Cultural consensus modeling to measure transactional sex in Swaziland: Scale building and validation

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ABSTRACT

Transactional sex is associated with increased risk of HIV and gender based violence in southern Africa and around the world. However the typical quantitative operationalization, "the exchange of gifts or money for sex," can be at odds with a wide array of relationship types and motivations described in qualitative explorations. To build on the strengths of both qualitative and quantitative research streams, we used cultural consensus models to identify distinct models of transactional sex in Swaziland. The process allowed us to build and validate emic scales of transactional sex, while identifying key informants for qualitative interviews within each model to contextualize women's experiences and risk perceptions. We used logistic and multinomial logistic regression models to measure associations with condom use and social status outcomes. Fieldwork was conducted between November 2013 and December 2014 in the Hhohho and Manzini regions. We identified three distinct models of transactional sex in Swaziland based on 124 Swazi women's emic valuation of what they hoped to receive in exchange for sex with their partners. In a clinic-based survey (n = 406), consensus model scales were more sensitive to condom use than the etic definition. Model consonance had distinct effects on social status for the three different models. Transactional sex is better measured as an emic spectrum of expectations within a relationship, rather than an etic binary relationship type. Cultural consensus models allowed us to blend qualitative and quantitative approaches to create an emicly valid quantitative scale grounded in qualitative context.

1. Introduction

The term "transactional sex" emerged approximately two decades ago to differentiate between sex work and relationships that focus on sexual-economic exchange but are not perceived as 'commercial' by either party (Chatterji et al., 2005; Cole, 2004; Dunkle et al., 2004b; Groes-Green, 2013; Leclerc-Madlala, 2003). In southern Africa transactional sex increases a woman's risk of HIV by up to 50% and is significantly associated with intimate partner violence (IPV) (Dunkle et al., 2010, 2007, 2004b, 2006; Jewkes et al., 2010). Transactional sex is typically operationalized as "the exchange of sex for gifts or money" (Luke et al., 2011; Swidler and Watkins, 2007). To borrow epedemiological language, this definition is sensitive but not specific. Many relationships contain both some degree of economic dependence and an expectation of sex. While the risks inherent in transactional relationships are often clear in context, "the exchange of sex for gifts or money" could conceivably capture behaviors ranging from sex work to receiving an engagement ring (Brinig, 1990). Women whose sexual relationships are their primary source of economic support may identify the relationship as transactional or commercial, or they may reject those labels and the associated stigma (Cole, 2004; Dunkle et al., 2010; Groes-Green, 2013; Stoebenau, 2009; Stoebenau et al., 2013, 2011). Rather than a binary measurement, transactional sex may be better operationalized as a characteristic present in almost all relationships as a matter of degree (Maganja et al., 2007; Stoebenau et al., 2011; Swidler and Watkins, 2007; Wamoyi et al., 2011).

The nature of transactional sex varies widely across geographical contexts. In southern Africa, women may use transactional sex

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to pay their school fees, acquire basic survival goods such as food or shelter, access fashionable commercial goods to improve their status amongst peers, or some combination of all of these (Groes-Green, 2013; Luke et al., 2011; Mojola, 2015; Stoebenau et al., 2011). While the act of receiving goods from a sexual partner does not pose health risks in itself, transactional relationships are likely to reflect strong gender and economic power imbalances, making it difficult for women to negotiate condom use or sexual encounters (Dunkle et al., 2004a). Transactional sex may also hurt or help a woman's social standing, as these relationships exist within a network of social and financial obligations (Cole, 2004; Groes-Green, 2013, 2014; Stoebenau et al., 2013, 2011; Swidler and Watkins, 2007; Wamoyi et al., 2011, 2010). Peers or family may encourage women to charm their partners for more gifts and financial support, and those who receive nothing in exchange for sex can be mocked as "prostitutes" (Wamoyi et al., 2011, p.9) who have devalued themselves or failed to support their family (Groes-Green, 2013, 2014; Wamoyi et al., 2011). Access to fashionable goods may improve social status, however being seen as promiscuous may result in being cutoff from material help in times of need (Kaschula, 2011; Masvawure, 2010; Strebel et al., 2013).

Despite the importance and social normalcy of economic support from a partner, women must be careful that their relationships are perceived to be motivated by affection, rather than financial gain. Those who do not may be called materialistic, and risk being cut off from support in times of need (Bandali, 2011; Fielding-Miller et al., 2014, 2011; Kaschula, 2011; Stoebenau et al., 2011; Strebel et al., 2013). In a US study, fewer than 10% of women who reported initiating or staying in a relationship because of financial concerns agreed that they had ever exchanged sex for money (Dunkle et al., 2010). Measuring transactional sex based on what women actually receive from their partners, and how they weigh these items when considering their sexual obligations, would more accurately capture the degree of transaction inherent in the relationship than asking women to identify with a possibly stigmatized motive.

