Extended summary

Introduction: The landscape of existing family planning measures is shifting from a focus on contraceptive use- and behavior-focused metrics to those that center individuals' choice, preferences, and goals. A gap within this landscape are measures which can connect a person's *desire* for contraception with their *demand* for contraception.[1] One such connection point is *contraceptive acceptability*, or the degree of willingness to use a contraceptive method when pregnancy is not desired. This idea was first proposed by Fabic and Tsui, who suggested that existing frameworks of vaccine hesitancy may be useful in considering the degree to which individuals find contraceptive use acceptable.[2]

Contraceptive acceptability offers a unique lens through which to better understand the spectrum of contraceptive decision-making and (un)certainty, as it prioritizes individual perceptions and experiences, but situates those factors within the broader social and structural contexts in which those experiences occur. Being able to measure this construct would provide a key means of understanding and promoting choice and agency within family planning programs.

Cameroon and Kenya are important settings in which to examine contraceptive acceptability. Ministries of Health in both countries have prioritized family planning policies and have done so in very contrasting contexts. Only 20% of adult women in Cameroon use contraception, in contrast to 47% in Kenya, with distinct method mixes and levels of engagement in family planning decision-making.[3,4] Qualitative formative research from Cameroon and Kenya tested the extent to which the 5Cs framework of vaccine hesitancy[5] would translate to contraceptive acceptability. Results indicated that while some of the 5C constructs (namely, confidence, calculation, and constraints) were relevant to contraception in these settings, the framework overall required a greater emphasis on family responsibility, partner engagement, and norms around contraceptive use and childbearing.[6]

This paper shares the results of a mixed-methods, measure development study that aims to develop a measure of contraceptive hesitancy using existing conceptual frameworks and evidence, novel formative research, and quantitative measure development and testing. We present findings from our exploratory factor analysis aimed at item reduction, as well as scale reliability and validity psychometric assessments.

Methods: *Study design*. We conducted a mixed methods measure development study comprising formative research (in-depth interviews and focus group discussions), cognitive interviews, and pilot scale development surveys. The formative research, previously conducted in July-October 2023, informed the development of a draft measure of contraceptive acceptability. This draft measure was tested via cognitive interviews, refined, and piloted in a development sample of adult men and women. This study is being conducted by Agency for All, a USAID-funded project generating and applying evidence on agency, empowerment, and effective social and behavior change programs, with support from USAID's Bureau for Africa and Office of Population and Reproductive Health.

Setting. This study was set in four study sites in Cameroon (n=2) and Kenya (n=2). Each country included one urban and one rural site in Cameroon (Yaoundé and Nganha, respectively) and Kenya

(Mukuru and rural communities in Homa Bay, respectively). Cognitive interviews and pilot survey data collection occurred in March - May 2024.

Study sample. Participants were recruited using door-to-door screening and included men and women of reproductive age (21-49 in Cameroon, 18-49 in Kenya). Cognitive interviews were conducted with eight individuals per country (n=16 total). The pilot survey was conducted with 74 women and 28 men in Cameroon (n=102) and 75 women and 34 men in Kenya (n=109).

Analysis. Cognitive interviews were conducted on a draft 15-item contraceptive acceptability measure developed based on the results of a literature review and formative research in Cameroon and Kenya.[6,7] Cognitive interviews were analyzed using structured memos, which were reviewed for feedback on phrasing, comprehension, clarity, and response options. Results were compared across countries to ensure that measure item phrasing and structure was optimized for all study settings. Following cognitive interviews, three items were removed from the draft scale, and wording was adjusted on nine additional items; three items remained unchanged. Cognitive interviews compared response options of a five-point Likert scale versus a visual scale of smiley faces; the former were overwhelmingly better understood by cognitive interview respondents. Cognitive interviews also assessed the utility of a three-point Likert scale for response options, but the five-point scale remained preferred.

