



## Power and the association with relationship quality in South African couples: Implications for HIV/AIDS interventions



Amy A. Conroy<sup>a, \*</sup>, Nuala McGrath<sup>b, c</sup>, Heidi van Rooyen<sup>d</sup>, Victoria Hosegood<sup>c, e</sup>,  
Mallory O. Johnson<sup>a</sup>, Katherine Fritz<sup>f</sup>, Alexander Marr<sup>a</sup>, Thulani Ngubane<sup>d</sup>,  
Lynae A. Darbes<sup>a</sup>

<sup>a</sup> Center for AIDS Prevention Studies, University of California, San Francisco, 550 16th Street, San Francisco, CA, 94158, USA

<sup>b</sup> Faculty of Medicine, University of Southampton, Southampton General Hospital, Mailpoint 805, South Academic Block, Level C Room AC23, Tremona Road, Southampton SO16 6YD, UK

<sup>c</sup> Africa Centre for Population Health, University of KwaZulu-Natal, Mtubatuba, South Africa

<sup>d</sup> Social, Behavioural and Biomedical Interventions Unit, HIV/AIDS, STIs and Tuberculosis Programme, Human Sciences Research Council, P.O. Box 90, Msunduzi 3200, South Africa

<sup>e</sup> Division of Social Statistics and Demography, University of Southampton, Southampton SO17 1BJ, UK

<sup>f</sup> Global Health, International Center for Research on Women, 1120 20th Street NW, Suite 500 North, Washington, D.C., USA

### ARTICLE INFO

#### Article history:

Received 22 April 2015

Received in revised form

9 January 2016

Accepted 22 January 2016

Available online 28 January 2016

#### Keywords:

South Africa

Power

Relationship quality

Gender

Couples

HIV/AIDS

### ABSTRACT

**Introduction:** Power imbalances within sexual relationships have significant implications for HIV prevention in sub-Saharan Africa. Little is known about how power influences the quality of a relationship, which could be an important pathway leading to healthy behavior around HIV/AIDS.

**Methods:** This paper uses data from 448 heterosexual couples (896 individuals) in rural KwaZulu-Natal, South Africa who completed baseline surveys from 2012 to 2014 as part of a couples-based HIV intervention trial. Using an actor-partner interdependence perspective, we assessed: (1) how both partners' perceptions of power influences their own (i.e., actor effect) and their partner's reports of relationship quality (i.e., partner effect); and (2) whether these associations differed by gender. We examined three constructs related to power (female power, male equitable gender norms, and shared power) and four domains of relationship quality (intimacy, trust, mutually constructive communication, and conflict).

**Results:** For actor effects, shared power was strongly and consistently associated with higher relationship quality across all four domains. The effect of shared power on trust, mutually constructive communication, and conflict were stronger for men than women. The findings for female power and male equitable gender norms were more mixed. Female power was positively associated with women's reports of trust and mutually constructive communication, but negatively associated with intimacy. Male equitable gender norms were positively associated with men's reports of mutually constructive communication. For partner effects, male equitable gender norms were positively associated with women's reports of intimacy and negatively associated with women's reports of conflict.

**Conclusions:** Research and health interventions aiming to improving HIV-related behaviors should consider sources of shared power within couples and potential leverage points for empowerment at the couple level. Efforts solely focused on empowering women should also take the dyadic environment and men's perspectives into account to ensure positive relationship outcomes.

© 2016 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

### 1. Introduction

Gender-based power imbalances within sexual relationships can negatively affect women's sexual, reproductive, physical, and mental health (Blanc, 2001; Hatcher et al., 2012; McMahon et al., 2015; Siedner et al., 2012; Wingood and DiClemente, 2002). According to the theory of gender and power (TGP), there are three

\* Corresponding author.

E-mail addresses: [Amy.Conroy@ucsf.edu](mailto:Amy.Conroy@ucsf.edu) (A.A. Conroy), [n.mcgrath@soton.ac.uk](mailto:n.mcgrath@soton.ac.uk) (N. McGrath), [hvanrooyen@hsrsc.ac.za](mailto:hvanrooyen@hsrsc.ac.za) (H. van Rooyen), [v.hosegood@soton.ac.uk](mailto:v.hosegood@soton.ac.uk) (V. Hosegood), [Mallory.Johnson@ucsf.edu](mailto:Mallory.Johnson@ucsf.edu) (M.O. Johnson), [kfritz@icrw.org](mailto:kfritz@icrw.org) (K. Fritz), [Alexander.Marr@ucsf.edu](mailto:Alexander.Marr@ucsf.edu) (A. Marr), [tngubane@hsrsc.ac.za](mailto:tngubane@hsrsc.ac.za) (T. Ngubane), [Lynae.Darbes@ucsf.edu](mailto:Lynae.Darbes@ucsf.edu) (L.A. Darbes).

social structures that interact at the societal and institutional levels to influence health: economic inequalities (the division of labor), male partner control (the division of power), and social norms and affective attachments around gender (Connell, 1987). Other scholars have defined power in terms of “power to” (or the ability to act) and “power over” (to assert one’s wishes in the face of opposition) (Riley, 1997). For example, women with lower access to economic resources may have limited “power to” attend school, enter or leave a relationship, and inherit land. With regards to “power over”, male dominance and control can result in women having restricted mobility, and less participation and authority in decision-making. These deficits in power can affect women’s functional autonomy, a dimension of empowerment that measures the degree of independence women have through control of material and financial resources (Jejeebhoy, 2000).

Power imbalances are linked to health through three pathways: (1) directly—by limiting women’s functional ability to acquire health information, make decisions regarding health, and take action to improve health; (2) through the association with violence; and (3) through the influence on the use of health services (Blanc, 2001). Direct effects can include how power constrains women’s ability to negotiate condom use to prevent disease and pregnancy (Pulerwitz et al., 2002; Wingood and DiClemente, 2000; Woolf and Maisto, 2008). Power imbalances are also closely linked to intimate partner violence (Babcock et al., 1993; Conroy, 2014; Jewkes, 2002)—which has significant consequences for physical and mental health (Campbell, 2002; Garcia-Moreno et al., 2006). Finally, power imbalances may influence women’s access to and use of essential health services, potentially through male control over women’s mobility and access to financial resources (Blanc, 2001).

One important application of power theory has been to understand women’s increased risk for HIV infection (for example, see Pulerwitz et al., 2002; Wingood and DiClemente, 2000, 2002). Women are disproportionately affected by HIV infection worldwide, particularly in sub-Saharan Africa where they comprise almost 60% of all people living with HIV (UNAIDS, 2013). In settings such as Zambia and Rwanda, the majority of new HIV infections among women are believed to occur within primary partnerships such as marriage or cohabitation (Dunkle et al., 2008). To study women’s risk for HIV within relationships, researchers have used a validated, theoretically-based instrument called the Sexual Relationship Power Scale (SRPS) (SRPS; Pulerwitz et al., 2000). The SRPS has been applied across many different populations and consists of two main domains: Decision-making dominance and relationship control (McMahon et al., 2015). Research from South Africa that uses the SRPS finds that low levels of relationship power among women are associated with HIV infection and many risk factors for HIV including unprotected sex, physical violence, sexual violence, greater frequency of sex, multiple sexual partners, and transactional sex (Dunkle et al., 2004; Jewkes et al., 2006, 2010; Pettifor et al., 2004).

The global response to women’s increased vulnerability to HIV/AIDS has focused on interventions to empower women to improve functional aspects of power such as sexual decision-making (Higgins et al., 2010). However, an overemphasis on female vulnerability masks how variability in socio-cultural contexts influences both women’s and men’s risk for HIV/AIDS (Higgins et al., 2010). This has led researchers to question the effectiveness of empowerment interventions such as microfinance (Dworkin and Blankenship, 2009), calling for more research to understand masculinity and men’s responses to women’s increasing power (Dworkin et al., 2013a; Dworkin and Blankenship, 2009).

Adherence to hegemonic norms of masculinity—the dominant form of masculinity at a given time and location (Connell, 2005)—is

associated with decreased female power and negative health behaviors related to HIV/AIDS such as alcohol use, perpetration of violence, low condom use, and avoidance of healthcare (Kaufman et al., 2008; Peralta et al., 2010; Shannon et al., 2012; Skovdal et al., 2011). Transforming harmful aspects of masculinity through gender-transformative interventions with men has the potential to improve women’s relationship power and the health of both genders (Dworkin et al., 2013b). While generally less research has captured gender and power relations from men’s perspectives, Pulerwitz and Barker (2008) developed the Gender-Equitable Men (GEM) scale to measure men’s equitable attitudes towards issues such as sexual relations, sexual and reproductive health, and intimate partner violence (IPV)—providing new opportunities to study how gender norms among men affect health outcomes related to HIV.

While HIV-related health is an important consequence of gender-based power relations, scholarly attention is shifting towards understanding how power differentials shape aspects of relationship quality (Simpson et al., 2013). Relationship quality is typically measured as a composite of constructs such as relationship satisfaction, commitment, trust, intimacy, love, and mutually constructive communication (Fletcher et al., 2000; Kurdek, 1996). These constructs are positively correlated with one another, but are often treated as distinct factors (Larzelere and Huston, 1980). There is little quantitative research that has characterized relationships across these domains in sub-Saharan African settings of high HIV prevalence and widespread gender inequality, none of the research to date has assessed whether power is associated with relationship quality. Relationship quality is an important area of inquiry for health researchers, as it is theorized to be a precursor for healthy behaviors within couples (Lewis et al., 2006; Robles et al., 2014). Indeed, lower quality relationships are more prone to violence, relationship dissolution, and extra-relationship partnerships—which are correlates of HIV/AIDS in African settings such as Malawi and South Africa (Conroy and Chilungo, 2014; Dunkle et al., 2004; Jewkes et al., 2010; Morris and Kretzschmar, 1997).