Social science and public health research has at its disposal a large toolkit of methodologies, drawing from a range of epistemologies, paradigms, and research traditions, to better understand the context, prevalence, and correlates of health behaviors and risks such as those associated with transactional sex (Creswell, 2013; Rosenthal and Rosnow, 1991; Schutt, 2004; Tebes, 2005). Etic perspectives allow researchers to compare concepts and behaviors across cultures using a universal "outside" definition, whereas emic perspectives emphasize the local understandings and meanings of a phenomenon (Harris, 1976). While neither emic nor etic perspectives are the exclusive domain of a particular research approach, qualitative research tends to approach research questions from an emic perspective, while quantitative projects more often utilize the latter. Similarly, while no method or research project draws exclusively from a single paradigm, in broad terms quantitative approaches tend to draw on a positivist tradition to measure prevalence and infer generalizable associations, while qualitative approaches originated from interpretivist traditions and typically utilize textual data to understand a research question from local, emic perspectives (Harris, 1976; Hennink et al., 2011; Schutt, 2004; Tebes, 2005).

The traditional operationalization of transactional sex stems from an international, etic, perspective that can be quantitatively compared across cultures. However it does not necessarily reflect women's lived experiences and fails to capture the influence of economic considerations on sexual relationships as a matter of degree. Bridging the gap between the rich streams of qualitative and quantitative research on transactional sex requires a quantitative tool which measures these relationships in a way that captures women's understanding of their own behavior, is grounded in

the pressures of the social landscape, and is capable of measuring associations with both health behaviors and potential social risks and benefits.

Cultural consensus modeling is a systematic measurement approach that moves from interpretive, emic description to positivist, quantitative measurement within one study design (Dressler and dos Santos, 2005; Weller, 2007). The researcher uses rapid ethnographic methods to define the boundaries of a set of knowledge or behaviors shared by a group - a cultural domain - followed by quantitative analysis of numerical data generated in the ethnographic phase. The final product is a cultural consensus model (CCM), an emicly valid operationalization of a cultural domain that can be used in quantitative studies (Weller, 2007).

The consensus analysis process assumes that if informants answer a question about their culture (rather than their personal tastes) in a similar way, they do so because they are drawing on a shared cognitive domain, or realm of cultural knowledge. Cultural consensus analysis (CCA) is essentially an exploratory factor analysis that uses participants, rather than items, as variables of interest and identifies clusters of similar answer patterns. An answer key and competence score for each individual can then be generated. The answer key identifies clusters of similar answers and assumes that these answers are similar — and therefore emicly correct – because participants who share knowledge of a domain answer similarly, while the answers of those without knowledge of this domain will be more scattered. Competence scores reflect the number of culturally correct answers each participant gave, and range from 0 to 1.00. Participants with a competence score of 1.00 are assumed to have perfect knowledge of a domain and would likely make reliable key informants (Hruschka and Maupin, 2013; Romney et al., 1986). Consonance, ie how much an individual aligns with the values or behaviors that relate to the domain, can be determined in a second sample of individuals by assessing whether or to what degree individuals endorse a value or enact a behavior identified. For further details see Romney et al. (1986).

When conducting CCA an eigenvalue ratio greater than 3.0 between participant answer clusters suggests that participants are drawing on a single dominant CCM. An eigenvalue ratio below 3.0 suggests that no single dominant CCM exists within the sample and participant answers are drawing from two or more CCMs.

Our objective was to build an emicly valid quantitative scale of transactional sex that was responsive to both the social and health consequences of transactional sex and based on concrete behaviors rather than subjective assessments of motive. To do this, we used cultural consensus modeling to first create a scale of transactional sex, and then validated our scale by measuring its association with social standing and condom use compared to the etic definition. We used an iterative series of research questions:

1) What items do women hope to get in exchange for sex?
2) How are these valued in exchange for sex?
3) Are there distinct subgroups that value items differently?
4) How do these distinct subgroups differ from one another?
5) How does level of participation in a CCM affect social status and condom use?

2. Methods

2.1. Setting

Swaziland is a small absolute monarchy in southern Africa with a population of approximately 1.2 million (DHS, 2007). Two thirds of Swazis live on less than $1.25 a day and 25% are food insecure ("Swaziland loses AGOA benefits," 2014; Spaull, 2013; WFP, 2009).

Swaziland has an adult HIV prevalence of approximately 31% and the Swazi government has highlighted gender inequality and transactional sex as drivers of the epidemic (Bicego et al., 2013; NERCHA, 2014).

2.2. Ethical considerations

Ethics approval was granted by the Emory University IRB, the Swaziland Scientific and Ethics Committee, traditional leadership at rural study sites, and head nurses at clinical sites. All participants provided written informed consent. Preliminary results were disseminated at the community and national level at the conclusion of fieldwork.