The contraceptive acceptability scale was therefore incorporated into the pilot survey with 12 items and a five-point Likert response scale. These items were spread across six domains that emerged from formative research, prioritizing relevance across contraceptive methods and types, and comprised: **Confidence** (‘*I am confident that the contraceptive method that I am using (could choose to use) is effective at preventing pregnancy’, ‘I am confident that using contraception will not affect my [or my partner’s] health’),* **Calculation** (‘*Having a baby when I did not plan for one would make it harder for me to achieve my goals’, ‘My past experiences with contraception make me more willing to use contraception in the future’)*, **Constraints** (‘*I can easily get my preferred contraceptive method if I wish to use one’, ‘I trust my health service provider to provide me [or my partner] with the information I need to make the best decision about contraception’)*, **Family responsibility** (‘*Using contraception can help me better take care of my family [when I have one]’, ‘My parents would be disappointed in me if I [or my partner] became pregnant when I did not plan for it’)*, **Partner engagement** ‘*I would use contraception [for men: (condoms or withdrawal)] whether or not my partner agreed’)*, and **Childbearing and contraceptive norms** (‘*People in my community expect me to start having children right after marriage’, ‘People in my community find it acceptable for an unmarried person to use contraception’,* and *‘My family and friends will always support my decision to use any contraceptive method’)*. Response options were strongly disagree, disagree, neither agree nor disagree, agree, strongly agree.

Pilot survey data was analyzed to assess psychometric performance of the contraceptive acceptability measure. Scale dimensionality was assessed through exploratory factor analysis using iterated principal factor method and a complementary review of eigenvalues, scree plots, and parallel analysis. Factor loadings were compared across unrotated, promax, and varimax rotations. Scale items were considered for exclusion based on factor loadings of ≤0.4,[8,9] uniqueness of ≥0.5,[10,11] and item-rest correlations of ≤0.4.[12] Items that were excluded based on these criteria were removed from the scale. Reliability was assessed using Cronbach’s alpha with a cutpoint of 0.60 as

acceptable.[13-15] Construct validity was assessed by testing associations between the contraceptive acceptability scale and outcomes with hypothesized associations with contraceptive acceptability, namely current contraceptive use ('*Are you or your partner currently doing something or using any method to avoid* pregnancy'; yes / no), contraceptive desire[16] ('*Do you currently want to be using any method to avoid pregnancy – that is, to do something to keep it from happening?*'; yes / no), contraceptive agency (defined as yes if responses to the following questions were concordant, and no if responses were discordant: '*Who would you say had the FINAL say in whether you or your partner use contraception - is it mainly your decision, mainly your partner's decision, did/should you both decide together, or was it someone else's decision?*' and *'Who do you want to make the decision of whether you or your partner use contraception?*'), and reproductive empowerment, as defined by the Reproductive Empowerment Scale.[17] Construct validity tests used multivariable regression analysis (logistic or linear based on the outcome variable in question), and adjusted for gender, study site, and respondent age. The p-value threshold for statistical significance was set at 0.10.[18]

Ethics. All participants provided written consent. Ethical approval was provided by the University of California San Diego Institutional Review Board, the National Ethics Committee for Research in Human Health in Cameroon, and the AMREF Ethics and Scientific Review Committee.

Results: Respondents in Cameroon were an average of 30 years of age, 76% were currently married, 54% were current contraceptive users, and 37% had never used contraception. Respondents in Kenya were an average of 30 years of age, 75% were currently married, 69% were current contraceptive users, and 26% had never used contraception.
Exploratory factor analysis indicated that the 12-item contraceptive acceptability scale had one or two factors, and that unrotated models were a better fit than rotated models in the two-factor models. Using known cutpoints for factor loadings, uniqueness, and item-rest correlations, nine items were eliminated from the original 12 items, leaving three items comprising one factor in the revised contraceptive acceptability scale: *I can easily get my preferred contraceptive method if I wish to use one, I trust my health service provider to provide me [or my partner] with the information I need to make the best decision about contraception*, and *Using contraception can help me better take care of my family [when I have one]*. The contraceptive acceptability scale score was calculated by adding up responses for all three questions comprised in the final scale, with strongly disagree=1, disagree=2, neither agree nor disagree=3, agree=4, and strongly agree=5, and dividing by three. The range of this score is therefore 1-5, with higher values indicating higher levels of contraceptive acceptability.

