



## Differential impact on men in an IPV prevention intervention: A post hoc analysis using latent class analysis of the Stepping Stones and Creating Futures intervention in South Africa

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### ABSTRACT

Working with men to prevent their perpetration of intimate partner violence and non-partner sexual violence is increasingly recognised as effective. However, in any given context there are a multiplicity of masculinities, each of which has a different association with violence perpetration. There remains lack of clarity about whether such interventions impact all men and masculinities equally. We undertook a post-hoc analysis of men involved in the successful Stepping Stones and Creating Futures cluster randomized control trial in Durban, South Africa, to assess: i) whether there were different groups of men, ii) the factors associated with group allocation, and iii) whether the intervention had a differential impact on these groups in terms of violence perpetration. We used Latent Class Analysis (LCA) to identify masculinity classes, based on fit statistics and theoretical plausibility, and then used descriptive statistics (numbers, percentages, means) and p-values and multinomial models (95% confidence intervals, p-values) to assess factors associated with allocation to each class. To assess intervention impact by group, we used an intention-to-treat analysis, comparing men in each masculinity class, by intervention and control arm, using generalized estimating equations reporting unadjusted and adjusted odds ratios (aORs). In total 674 were recruited at baseline, and the LCA identified three classes of men: high violence (29% of men), medium violence (50% of men) and low violence (21% of men). Multinomial models showed those in more violent classes were more supportive of violence, had more adverse experiences, more depression and had worked more. By masculinity class, the impact of SS-CF showed reductions among the most violent men, with significant reductions in past year physical IPV (aOR0.59,  $p = 0.014$ ), emotional IPV (aOR0.44,  $p = 0.044$ ) and economic IPV (aOR0.35,  $p = 0.004$ ), with non-significant reductions among other classes of men. This analysis suggests intensive group-based interventions can have significant impacts on the most violent men in communities.

### 1. Introduction

Interventions working with men to prevent their perpetration of intimate partner violence (IPV) are increasingly common globally

(Jewkes et al., 2015a). Such approaches focus on changing men's gender attitudes and practices, often through participatory small-group processes, but can also include economic strengthening, and addressing social norms at a community level (Ellsberg et al., 2015; Jewkes et al.,

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2015a). Emerging evidence suggests these approaches successfully reduce men's IPV perpetration (Ellsberg et al., 2015; Jewkes et al., 2015a; Kerr-Wilson et al., 2020).

Within the field of public health, interventions working with men and boys to address their gender attitudes, practices, and more broadly, how they think about themselves as men, have been described as 'transforming masculinities' (Gibbs et al., 2015b; Peacock and Barker, 2014). This recognizes how they move beyond simply changing behaviours, to encourage men to reflect on their identity as men and related practices (Gibbs et al., 2015b; Jewkes et al., 2015a).

The work around transforming masculinities has been shaped by Connell's theoretical analysis of multiple masculinities and the concept of hegemonic masculinity (Connell, 2005; Connell and Messerschmidt, 2005). Hegemonic masculinity refers to the most legitimate form of masculinity in any context, which is an agreed social ideal and confers power to men over women, and to certain men over other men (Connell, 2005). In any context there are multiple masculinities, and the men who embody these different masculinities have different behaviours and attitudes, including around the use of violence and gendered power and entitlement (Connell, 2005; Connell and Messerschmidt, 2005; Jewkes et al., 2015a). One masculinity described is a hyper-masculine position, where men perform an exaggerated masculinity marked by the use of violence against women and other men, and anti-social behaviours more generally (Herek, 1986; Jewkes and Morrell, 2010). In a South African population-based study Jewkes and Morrell (2017) identified three groups of men, each using violence differently: one group comprising 24.7% were notably violent and anti-social, a hyper-masculine position. A second group with 29.6% were very violent against women, but much less engaged in anti-social and sexually risky practices, and was considered the hegemonic masculinity. The largest group (45.7%) perpetrated less violence and rarely engaged in other anti-social and sexually risky behaviours (Jewkes and Morrell, 2017). The study showed that men's allocation into these groups was associated with poverty, experiences of violence in childhood, and also measures of psychopathology (Jewkes and Morrell, 2017). An analysis from nine sites across six countries in the Asia-Pacific region identified five different masculine positions, including one particularly violent masculine position comprising 7.9% of the sample, with similar risk factors for of allocation to this masculinity class as in the South African analysis (Jewkes et al., Submitted). These studies provided quantitative reflection on qualitative research which had repeatedly shown that different masculinities are associated with differential use of violence (Bourgeois, 2002; Connell, 2005; Gibbs et al., 2014; Morrell et al., 2012).