According to the interdependence model, positive relationship dynamics foster a “transformation in motivation” from an individualistic orientation to one that is more pro-relationship (Lewis et al., 2006; Rusbult and Lange, 2003). Couples that have undergone this transformation are more likely to work collaboratively to minimize the threat of a particular health issue such as HIV/AIDS—in a process referred to as “communal coping”. Other theoretical work on dyads and HIV prevention has highlighted the importance of relationship dynamics on the dyad’s capacity to successfully coordinate risk-reduction practices such as condom use and couples’ testing for HIV (Karney et al., 2010).

In contrast to studies on separate groups of men or women, couples-based approaches provide a novel opportunity to understand dyadic and relational processes related to HIV/AIDS by bringing women and men into the same analytic frame (Burton et al., 2010; Karney et al., 2010). A dyadic perspective also helps to avoid pseudo-unilaterality, a bias that results from continually examining only one side of a two-sided interaction (Lewis et al., 2006). However, few studies conducted among high HIV-prevalence populations in sub-Saharan Africa have examined gender and power relations using a dyadic perspective. The current study conducts a dyadic investigation of how power affects the quality of relationships in one particular setting in southern Africa: rural KwaZulu-Natal (KZN), South Africa. We used three measures that capture different aspects of power (both experiences and norms): female power as assessed using the South African SRPS (Jewkes et al., 2002), male equitable gender norms as assessed using the GEM scale (Pulerwitz and Barker, 2008), and shared power as assessed using the equality subscale of the Relationship

Values scale (Kurdek, 1996). Incorporating an innovative measure of “power with” allows us to study power as a shared couple attribute rather than an individualistic construct (e.g., women’s functional autonomy)—which is how couples from settings such as Malawi and South Africa have conceptualized power in their relationships (Conroy, 2013; Shefer et al., 2007). Using these measures, we test for associations with dimensions of relationship quality found to be salient in parts of southern Africa: intimacy, trust, mutually constructive communication (MCC), and conflict (Conroy, 2013; Gevers et al., 2013; Hunter, 2010). Our findings can be used to build the evidence base for how female empowerment and gender transformative interventions among men may positively or negatively affect relationship dynamics in sub-Saharan Africa, which has important implications for the HIV/AIDS epidemic.

## 2. Conceptualizing power and relationship quality

In our approach, we conceptualize power using a dyadic framework based on Interdependence theory (Thibaut and Kelley, 1959) such that each partner’s perceptions of power in the relationship affects the interaction they have together as a couple. For example, if Thabisa and Lwandile are a heterosexual couple, Thabisa’s perceptions of her power will affect Thabisa’s perceived relationship quality (i.e., “actor effect”) and her partner Lwandile’s perceived relationship quality (i.e., “partner effect”). Similarly, Lwandile’s attitudes towards equitable gender norms will affect Lwandile’s relationship quality (actor effect) and Thabisa’s relationship quality (partner effect). Finally, Thabisa and Lwandile’s reports of shared power will affect their own (actor effect) and their partner’s perceived relationship quality (partner effect) (as shown in Fig. 1).

If power is associated with greater access to resources, decision-making opportunities, and autonomy (Cromwell and Olson, 1975), it may provide a source of benefits for a partner. These benefits may translate into higher intimacy, trust, and MCC, and lower levels of

conflict. For example, women with higher functional power in their relationship may report higher intimacy and trust through greater participation in decision-making (actor effect). On the other hand, women with higher functional power who are perceived as transgressing from traditional gender roles may report lower intimacy and trust if power leads to conflict and/or communication problems (actor effect). One theory posits that as women gain more power in society, deviate from traditional gender roles, or challenge male privilege, men may feel threatened and resort to violence in an attempt to regain control (Jewkes, 2002). For example, a prospective study in Bangalore, India, found that rapid changes in gender roles in the form of women’s employment may lead to violence—perhaps due to men’s insecurity or perception that employment interferes with social expectations around being a wife and mother (Krishnan et al., 2010).

With regards to MCC and conflict, having higher levels of power may enable women to openly communicate with male partners on difficult issues (actor effect). Powerless individuals are unlikely to express their concerns if they fear violence, conflict, or relationship dissolution (Cloven and Roloff, 1993). However, this power could lead to more conflict if it is perceived as challenging male authority. Women’s power could also affect male partners’ reports of intimacy, trust, MCC, and conflict (partner effects). However, the direction of these associations is likely to depend upon whether men embrace or react negatively towards women’s rights and rising social status. For example, in South Africa, some men often perceive women’s increasing social power as a “zero-sum” game, meaning that gains for women result in equivalent losses for men. According to men’s perspectives, these losses can take the form of unemployment, social stigma for doing women’s work, women’s increasing ability to confront domestic violence, and perpetration of violence by women (Dworkin et al., 2012; Shefer et al., 2007).

Among men, possessing more equitable beliefs about gender could foster respectful behavior towards a partner. In Botswana and Swaziland, men who adhered to more equitable gender norms were less likely to force their partners to have sex (Shannon et al.,

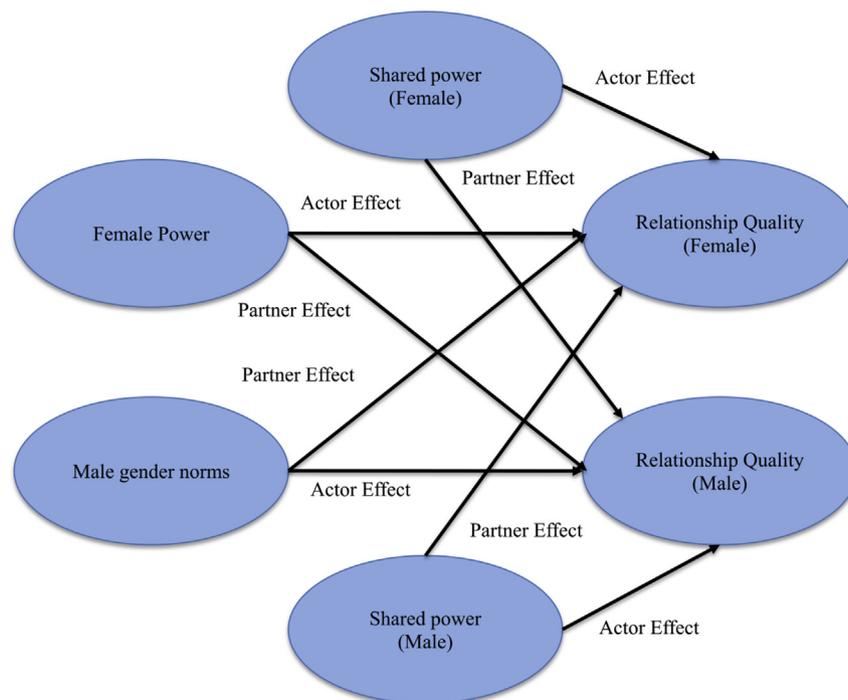


Fig. 1. Hypothesized pathways between female power, male gender norms, shared power, and relationship quality using an actor-partner independence model.

2012). In addition, men who participated in a gender transformative intervention in South Africa revealed how their relationships improved in terms of loving communication, respectful handling of emotions, and joint decision-making with their partners (Hatcher et al., 2014). Therefore, we expect that men who possess more equitable attitudes towards gender will report higher levels of intimacy, trust, and MCC, and lower conflict (actor effects) and will have a female partner who reports higher intimacy, trust, MCC, and lower conflict (partner effects).

Interdependence theory also posits that partners who share power may have a more communal or “we-ness” orientation to their relationships—which is linked to positive relationship dynamics (Lewis et al., 2006; Rusbult and Lange, 2003). Therefore, these individuals may report higher intimacy and trust (actor effects) and also have partners who report higher intimacy and trust (partner effects). In the United States (US), women in equal-power relationships reported greater relationship and sexual satisfaction, and closeness than women in power imbalanced relationships (Caldwell and Peplau, 1984). Regarding MCC, Dunbar and Burgoon (2005) notes that partners who perceive their relative power as extremely high or low (unequal) will use more control attempts than those with smaller perceived power differentials. In the US, Christensen and Heavey (1990) found that higher power husbands were more likely to “withdraw” from conversations when their wives were demanding because they had nothing additional to gain from discussing the problems. Thus, we hypothesize that individuals who report more shared power will report higher levels of MCC and lower levels of conflict (actor effects), as will their partners (partner effects).

### 3. Methods

#### 3.1. The study setting

The current study is situated in the Vulindlela community in rural KZN province in South Africa. The majority of residents identify as Zulu. The KZN province is characterized by high unemployment rates (39% among adults) and low per capita income levels with 30% of households making less than \$1200 US dollars per year (Shisana et al., 2009). Marriage rates in KZN have declined over time and are very low in comparison to other African settings (Hosegood et al., 2009). This has prompted the growing acceptance of extramarital fertility, the formation of cohabitating unions and other non-cohabitating partnerships, as well as the rise of female-headed households (Hunter, 2010). The KZN province has the highest rates of HIV in South Africa, with almost 17% of adults living with HIV/AIDS (Shisana et al., 2014).

