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Gender role orientation is associated with health-related quality of life differently among African-American, Hispanic, and White youth

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Abstract
Purpose This study examined the association between gender role orientation (GRO) and health-related quality of life (HRQOL) in youth, and how this relationship may differ between males and females as well as among African-American, White, and Hispanic individuals. GRO has been reported to influence serious health outcomes including cancer, heart disease, mental illness, and mortality rates. However, few studies have examined the link between GRO and health outcomes for children, even though gender identity is formed in childhood.

Methods Data were examined from 4824 participants in the Healthy Passages™ project, a population-based survey of fifth-grade children in three US metropolitan areas. Children reported their own HRQOL using the PedsQL and degree of female, male, and androgynous GRO using the Children's Sex Role Inventory.

Results Based on structural equations analysis, male GRO was positively associated with HRQOL for all racial/ethnic groups, regardless of sex, whereas female GRO was associated with better HRQOL for Hispanic and White females and poorer HRQOL for Hispanic males. Androgynous GRO was associated with better HRQOL among Hispanic and White females, but not males nor African-Americans of either sex.

Conclusions Racial/ethnic differences emerged for female and androgynous, but not male, GROs. Hispanic males are the only group for which GRO (female) was associated with poorer HRQOL. Future research should find ways to help youth overcome negative effects on health from gender beliefs and behavior patterns with sensitivity to racial/ethnic membership.

Keywords Gender role orientation · Early adolescence · Health · Quality of life · Race · Ethnicity

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the CDC.

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Introduction

Gender role orientation has a complex relationship with health and well-being. Gender differences emerge in adolescence for various aspects of health including depression and anxiety, and the engagement of risky behaviors [10, 46]. Defined as one's orientation with gender-typed personality traits and characteristics, including masculine, feminine, or androgynous dimensions [2, 7, 42], gender

roles become increasingly important in early adolescence. According to the gender intensification hypothesis, behavioral, attitudinal, and psychological differences between adolescent boys and girls increase and solidify with age, as a result of increased pressures to conform to traditional gender roles [17, 23]. Gender socialization encourages girls to display feminine characteristics (e.g., nurturance) and boys to display masculine characteristics (e.g., strength), which has been shown to impact various aspects of health [5, 12, 17, 26]. However, most research examining gender role orientation (GRO) and overall health has focused on adults, even though gender identities impact behavior as young as 3 years of age [15]. This study aims to examine the association between GRO and broadly construed health and well-being, and how the relationship may differ between male and female youth in different racial/ethnic groups.

Racial/ethnic differences in gender role orientation

There appear to be racial/ethnic differences in GRO, which have implications for health. African-American young men endorse more masculine norms than Whites and Latinos [13]. African-American girls are expected to prioritize their families and communities over their own health to the point of ignoring signals of illness and delaying treatment until crises begin [22, 25]. Hispanic adolescents emphasize relationships and family ties more strongly than other demographic groups [11] and have greater restrictions based on traditional gender roles compared to the normative culture in the USA [41, 54]. Adherence to culturally sanctioned, traditional gender roles are linked with greater well-being [30], whereas those adhering to gender roles opposite of their genders may experience some degree of distress from this conflict.

Health outcomes

The World Health Organization [53] defines health as "a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity." The majority of the research on health, however, has examined rates of mortality or specific health conditions in lieu of considering health broadly by this definition. We propose that children's own reports of their quality of life matches well this conception of health. One typical definition states that quality life for youth refers to "well-being in multiple domains of life considered salient in one's culture and time, while adhering to universal standards of human rights" [47]. When focusing on those aspects of quality life that overlap with the definition of health and typically examined in health research, we refer to health-related quality of life (HRQOL). HRQOL concerns how youth are able to engage physically in daily activities and feel about themselves and their lives, view their place among and relationships with others, and function in their major roles [47].

Gender role orientation and health

Meta-analyses have examined the research on the relationship between GRO and well-being only among adults thus far [14, 35, 49]. Contrary to older research [49], more recent meta-analyses [16, 35] generally found masculinity and gender role conflict to be negatively associated with health and health behaviors among adult men. Corresponding with previous mental health research [28], female African-American college students with greater masculine role orientations experienced reduced psychological functioning due to daily hassles, whereas feminine or androgynous role orientations buffered this relationship [7]. Certain aspects of femininity were associated with poorer body image among a diverse group of male and female college students [12].