There remain, however, unresolved questions around interventions focused on 'transforming masculinities', specifically which masculinity (ies) the interventions are seeking or able to change (Jewkes et al., 2015b), and whether interventions are effective for intervening with/on all masculinity positions. If not, a key concern is that gender transformative interventions may shift less patriarchal men towards even less patriarchal positions but not impact men who practice the most or more extreme forms of violence. This concern is underscored by criminology studies that suggest between 1 and 10% of a population, mostly men, account for over half of all criminal convictions (Falk et al., 2014; Farrington et al., 2006). Interventions that shift the masculinity of the most violent and anti-social men are particularly needed.

In this paper, we seek to explore the overall question of which 'group' of men change in response to a particular gender transformative and livelihoods strengthening intervention, Stepping Stones and Creating Futures (SS/CF). We do so through a post-hoc analysis of data collected as part of a cluster randomised controlled trial. The intervention worked with young men in urban informal settlements in eThekweni Municipality, South Africa. Urban informal settlements, defined by lack of formal housing and services, are incredibly common in South Africa, with an estimated 1 in 7 households residing in them (HDA, 2012). They are spaces of high levels of violence, poverty and generalized poor health, including high rates of HIV (Gibbs et al., 2020a).

Evaluated in a cluster randomized controlled trial in which participants were followed for two years, SS/CF produced significant reductions in physical IPV and economic IPV, with suggestions of reductions in sexual IPV, emotional IPV and non-partner sexual violence perpetration by young men (Gibbs et al., 2020b). It also showed a significant reduction in alcohol use, and men improved their savings (Gibbs et al., 2020b). Our analysis has three aims: 1) to define and describe masculinity classes at baseline among young men involved in the trial, 2) to describe the factors associated with membership of each masculinity class, and 3) to assess whether SS/CF had a differential impact by masculinity class.

## 2. Methods

**Study design:** We conducted a secondary *post-hoc* (i.e. not pre-specified) analysis drawing on cohort data at baseline and end-line among young men, enrolled in the SSCF intervention, living in urban informal settlements in eThekweni Municipality (Durban), South Africa.

**Context of current study:** We previously conducted a two-arm cluster randomized controlled trial of SS/CF with 24 month follow up. Clusters ( $n = 34$ ) were informal settlements, with organically occurring boundaries. In each cluster we recruited ~20 men (and ~20 women) in conjunction with our NGO implementation partner, Project Empower. At baseline, we recruited 674 men, and at endline we retained 74.9% ( $n = 505$ ). More information on study design is available (see Gibbs et al., 2017).

Eligibility was aged 18 to 30, resident in the cluster, not formally employed, or in education, and competent to complete informed consent. Data collection was self-completed in English, isiZulu or isiXhosa, on cellphones, utilizing the Mobenzi platform, enabling skip patterns and in-built logic checks. Those in intervention clusters received SS/CF immediately. The intervention is group-based and participatory, and supported young people to strengthen their livelihoods and transform their gender relationships through 21 sessions, each 3 h long (Gibbs et al., 2017). The intervention was delivered by trained peer facilitators, with sessions twice a week.

The trial was registered with [ClinicalTrials.gov](https://clinicaltrials.gov) (NCT03022370). Ethical approval was received from the South African Medical Research Council, and the University of KwaZulu-Natal Biomedical Research ethics committees. All participants provided written informed consent. More information on the trial has been published (see Gibbs et al., 2020b).