2.3. Study design

Drawing on the qualitative notion of research as a cyclical process, we collected and analyzed data iteratively (Fig. 1) (Creswell, 2013; Hennink et al., 2011). We used cultural consensus analysis to build and characterize transactional sex CCMs, in-depth interviews (IDIs) to learn about Swazi women's perceptions of transactional sex and risk in their own relationships, and a clinic-based survey to measure the association between transactional sex CCMs, social standing, and condom use. Data were collected between November 2013 and October 2014.

2.4. What do women hope to get in exchange for sex?

To compile a list of items that Swazi women hoped to get in exchange for sex we discussed the etic definition of transactional sex with local colleagues and created a free-list question that preserved the intent but allowed participants to express the concept emicly: "What do Swazi women get, or hope to get, in exchange when they have sex with a man?"

We recruited a convenience sample of women from university, rural, urban, and peri-urban sites, as the literature suggested that women living in different areas may have different priorities. Swazi research assistants (RAs) and the first author approached women in public spaces (ie, public shopping areas in urban and peri-urban sites, and in roads and by a river in rural sites) and asked them to list as many items as they could think of in English or siSwati in response to the free-list question. The meaning was left to participants' interpretation: an "item" could be emotional (love), tangible (a cell phone), or relational (marriage). Researchers purposively sought women with a range of education, age, and marital statuses, although there was no specific quota, as the literature suggests that these may influence what items women would hope to get. Free-list

responses were condensed to a single master list based on frequency of mention, discussion with local colleagues and experts, and theoretical interest. Sample size was determined based on iterative checks for data saturation.

2.5. How are items valued in exchange for sex?

We used a rating activity to understand the importance of receiving an item in exchange for sex. A second convenience sample was approached in the same way and same locations as before. For each item women were asked, "On a scale of 1–5, how important is it to get this item in exchange when having sex with a man?" Researchers emphasized that the question related to Swazi women in general rather than the participant's individual preference. Age, education, recruitment site, and marital status were recorded for each participant. After the rating activity we asked women if they were interested in participating in a longer personal interview. If they agreed we recorded their contact details and linked these to rating data using an anonymous unique ID.

2.6. Are there distinct transactional sex CCMs?

We used CCA, multiple regression quadratic assignment procedure (MRQAP), exploratory factor analysis (EFA), and bivariate tests of significance to identify distinct transactional sex CCMs, the most correct way of rating each item within a CCM, and individuals who were highly competent within CCMs.

2.7. How do CCMs differ from one another qualitatively?

IDIs with key informants (KIs) were used to elicited personal narratives of engaging in a particular transactional sex CCM. KIs were women who had participated in the rating activity, had high cultural competence scores within a CCM, and had agreed to a follow-up interview. A bilingual female Swazi RA trained in qualitative interview methods conducted all interviews in siSwati. Interviews were recorded, transcribed, translated, and analyzed using comparative analysis (Creswell, 2013; Hennink et al., 2011).

2.8. How does participation in a CCM affect social status and condom use?

We conducted an audio computer-assisted self-interview (ACASI) survey with pregnant women accessing antenatal care in one urban and one rural public clinic. Antenatal clinics were chosen because this project is nested within a larger study examining transactional sex and HIV risk. 95% of Swazi women experience at
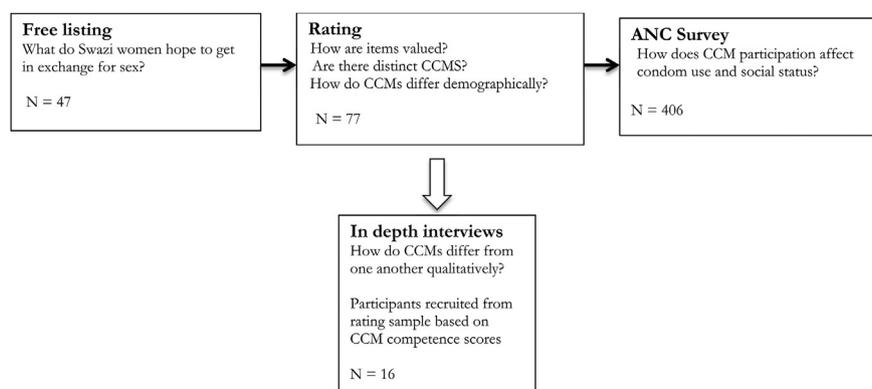
Fig. 1. Order of study phases, with main research question and sample size.

least one lifetime pregnancy, 97% of these access care at least once, and all pregnant women accessing antenatal care receive HIV screenings at all clinic visits (DHS, 2011; Ministry of Health (2011)). A female Swazi RA approached all women waiting in line for antenatal services. The survey took place in a private area with the RA present to assist women who were unfamiliar with laptops or had questions. The survey was translated into siSwati, back translated into English, and administered in siSwati.