#### 3.2. Study procedures

The data for this study come from *Uthando Lwethu* (“Our Love” in Zulu), a randomized controlled trial of a couples-based intervention to improve relationship dynamics and uptake of couples-based HIV testing and counseling. Study procedures have been described elsewhere (Darbes et al., 2014). To summarize, heterosexual couples were recruited through the community by mixed-gender recruiters using both active recruitment (e.g., approaching couples in the markets) and passive recruitment (e.g., posting fliers at community-based agencies) strategies. Most recruitment and screening activities were conducted via the use of a mobile caravan that was divided into partitions to allow for privacy. To be eligible to participate, both partners had to be at least 18 years old, in a primary relationship with each other for at least six months, sexually active with each other, and have reported no severe IPV in the past six months. Severe IPV was assessed by the level of agreement with

statements such as, “In the past 6 months, my partner kicked me, slammed me against a wall, punched me or hit me with something that could hurt.” (One couple was excluded due to severe IPV). Participants were also excluded if they were in a polygamous marriage. Since the primary outcome of the *Uthando Lwethu* was participation in couples-based HIV testing and counseling by nine-months follow-up, couples in which both partners had previously tested for HIV or couples who had mutually disclosed their status were excluded.

Eligible couples were invited to complete a baseline survey assessing demographics, relationship characteristics and dynamics, sexual behavior, and HIV testing history. Baseline surveys were conducted between March 2012 and August 2014, took approximately 60 min to complete, and were administered by gender-matched interviewers through the use of mobile phone technology. Each partner was interviewed separately, but simultaneously, in private rooms of the mobile caravan. This paper uses data from 448 couples (896 individuals) who completed the baseline survey.

Ethical approval for the study was obtained from the Committee on Human Research of the University of California San Francisco, the Research Ethics Committee of the London School of Hygiene and Tropical Medicine, and the Research Ethics Committee of the Human Sciences Research Council in South Africa.

## 4. Measures

### 4.1. Independent variables (power)

For our independent variables, we used validated scales to capture female power (asked of women only), gender equitable norms among men (asked of men only), and shared power (asked of both partners). All measures were subjected to pilot testing to assess comprehension and local relevance, which did not suggest the need for any major adaptations of the scales.

Female power was measured using the 10-item SRPS for South Africa (Jewkes et al., 2002). The South African SRPS captures aspects of women's functional power (such as decision-making, mobility, and autonomy), fears of violence associated with condoms, and dependence on the relationship. Women were asked to indicate their agreement with statements on their level of relationship power (e.g., “My partner has more say than I do about important decisions that affect us”). Responses were based on a four-point Likert scale ranging from 1 (strongly agree) to 4 (strongly disagree), with higher scores indicating higher power. Coefficient alpha was for the 10-items was 0.77.

Gender norms among men were captured using the GEM scale developed by Pulerwitz and Barker (2008). Items included the 17-item inequitable gender norms subscale and two additional items from the equitable gender norms subscale. Although the GEM scale captures broader social norms or attitudes towards gender, we hypothesized that these attitudes ultimately affect how men perceive and treat their female partners. Men were asked whether they agreed (=1) or disagreed (=2) with statements related to gender roles (e.g., “It is the man who decides what type of sex to have”). Higher scores indicated more equitable beliefs about gender. One item (“It is OK for a man to have beat his wife if she won't have sex with him?”) was dropped since all men disagreed. Coefficient alpha for the remaining 18-items was 0.75.

Shared power was captured using the eight-item equality subscale from the Relationship Values scale developed by Kurdek (1996). The equality subscale captures the extent to which power and responsibility in the relationship are shared between partners (e.g., “My partner and I have equal power in the relationship”). Response options ranged from 1 (not at all true) to 9 (extremely true), with higher scores indicating more shared power. Coefficient

alpha for the eight items was 0.79.

#### 4.2. Control variables (relationship characteristics)

Marital status was a binary variable consisting of unmarried (=0) or married (=1). Partners were 100% concordant in reports of marital status. Cohabitation status was assessed by asking respondents, “Is [Partner’s Name] a member of your household?” (0 = No; 1 = Yes). For couples with discrepant responses (28 out of 448), we considered the couple to be cohabitating if one partner reported they were living together. Relationship length (in months) was assessed by asking respondents, “How long have you been in a primary partnership with [Partner’s Name]?” We computed the average relationship length using both partners’ accounts, which were highly correlated ( $r = 0.98$ ). Normality checks indicated that relationship length was highly skewed to the left and thus we transformed the variable by computing the square-root. For shared children, we created a binary variable that indicated whether the respondent reported having at least one biological child with their partner (0 = No; 1 = Yes). For couples who were discrepant (40 out of 448), we defaulted to the female partner’s response, which we assumed was more accurate.

#### 4.3. Dependent variables (relationship quality)

For the dependent variables, we used three validated scales for intimacy, dyadic trust, and MCC, and a single-item measure for couple conflict. Intimacy was measured using the six-item intimacy subscale of the Relationship Values scale developed by Kurdek (1996) (e.g., “I think in terms of we or us instead of I or me”). Response options ranged from 1 (not at all true) to 9 (extremely true), with higher scores indicating higher intimacy. Coefficient alpha was 0.62. Dyadic trust was measured using the eight-item scale developed by Larzere and Huston (1980) (e.g., “I feel that I can trust my partner completely”). Response options ranged from 1 (strongly disagree) to 7 (strongly agree). Negatively worded items were reverse coded such that higher scores indicated higher trust. Coefficient alpha was 0.80. MCC was measured by the three-item MCC subscale of the general communication and conflict resolution scale developed by Christensen and Shenk (1991) (e.g., “When an issue or problem arises, both of us try to discuss the problem”). Response options ranged from 1 (very unlikely) to 9 (very likely), with higher scores indicating higher MCC. Coefficient alpha was 0.47. Couple conflict was measured by the question, “In your relationship, how often would you say that you quarreled?” Response options included rarely (1), sometimes (2), and often (3), with higher scores indicating more frequent conflict.

#### 4.4. Statistical analyses

To test for gender differences in individual socio-demographic characteristics (e.g., age, employment status) and relationship dynamics (e.g., intimacy, trust), we used Chi-squared ( $\chi^2$ ) tests for categorical variables and  $t$ -tests for ordinal variables. Due to the hierarchical nature of dyadic data, we computed the Intraclass Correlation Coefficient (ICC) for each relationship dynamic to test for non-independence. ICC values range from 0 to 1; a higher ICC indicates that individuals within dyads are more similar in their relationship dynamic than any other two individuals in the study (Kenny et al., 2006). The ICC was computed using a one-way analysis of variance with the couple identifier as the grouping variable. We also computed bivariate correlations between all relationship variables. All descriptive analyses were performed using Stata 13.1.

For our primary analysis, we used a two-step structural equation

modeling approach (Anderson and Gerbing, 1988). We first conducted a confirmatory factor analysis (CFA) to test our measurement model (step one) followed by a latent variable structural equation model (SEM) to test hypothesized associations (step two). A latent variable is a theoretical construct that is not directly measured, but is inferred through multiple (measured) indicator variables. A CFA describes the relationships between the latent and indicator variables and is used to evaluate the model fit, and if necessary, modify the model before proceeding with step two. Because we intended to maintain fidelity to fully-validated scales (to the extent possible), we only made changes to the measurement model if standardized factor loadings were non-trivial in size ( $<0.20$ ) and non-significant, or if the  $t$  statistic value exceeded 1.96 (i.e., ratio of parameter estimate to corresponding standard error [SE]) (Hatcher, 1994). We assessed model fit and the reliability of the latent variables by computing coefficient alpha.

For step two, we used the Actor-Partner Interdependence Model (APIM) to test for actor and partner effects of female power, male gender norms, and shared power. The APIM model is based on the premise that one partner’s independent variable affects their own dependent variable (actor effect) and their partner’s dependent variable (partner effect) (Kenny et al., 2006). If partner effects are found, it suggests that the two individuals are part of an interdependent system. Prior to analysis, the data were organized according to a dyad structure such that each row represented a unique couple and both partners’ data were contained within a single observation (Kenny et al., 2006). Four separate models were used to analyze each of the dependent variables: intimacy, trust, MCC, and conflict. Consistent with the literature on power and relationship quality (Simpson et al., 2013), we controlled for the potential confounding effects of marital status, cohabitation, relationship length, and shared children.

While multiple strategies are appropriate for APIM, we followed Kenny et al., (2006) SEM approach because it is the recommended method for distinguishable dyads (see Fig. 1). By including both partners in the model simultaneously in addition to correlating both partners’ independent and dependent variables, we can account for non-independence. In our models, we allowed latent variables for shared power, female power, and male gender norms, and their corresponding residual errors to co-vary across the dyad members (Fig. 1). The SEM approach is also useful for isolating measurement error through the use of latent variables, which can increase predictive power (Acock, 2013). Finally, the SEM approach allows for the use of model constraints, for example, to test whether actor and partner effects differed by gender. If any of the actor or partner effects were statistically significant ( $p < 0.05$ ) for both men and women, we tested for gender differences by setting the two effects to be equal and assessing whether the model fit significantly worsened via the Wald  $\chi^2$  test (Kenny et al., 2006).