### 2.1. Measures

For the LCA we measured a range of men's violent and anti-social practices at baseline. We assessed five forms of violence perpetrated by men using behaviourally specific items based on the WHO's Violence Against Women Scale, and the UNMCS study (Fulu et al., 2013; Garcia-Moreno et al., 2006), which has been used previously in South Africa (Jewkes and Morrell, 2010). Items asked about perpetration of any of the following against a current or previous female partner in the past year: (1) insulted, (2) humiliated, (3) scared, (4) threatened, (5) hurt others of importance, (6) slapped, (7) pushed, (8) hit, (9) kicked/beat, (10) threatened or attacked with a weapon, (11) forced to have sex, (12) intimidated to have sex, (13) forced other sexual act, (14) stopped partner working, (15) taken earnings, (16) thrown partner out of house, (17) spent money on alcohol/drugs when partner didn't have enough. Response options to each were: "never", "once", "few", or "many". Binary variables (never/yes) were created indicating any past year perpetration of psychological IPV (items 1–5), physical IPV (items 6–10), sexual IPV (items 11–13) and economic IPV (items 14–17). Additionally, we assessed past year non-partner rape, using a scale developed in South Africa (Jewkes et al., 2006), which asked five items about behaviours in the past year of the men acting alone or with others (gang rape), with responses, "never", "once", "few" or "many", and recoded as never/yes.

We also asked about a range of other violent and anti-social behaviours, specifically: past year fighting with a knife, bottle or sharp object; having an illegal firearm; gang involvement; problem alcohol use assessed using the 10 item AUDIT scale (Saunders et al., 1993); past year transactional sex (Dunkle et al., 2004); having sex with a sex worker; and having four or more sex partners in the past year.

To assess associations between masculinity group and socio-demographics and other risk factors, we assessed age, education (primary only, secondary not completed, secondary completed), food insecurity (assessed with a 3-item scale about past month household food-insecurity) (Coates et al., 2007), and a single item about having worked in the past three-months. To assess acceptability of violence against women, we asked three items about this (e.g. I think that if a wife does something wrong her husband has the right to punish her) with responses on a four point Likert Scale (Cronbach  $\alpha = 0.58$ ; range 3–12) and other gender attitudes using 7 items (e.g. I think that a man should have the final say in all family matters, see Supplementary Table 2) with the same response categories (Cronbach  $\alpha = 0.73$ , range 7–28).

We assessed adverse experiences and outcomes with three scales. We used a modified Adverse Childhood Experiences Questionnaire with 11 items, summed with larger scores indicating more experiences. We assessed eight other adverse events in men's lifetime (e.g. Have you ever witnessed the murder of a stranger or someone you knew?) recoded into never or one, two or three, or four or more experiences. Depressive symptoms were assessed using the CESD-20 scale with depression (Cronbach  $\alpha = 0.87$ , range 0–60) assessed as scoring 21 or more (Radloff, 1977).

For the analysis of impact of SSCF on violence perpetration, we used the measures described above for past year physical, sexual, emotional, and economic IPV perpetration, and non-partner sexual violence perpetration in the past year. These were all assessed at endline and coded as stated above.

## 2.2. Statistical analysis

First, we used Latent Class Analysis (LCA) to group men into 'classes', as we hypothesized that there were underlying latent subgroups defined by intersecting variables associated with the measured variables of violence, substance use and sexual behaviours. These eleven variables, measured at baseline, were used to define these groups. We iteratively built models for a different number of classes from one through to five and then assessed model fit for each class. To assess the best model fit, we used the likelihood ratio chi-squared statistic ( $L^2$ ), adjusted BIC (aBIC), consistent Akaike Information Criterion (CAIC), entropy and the Lo-Mendell-Rubin adjusted likelihood ratio test (LMR LRT). An important assumption of LCA is that there is local independence in the variables conditional on the latent class, and as such we assessed bivariate residual Pearson chi-squared statistic. We also assessed theoretical relevance of the different models. LCA was conducted in MPlus. Having identified the best class solution for the data, we assumed men could be allocated to a class.

Second, in Stata 14/IC, we described potential risk factors and socio-demographics by masculinity class allocation, describing the proportion and number, or mean and 95% confidence intervals (95%CI) in each group, and reporting chi-squared or Adjusted Wald p-values. We undertook a multinomial regression with the least violent class being the reference, reporting adjusted beta coefficients, with 95%CI, and p-values. All potential risk factors were considered candidate variables for the model.