Women were asked to provide a pseudonym for up to 5 partners in the past year. For each partner, women were asked which of the list items they had received in the last year and if they had used a condom the last time they had sex. To assess the social benefits or consequences of transactional sex, women were asked to place themselves on the MacArthur scale of subjective social status, an internationally validated measure of community social status (Brown et al., 2008; Hu et al., 2005; Operario et al., 2004; Yip and Adler, 2005). To assess community perceptions of promiscuity, women were asked if they knew or thought that they had ever been called a nasty name that implied mercenary or promiscuous sexuality with a list of examples. Terms for the latter item were based on qualitative data and included local equivalents of "slut" and "gold digger." Other measures included socio-economic indicators, lifetime number of sexual partners, and age of sexual debut. HIV status was recorded from test results of that day's clinic visit.

We asked if women had been motivated to have sex with their most recent partner because of poverty, hunger, for basic groceries, or for the sake of her children. Women who answered affirmatively to any of these were coded as having engaged in 'etic transactional sex.'

To assess how strongly women conformed to a transactional sex CCM we built a weighted scale based on the culturally correct rating for each item within a CCM. Items were weighted according to the value established by CCA. A participant's consonance with a CCM was equivalent to the total weighted value of each item she had received from her most recent sexual partner. Participants who had received more items that were rated more highly were considered more consonant with the CCM.

We examined the bivariate associations between CCM consonance and subjective social status, and CCM consonance and condom use at last sex. For each CCM we built a logistic regression model to assess the adjusted odds ratio (aOR) of condom use at last sex by CCM consonance, and a multinomial logistic regression model to assess the adjusted relative risk ratio (aRRR) of subjective social status according to CCM consonance. To test the sensitivity of our scale against a more traditional, binary definition predicated on motive we built a final logistic regression model examining the aOR of condom use or high social status for women who self-identified engaging in etic transactional sex.

3. Results

3.1. What do Swazi women hope to get in exchange for sex?

47 women were recruited for the free-list activity. Mean age was 28.0 (SD 8.9, range 18–40) with mean education of 11.1 years (SD 1.9, range 6–13). Participants named 177 unique items. These were condensed into a single master list of 31 items based on frequency of item mention, discussion with local colleagues, and theoretical interest (Table 1).

3.2. Are there distinct CCMs that value items differently?

77 women rated the 31 list items. Mean age was 27.4 (SD 8.1, range 18–57) and mean years of education were 10.9 (SD 2.5, range 0–13).

To identify emic CCMs we used UCINET software to perform a cultural consensus analysis on rating data (Borgatti et al., 2002). Our initial eigenvalue ratio for the full sample was 1.37, with an average competence score of 0.31 suggesting that the 77 participants were drawing from more than one transactional sex CCM (Borgatti et al., 2002; Hruschka et al., 2008).

To identify clusters of participants who rated items similarly, we conducted exploratory factor analysis (EFA) with the full sample (n = 77) in Stata 13, using participants as the variables of interest (StataCorp, 2013). We constrained Stata to 4 total factors and assigned group membership based on the EFA group in which an individual had the highest factor loading score. We then created four separate UCINET data sets according to EFA results. Group size ranged from n = 12 to n = 27 (see Table 2). We conducted a second round of CCA in UCINET with each group data set to determine if the four groups identified by EFA were drawing on distinct transactional sex CCMs.

Three groups had eigenvalue ratios greater than 3.0, indicating distinct transactional sex CCMs. The sample size and average competence score for each of these three groups were sufficient to assume with 95% confidence that participants had classified 95% of items correctly (S. C. Weller and Romney, 1988). The fourth had an eigenvalue ratio of 2.59, suggesting these participants were not drawing from a unique CCM. Participants from this fourth group were more likely to have been recruited from peri-urban sites with high work migration, making it likely they were drawing on multiple cultural models. Based on IDI and demographic data, we named the 3 significant groups "inkhosikati" (a traditional Swazi term denoting a respected senior woman), "aspirational," and "university." We elaborate on each of these group descriptors below.

3.3. How do CCMs differ demographically?

To identify distinct demographic characteristics within groups, we first used a multiple regression quadratic assignment procedure via double dekker semi-partialling (MRQAP) in UCINET (Borgatti et al., 2002) on the full 77 participant sample. This is a matrix regression that determines the amount and significance of answer variability explained by demographic characteristics that participants have in common as compared to participants who do not share that characteristic.

We assessed variability in list item ratings according to the following matrices of binary variables: Participant recruited in rural area, participant not recruited in rural area, participant married, participant not married, participant had grade 12 education, participant had no grade 12 education, participant was over 25, and participant was not over 25. Being recruited from a rural area accounted for 11% variability in participant's rating of list items (p = 0.001), while not being recruited from a rural area explained 6% of variability (p = 0.02), implying that being from a rural area has a larger effect on women's tendency to rate items similarly than being from a non-rural area. Being married explained 4.8% of variability in answer patterns (p = 0.04), while women who were not married did not rate items in significantly similar ways. Neither age nor education significantly explained variance in item rating patterns in the full sample.