For all SEM analyses, including the CFA, we assumed our ordinal variables had an underlying continuous and normal distribution, and all models followed maximum likelihood estimation. The maximum likelihood estimator in Mplus 6.11 takes into account skewness and kurtosis present in ordinal variables using Satorra-Bentler robust SEs (Satorra and Bentler, 1994). This estimator also performs well with ordinal data when variables have five or more categories (Rhemtulla et al., 2012). Model fit was evaluated using the Root Mean Square Error of Approximation (RMSEA) and the Standard Root Mean Square Residual (SRMR) indices, which are most appropriate for models with large number of indicators and a relatively large sample size (Kenny, 2014). Good model fit was based on the following criteria: RMSEA  $< 0.06$  and SRMR  $< 0.08$  (Hu and Bentler, 1999). There were no missing data to consider.

## 5. Results

### 5.1. Descriptive characteristics

Among the sample of 448 couples (896 individuals), the average respondent was 28 years old, had a secondary school education (10.5 years of education), and was unemployed (70%). Most couples were unmarried (90.8%) and not living together (79.7%). Over one-third of couples (38.2%) had at least one child together and the median relationship length was three years. For all relationship dynamics, the mean or median values were towards the upper boundary of the scales, indicating relatively high levels of female power, equitable male gender norms, intimacy, trust, MCC, and relatively low frequency of conflict. Men reported significantly higher levels of shared power, intimacy, trust, and MCC as compared to women (see Table 1).

The ICCs for trust, MCC, and conflict were 0.10, 0.25, and 0.09, respectively, suggesting that non-independence was present among these relationship dynamics. Bivariate correlations between relationship variables ranged from  $-0.34$  to  $0.63$  (Table 2).

### 5.2. The final measurement model

One item for female power (“Because my partner buys me things, I want to please him”) had an unacceptable standardized factor loading and *t* statistic values. Therefore, we dropped the item in our analysis. The coefficient alpha for the remaining nine items was 0.80. For male gender norms, two items had unacceptable factor loadings and *t* statistic values (“A couple should decide together if they want to have children” and “It is important that a father is present in the lives of his children, even if he is no longer with the mother”), and therefore, were dropped from analysis. The coefficient alpha for the remaining 16 items was 0.75. No other modifications were made. The final measurement model demonstrated good fit (RMSEA = 0.043; SRMR = 0.071), and all of the factor loadings were statistically significant ( $p < 0.001$ ), confirming that these indicator variables appropriately measured the latent

variables.

### 5.3. Power and relationship quality

We present the unstandardized (Table 3) and standardized (Fig. 2) parameter estimates for the four SEM models testing for associations with relationship quality.

### 5.4. Associations with intimacy

For Model 1, there were significant actor effects of female power and shared power on female reports of intimacy after controlling for other relationship characteristics (see Table 3 and Fig. 2, Panel A). For female power, it was in the negative direction; women who had higher female power reported significantly lower levels of intimacy in their relationships ( $p < 0.001$ ). Regarding shared power, respondents' own reports were positively associated with their own reports of intimacy—which held for both women and men ( $p < 0.001$ ). For partner effects, there was a positive and statistically significant effect of male gender norms on women's reports of intimacy ( $p = 0.027$ ). Model 1 demonstrated good fit (RMSEA = 0.045; SRMR = 0.072). We found no gender differences in actor effects of shared power on intimacy (Wald  $\chi^2 = 0.363$ ;  $p = 0.547$ ). Cohabitation was positively and significantly associated with both women and men's reports of intimacy ( $p < 0.001$ ), whereas relationship length was positively and significantly associated with only women's report of intimacy ( $p = 0.021$ ).

### 5.5. Associations with trust

For Model 2, there was a positive and statistically significant actor effect of female power on women's report of trust ( $p = 0.046$ ; see Table 3 and Fig. 2, Panel B). There was also a positive and statistically significant actor effect for shared power on both men and women's reports of trust ( $p < 0.001$ ). No significant partner effects for trust were found. Model 2 demonstrated good fit (RMSEA = 0.046; SRMR = 0.068). When we tested whether actor

**Table 1**  
Descriptive characteristics of 448 heterosexual couples from the *Uthando Lwethu* baseline survey.

Sample characteristics <sup>a</sup>	Total (N = 896)		Women (N = 448)		Men (N = 448)		Non-independence	
	%	Mean (SD)/median (IQR)	%	Mean (SD)/median (IQR)	%	Mean (SD)/median (IQR)	ICC <sup>b</sup>	<i>p</i>
<i>Individual characteristics</i>								
Age (yr)		28.44 (9.33)*		27.13 (8.93)		29.75 (9.53)		
Education level (yr)		10.48 (2.31)		10.51 (2.34)		10.45 (2.28)		
Unemployed (yes/no)	69.20*		74.55		63.84			
<i>Couple characteristics</i>								
Age difference between partners (yr)		3.69 (3.26)						
Married	9.15							
Currently living together	20.31							
Relationship length (years)		3.00 (2.00–6.00)						
At least one child together	38.17							
<i>Relationship dynamics</i>								
Female power (range: 1–4)			2.96 (0.34)					
Male gender norms (range: 1–2)					1.72 (0.22)			
Shared power (range: 1–9)		8.00 (7.75–8.38)*		8.00 (7.63–8.00)		8.25 (7.88–8.75)	0.00	0.92
Intimacy (range: 1–9)		6.50 (6.17–6.83)*		6.33 (5.92–6.50)		6.66 (6.33–7.17)	0.00	0.90
Trust (range: 1–7)		6.25 (5.88–6.63)*		6.00 (5.75–6.25)		6.63 (6.13–6.75)	0.10	0.01
MCC (range: 1–9)		8.00 (7.66–8.66)*		8.00 (7.67–8.00)		8.33 (8.00–8.66)	0.25	0.00
Couple conflict (range: 1–3)		1.35 (0.52)		1.34 (0.50)		1.36 (0.55)	0.09	0.02

**Notes.** Statistics are summarized as Means and standard deviation (SD) for normally-distributed variables; median and interquartile range (IQR) for non-normal variables (skewness > 3; kurtosis > 8). ICC = Intraclass correlation coefficient. MCC = Mutually constructive communication.

\*Gender differences were significantly different at  $p < 0.05$ .

<sup>a</sup>  $\chi^2$  tests for categorical variables and *t*-tests for continuous variables were used to determine differences by gender.

<sup>b</sup> ICCs were computed for relationship dynamics using a large one-way analysis of variance.

**Table 2**

Bivariate correlations among the relationship variables used in the actor-partner interdependence models.

Variables	Female variables						Male variables					
	1	2	3	4	5	6	7	8	9	10	11	12
1 Female power	1.00											
2 Shared power (female)	0.25	1.00										
3 Intimacy (female)	-0.12	0.56	1.00									
4 Trust (female)	0.27	0.63	0.55	1.00								
5 MCC (Female)	0.29	0.35	0.24	0.32	1.00							
6 Conflict (female)	-0.07	-0.14	-0.09	-0.22	-0.11	1.00						
7 Male gender norms	0.14	0.09	0.07	0.10	0.12	0.10	1.00					
8 Shared power (male)	0.15	0.00	-0.08	0.08	0.10	0.05	0.03	1.00				
9 Intimacy (male)	0.03	0.07	0.06	0.16	0.12	0.00	-0.02	0.50	1.00			
10 Trust (male)	0.13	0.12	0.06	0.19	0.22	0.06	0.11	0.53	0.42	1.00		
11 MCC (male)	0.16	0.16	0.09	0.22	0.30	0.14	0.12	0.32	0.26	0.42	1.00	
12 Conflict (male)	-0.13	-0.04	0.02	-0.13	-0.03	0.09	-0.06	-0.30	-0.24	-0.34	-0.22	1.00

**Note.** MCC = Mutually Constructive Communication.**Table 3**

Unstandardized estimates for effects of power on four aspects of relationship quality, Uthando Lwethu baseline survey on 448 couples.