Third, to assess the impact of the intervention by each masculinity class, we replicated the outcomes analysis used in the main trial paper (Gibbs et al., 2020b), assessing intervention effect on past year physical, sexual, emotional, and economic IPV and non-partner sexual violence perpetration. In short, we did an individual level, intention-to-treat analysis, with arm allocation as randomized. We used generalized estimating equation models as all outcomes were binary. In the adjusted

analyses, following the primary trial analysis, we included only the baseline outcome term. In all models we report unadjusted and adjusted odds ratios (aOR) with 95% confidence intervals (95%CI) and p-values. We stratified each violence outcome in the analysis by allocation into masculinity class at baseline, thus we compared all those in the least violent class by arm, and so forth for each violence measure. More information on the main analysis is available in the outcomes paper (Gibbs et al., 2020b).

## 3. Results

The model that best fit the data was a three-class solution, with the model fit indices comparing models in Supplementary Material Table 1. Table 1 (and Fig. 1) show the conditional probability of men's behaviour as allocated in the three different classes. Overall a fifth (20.5%) were in the low violence class, half (50.2%) in the medium violence class, and 29.5% in the high violence class. Broadly, men in the high violence class had the highest probability of reporting each behaviour and those in the low violence class the lowest probability. Notable differences between classes were that men in the low violence and medium violence classes reported much lower probabilities of engaging in illegal and anti-social behaviours - gang membership, having an illegal firearm, a knife fight, and sex with a sex worker - than those in the high violence class. Differences between low violence and medium violence classes related to perpetration of most forms of violence against women and risky sexual behaviour, which were distinctly lower in the low violence class.

Men in the moderate and high violence classes (Table 2), compared to those in the low violence class, had less education, were more likely to endorse attitudes supportive of violence, reported more adverse experiences in childhood and other adverse experiences, and had more depressive symptoms. There was no difference by class in allocation between intervention arms, or intervention attendance (among those in the intervention arm).

In the multinomial regression (Table 2), compared to the least violent class of men, those in the medium and high violence classes were more likely not to have completed secondary education (medium  $\beta 0.20$  [0.32, 1.67]  $p = 0.004$ , high  $\beta 0.92$  [0.18, 1.66]  $p = 0.015$ ), and were more likely to have worked in the past three months (medium  $\beta 0.56$

**Table 1**  
Measurement probabilities of Variables Loading on the Masculinity Classes.

Variable	Measurement Probabilities		
	Low Violence Class (20.5%)	Medium Violence Class (50.2%)	High Violence Class (29.4%)
Fought with a knife in the past year	0.007	0.189	0.564
Had an illegal firearm in the past year	0.000	0.063	0.403
Involved in a gang in the past 12 m	0.081	0.107	0.284
Problem alcohol use past year	0.095	0.440	0.662
Any physical or sexual IPV perpetration past year	0.026	0.568	0.947
Non-partner sexual violence perpetration past year	0.075	0.274	0.800
Transactional sex past year	0.243	0.435	0.815
Had sex with a sex worker past year	0.000	0.105	0.352
>1 perpetration emotional violence	0.167	0.690	0.933
>1 perpetration of economic violence	0.070	0.367	0.922
4 or more past year sexual partners	0.307	0.645	0.832