We next compared demographic characteristics across the 4 identified groups. Place of recruitment and education level were significantly different across groups in ANOVA analyses. In chi-square and t-tests women in the inkhosikati group were on average 5.3 years older (p = 0.02) and those in the university group had 1.8 more years of education (p < 0.01) and were more likely to have been recruited at an urban or university site (Table 2).

Table 1
Items that a woman may hope to receive from her partner, with weighted value by group.

Aspirational		Inkhosikati		University	
Item	Score	Item	Score	Item	Score
*fun night out	4.5	*basic food	3.9	love	4.2
*phone	4.4	*alcohol	3.4	marriage	4.1
*airtime	4.1	*phone	3.2	*provide for children	3.9
*clothes	3.9	*clothes	2.9	label clothes	3.9
*toiletries	3.7	*airtime	2.7	*fashionable clothes	3.7
*hairstyle	3.7	*cosmetics	2.6	expensive clothes	3.7
*restaurant	3.6	*fashionable clothes	2.5	*nice lifestyle	3.7
*alcohol	3.6	*toiletries	2.5	enjoyment	3.6
label clothes	3.6	*hairstyle	2.4	*phone	3.6
*basic food	3.6	*provide for child	2.2	*clothes	3.6
expensive clothes	3.6	*provide for family	2.1	*rent	3.5
*takeaway	3.6	marriage	2.1	*shoes	3.5
enjoyment	3.5	label clothes	2.0	*hairstyle	3.3
*fashionable clothes	3.5	sexual satisfaction	2.0	sexual satisfaction	3.3
sexual satisfaction	3.4	*nice lifestyle	1.9	*job	3.2
*rent	3.4	*fun night out	1.9	*provide for family	3.0
*shoes	3.4	enjoyment	1.8	*car	2.9
*jewelry	3.3	*rent	1.7	status	2.8
*transport	3.2	love	1.7	*fun night out	2.7
status	3.1	status	1.6	*basic food	2.6
*place to sleep for the night	3.0	*jewelry	1.6	*jewelry	2.6
*nice lifestyle	2.8	school fees	1.5	*cosmetics	2.5
*cosmetics	2.8	*takeaway	1.3	school fees	2.5
*job	2.2	*job	1.3	*restaurant	2.4
*provide for family	2.1	*place to sleep for the night	1.2	*transport	2.1
love	1.8	expensive clothes	1.2	*airtime	2.0
*car	1.2	*shoes	1.0	*toiletries	1.8
*provide for child	1.2	*car	0.8	*alcohol	1.2
school fees	1.1	*transport	0.7	children	0.8
children	0.8	*restaurant	0.6	*place to sleep for the night	0.7
marriage	0.7	children	0.5	*takeaway	0.5

*Retained in ACASI consonance scale.

3.4. How are items valued in exchange for sex?

CCA generated an answer key of the culturally correct rating of exchange items within each CCM, along with participant competence scores. Answer keys reflect which items were considered most important within each transactional sex CCM and are shown in Table 1.

3.5. How do CCMs differ qualitatively?

We recruited in-depth interview participants based on competence scores within each of the three significant CCMs.

We interviewed 3 aspirational, 3 inkhosikati, and 5 university informants who were part of the previous rating sample, had agreed to a follow-up interview, and provided contact details. All emphasized the importance of both love and financial

Table 2
Identified models of transactional sex with descriptive demographics.

	Full sample	Aspirational	Inkhosikati	University
n	77	12	19	17
Eigenvalue ratio	NA	3.61	3.03	4.55
Age mean (SD)	27.42 (8.14)	27 (7.27)	31.44† (11.43)	24.41 (3.24)
Education* mean (SD)	10.90 (2.48)	11.33 (2.19)	10.21 (2.37)	12.29 (1.36)††
Married % (n)	29.87 (23)	16.67 (2)	47.37 (9)	11.76 (2)
Rural* % (n)	55.84 (43)	41.67 (5)	68.42 (13)	29.41 (5)†
University** % (n)	32.47 (25)	50.00 (6)	15.79 (3)	64.71 (11)††

Significant ANOVA: *p < 0.05 **p < 0.01.
Significant t-test or chi-square vs. other consensus groups: †p < 0.05 ††p < 0.01.

