this hypothesis. This finding is also corroborated by other researchers (Gülbetekin & Gül Can, 2023; Vaillancourt *et al.*, 2023) with some evidence suggesting that even repeating a grade level increases one's chances of being bullied (Lian *et al.*, 2021). The relationship between grade and bullying victimisation and behaviour follows a convex lens phenomenon of bullying. That is, bullying victimisation rates decreased steadily until SHS 3 where it dropped drastically. This observation is supported by a study that investigated bully victimisation rates plummeting as students transition from grade 8 to grade 9 (Vaillancourt *et al.*, 2023). Conversely, bullying behaviour increases steadily until SHS 3 where it increases sharply. This finding is corroborated by the work done by Aboagye and colleagues where they observed that bullying victim rates decreased as one climbed the educational ladder in SHS (Aboagye, Seidu, Hagan, Frimpong, Okyere, *et al.*, 2021). Additionally, SHS 3 students have been reported to be three times less likely to be bullied than students in SHS 1 (A. Owusu *et al.*, 2011). However, while they attribute the decline to an increase in physical and psychological maturity, we are sceptical about whether that elucidates the complete story. We posit that the reason students are bullied less as they move from SHS 1 to SHS 3 is not because they are mature but because fewer people can bully them. As junior students, often the popular ones, are bullied by seniors (Mbah, 2020) aiming to climb the dominance social hierarchy, these juniors face less bullying when they become seniors themselves. By the time they reach SHS 3, no one attempts to bully them for social dominance.

Bullying behaviour and victimisation are correlated with social hierarchies (De Vries *et al.*, 2021). In our study, the group of students

who experienced the most bullying identified as juniors and "popular" males in SHS. This is to say that the most bullied people were generally looked up to by their peers and hence occupied a high position within the social hierarchy. Conversely, the group of male students that were bullied the least and yet were more likely to bully others were those that were not popular, which is to say that they were not particularly held in high regard by their peers and so occupied the lowest category in the social hierarchy. This finding is supported, in part, by a study that demonstrated that students of relatively lower social status showed increased bullying behaviour (Marengo *et al.*, 2021). We posit that the reason students who have a high social status in their junior years are bullied considerably more than their peers of relatively lower status is because the bullies, who are often of lower social status, want to rise to the dominance social hierarchy in SHS. A meta-analysis showed that bullies become more popular as they engage in bullying behaviour (Wiertsema *et al.*, 2023) suggesting that the reason unpopular students bully is to gain more popularity to rise the dominance social hierarchy.

Given that we posited a dominance hierarchical framework to explain the mechanism of bullying, we proposed that flattening the hierarchy may dampen bullying behaviour and victimisation. Flattening organisational hierarchies more broadly has been associated with positive outcomes (Kubheka et al., 2013). Indeed, we observed that bullying victimisation decreased substantially when the hierarchy was flattened. A key characteristic of this flattened hierarchy was that seniors and juniors worked cooperatively, unlike the established hierarchy where there was no cooperation. However, it is important to note that not all hierarchies are inherently "bad" and we do not propose a broad spectrum elimination of all social hierarchies

that exist in SHS. In fact, most hierarchies are pervasive in human societies, many in benign forms (Redhead & Power, 2022). Instead, we propose to flatten or dampen the hierarchies whose influence when taken to the extreme leads to unacceptable bullying behaviours. For instance, the dominance social hierarchy that sets senior students from junior students is what allows seniors to effectively delegate housekeeping tasks to junior students to maintain sanitation and organisation in boarding schools. However, when the power associated with hierarchy is abused, it can lead to an increase in bullying behaviour in SHS, especially in the form of physical abuse (Antiri, 2016).