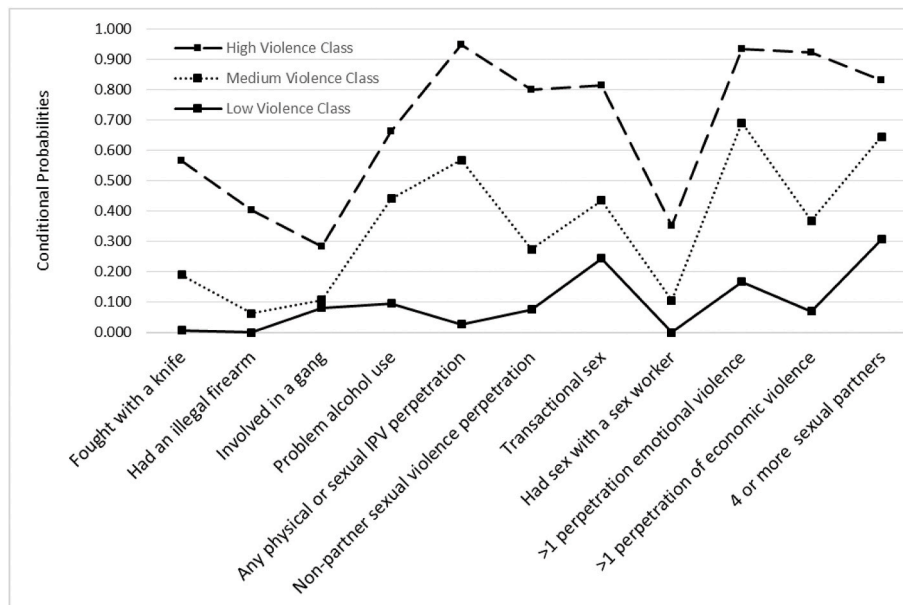


Fig. 1. Conditional probabilities for past year behaviours at baseline by masculinity class.

[0.16, 0.97]  $p = 0.006$ ; high  $\beta 0.99$  [0.46, 1.52]  $p < 0.001$ ). In addition, they endorsed more attitudes supportive of violence against women (medium  $\beta 0.24$  [0.09, 0.40]  $p = 0.002$ ; high  $\beta 0.32$  [0.15, 0.48]  $p < 0.001$ ), and had experienced more adverse events in their lifetime (medium  $\beta 0.91$  [0.19, 1.62]  $p = 0.013$ ; high  $\beta 0.85$  [0.18, 1.52]  $p = 0.013$ ). Men in the high violence class, compared to the low violence class, additionally reported more adverse childhood experiences ( $\beta 0.15$  [0.08, 0.23]  $p < 0.001$ ), and greater depressive symptoms ( $\beta 1.05$  [0.49, 1.60]  $p < 0.001$ ).

The differential outcomes analysis (Table 3) showed evidence of the intervention impacting on the classes of men differently. Among the most violent class, there was a consistent pattern whereby they appeared to benefit the most from the intervention. Compared to the most violent men in the control arm, those in the intervention arm reported perpetrating less physical IPV (aOR0.59,  $p = 0.014$ ), less emotional IPV (aOR0.44,  $p = 0.044$ ), and less economic IPV (aOR0.35,  $p = 0.004$ ) at endline. For the most violent men, there was also indication of a reduction in non-partner sexual violence (aOR0.78, [0.38, 1.59]), but this was not significantly different to the control.

Among the medium violence class, there was weak evidence that the intervention impacted on their perpetration of physical IPV, sexual IPV, and non-partner sexual violence, compared to similar men in the control arm. In this class, the adjusted odds ratio was of a similar magnitude to the overall intervention effects for the whole sample (Gibbs et al., 2020b), but none of these findings were statistically significant. There was no indication of intervention effects among the least violent class of men.

#### 4. Discussion

This analysis of young men participating in the Stepping Stones and Creating Futures trial in urban informal settlements in South Africa demonstrated that men could be allocated into three masculinity classes, shaped by men's use of violence in intimate relationships and in public spaces, as well as men's sexual and anti-social behaviour. Allocation to the most violent class of men was associated with less education, being more likely to have worked in the past three months, more adverse childhood experiences and experiencing other adverse events, holding attitudes supportive of violence, and more depression. The analysis further demonstrated that the intervention had the greatest impact among men in the most violent class.

The three class solution identified using LCA was very similar to the three classes described by Jewkes and Morrell (2017) in their population-based sample of South African men. The notable difference was in the proportion of the population allocated to each class. While Jewkes and Morrell found the lowest violence class to be the most common (Jewkes and Morrell, 2017), in this study, the most common class was the medium violence group. The much higher prevalence of the more violent classes in our model was potentially related to the sample being drawn from informal settlements, areas of extreme hardship. However, despite the much greater probability that men in our sample had been more violent, the analysis clearly demonstrated variation among groups of men in their use of violence. The least violent masculinity class comprised one fifth of the sample, and reported relatively little violence perpetration in the past year (although emotional IPV perpetration was high) and low levels of alcohol use problems, demonstrating that even where such practices are common, not all men engage in them. The two more violent classes, while showing similarities, also showed differences; specifically, men in the most violent class perpetrating much more non-partner sexual violence, fighting with knives, and owning illegal guns, highlighting a public use of violence, and also greater involvement in gangs compared to the medium violence class. The most violent class was clearly a hyper-masculinity group (Herek, 1986) where gang membership and violence was normalised and common, but the second most violent class was formed with a high probability of perpetration of violence against women. This is likely to reflect a hegemonic masculinity in the study area. This group was hegemonic, not because it was numerically dominant (though it was), but because qualitative research had demonstrated that it was one which was enforced and maintained in everyday social relations and legitimised unequal gender relationships (Gibbs et al., 2014; Messerschmidt, 2019; Morrell et al., 2012).