Research on adolescent gender roles has generally been limited to mental health and risk behaviors. African-American, Hispanic, and White youth with high levels of masculinity reported lower levels of depression and anxiety [1, 5, 33, 36, 38]. Findings on risk behaviors vary depending on the outcome of interest. Substance use and injury risk behaviors are associated with masculine gender roles among youth from early childhood to late adolescence, regardless of gender [14, 15, 20]. In contrast, masculinity (without gender role conflict) was associated with fewer health risk behaviors among college students in other studies [27, 42].

Present study

There is a dearth of research on the association between GRO and health in youth despite that gender roles develop during childhood. Given some findings that GRO may vary across race/ethnicity, it will be important to examine further whether it is related differently to health across racial/ethnic groups. Moreover, because prior research has largely focused on psychological health outcomes and risk behaviors, it will be informative to apply a broader definition of health by considering the association between gender role orientation and HRQOL.

Therefore, we address the following questions: (1) Is GRO associated with HRQOL in youth? (2) Are there differences in these associations across the major racial/ethnic groups of African-American, Hispanic, and White? (3) Does the youth's sex moderate the association between GRO and HRQOL? We hypothesize that GRO will be associated with HRQOL in youth, but given the paucity of

research into health among diverse youth we are unable to formulate hypotheses concerning racial/ethnic and sex differences. We focus here on youth around age 10–11, at an important juncture in development at the cusp of adolescence and prior to transition to middle school.

Methods

Data were from Healthy Passages Wave I, a multi-site community study of health and health behaviors and their correlates among youth [39, 52]. Institutional review boards at all research sites approved this study.

Participants

Participants were recruited from public schools in three areas: (1) ten contiguous public school districts in and around Birmingham, Alabama, (2) 25 contiguous public school districts in Los Angeles County, California, and (3) the largest public school district in Houston, Texas. A cluster probability sampling procedure was used to recruit students from each area. Public schools within the three areas were randomly selected with probabilities proportionate to a weight representing the scarcity of a school's students relative to race/ethnicity targets. To ensure adequate sample sizes of (non-Hispanic) African-American, Hispanic, and (non-Hispanic) White students, we took a random sample of schools using probabilities that were a function of how closely a school's racial/ethnic mix corresponded to the site's racial/ethnic target. Information on the study was disseminated to the fifth-grade children in the 118 selected schools to bring to their parents (or caregivers), containing 11,532 students. Children were excluded from participation if they were not attending a regular academic classroom or if they or their parents could not complete interviews in English or Spanish.

A total of 6663 returned permission to be contacted of which 5147 (77 %) completed both a parent and a child interview. IRB did not allow for further contact with families that did not return the permission to contact form. To focus on the three major race/ethnic groups, the 6 % who were not identified as being African-American, Hispanic, or White were eliminated from the analysis. Of the 4824 constituting the final sample, the unweighted (weighted) distribution was 51 % (51 %) female, 36 % (30 %) African-American, 38 % (47 %) Hispanic, and 26 % (23 %) White and child age $M = 11.12$ (SD = 0.56). Additional demographics are provided in Table 1.

Procedures

Following standard procedures across sites, two trained interviewers met the child and parent at their home or an agreed-upon other location. The parent provided signed informed consent and the child signed assent. Parents could choose whether to complete the interview in English or Spanish (prepared using standard back translation). Interviews were conducted with the child and parent separately, in private spaces. Primary caregiver received $50 and children a $20 gift card for completing the interview.