Contraceptive acceptability scale items had good reliability both overall in each country (α=0.85 in Cameroon and α=0.79 in Kenya), and across most key populations (Table 1). Contraceptive acceptability had a mean value of 4.1 in Cameroon and 4.4 in Kenya, and tended to be higher among women, people who had ever used contraception, and who were younger.

Table 1. Internal reliability of Contraceptive Acceptability Scale in Cameroon and Kenya.

			Gender		Site		Contraceptive use			Age	
		Total	**Women**	**Men**	**Urban**	**Rural**	**Current user**	**Past user**	**Never user**	**18-29**	**30-49**
	α	0.85	0.71	0.96	0.80	0.86	0.90	0.85	0.79	0.90	0.82

Cameroon (n=102)	Scale score	4.09	4.30	3.55	3.70	4.52	4.13	4.27	3.98	4.20	3.99
Kenya (n=109)	α	0.79	0.72	0.90	0.48	0.81	0.75	0.85	0.84	0.77	0.81
	Scale score	4.36	4.41	4.26	4.75	4.10	4.44	4.56	4.10	4.46	4.26

Associations of the three-item contraceptive acceptability scale with measures of contraceptive use and women's agency and empowerment demonstrate the construct validity of this measure. Higher levels of contraceptive acceptability were associated with current contraceptive use (OR=1.74, p=0.01), the desire to use contraception, irrespective of current use (OR=1.47, p=0.06), agency in contraceptive decision-making (OR=1.58, p=0.07), and reproductive empowerment (*B*=0.41, p<0.001) (Table 2).

Table 2. Associations of Contraceptive Acceptability Scale with contraceptive use, intention, agency, and empowerment in Cameroon and Kenya.

	Current contraceptive use		**Contraceptive desire**		**Contraceptive agency**		**Reproductive Empowerment Scale**
	No	**Yes**	**No**	**Yes**	**No**	**Yes**	
Contraceptive Acceptability Scale	REF	OR=1.74, p=0.01	REF	OR=1.47, p=0.06	REF	OR=1.58, p=0.07	*B*=0.41, p<0.001

Note: Multivariable models adjust for gender, study site, and age.

Discussion: The Contraceptive Acceptability Scale is a novel three-item measure assessing the degree to which people find contraceptive use acceptable. Psychometric analysis demonstrates strong internal reliability and construct validity of this measure among adult women and men in Cameroon and Kenya. We have prioritized cross-country comparability and brevity throughout scale development, from formative research to item reduction and psychometric analysis, resulting in measure that not only performs well in different populations in Cameroon and Kenya, but is short and feasible for inclusion in a variety of programmatic and survey-based data collection efforts. Importantly, this scale reflects contraceptive acceptability as a gradient between hesitancy to certainty. The desires, knowledge, beliefs, experiences, and contexts that inform contraceptive acceptability do not manifest as a binary, but rather reflect people's lived experiences across a nuanced range of perspectives. Being able to measure this variability offers an important opportunity to inform and strengthen family programming by quantifying the degree to which individuals feel comfortable with contraceptives. This information can be used for diagnostic purposes, to better understand why people initiate, switch, discontinue, or decline contraceptives, as well as to better focus programmatic activities on enabling people to make and enact contraceptive decisions aligned with their unique reproductive goals.

These results summarize reliability and validity testing from a measure development sample. Future work is in process to test the performance of the Contraceptive Acceptability Scale over time, in different populations, and for individual contraceptive methods. This measure offers an important contribution to person-centered family planning programming and expands the basket of measurement options available to better understand whether and why people use contraception, and to support their choice and agency to achieve their reproductive goals.

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