Effect	Model 1: Intimacy			Model 2: Trust			Model 3: MCC			Model 4: Conflict		
	Estimate	SE	p	Estimate	SE	p	Estimate	SE	p	Estimate	SE	p
<i>Actor effects</i>												
Female power → female RQ	-1.392	0.220	<0.001	0.178	0.089	0.046	0.622	0.129	<0.001	0.001	0.114	0.995
Male norms → male RQ	-1.144	0.212	0.498	0.291	0.194	0.133	0.831	0.364	0.023	-0.097	0.189	0.606
Shared power (female) → female RQ	0.725	0.086	<0.001	0.362	0.061	<0.001	0.231	0.044	<0.001	-0.059	0.021	0.006
Shared power (male) → male RQ	0.644	0.129	<0.001	0.659	0.117	<0.001	0.660	0.189	<0.001	-0.295	0.069	<0.001
<i>Partner effects</i>												
Female power → male RQ	0.009	0.105	0.932	0.066	0.071	0.356	0.215	0.149	0.148	-0.107	0.091	0.237
Male norms → female RQ	0.681	0.309	0.027	0.187	0.138	0.175	0.259	0.253	0.305	-0.396	0.202	0.050
Shared power (female) → male RQ	0.026	0.032	0.416	0.049	0.035	0.164	0.140	0.067	0.037	-0.010	0.027	0.711
Shared power (male) → female RQ	-0.099	0.065	0.126	0.060	0.043	0.165	0.072	0.091	0.427	-0.054	0.045	0.226
<i>Control variables</i>												
Married → female RQ	-0.136	0.148	0.356	0.006	0.069	0.928	-0.029	0.128	0.818	-0.018	0.104	0.859
Married → male RQ	0.138	0.093	0.138	0.086	0.081	0.287	0.051	0.155	0.745	-0.186	0.106	0.079
Cohabitation → female RQ	0.527	0.104	<0.001	0.125	0.047	0.009	0.175	0.070	0.013	-0.046	0.062	0.461
Cohabitation → male RQ	0.382	0.076	<0.001	0.159	0.052	0.002	0.002	0.109	0.998	0.087	0.065	0.179
Relationship length → female RQ	0.027	0.012	0.021	0.008	0.005	0.158	0.018	0.012	0.128	-0.007	0.008	0.434
Relationship length → male RQ	-0.005	0.009	0.589	-0.002	0.007	0.803	-0.001	0.016	0.941	-0.006	0.008	0.464
Kids together → female RQ	-0.134	0.083	0.106	-0.046	0.042	0.158	-0.097	0.074	0.192	0.064	0.052	0.216
Kids together → male RQ	0.102	0.055	0.061	0.063	0.054	0.247	0.154	0.101	0.128	0.057	0.059	0.340
<i>Model fit statistics</i>												
RMSEA	0.045			0.046			0.045			0.046		
SRMR	0.072			0.068			0.065			0.065		

**Notes.** RQ = Relationship Quality; SE = Standard Error; MCC = Mutually Constructive Communication; RMSEA = Root Mean Squared Error of Approximation; SRMR = Standardized Root Mean Square Residual.

effects of shared power on trust differed for men and women, we found a statistically significant difference such that the actor effect for men was stronger (Wald  $\chi^2 = 4.626$ ;  $p = 0.032$ ). Cohabitation was positively and significantly associated with both women and men's reports of trust ( $p < 0.01$ ).

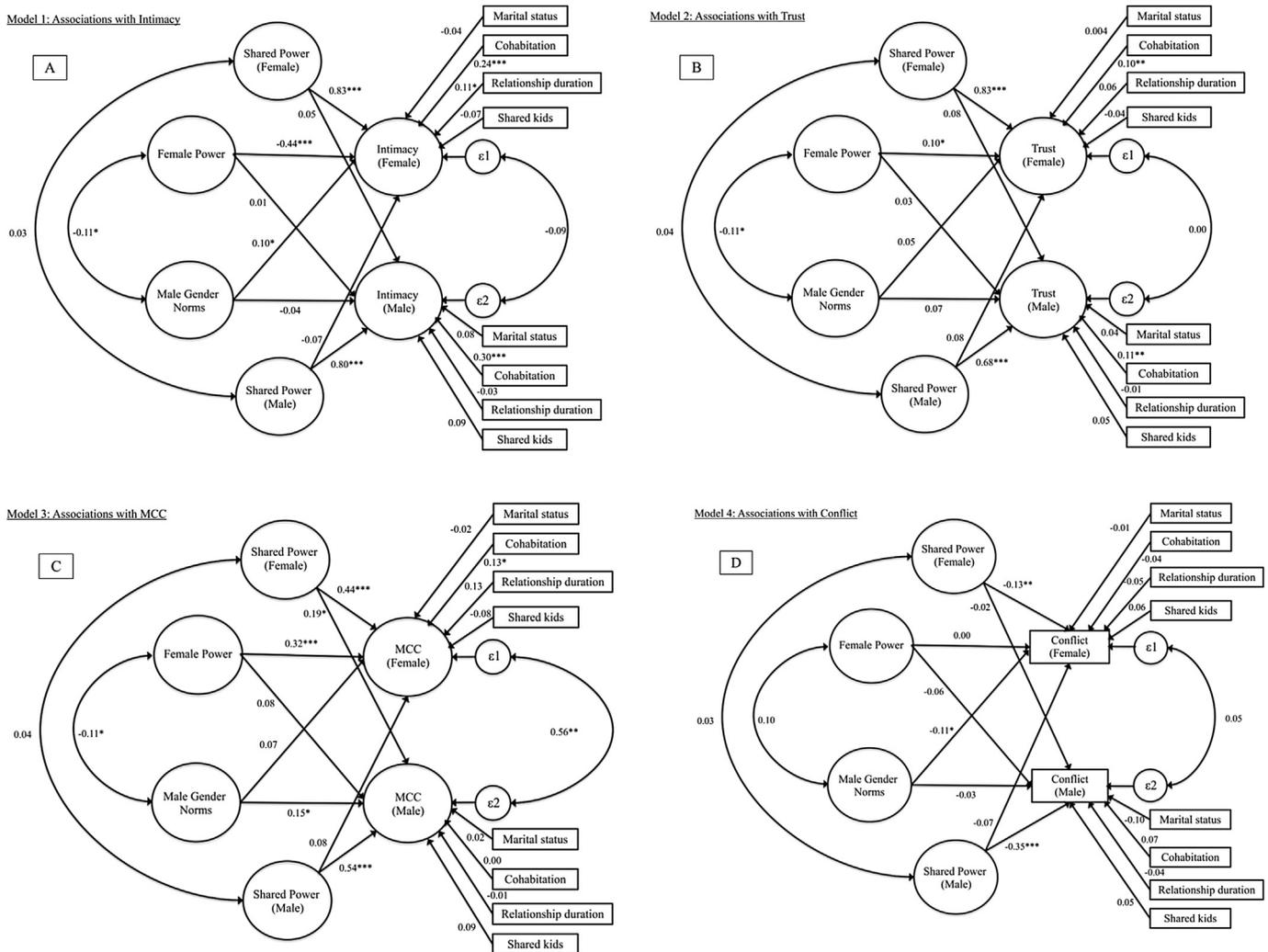
### 5.6. Associations with MCC

For Model 3, there were significant actor effects of female power, male gender norms, and shared power on respondents' reports of MCC (see Table 3 and Fig. 2, Panel C). Women who reported higher female power ( $p < 0.001$ ) and shared power ( $p < 0.001$ ) were more likely to report higher levels of MCC. Similarly, men who reported more equitable gender norms ( $p = 0.023$ ) and shared power ( $p < 0.001$ ) were more likely to report higher levels of MCC. For partner effects, there was a positive and statistically significant effect of women's report of shared power on men's report of MCC ( $p = 0.033$ ). Cohabitation was positively and significantly associated with women's MCC reports ( $p = 0.013$ ). Model 3 demonstrated good fit (RMSEA = 0.045; SRMR = 0.065). When we tested whether

actor effects of shared power on MCC differed for men and women, we found a statistically significant difference such that the actor effect for men was stronger (Wald  $\chi^2 = 5.06$ ;  $p = 0.025$ ).

### 5.7. Associations with couple conflict

For Model 4, there were significant actor effects of shared power on respondents' reports of conflict (see Table 3 and Fig. 2, Panel D). Women who reported higher equal power ( $p < 0.01$ ) reported a lower frequency of conflict. Similarly, men who reported higher equal power ( $p < 0.001$ ) reported a lower frequency of conflict. For partner effects, there was a marginally significant effect of men's equitable gender norms on women's report of conflict ( $p = 0.050$ ) such that men who reported more equitable gender norms had a female partner who reported lower conflict. Model 3 demonstrated good fit (RMSEA = 0.046; SRMR = 0.065). When we tested whether actor effects of equal power on conflict differed for men and women, we found a statistically significant difference such that the actor effect for men was stronger (Wald  $\chi^2 = 10.42$ ;  $p < 0.01$ ).



**Fig. 2.** Structural equation models with standardized parameters testing for associations between actor and partner effects of female power, male gender norms, and shared power on four aspects of relationship quality: intimacy (Model 1, Panel A), trust (Model 2, Panel B), Mutually Constructive Communication (MCC; Model 3, Panel C), and conflict (Model 4, Panel D). Circles denote latent variables and residual errors (indicated by subscript  $\epsilon$ ); squares denote measured variables. Two-way arrows denote a correlation; one-way arrows denote a hypothesized association. Measured scale items for latent variables and their corresponding residuals were not included for sake of clarity. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

## 6. Discussion

Although gender-focused interventions targeting HIV prevention should serve to benefit couple dynamics through shared power and decision-making, couples are rarely the unit of analysis. This study is one of the first to conduct a dyadic investigation of the association between power and relationship quality in heterosexual South African couples. Our approach used an innovative dyadic perspective to consider men and women in the same analytic frame. We highlight five main findings. First, we found that shared power was positively associated with higher relationship quality across all four domains—for both men and women. This is consistent with interdependence theory (Lewis et al., 2006; Rusbult and Arriaga, 1997), which posits that couples who share decision-making and power in their relationships may adopt a more collectivist or we-ness orientation to the relationship (Agnew et al., 1998). These findings are encouraging news for empowerment and gender-transformative interventions, as it highlights that men and women are embracing gender equity as evidenced by their stronger relationships.