Measures

Health-Related Quality of life (HRQOL) was measured with the self-report form of the Pediatric Quality of Life Inventory™ version 4.0 (PedsQL™) [44], a well-validated measure of children's HRQOL [e.g., 45]. The PedsQL provides subscale scores for physical (eight items, $\alpha = 0.72$ for the study sample), emotional (five items, $\alpha = 0.71$), social (five items, $\alpha = 0.76$), and school (five items, $\alpha = 0.66$) QL. This scale structure has been replicated across multiple racial/ethnic groups [29]. Each item asks how much a certain behavior has been a problem in the past month (e.g., it is hard for you to run; you feel afraid or scared). Responses are reported on five-point scales (0 = never a problem, 4 = almost always a problem), but scale scores are calculated such that higher scores indicate better HRQOL.

Gender Role Orientation was measured with an abbreviated version of the Children's Sex Role Inventory [4]. High internal consistency was demonstrated for the femininity and masculinity scales (average $\alpha = 0.81$) and stable test–retest correlations over 1 year (average $r = 0.60$) for the original 20-item scales [4]. Validity was supported by gender differences on both scales and confirmation of hypothesized relations between gender role categories and measures of sex-typed toy and activity preferences; self-perceptions of global self-worth, scholastic competence, social acceptance, athletic competence, physical attractiveness, and behavioral conduct; and cognitive performance [4]. Responses are reported on four-point scales (1 = very true of you, 4 = not at all true of you). As expected, internal consistency was reduced for the current abbreviated scales compared to the full version, but remained acceptable for the six-item female gender roles scale ($\alpha = 0.61$ for study sample) and five-item to male gender roles scale ($\alpha = 0.58$). Female gender role items assess helpfulness, liking small children, and empathy. Male gender role items assess leadership, confidence, and competitiveness. Scores were reversed such that higher scores indicated greater male and female GRO. In addition, androgyny was measured with the recommended formula [7, 42]: (masculinity score + femininity score) − (masculinity score − femininity score).

Child race/ethnicity was based on the parent's response when asked first whether the child belonged to any of

Table 1 Sample demographics

	Total analysis sample (n = 4,824)		African-American (n = 1,755)	Hispanic (n = 1,813)	White (n = 1,256)
	Raw n	Wtd%	Wtd%	Wtd%	Wtd%
Child's age (years)					
≤10	2,113	42	40	45	38
11	2,333	50	49	46	59
≥12	342	8	11	9	4
Highest education by parent					
<9th grade	677	19	2[a]	39[b]	0[a]
Some High School	537	13	12[a]	18[a]	4[b]
High School graduate	939	21	31[a]	19[b]	11[b]
Some college or 2-year degree	1,272	24	37[a]	17[b]	23[b]
Bachelor degree	760	14	13[a]	5[b]	35[c]
>Bachelor degree	532	9	6[a]	2[a]	27[b]
Household income as % FPL					
<100 %	1,542	38	47[a]	50[a]	7[b]
100–199 %	967	23	25[a]	28[a]	11[b]
200–299 %	599	13	14	12	13
300–399 %	338	7	6[a]	4[a]	15[b]
400–499 %	316	6	4[a]	3[a]	15[b]
≥500 %	680	13	5[a]	3[a]	40[b]
Household size					
2	633	12	18[a]	9[b]	10[b]
3	724	14	18[a]	10[b]	17[a]
4	1,312	27	23[a]	23[a]	38[b]
5	1,096	24	21	25	23
6	574	13	11[a]	17[a]	9[b]
>6	454	11	9[a]	16[b]	4[a]
Family structure					
2 Biological parents	2,186	48	2[a]	57[b]	65[b]
Other	2,604	52	79[a]	43[b]	35[c]

Wtd weighted (calculated with sampling weights), *FPL* Federal Poverty Level

[a,b,c] A different superscript (a, b, c) across a row indicates significant group differences by *Chi-square* test at $p < .05$

several Hispanic groups, followed by which of seven races applied. The child was classified as Hispanic if so indicated regardless of race category. Children not categorized as Hispanic were classified as African-American, White, or other (including multi-racial youth). The latter category was not included in the analysis sample due to small size.

Education was indexed by parent report of highest education completed in the household. This is considered the best indicator of SES for members of racial/ethnic minority groups [50], who do not receive the same financial gains for equivalent years of education as do Whites [21, 51]. Seven categories reflected the highest education completed (*<9th grade to >4-year college degree*).