The findings about factors associated with allocation into different masculinity classes supports some previous research. Jewkes and Morrell (2017) also showed that men in the more violent groups had experienced much more adversity in childhood. Similarly, in Jewkes and Morrell's study, there was an association with poverty, which was shown as a complex indirect association, whereas we have shown in our group that more violent men were less well educated, and more likely to have worked in the past three months. In this population, we understood working as an indication of lacking familial financial support, and therefore indicative of poverty and feeling pressurised to work to survive



**Table 2**  
Social, demographic and risk factors associated with masculinity categories, and multinomial analysis.

	Descriptive associations between masculinity categories and socio-demographic and risk factors					Multinomial multivariable regression of socio-demographic and risk factors for masculinity categories			
	N	Low	Medium	High	p-value	Low versus Medium		Low versus high	
		%/mean(95% CI)	%/mean(95%CI)	%/mean(95%CI)		$\beta$ (95% CI)	p-value	$\beta$ (95%CI)	p-value
<b>Age</b>									
18/19	72	11.8(7.3, 18.6)	10.2(7.4, 13.9)	10.7(7.1, 15.8)	0.928	ref		ref	
20/24	349	49.6(41.1, 58.2)	53.5(48.2, 58.8)	50.2(43.4, 57.1)		0.26 (-0.54, 1.06)	0.527	0.43(-0.68, 1.53)	0.452
25/30	208	29.9(22.6, 38.4)	30.4(25.7, 35.5)	32.2(26.1, 38.9)		0.14 (-0.69, 0.98)	0.741	0.38(-0.76, 1.52)	0.511
31+	45	8.7(4.9, 15.0)	5.9(3.8, 8.9)	6.8(4.1, 11.2)		-0.37 (1.33, 0.59)	0.454	-0.21(-1.71, 1.28)	0.779
<b>Education</b>									
Primary only	77	16.5(11.0, 24.1)	7.9(5.5, 11.3)	14.2(10.0, 19.6)	<0.001	ref		ref	
Secondary (not completed)	391	48.8(40.2, 57.6)	56.1(50.9, 61.3)	66.8(60.1, 73.0)		0.20 (0.32, 1.67)	0.004	0.92(0.18, 1.66)	0.015
Completed secondary	206	34.7(26.9, 43.4)	36.0(31.1, 41.1)	19.0(14.2, 24.9)		0.93 (0.16, 1.69)	0.018	0.07(-0.77, 0.90)	0.876
<b>Gender relationships</b>									
VAW attitudes (mean)	672	5.8(5.4, 6.1)	6.3(6.0, 6.5)*	6.7(6.4, 6.9)***		0.24 (0.09, 0.40)	0.002	0.32(0.15, 0.48)	<0.001
Gender attitudes (mean)	672	16.8(15.9, 17.6)	17.0(16.6, 17.5)	18.0(17.4, 18.5)*		-0.03 (-0.10, 0.30)	0.291	-0.06(-0.14, 0.02)	0.132
<b>Livelihoods</b>									
Food insecurity (mean)	673	2.7(2.4, 2.9)	2.8(2.6, 3.0)	3.2(3.0, 3.4)**		0.03 (-0.25, 0.22)	0.721	0.03(-0.16, 0.22)	0.749
Worked in past 3 months (yes)	240	23.8(17.2, 32.1)	22.9(29.1, 39.1)	45.9(39.1, 52.8)	<0.001	0.56 (0.16, 0.97)	0.006	0.99(0.46, 1.52)	<0.001
<b>Traumas</b>									
Childhood traumas (>=more)	672	16.4(15.5, 17.3)	18.1(17.5, 18.6)**	23.1(22.2, 24.1)***		0.04 (-0.02, 1.07)	0.207	0.15(0.08, 0.23)	<0.001
Traumatic experiences (0/1)	235	55.2(46.4, 63.7)	32.7(28.0, 37.9)	26.8(21.3, 33.2)	<0.001	ref		ref	
2 or 3	213	26.4(19.4, 34.8)	34.8(29.9, 40.1)	20.2(24.4, 36.8)		0.80 (0.25, 1.35)	0.004	0.86(0.21, 1.50)	0.009
4 or more	221	18.4(12.6, 26.1)	32.5(27.7, 37.6)	42.9(36.3, 49.8)		0.91 (0.19, 1.62)	0.013	0.85(0.18, 1.52)	0.013
Depressive symptoms (yes)	313	28.0(20.8, 36.6)	41.6(36.5, 46.9)	66.8(60.0, 73.0)	<0.001	0.46 (-0.13, 1.06)	0.126	1.05(0.49, 1.60)	<0.001
<b>Intervention information</b>									
Arm allocation (intervention)	338	51.2(43.3, 59.0)	49.7(46.0, 53.4)	50.2(44.6, 55.9)	0.96	xx		xx	
Percentage attendance (intervention only)	327	32.0(23.4, 40.7)	33.2(28.6, 38.2)	35.7(28.9, 42.6)		xx		xx	