Second, we found that the influence of shared power on trust,

MCC, and conflict was stronger for men than women. Gender role strain theory (Pleck, 1995) suggests that men who perceive themselves as failing to live up to the provider role may experience negative psychological consequences and exhibit more aggression towards female partners (Moore et al., 2008). In KZN, Hunter (2010) documents the plight of marginalized men unable to achieve aspirations of being a male provider and setting up a rural homestead. Thus, sharing responsibilities with a female partner may provide a more important buffer against men's experiences of stress, than for women with different gender role expectations. It is also possible that sharing power with a partner provides greater relationship benefits for men—in terms of constructive communication and trust—than for women. Close relationships like marriage are generally more beneficial for men's health for a number of reasons, with one hypothesis being women's tendency to adopt a more interpersonal orientation to the relationship and exert more positive influence over men's health (Robles et al., 2014; Umberson, 1992). Thus, if women are more accustomed and likely to work under a communal or shared-power model, the effects of equality on women's use of constructive communication may be less pronounced than for men.

Third, the findings for female power and male equitable gender norms were more mixed. Female power was positively associated with women's reports of trust and MCC, whereas male equitable gender norms were positively associated with men's reports of MCC. Female empowerment and equitable gender norms may enable good communication in couples, perhaps by improving women's communication self-efficacy and men's ability to listen and engage in active dialog. However, there was one exception to these findings. Women with higher female power reported less intimacy (or level of we-ness) in their relationships. Several explanations are possible. If the SRPS is capturing aspects of women's functional autonomy (e.g., in terms of mobility), women with higher SRPS scores may adopt less of a we-ness orientation of how they view themselves within their relationships. This might suggest there is a trade-off for having higher individualistic-oriented power (i.e., "I/me") such that it interferes with relationship collectivism (i.e., "we-ness"). But it is also possible that the negative association between SRPS and intimacy is confounded by another unmeasured variable like male control, dependence on men, or personal identity. Factors such as these could be correlated with both the SRPS and intimacy, contributing to the negative association that we found. Future studies using qualitative methods could help to disentangle the meaning behind this association. Further, the closer involvement of men in interventions targeting female empowerment could also help to improve our understanding of how increases in women's power affects gender relations (Dworkin et al., 2012; Dworkin and Blankenship, 2009).

Fourth, while the associations between constructs of power and relationship quality tended to be more actor-driven, we did find evidence in support of interdependence theory. Specifically, women with more shared power had male partners who reported higher levels of MCC. This suggests that women's report—whether perceived or experienced—of shared power in the relationship matters for men's ability to engage in MCC. We also found that men who possessed more equitable gender norms had female partners who reported higher intimacy. It is plausible that women may have closer attachments to men who are more respectful of women, refrain from use of violence, and who share domestic responsibilities—as measured by the GEM scale. Research on couples from other settings finds that when men contribute to household and child-related tasks, women report higher relationship satisfaction (Coltrane, 2000; Harris and Morgan, 1991). It is important to point out that this association conflicts with the finding for women, which showed that female power and female intimacy were negatively associated. Unlike the measure of female power, which taps into aspects of individual autonomy and independence from men, the GEM scale may be capturing more egalitarian beliefs about gender that are closely aligned with communal aspects of the relationship such as shared power. Finally, we found that more equitable gender norms held among men were associated with lower frequency of conflict as reported by women. This finding is consistent with what others have concluded about South African men participating in a gender-transformative intervention (Hatcher et al., 2014). The significance of these partner effects highlights the importance of using a dyadic perspective to examine the mutual influence of partners on each other.

Finally, we found that respondents, overall, reported high levels of female power, equitable gender norms, and rated their relationships very positively. One general explanation may relate to the self-selection of higher functioning couples into the study such that those with greater discordance and power imbalances could be less likely to participate. We also found men were more likely to report higher relationship quality across all domains as compared to women. This finding is consistent with a study of couples from Ghana that used similar measures of relationship quality (Cox et al.,

2013). Men may be more likely than women to provide socially-desirable responses to portray themselves in a positive light with an interviewer. Men's underreporting has been suspected in studies on IPV in southern Africa (Conroy, 2014; Gass et al., 2011). In addition, the gender rights discourse in South Africa may influence men and women's reporting of responses in support of the promoted ideals in South African legislation and in gender-focused interventions: equality and women's social rights. Men may be more likely to provide responses in favor of higher equality, while women may be more likely to bring attention to negative aspects of relationships in the continued struggle for gender equality.

### 6.1. Limitations

Several limitations are noteworthy. First, as with all cross-sectional studies, we are unable to assess the causal relationship between power and relationship quality. For example, it may be possible that couple communication is the vehicle through which partners develop more equitable power dynamics and attitudes towards gender roles—rather than vice versa. We relied on existing theory and literature to propose that power affects relationship dynamics. If gender relations are the product of longstanding social norms and structural forces that privilege men and masculinity over women (Connell, 1987, 2005), it stands to reason that partners could enter the relationship with an *a priori* set of power resources and preconceived notions of gender roles—before formulating communication patterns through the dyadic interaction. In their theoretical paper on power in relationships, Simpson et al. (2013) argue that power predicts relationship outcomes such as relationship satisfaction and commitment in the immediate future and long-term; however, the authors concede that this theory needs to be tested with empirical data. Therefore, it is not to say that the association between power and relationship quality cannot change wax and wane over time or reverse in directionality—however, little research has studied these processes. Our study is one of the first to use dyadic data to examine the association between power and relationship quality—which is a necessary starting point for exploring temporality in future longitudinal studies.

A second limitation relates to our ability to draw conclusions about other types of couples living in rural KZN or other geographic regions in sub-Saharan Africa. Couples were recruited using a community-based rather than a population-based sampling approach, which would be less prone to bias. Thus, those who participated may have self-selected to participate and may differ from other couples based on characteristics such as socio-economic status and power. For instance, a pilot study on couples from KZN found when the index partner was male, the couple was more likely to participate than when the index partner was female—suggesting the influence of power dynamics on enrollment (McGrath et al., 2010). A third limitation relates to the potential for social-desirability bias in our measures of relationship quality. Although the interview rooms of the mobile caravan were completely soundproof, having a partner is such close proximity may have had a psychological effect on couples' responses—with a bias towards the reporting of more favorable relationship dynamics. Fourth, we used four measures of relationship quality developed in non-African settings. Given the complexity of intimate relationships in South Africa, there is a need for formative research to explore locally appropriate measures of relationship quality and ways to effectively capture this information—particularly for the construct of MCC, which demonstrated lower reliability. However, we did pilot test our measures to ensure comprehension and relevance in this particular setting in South Africa. Finally, we acknowledge potential limitations of our measures of power. For example, the GEM scale captures social norms or attitudes and therefore we did

not capture men's functional power. Further, men's responses to the GEM items could be biased by social desirability if they are responding based on gender ideals or cultural representations of power. With regards to the South African SRPS, we cannot assess the unique contribution of women's functional power (e.g., autonomy, decision-making) on aspects of relationship quality. Future studies using more specific measures of women's functional power could provide information on how certain aspects of female empowerment affect relationship quality.

## 6.2. Study implications

We highlight several implications for HIV interventions in sub-Saharan Africa. Current efforts to transform hegemonic forms of masculinity and empower women show great promise to positively change relationship and HIV-related health outcomes (Dworkin et al., 2013b; Hatcher et al., 2014; van den Berg et al., 2013). Our findings could be extrapolated to support the idea that gender transformative interventions have a positive effect on relationships. We state this with some level of caution. It is possible that efforts that promote women as autonomous decision-makers may interfere with couples' ability to achieve intimacy or wholeness. Intimacy has been found to be an important relationship aspiration among couples from rural Malawi and other areas of KZN, South Africa (Conroy, 2013; Hunter, 2010) and decreases in intimacy has implications for relationship outcomes such as extra-relationship sex and relationship dissolution (Stern and Buikema, 2013). From a health perspective, intimacy is an important leverage point for couples to engage in health-promoting behaviors together through the process of communal coping (Lewis et al., 2006). More attention is needed to ensure that gender-focused interventions targeting female power do not inadvertently conflict with relationship values such as intimacy.

To date, the majority of gender-focused interventions for the prevention of HIV/AIDS have been conducted with separate groups of women and men—rather than couples. Couple-based interventions have shown to be relatively efficacious at reducing HIV risk behaviors (Burton et al., 2010). Since a common goal of gender-focused interventions and couples-based interventions targeting HIV/AIDS is to create more equitable, higher functioning relationships, there remain many untapped opportunities to merge lessons learned from both types of interventions. This point is illuminated by Karney and colleagues' dyadic framework for HIV prevention (2010), which presents how that multiple levels of factors (structural, individual, and dyadic) affect the dyad's capacity to coordinate healthy behaviors such as safer sex. Thus, there may be a need for multi-level interventions that target power, relationship quality, and HIV prevention. For example, structural and individual-level interventions that address female empowerment and gender equitable norms could be layered with a dyadic intervention focusing on shared power and relationship quality—for the common goal of improving the dyadic capacity to engage in a particular HIV-related behavior.

Finally, the findings point to the importance of the shared power construct when considering the prioritization of resources and efforts for couple-based interventions. If relationship quality is the main pathway through which healthy behaviors in couples can occur (Karney et al., 2010; Lewis et al., 2006), efforts could harness shared power at the couple level—a construct that emerged as the most consistent correlate of relationship quality. Interventions that intervene with couples to improve relationship dynamics as a pathway to improved HIV-related behaviors, such as *Uthando Lwethu* (Darbes et al., 2014), have the potential to empower couples in the process. This will require new ways of conceptualizing power at the couple level and ways to change dyadic power that go beyond

the individual level. However, as a starting point, more research is needed to further develop the concept and measure of shared power with dyads as a tool to evaluate the effectiveness of interventions aimed at empowering the couple.