Household income was indexed by net equivalent total household income in the past 12 months, transformed as percent of US federal poverty level, which takes into account household size. Higher scores indicate higher net household income.

Family structure was represented by whether the youth resides with both biological parents (0 = no, 1 = yes).

Household size was reported by the parent.

Statistical analyses

All analyses were performed with M*plus* version 7 using design weights to account for differential probabilities of selection of students according to their school and a cluster variable to account for clustering of students within schools [34]. All aims regarding association between GRO and HRQOL was addressed using multigroup structural equations model (SEM) analyses.

Measurement model

Initial exploration of a measurement model addressed whether male and female gender role orientation could be treated as latent variables based on item scores. However, there were several concerns including the reliance upon a single subscale and the unavailability of fit indices due to the model type required to process latent variable interactions. Therefore, male and female GRO needed to be treated as separate observed variables, each based on the composite of its scale items. Androgynous GRO was necessarily treated as an observed variable because it was calculated from an algorithm (see above). In contrast, the physical, emotional, social, and school scale scores formed a latent HRQOL factor, which effectively captured health across domains.

Measurement invariance across groups

Before any cross-group comparisons could commence, measurement invariance must be tested to ensure the measurement model for any latent variable is comparable across groups [43]. For this analysis, measurement invariance in the latent HRQOL variable was tested across racial/ethnic groups, for both the female/male and androgynous GRO model. Results are reported in Table 2. Changes in the comparative fit index (CFI) of 0.02 or less are indicative of factor invariance across the groups [6, 43]. For both the female/male and androgynous gender GRO models, model specification involved (a) invariant covariance matrices (the baseline model without a multigroup component), (b) configural invariance (the pattern of fixed and free factor loadings was held constant across groups, but the magnitudes of these loadings were not constrained to be equal), (c) metric invariance (the factor loadings were constrained to be equal), and (d) scalar invariance (the intercepts were constrained to be equal) across racial/ethnic groups [18, 43]. We also assessed for invariant uniqueness (the residual variances were constrained to be equal), but the change in CFI following scalar invariance was above the cutoff of 0.02, resulting in testing for invariant factor variances (the factor variances were constrained to be equal) becoming moot. Assessing invariant factor covariances (constraining the factors to be equal across groups) was not relevant for this model, because we only analyze a single latent factor (HRQOL). Likewise, invariant factor means (the factor means were constrained to be equal) could not be assessed because this did not achieve convergence. Thus, we concluded that a multigroup model with scalar invariance would be the best way to proceed for both the female/male and androgynous GRO models.

Structural models

Because the androgynous GRO variable was a composite derived from the male and female GRO scores, the association between HRQOL and androgynous GRO had to be tested separately from that with male/female GRO. Given our research questions, sex was included in the models (0 = females, 1 = males), along with the interaction between sex and the GRO scores. In addition, the models contained parental education, household income, and family structure as covariates of HRQOL. Household size was also explored as a covariate, but because it was not a significant correlate of HRQOL for any group it was not retained in the final model. Age was initially included as a covariate as well, but because it was not a significant correlate it was removed. Listwise deletion was used because the rate of missing was very low ($\leq$1.7 %). All estimates were standardized, in which each group's mean was subtracted from each value and then divided by the standard deviation, to enable comparisons across racial/ethnic groups.

For each model, several indices of fit are reported [19]: The comparative fit index (CFI) and Tucker–Lewis index (TLI) range from 0 to 1 and indicate the degree to which the model in question is superior to a null model, which specifies no covariances among the variables [3]. Values greater than 0.90 are considered to represent adequate fit of the model to the data. The standardized root mean residual (SRMR) is an absolute fit index indicating how well the model reproduces the sample data, preferably with a value of less than or equal to 0.09. The root-mean-square error of approximation (RMSEA) is a measure of the discrepancy of the model from the data per degree of freedom. An RMSEA of 0.06 or less is taken to be a good fit, and its standard errors allow construction of confidence intervals to examine whether RMSEA is less than or equal to 0.05. The Chi-square goodness-of-fit index (GFI) indicates the fit between the model and the data with higher values indicating worse fit. However, given that Chi-square is quite sample size dependent, it needs to be interpreted in combination with the other fit indices. Furthermore, the significance and valence of the predicted relationships in the model are important because a model can fit the data well without its paths reaching statistical significance.