For continuous variables only: \*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001, compared to low category; xx excluded from multinomial model; all models adjusted for clustering of data.

(Gibbs et al., 2014). Importantly, it was men's attitudes towards violence against women that was associated with class allocation in our data, compared to controlling behaviours and gender attitudes in Jewkes and Morrell's (2017). In a six country analysis in Asia-Pacific, similar factors of poverty, gender inequitable attitudes and depression were also associated with allocation of men into more violent classes (Jewkes et al., submitted).

There were clear differential outcomes of the Stepping Stones and Creating Futures intervention for different masculinity classes, with the most violent men showing the largest reductions in violence perpetration. Thus, SS/CF potentially has the greatest impact among men who

conform to a 'hyper-masculinity'. This is important, as in the global north there are a lack of effective 'batterers programmes' (Ellsberg et al., 2015), i.e. interventions working with men incarcerated for perpetrating IPV. Yet, we have demonstrated that changing these very violent men is possible through intensive and well-designed programmes, focusing on gender transformation and incorporating economic components. This contrasts with the Sonke CHANGE trial (Christofides et al., 2019), which was a social norms change community level intervention working with men in informal settlements in South Africa. Using a similar analysis (i.e. LCA), there was some suggestion that the Sonke CHANGE trial had more impact on reducing violence among those relatively less violent, whose

**Table 3**  
Unadjusted and adjusted outcomes of the Stepping Stones and Creating Futures trial by masculinity class.

	Unadjusted models		Adjusted <sup>a</sup> models	
	OR(95%CI)	p-value	aOR(95%CI)	p-value
<b>Physical IPV</b>				
Overall (n = 504)	0.73(0.53, 0.99)	0.046	0.71(0.51, 0.97)	0.032
Low violence (n = 101)	1.09(0.40, 2.98)	0.870	1.09(0.40, 2.98)	0.87
Medium violence (n = 298)	0.75(0.46, 1.21)	0.237	0.74(0.46, 1.20)	0.222
High violence (n = 155)	0.59(0.38, 0.92)	0.019	0.59(0.39, 0.90)	0.014
<b>Sexual IPV</b>				
Overall (n = 504)	0.73(0.53, 1.00)	0.047	0.74(0.54, 1.03)	0.072
Low violence (n = 101)	0.53(0.11, 2.65)	0.441	0.53(0.11, 2.65)	0.441
Medium violence (n = 298)	0.68(0.39, 1.18)	0.169	0.74(0.43, 1.29)	0.290
High violence (n = 155)	0.87(0.57, 1.33)	0.520	0.82(0.53, 1.26)	0.363
<b>Emotional IPV</b>				
Overall (n = 504)	0.7(0.57, 1.05)	0.097	0.82(0.59, 1.14)	0.245
Low violence (n = 101)	1.07(0.53, 2.15)	0.855	1.47(0.88, 2.48)	0.144
Medium violence (n = 298)	0.96(0.64, 1.44)	0.856	1.00(0.66, 1.53)	0.998
High violence (n = 155)	0.44(0.20, 0.99)	0.046	0.44(0.20, 0.98)	0.044
<b>Economic IPV</b>				
Overall (n = 504)	0.69(0.49, 0.96)	0.029	0.65(0.44, 0.97)	0.035
Low violence (n = 101)	0.69(0.24, 1.97)	0.493	0.72(0.25, 2.05)	0.534
Medium violence (n = 298)	0.84(0.53, 1.33)	0.453	0.84(0.52, 1.38)	0.493
High violence (n = 155)	0.38(0.19, 0.77)	0.007	0.35(0.18, 0.71)	0.004
<b>Non-partner sexual violence</b>				
Overall (n = 504)	0.69(0.52, 0.93)	0.015	0.78(0.57, 1.07)	0.131
Low violence (n = 101)	0.95(0.33, 2.77)	0.930	0.89(0.24, 3.35)	0.867
Medium violence (n = 298)	0.64(0.41, 1.00)	0.052	0.68(0.43, 1.10)	0.116
High violence (n = 155)	0.70(0.35, 1.38)	0.298	0.78(0.38, 1.59)	0.489