## Acknowledgements

The *Uthando Lwethu* study was funded by grant R01-MH086346 from the National Institute of Mental Health (NIMH). AC was supported by grant T32-MH19105 from the NIMH. NM was supported by fellowship grant WT083495MA from the Wellcome Trust. VH was supported by grant WT082599/Z/07/Z from the Wellcome Trust and by grant ES/J021202/1 from the Economic and Social Research Council. The authors would like to thank Dr. Torsten Neilands for methodological guidance, whose efforts were supported by a grant from the NIMH (grant P30-MH062246).

## References

- Acock, A.C., 2013. *Discovering Structural Equation Modeling Using Stata*. StataCorp, College Station, Texas.
- Agnew, C., Van Lange, P., Rusbult, C., Langston, C., 1998. Cognitive interdependence: commitment and the mental representation of close relationships. *J. Personality Soc. Psychol.* 74, 939–954.
- Anderson, J.C., Gerbing, D.W., 1988. Structural equation modeling in practice: a review and recommended two-step approach. *Psychol. Bull.* 103 (3), 411–423.
- Babcock, J., Waltz, J., Jacobson, N.S., Gottman, J.M., 1993. Power and violence: the relationship between communication patterns, power discrepancies, and domestic violence. *J. Consult. Clin. Psychol.* 61 (1), 40–50.
- Blanc, A., 2001. The effect of power in sexual relationships on sexual and reproductive health: an examination of the evidence. *Stud. Fam. Plan.* 32 (3), 189–213.
- Burton, J., Darbes, L.A., Operario, D., 2010. Couples-focused behavioral interventions for prevention of HIV: systematic review of the state of evidence. *AIDS Behav.* 14, 1–10.
- Caldwell, M.A., Peplau, L.A., 1984. The balance of power in lesbian relationships. *Sex. Roles* 10 (7/8), 587–599.
- Campbell, J., 2002. Health consequences of intimate partner violence. *Lancet* 359, 1331–1336. [http://dx.doi.org/10.1016/S0140-6736\(02\)08336-8](http://dx.doi.org/10.1016/S0140-6736(02)08336-8).
- Christensen, A., Heavey, C.L., 1990. Gender and social structure in the demand/withdraw pattern of marital conflict. *J. Personality Soc. Psychol.* 59, 73–81.
- Christensen, A., Shenk, J.L., 1991. Communication, conflict, and psychological distance in nondistressed, clinic, and divorcing couples. *J. Consult. Clin. Psychol.* 59, 458–463.
- Cloven, D.H., Roloff, M.E., 1993. The chilling effect of aggressive potential on the expression of complaints in intimate relationships. *Commun. Monogr.* 60, 199–219.
- Coltrane, S., 2000. Research on household labor: modeling and measuring the social embeddedness of routine family work. *J. Marriage Fam.* 62 (4), 1208–1233.
- Connell, R.W., 1987. *Gender and Power*. Stanford University Press, Stanford, CA.
- Connell, R.W., 2005. *Masculinities*, second ed. University of California Press, Berkeley, CA.
- Conroy, A., 2013. *Gender, Relationship Power, and HIV Testing in Rural Malawi*. University of Colorado Denver, Department of Health and Behavioral Sciences, Denver. PhD Dissertation.
- Conroy, A.A., 2014. Gender, power, and intimate partner violence: a study on couples from rural Malawi. *J. Interpers. Violence* 29 (5), 866–888.
- Conroy, A.A., Chilungo, A., 2014. Male victims of sexual violence in rural Malawi: the overlooked association with HIV infection. *AIDS Care* 26 (12), 1576–1580.
- Cox, C.M., Hindin, M.J., Otupiri, E., Larsen-Reindorf, R., 2013. Understanding couples' relationship quality and contraceptive use in Kumasi, Ghana. *Int. Perspect. Sex. Reprod. Health* 39 (4), 185–194.
- Cromwell, R.E., Olson, D.H., 1975. *Power in Families*. Sage Publications, New York.
- Darbes, L.A., Van Rooyen, H., Hosegood, V., Ngunane, T., Johnson, M.O., Fritz, K., McGrath, N., 2014. *Uthando Lwethu* ('our love'): a protocol for a couples-based intervention to increase testing for HIV: a randomized controlled trial in rural KwaZulu-Natal, South Africa. *Trials* 15 (64).
- Dunbar, N.E., Burgoon, J.K., 2005. Perceptions of power and interactional dominance in interpersonal relationships. *J. Soc. Personal Relat.* 22, 207–233.
- Dunkle, K.L., Jewkes, R.K., Brown, H.C., Gray, G.E., McIntyre, J.A., Harlow, S.D., 2004. Gender-based violence, relationship power, and risk of HIV infection in women attending antenatal clinics in South Africa. *Lancet* 363, 1415–1421. [http://dx.doi.org/10.1016/S0140-6736\(04\)16098-4](http://dx.doi.org/10.1016/S0140-6736(04)16098-4).
- Dunkle, K.L., Stephenson, R., Karita, E., et al., 2008. New heterosexually transmitted HIV infections in married or cohabiting couples in urban Zambia and Rwanda: an analysis of survey and clinical data. *Lancet* 371, 2183–2191.
- Dworkin, S., Colvin, C., Hatcher, A.M., Peacock, D., 2012. Men's perceptions of women's rights and changing gender relations in South Africa lessons for working with men and boys in HIV and antiviolenace programs. *Gen. Soc.* 26