Results

Although not an aim of this study, differences in HRQOL and GRO among the racial/ethnic groups are reported in Table 3 for descriptive purposes. White youth reported higher levels of HRQOL and SES than the other two racial/ethnic groups, as has been reported elsewhere [38].

Table 2 Tests of female/male as well as androgynous gender role orientation measurement invariance across racial/ethnic groups

Model	Female/male gender role orientation						Androgynous gender role orientation					
	df	χ^2	SRMR RMSEA	CFI TLI	$\Delta\chi^2$ (Δdf)	ΔCFI	*df*	χ^2	SRMR RMSEA	CFI TLI	$\Delta\chi^2$ (Δdf)	ΔCFI
0. Invariant covariance matrices	26	165.025*	0.023	0.968	–	–	20	139.57*	0.022	0.972	–	–
			0.035	0.953	–				0.037	0.958	–	
1. Configural invariance (1 vs. 2)	78	252.049*	0.026	0.958	89.454	−0.018	60	209.338*	0.026	0.963	90.992	0.019
			0.039	0.939	(12)				0.041	0.945	12	
2. Metric invariance (2 vs. 3)	90	341.503*	0.046	0.940	0	0	72	300.33*	0.052	0.944	0	0
			0.044	0.923	(0)				0.047	0.929	(0)	
3. Scalar invariance (3 vs. 4)	90	341.503*	0.046	0.940	84.842* (8)	−0.019	72	300.33*	0.052	0.944	81.95*	−0.019
			0.044	0.923					0.047	0.929	(8)	
4. Invariant uniqueness (4 vs. 5)	98	426.345*	0.076	0.921	1319.793* (3)	−0.316	80	382.28*	0.088	0.925	1299.20* (3)	−0.321
			0.048	0.908					0.051	0.916		
5. Invariant factor variances (5 vs. 6)	101	1746.138*	0.141	0.605	–	–	83	1681.47*	0.163	0.694	–	–
			0.106	0.554					0.115	0.571		
6. Invariant factor covariances (6 vs. 7)	Not applicable to this model						Not applicable to this model					
7. Invariant factor means	No convergence						No convergence					

df degrees of freedom, *SRMR* standardized root mean residual, *RMSEA* root-mean-squared error of approximation, *CFI* comparative fit index, *TLI* Tucker–Lewis index. *Δ*, change; –, denotes that that this statistic is not applicable in the current model

* $p < .01$

Table 3 Disparities in HRQOL, gender role orientation, and SES associated with race/ethnicity

Variable (range)	African-American		Hispanic		White		Wald F	R^2	Post hoc differences
	Mean	SE	Mean	SE	Mean	SE			
Emotional HRQOL (0–100)	70.40	0.62	67.52	0.58	73.75	0.81	19.03***	0.02	W > AA > H
Social HRQOL (0–100)	76.61	0.66	76.96	0.61	81.52	0.80	13.83***	0.01	W > AA, H
School HRQOL (0–100)	72.20	0.58	73.48	0.52	77.47	0.79	18.68***	0.01	W > AA, H
Physical HRQOL (0–100)	84.05	0.41	81.95	0.47	87.42	0.40	42.40***	0.02	W > AA > H
Female GRO (0–4)	3.09	0.02	2.99	0.02	3.10	0.02	8.49***	0.01	AA, W > H
Male GRO (0–4)	2.88	0.02	2.60	0.02	2.87	0.02	116.45***	0.06	AA, W > H
Androgynous GRO (0–8)	6.18	0.03	5.99	0.04	6.20	0.05	8.49***	0.01	AA, W > H
SES: parental education (0–7)	2.72	0.05	1.96	0.07	3.57	0.07	130.34**	0.32	W > AA > H

After a Bonferroni correction, $p < .006$ indicated significant racial/ethnic differences, yet all Wald F tests are significant at $p < .001$; > indicates higher levels reported