<sup>a</sup> Adjusted models, only adjusted for baseline outcome measure.

behaviour was potentially shaped more by social norms (Christofides et al., 2019). While our analysis does not demonstrate how the intervention worked successfully with the most violent men, qualitative work suggested it allowed them to establish less violent masculinities (Gibbs et al., 2015a, 2019) through the combined approach of gender transformation and livelihood strengthening premised around critical thinking. This supported men to recognize the underlying drivers of their situation, be more emotionally engaged, and less conflictual in friendships and intimate relationships within a framework of improving their economic position.

While the analysis showed less effect for men in the medium violence and low violence classes, this is not to suggest that there was no benefit to them, or that they should be excluded from such interventions. The overall focus on transforming gender attitudes and strengthening livelihoods would have been of benefit to all men, and for the moderate violent group there were reductions in perpetration of violence, though non-significant.

This study has a number of limitations. First, all data were self-reported and men could have reduced their reporting of illegal behaviours. However, data were self-completed on cellphones, so desirability

would have been reduced. Second, our small sample size meant a three-class solution was the best fit for the LCA, and if the sample was larger a different solution may have been better, although in a larger representative sample (where more forms were possible) a three-class solution was also the best fit (Jewkes and Morrell, 2017). Third, masculinities are constantly changing, and we used a snapshot approach to allocate men into different masculinity classes. As such, it limits our ability to reflect on many aspects of performance of masculinities, such as how they may be contextually specific. It was also a post hoc analysis, and as such, the analyses are exploratory and we did not adjust for the multiple testing, nor compare whether there were true differences between the different outcomes. Limitations of the broader trial are described in the main outcomes paper (Gibbs et al., 2020b).

## 5. Conclusions

Even in contexts of high levels of violence perpetration there are differences in the use of violence among different groups of men. The combined economic strengthening and gender transformative intervention of Stepping Stones and Creating Futures had a differential impact on men's perpetration of IPV and non-partner sexual violence, based on men's masculinity class. Specifically, it demonstrated greatest impact among the most violent men. This analysis opens a novel dimension to targeting of violence prevention interventions according to local context in that we have confirmed the overall findings of the Sonke Change trial (Christofides et al., 2019); that interventions may not have impact equally across different groups of men. This raises important considerations for tailored intervention choices in different settings. This is an area for important future research and reflection among intervention practitioners.

## Credit author statement

AG: Conceptualisation, Methodology, Investigation, Writing - Original Draft, Funding; NA: Formal analysis, Writing - Review & Editing; LW: Investigation, Funding, Writing - Review & Editing; EC: Formal analysis, Writing - Review & Editing; SW: Conceptualisation, Funding, Writing - Review & Editing; NS: Conceptualisation, Funding, Writing - Review & Editing; YS: Conceptualisation, Funding, Writing - Review & Editing; RJ: Conceptualisation, Methodology, Funding, Supervision, Writing - Original Draft.

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## Appendix A. Supplementary data

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