demonstrations of affection in their relationships. Inkhosikati relationships reflected those of married, older, more rural women with slightly less formal education. Marriage conferred both social and economic stability, and married women were highly respected in their communities. Inkhosikatis linked a partner's ability to provide financial support with the courtship process and family approval. They felt a man should provide for his family and that marriage improved social status for both partners. Women in the aspirational group, who were more likely to be urban and have at least a secondary education, were predominantly characterized by the aspiration to either transform their relationship into marriage, or to mirror a marriage relationship as closely as possible. These informants were practical about their partner's economic role in their lives. They felt it was his responsibility to provide for them and gifts were expected when they met for sex, especially if marriage was impossible because he already had a wife or primary partner. University informants were predominantly young women recruited from the residential university site. They linked love to gift giving but were not immediately interested in marriage, and were more likely to declare an independent ideology in which they did not need a man, but still liked to receive gifts from a boyfriend as a sign of affection. Some relationships were primarily motivated by economic gain. These could be affectionate but were also likely to be hidden from family and all but certain friends. Family and friends were more likely to approve of a relationship if money and high status items were shared and the man had the potential for a strong economic future. When asked "what does it mean to be a respected Swazi woman?" across all CCMs, participants agreed that feminine respectability was closely linked to sexual behavior and financial resources. According to participants, "materialistic" women were condemned, and participants suggested that "loose"

women would have difficulty accessing financial assistance from their community in times of need. All informants agreed that according to traditional Swazi culture, all women should aspire to marriage, and marriage represented the height of feminine respectability (Table 3). Further details on qualitative findings can be seen elsewhere (Fielding-Miller et al., 2015).

3.6. How does CCM participation affect social status and condom use?

For the ACASI survey we recruited 406 pregnant women. Each participant was assigned a score assessing her consonance with each CCM, determined by how many items she had received from her partner and how valuable these items were according to each weighted CCM scale. The original 31 items were further collapsed into 22 items to account for redundancy ("fashionable" vs "label" clothes) and non-material items ("love" or "marriage").

Each of the 3 distinct CCM answer keys were used to construct weighted scales. If in the ACASI survey a woman reported receiving a cell phone, basic groceries, and basic clothes from her partner her score would be 11.85 (3.57 + 4.36 + 3.92) out of a possible 92.12 in the aspirational model, 10 (3.93 + 3.17 + 2.90) out of a possible 58.4 within the inkhosikati CCM, and 9.79 (2.58 + 3.61 + 3.60) out of a possible 87.77 in the university model. The participant would then be considered 13%, 17%, and 11% consonant with each model, respectively, suggesting that her actions − or the type of items she received from her partner − were most consistent with the inkhosikati transactional sex CCM. We converted each CCM scale into a standardized Z-score to compare analyses across groups. Each participant had 3 unique scale scores corresponding to the 3 unique scales.

ANC survey demographics are shown in Table 4. Mean participant age was approximately 25 years, and fewer than half (47%) of participants had ever held employment. Thirteen percent of participants reported engaging in 'etic' transactional sex in the past 12 months. Thirty-four percent of participants were living with HIV.

In bivariate t-tests, higher transactional sex CCM consonance scores were associated with lower condom use for aspirational and inkhosikati scales, but not the university model. Women who reported using a condom at last sex scored 0.2 units lower on both the inkhosikati and aspirational scales (p = 0.04, both). In simple linear regression women placed themselves 0.32 rungs higher on the social status ladder for each standardized increase in the inkhosikati scale (p = 0.02), 0.43 rungs higher for each increase in the aspirational scale (0.002), and 0.38 rungs higher per standardized unit in the university scale (p = 0.006). Women who had engaged in etic transactional sex in the last 12 months placed themselves 0.89 rungs lower (p = 0.03).

Results for logistic and multinomial logistic regression models are shown in Table 5. For every increase in standardized CCM Z-score, women were approximately 25% less likely to have used a condom at last sex across all scales.

Subjective social status was collapsed into a categorical variable by quartile to account for non-normality. Women who placed themselves in the highest status quartile scored 0.41 units higher on the inkhosikati consonance scale than women who placed

Table 3
In-depth interview quotes, perspectives on different relationship models and the notion of feminine respectability in Swaziland.

	Aspirational	Inkhosikati	University	What does it mean to be a respectable Swazi woman?
Quote	You develop a mentality that you're going to get what you're having sex for… It is what I am in need of that particular time, what you have both agreed on, what he promised to give… maybe it's airtime, maybe we agreed that you would buy me that airtime when we sleep together… You don't sleep with someone you do not love; you only sleep with someone you love. - Thembisile 36 years old, grade 11 education, not married. Consonance score: 0.77	He would give me money just so I could be able to buy myself toiletries or clothing… we would sleep together, it would be my way of saying thank you. It was basically that …At home they did not want to understand, because he has a poor family background, so they felt like I had no future with him. But I loved him and today he is my husband. And they accepted him – everything is fine. - Sibongile 28 years old, grade 9 education, married. Consonance score 0.78	I do it because I love this person and he promised me heaven and earth… The fact that he loves me and he promised to give me everything I need and mostly he loves me…that he will love me till the end and one day we will get married and be husband and wife… I don't have that mentality of being dependent on other people… I do ask him for some money if I need to do my hair… He knows that every month he has to give me money to do my hair and buy myself anything I need. - Nolwazi 21 years old, university student, not married. Consonance score 0.81	She is respected by the way she dresses up and the manner in which she talks to people…It has to be in a respectable way like she doesn't dress in clothes which will reveal her body and she has to look so smart … a woman has to know her status and if she is still playing some games then she has to stop doing so…the cheating games, having more than one boyfriend and if she is married having secret lovers, you have to be straight. -Nobuhle 20 years old, grade 12 education, not married.
Quote			I started this relationship not based on love but I wanted his money… the allowance we get here is not enough to get us through the whole year. He is understanding. He can see that I'm a single parent and I am still at school, he helps me a lot when I tell him my problem. The only problem I have is that I have to have sex with him whereas I don't love him at all… my friends they were supportive of this relationship because they also get to have a share. -Thandeka 19 years old, university student, not married. Consonance score 0.76	I have to respect myself and respect those that I live with so that… when I am in need of something they can help me…. You have to know other people and humble yourself before other people… if you are known in the community that you have money, of course they will want to get closer to you, because they know that if they need help they will get it from you. -Zamokuhle 28 years old, grade 9 education