- (1), 97–120.
- Dworkin, S., Grabe, S., Lu, T., Hatcher, A., Kwena, Z., Bukusi, E., Mwaura-Muiru, E., 2013a. Property rights violations as a structural driver of women's HIV risks: a qualitative study in Nyanza and western provinces, Kenya. *Arch. Sex. Behav.* 42, 703–713.
- Dworkin, S.L., Blankenship, K., 2009. Microfinance and HIV/AIDS prevention: assessing its promise and limitations. *AIDS Behav.* 13, 462–469.
- Dworkin, S.L., Treves-Kagan, S., Lippman, S.A., 2013b. Gender-transformative interventions to reduce HIV risks and violence with heterosexually-active men: a review of the global evidence. *AIDS Behav.* 17 (9), 2845–2863.
- Fletcher, G.J.O., Simpson, J.A., Thomas, G., 2000. The measurement of perceived relationship quality components: a confirmatory factor analysis. *PSPB* 26 (3), 340–354.
- García-Moreno, C., Jansen, H.A., Ellsberg, M., Heise, L., Watts, C.H., 2006. Prevalence of intimate partner violence: findings from the WHO multi-country study on women's health and domestic violence. *Lancet* 368, 1260–1269. [http://dx.doi.org/10.1016/S0140-6736\(06\)69523-8](http://dx.doi.org/10.1016/S0140-6736(06)69523-8).
- Gass, J.D., Stein, D.J., Williams, D.R., Seedat, S., 2011. Gender differences in risk for intimate partner violence among south African adults. *J. Interpers. Violence* 26 (4), 2764–2789. <http://dx.doi.org/10.1177/0886260510390960>.
- Gevers, A., Jewkes, R., Matthews, C., 2013. What do young people think makes their relationships good? Factors associated with assessments of dating relationships in South Africa. *Cult. Health Sex.* 15 (9), 1011–1025.
- Harris, K.M., Morgan, S.P., 1991. Fathers, sons, and daughters: differential parental involvement in parenting. *J. Marriage Fam.* 53, 531–564.
- Hatcher, A.M., Colvin, C.J., Ndlovu, N., Dworkin, S.L., 2014. Intimate partner violence among rural south African men: alcohol use, sexual decision-making, and partner communication. *Cult. Health & Sex.* 16 (9), 1023–1039.
- Hatcher, A.M., Tsai, A.C., Kumbakumba, E., et al., 2012. Sexual relationship power and depression among HIV- infected women in rural Uganda. *PLOS One* 7 (12), 1–7.
- Hatcher, L., 1994. A Step-by-step Approach to Using the SAS System for Factor Analysis and Structural Equation Modeling. SAS Institute, Cary, NC.
- Higgins, J.A., Hoffman, S., Dworkin, S.L., 2010. Rethinking gender, heterosexual men, and women's vulnerability to HIV/AIDS. *Am. J. Public Health* 100 (3), 435–442.
- Hosegood, V., McGrath, N., Moultrie, T., 2009. Dispensing with marriage: marital and partnership trends in rural KwaZulu-Natal, South Africa 2000–2006. *Demogr. Res.* 20 (13), 279–312.
- Hu, L., Bentler, P.M., 1999. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct. Equ. Model.* 6, 1–55.
- Hunter, M., 2010. *Love in the Time of AIDS: Inequality, Gender, and Rights in South Africa*. Indiana University Press, Bloomington, Indiana.
- Jejeebhoy, S., 2000. Women's autonomy is rural India: Its dimensions, determinants, and the influence of context. In: Presser, H.B., Sen, G. (Eds.), *Women's Empowerment and Demographic Process: Moving beyond Cairo*. Oxford University Press, Oxford: UK.
- Jewkes, R., 2002. Intimate partner violence: causes and prevention. *Lancet* 359, 1423–1429. [http://dx.doi.org/10.1016/S0140-6736\(02\)08357-5](http://dx.doi.org/10.1016/S0140-6736(02)08357-5).
- Jewkes, R., Dunkle, K., Nduna, M., et al., 2006. Factors associated with HIV sero-status in young rural south African women: connections between intimate partner violence and HIV. *Int. J. Epidemiol.* 35, 1461–1468. <http://dx.doi.org/10.1093/ije/dyl218>.
- Jewkes, R., Nduna, M., Jama, P., Levin, J., 2002. Measuring relationship power: adaptation of the SRPS for South Africa. In: Abstract Presented at the XIV International Conference on AIDS, July 7–12 2002, Barcelona, Spain.
- Jewkes, R.K., Dunkle, K., Nduna, M., Shai, N., 2010. Intimate partner violence, relationship power inequity, and incidence of HIV infection in young women in South Africa: a cohort study. *Lancet* 376, 41–48. [http://dx.doi.org/10.1016/S0140-6736\(10\)60548-X](http://dx.doi.org/10.1016/S0140-6736(10)60548-X).
- Karney, B.R., Hops, H., Redding, C.A., Reis, H.T., Rothman, A.J., Simpson, J.A., 2010. A framework for incorporating dyads in models of HIV-prevention. *AIDS Behav.* 14, S189–S203.
- Kaufman, M.R., Shefer, T., Crawford, M., Simbayi, L., Kalichman, S., 2008. Gender attitudes, sexual power, HIV risk: a model for understanding HIV risk behavior of south African men. *AIDS Care* 20 (4).
- Kenny, D.A., 2014. Measuring Model Fit. Retrieved December 1, 2014, from. <http://davidakenny.net/cm/fit.htm>.
- Kenny, D.A., Kashy, D.A., Cook, W.L., 2006. *Dyadic Data Analysis*. The Guilford Press, New York.
- Krishnan, S., Rocca, C.H., Hubbard, A.E., Subbiah, K., Edmeades, J., Padian, N.S., 2010. Do changes in spousal employment status lead to domestic violence? Insights from a prospective study in Bangalore, India. *Soc. Sci. Med.* 70, 136–143.
- Kurdek, L., 1996. The deterioration of relationship quality for gay and lesbian cohabiting couples: a five-year prospective longitudinal study. *Personal. Relat.* 3, 417–442.
- Larzelere, R.E., Huston, T.L., 1980. The dyadic trust scale: toward understanding interpersonal trust in close relationships. *J. Marriage Fam.* 42 (3), 595–604.
- Lewis, M.A., McBride, C.M., Pollak, K.I., Puleo, E., Butterfield, R.M., Emmons, K.M., 2006. Understanding health behavior change among couples: an interdependence and communal coping approach. *Soc. Sci. Med.* 62, 1369–1380.
- McGrath, N., Hosegood, V., Chirwodza, A., Joseph, P., Darbes, L., Boettiger, M., van Rooyen, H., 2010. Recruiting heterosexual couples from the general population for studies in rural South Africa – challenges and lessons (Project Accept, HPTN 043). *SAMJ* 100 (10), 658–660.
- McMahon, J.M., Volpe, E.M., Klostermann, K., Trabold, N., Xue, Y., 2015. A systematic review of the psychometric properties of the sexual relationship power scale in HIV/AIDS research. *Archives Sex. Behav.* 44 (2), 267–294.
- Moore, T.M., Stuart, G.L., McNulty, J.K., Addis, M.E., Cordova, J.V., Temple, J.R., 2008. Domains of masculine gender role stress and intimate partner violence in a clinical sample of violent men. *Psychol. Men Masculinity* 9, 82–89.
- Morris, M., Kretzschmar, M., 1997. Concurrent partnerships and the spread of HIV. *AIDS* 11, 641–648.
- Peralta, R.L., Tuttle, L.A., Steele, J.L., 2010. At the intersection of interpersonal violence, masculinity, and alcohol use: the experiences of heterosexual male perpetrators of intimate partner violence. *Violence Against Women* 16 (4), 387–409.
- Pettifor, A.E., Measham, D.M., Rees, H.V., Padian, N.S., 2004. Sexual power and HIV risk, South Africa. *Emerg. Infect. Dis.* 10 (11), 1996–2004.
- Pleck, J.H., 1995. The gender role strain paradigm: an update. In: Levant, R.F., Pollack, W.S. (Eds.), *A New Psychology of Men*. Basic Books, New York, NY.
- Pulerwitz, J., Amaro, H., DeJong, W., Gortmaker, S.L., Rudd, R., 2002. Relationship power, condom use, and HIV risk among women in the USA. *AIDS Care* 14 (6), 789–800.
- Pulerwitz, J., Barker, G., 2008. Measuring attitudes toward gender norms among young men in Brazil: development and psychometric evaluation of the GEM Scale. *Men Masculinities* 10, 322–338.
- Pulerwitz, J., Gortmaker, S.L., DeJong, W., 2000. Measuring relationship power in HIV/STD research. *Sex. Roles* 42 (7/8), 637–660.
- Rhemtulla, M., Brousseau-Liard, P.E., Savalei, V., 2012. When can categorical variables be treated as continuous? A comparison of robust continuous and categorical SEM estimation methods under suboptimal conditions. *Psychol. Methods* 17 (3), 354–373.
- Riley, N.E., 1997. Gender, power, and population change. In: *Population Bulletin*, vol. 52. Population Reference Bureau, Washington, DC.
- Robles, T.F., Trombello, J.M., Slatcher, R.B., McGinn, M.M., 2014. Marital quality and health: a meta-analytic review. *Psychol. Bull.* 140 (1), 140–187.
- Rusbult, C., Arriaga, X., 1997. Interdependence theory. In: Duck, S. (Ed.), *Handbook of Personal Relationships*, second ed. Wiley, London, UK.
- Rusbult, C., Lange, P.M.A.V., 2003. Interdependence, interaction, and relationships. *Annu. Rev. Psychol.* 54 (54), 351–375.
- Satorra, A., Bentler, P.M., 1994. Corrections to Test Statistics and Standard Errors in Covariance Structure Analysis. Sage, Thousand Oaks, CA.
- Shannon, K., Leiter, K., Phaladze, N., et al., 2012. Gender inequity norms are associated with increased male-perpetrated rape and sexual risks for HIV infection in Botswana and Swaziland. *PLOS One* 7 (1), 1–8. <http://dx.doi.org/10.1371/journal.pone.0028739>.
- Shefer, T., Crawford, M., Strebel, A., et al., 2007. Gender, power and resistance to change among two communities in the western Cape, South Africa. *Fem. Psychol.* 18 (157), 157–182.
- Shisana, O., Rehle, T., Simbayi, L.C., et al., 2014. South African National HIV Prevalence, Incidence and Behaviour Survey, 2012. HSRC, Cape Town.
- Shisana, O., Rehle, T., Simbayi, L.C., Zuma, K., Jooste, S., et al., 2009. South African National HIV Prevalence, Incidence, Behavior and Communication Survey 2008. HSRC Press, Cape Town.
- Siedner, M.J., Tsai, A.C., Dworkin, S., et al., 2012. Sexual relationship power and malnutrition among HIV-positive women in rural Uganda. *AIDS Behav.* 16, 1542–1548.
- Simpson, J.A., Farrell, A.K., Orina, M.M., Rothman, A.J., 2013. Power and social influence in relationships. In: Simpson, J.A., Dovidio, J.F. (Eds.), *APA handbook of personality and social psychology*, vol. 2. American Psychological Association, Washington, D.C.
- Skovdal, M., Campbell, C., Madanhire, C., Mupambireyi, Z., Nyamukapa, C., Gregson, S., 2011. Masculinity as a barrier to men's use of HIV services in Zimbabwe. *Glob. Health* 7 (13), 1–14.
- Stern, E., Buikema, R., 2013. The relational dynamics of hegemonic masculinity among south African men and women in the context of HIV. *Cult. Health Sex.* 15 (9), 1040–1054.
- Thibaut, J.W., Kelley, H.H., 1959. *The Social Psychology of Groups*. Wiley & Sons, Inc., New York.
- Umberson, D., 1992. Gender, marital status, and the social control of health behavior. *Soc. Sci. Med.* 34 (8), 907–917.
- UNAIDS, 2013. *Global Report: UNAIDS Report on the Global AIDS Epidemic 2013*. UNAIDS, Geneva, Switzerland.
- van den Berg, W., Hendricks, L., Hatcher, A., Peacock, D., Godana, P., Dworkin, S., 2013. One man can': shifts in fatherhood beliefs and parenting practices following a gender-transformative programme in eastern Cape, South Africa. *Gen. Dev.* 21 (1), 111–125.
- Wingood, G.M., DiClemente, R.J., 2000. Application of the theory of gender and power to examine HIV-related exposures, risk factors, and effective interventions for women. *Health Educ. Behav.* 27, 539–565.
- Wingood, G.M., DiClemente, R.J., 2002. The theory of gender and power: a social structural theory for guiding public health interventions. In: DiClemente, R.J., Crosby, R.A., Kegler, M.C. (Eds.), *Emerging Theories in Health Promotion Practice and Research*. Jossey-Bass, San Francisco, pp. 313–346.
- Woolf, S.E., Maisto, S.A., 2008. Gender differences in condom use behavior? the role of power and partner-type. *Sex. Roles* 58 (9–10), 689–701. <http://dx.doi.org/10.1007/s11199-007-9381-3>.