We propose the incorporation of leadership positions occupied by both seniors and juniors to bolster co-operation which we have observed to be the best determinant of decreasing bullying victimisation and behaviour. While this proposal has the potential to decrease bullying behaviour and victimisation, it also has the potential to increase senior-junior friction due to powerplay. It can also lead to the complete undermining of the authority of seniors necessary to ensure decorum in SHS. To address this, we suggest the following. 1) These leadership appointments must be formally assented to and recognised by schools to reduce the powerplay dynamics. 2) These leadership positions occupied by seniors and juniors can be designed to be rotational much like leadership positions in the United Nations, where students work together towards productive ends like improving sanitation on campus etc. Rotational leadership has been reported to improve innovation, skill acquisition and broaden the perspective of the leaders (Alberti et al., 2021; Young et al., 2024). Importantly, leaders in rotational leadership gain a newfound appreciation for the system they lead (Young et al., 2024). These reported findings suggest that in addition to flattening

the hierarchy, rotational leadership may augment the innovative and collaborative skill sets of students. However, rotational leadership is not without its challenges. One major challenge with rotational leadership is that some followers feel a lack of direction and lack of engagement of the leaders due to the frequency of change of leaders. This often leads to frustration within followers (Young et al., 2024). These problems can be managed by providing the rotational leaders with clear instructions on what their roles are. Additionally, an onboarding process for new rotational leaders can be established to ensure uniformity of leadership direction and engagement. Taken together, rotational leadership may help flatten the hierarchy and prevent the extreme use of the hierarchy as a means to exhibit bullying behaviour.

CONCLUSION

Ultimately, this study has demonstrated that there is a link between a dominance hierarchy and bullying victimisation. Our findings which support the convex lens theory of bullying provide further insight into anti-bullying strategies that will be efficient in tackling bullying in schools. Specifically, it suggests that most bullying victimisation programs, such as counselling, ought to target more SHS 1 and SHS 2 students who are at the most risk of being bullied, while anti-bullying behaviour programs should target SHS 3 students who exhibit the greatest amount of bully behaviour.

Finally, we have demonstrated that flattening the hierarchy through increasing cooperation of seniors and juniors is the best way to limit bullying victimisation. This can take the form of rotational leadership positions where seniors and juniors work together towards a common goal like improving sanitation or noise levels in schools. We recommend this as an optimal solution as it is not as labour-intensive and as temporary as other proposed solutions by various scholars. This solution coupled with conventional strategies like increased supervision and counselling will be an adequate strategy to reduce the incidence of bullying in our schools.

Limitations and Future Research

The study has a few limitations. The experiment would have benefited from comparing intra-level bullying rates within grade levels to the bullying rates in the flattened hierarchy cohort. This is because intra-level bullying is considered non-existent so it would have been useful to compare the bullying rates of flattened hierarchy to intra-level bullying as a form of positive control. Moreover, our experiment did not include female students and as such limits the generalisability of the experimental findings across the sexes. Additionally, the use of surveys always brings along recollection bias. Finally, our experimental study would have benefited from an increased sample size to increase power.

It will be useful for other scholars to investigate female bullying behaviours and the framework that underpins such behaviour. We hypothesize that rather than a dominance hierarchy, female students may be engaging in bullying (mostly verbal) behaviour for reputation-damaging reasons rather than as a means to climb up a social hierarchy.

Supplemental Material

Below are the questions asked in the survey

"This form is anonymous. Only people who attended SHS and were in boarding school should answer."

1. What is your name? (Optional)

2. What is your date of birth?

3. What was your age in your first year of high school?

4. What SHS did you attend?

5. What is your gender?

6. How popular would you say you were in boarding school?

7. Estimate your average exam percentage at the end of your first year of SHS.

8. Estimate your average exam percentage at the end of your second year of SHS.

9. Estimate your average exam percentage at the end of your last year of SHS.

10. How often were you bullied in your first year of SHS?

11. How often were you bullied in your second year of SHS?

12. How often were you bullied in your third year of SHS?

13. How often did you bully others in your first year?

14. How often did you bully others in your second year?

15. How often did you bully others in your final year?

16. Do you agree to take part in this study?

ACKNOWLEDGEMENT

Declaration of Interest

The authors have no conflict of interest to disclose.

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