Table 4
ANC survey sample demographics.

	n	Mean (SD)	Range	%	(n)
Consonance Score	401				
Inkhosikati					
Raw		11.41 (8.24)	0.00–40.71		
standardized		0 (1)	−1.38–3.56		
Aspirational					
Raw		16.23 (12.60)	0.00–67.03		
standardized		0 (1)	−1.29–4.03		
University					
raw		13.97 (10.61)	0.00–57.78		
standardized		0 (1)	−1.32–4.13		
"Etic" Transactional sex	401			12.97	(52)
Condom use at last sex (yes)	403			42.68	(172)
Social status quartiles	357				
1–2				31.37	(112)
3–4				19.33	(69)
5–6				27.17	(97)
7–10				22.13	(79)
Ever called a nasty name	394				
no				75.13	(296)
yes				24.87	(98)
Lifetime sexual partners	372	2.75 (5.14)	1–87		
Age	406	24.54 (4.99)	18–42		
Rural	403			54.09	218
Education	406				
none				3.45	(14)
primary				24.14	(98)
secondary				64.53	(262)
University or technical college				7.88	(32)
Ever done work to earn money	405			53.33	(216)
HIV status	375				
positive				34.13	(128)
negative				65.87	(247)

Table 5
aOR of condom use at last sex and aRRR of social status by CCM consonance quartile. Validated against etic definition of transactional sex.

	Inkhosikati consonance (Z-score)		Aspirational consonance (Z-score)		University consonance (Z-score)		Etic definition	
	aOR	(95% CI)	aOR	(95% CI)	aOR	(95% CI)	aOR	95% CI
Logistic Regression 1								
Condom use at last sex	**0.73**	**(0.58–0.93)**	**0.76**	**(0.60–0.96)**	**0.76**	**(0.60–0.97)**	0.78	(0.40–1.52)
Multinomial Logistic Regression 2	*aRRR*	*(95% CI)*	*aRRR*	*(95% CI)*	*aRRR*	*(95% CI)*	*aOR*	*95% CI*
Subjective social status								
Quartile 1	Ref		Ref		Ref		Ref	
Quartile 2	1.17	(0.80–1.70)	1.23	(0.83–1.82)	1.23	(0.83–1.82)	0.80	(0.31–2.07)
Quartile 3	1.36	(0.96–1.94)	1.44	(1.00–2.06)	**1.49**	**(1.04–2.15)**	0.39	(0.14–1.14)
Quartile 4	1.41	(1.00–2.00)	**1.51**	**(1.05–2.17)**	**1.52**	**(1.06–2.19)**	0.89	(0.35–2.24)

*Controlling for woman's age, HIV status, education, having ever earned own income, lifetime number of sexual partners, and ever called a nasty name.
Significant aORs and aRRR are in bold.

themselves in the lowest quartile, although the lower end of the confidence interval overlapped 1.00. According to the aspirational consonance scale, women were marginally more likely to rate themselves in the 3rd quartile of social status as the number of items received from a partner increased (aRRR: 1.44, 95% CI: 1.00–2.06), and 50% more likely to place themselves in the top quartile of their community for each unit increase in items received (95% CI: 1.05–2.17). The university consonance scale was significantly correlated with an increased likelihood of placing oneself in the top 3rd and 4th quartiles (aRRR 1.49, 95% CI: 1.04–2.15, and aRRR 1.52, 95% CI: 1.06–2.19).

The binary etic definition of transactional sex had no association with condom use at last sex or subjective social status.

4. Discussion

We identified three dominant CCMs through which Swazi women conceptualize sexual-economic exchange. These had three distinct relationships to social status and condom use, which would not have been apparent using only the traditional measure. Measuring transactional sex using emic scales based on CCMs created an operationalization that was more responsive to health behavior and social effects than the etic binary measurement. Rather than a subjective declaration of her motives, each CCM scale relied on what women had actually received from a partner, weighted in a way that was relevant to her social context. Conducting IDIs with culturally competent KIs from each CCM provided contextual data on the reasons behind our quantitative findings based on the experiences of women whom we know to be experts within a model.

Understanding transactional sex as a scale rather than a binary status variable promotes its conceptualization as a spectrum that manifests differently in different relationship types, rather than a categorical one-dimensional identity. This has implications for

interventions that seek to minimize relationship risk, but describe relationship characteristics that women may not identify or agree with, versus those that seek to support women who want to exit relationships with aspects they consider harmful (Baird et al., 2012; Dunbar et al., 2014; Tawfik and Watkins, 2007).

Our findings suggest that studies intending to measure the prevalence or associations of transactional sex may be better served if they adopt two main modifications: 1) Ask participants about items actually received from a partner, rather than relationship motive, to address the potential for social desirability bias resulting from participants' reluctance to admit to stigmatized behavior; and 2) Consider measuring transactional sex as a scale reflecting a spectrum of sexual-economic entanglement, rather than a binary relationship category. Further research is needed to determine the potential of developing a simplified list of items received that can be used across the region, or the possibility of developing regional, rather than country-specific, item based scales for cross country comparisons.

Measuring transactional sex using 3 different scales highlighted the divergent social risks and benefits across relationship models. All women must walk a careful tightrope to manage social and sexual reputations, financial needs, and financial obligations (Cole, 2004; Groes-Green, 2013; Kohler et al., 2007; Swidler and Watkins, 2007). Higher consonance with a transactional sex CCM was significantly associated with higher social status for aspirational and University models, with a more pronounced effect in the University model. This finding is consistent with ethnographic studies that have explored the role of consumer goods as symbolic capital among University students in particular, and some subsets of urban women in general (Cole, 2004; Masvawure, 2010). Conversely, the insignificant association between higher *inkhosikati* consonance and social status can be explained by our qualitative findings, which suggest that within these models social status is derived from the relationship itself — marriage — rather than the individual items received from a partner. For all women, however, being perceived as promiscuous or materially driven can severely compromise social status. KIs confirmed that financial support or a high status partner may increase a woman's social standing, but being seen as 'loose' or a 'gold digger' can harm her.

Increased gifts or support from a partner decreased condom use to a similar degree in all 3 relationship models, while the binary measure was not sensitive to condom use. While this may be a result of uneven power dynamics, as previous research suggests (Miller et al., 2011), our qualitative data suggests that financial support and gifts within a relationship are just as likely to demonstrate love and serious intent as economic coercion, and some women may choose to eschew condoms out of trust, affection, or even a desire for mutual pleasure, rather than a lack of agency.

The use of a cross-sectional clinic-based sample to validate our scale presents several limitations. The link between transactional sex consonance and condom use at last sex may be bi-directional: More gifts may decrease women's desire to use condoms with a partner, decreased condom use may increase a partner's gift giving or financial support, or both cases may be simultaneously true. A clinic-based sample may not be generalizable to the full population. Comparisons with a national household sample (SHIMS, 2012) and national ANC sentinel surveillance data (provided privately by Swazi Ministry of Health) suggest that women without primary or tertiary education may have been undersampled, along with women over the age of 45 (analyses not shown). While asking participants to report condom use at last sex is likely a more accurate measure than condom use frequency overall, the very high proportion of pregnant women reporting condom use at last sex suggests that this measure was subject to social desirability bias.

The clinic sample may also not necessarily match the convenience sample from which we derived our scales, however, average age and education were approximately similar to the freelist and rating convenience samples. Additionally, the eigenvalue ratio and average competence scores suggested that our rating sample was drawing from a known cultural model, and the derived scales were sensitive to both health behaviors and social correlates, suggesting that despite the disparate samples we have managed to capture and measure salient cultural domains. Despite these shortcomings, triangulating our qualitative and quantitative findings allows us to suggest possible causal links between transactional sex, condom use, and social status, and to report the link between transactional sex and decreased condom use with some confidence.

5. Conclusion

We measured transactional sex using three distinct emic scales that weighted items differently depending on the priorities of different relationship models. We found that the association between condom use and transactional sex, as well as between social status and transactional sex, varied depending on relationship model, and that all 3 scales were more sensitive to condom use and social status than a more traditional definition. While our scale is specific to Swaziland, the methods used were rapid and inexpensive, and are easily transferrable to other cultural settings. Similar approaches have been used globally to identify competing models of health knowledge, measure the health effects of cultural consonance, and define the process and effects of acculturation from one model to another (Brewis and Gartin, 2006; Broesch and Hadley, 2012; Hruschka et al., 2008; Sweet, 2010). Consensus modeling can create an emically grounded measure of a construct that is epidemiologically meaningful but difficult to operationalize. Because this approach bridges the divide between interpretivist and positivist approaches, CCMs are in important tool for areas of research, such as transactional sex, in which emic constructions of meaning and quantifiable risk surveillance are equally necessary.

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