SE standard error, *HRQOL* health-related quality of life, *GRO* gender role orientation, *W* White (non-Hispanic), *A* African-American (non-Hispanic), *H* Hispanic

*** $p < .001$

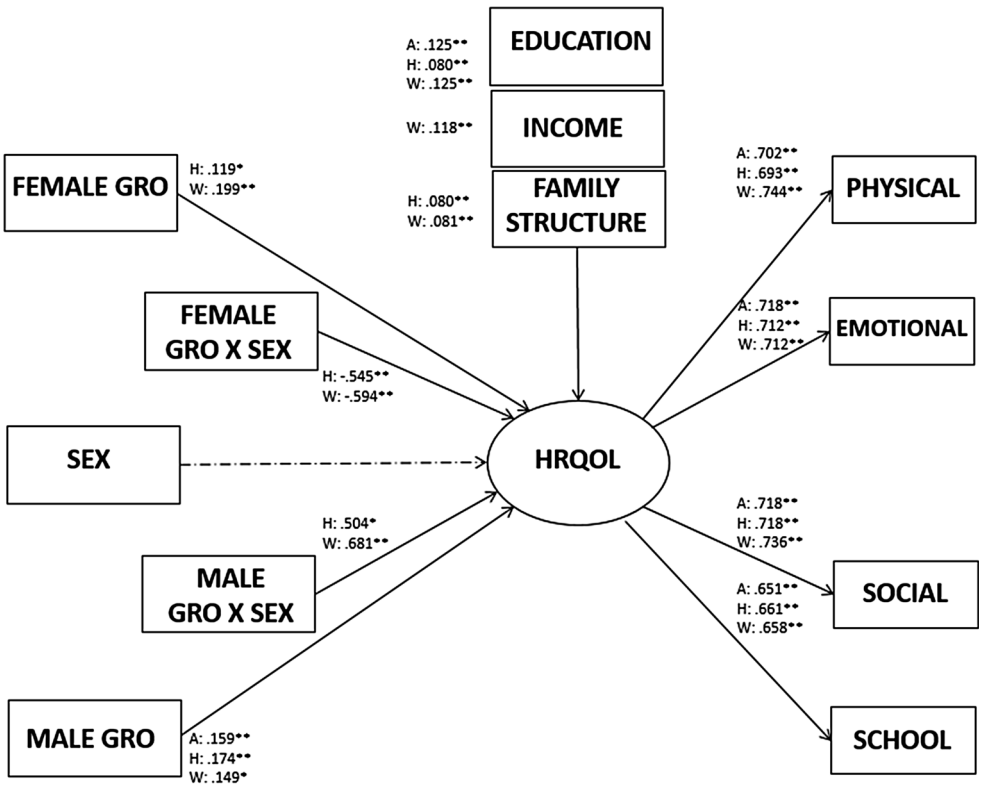

Fig. 1 Female and male gender role orientation model. All of the estimated path weights are standardized to enable group comparisons. Only significant path coefficients are included and nonsignificant paths are denoted by *dotted lines*. Path coefficients are indicated by *A* African-American, *H* Hispanic, *W* White. *HRQOL* health-related quality of life, *GRO* gender role orientation **$p < .01$; *$p < .05$

African-American and White youth reported higher levels than Hispanic youth of female, male, and androgynous GRO.

Female and male gender role orientation

Figure 1 depicts the results from the first multigroup SEM analysis, which assessed whether racial/ethnic and sex differences exist in the association between female or male GRO and HRQOL, controlling for parental education, household income, and family structure. The model fit the data well: CFI = 0.940, TLI = 0.923, SRMR = 0.046, RMSEA = 0.044, 90 % CI on RMSEA = 0.039–0.049, $\chi^2_{(90)} = 341.503$, $p < .001$. Higher male GRO was associated with better HRQOL among African-American, Hispanic, and White youth ($\beta = 0.159$, SE = 0.041; $\beta = 0.174$, SE = 0.049; $\beta = 0.149$, SE = 0.066, respectively). Among Hispanic and White youth, higher female GRO was also associated with better HRQOL ($\beta = 0.119$, SE = 0.057; $\beta = 0.199$,

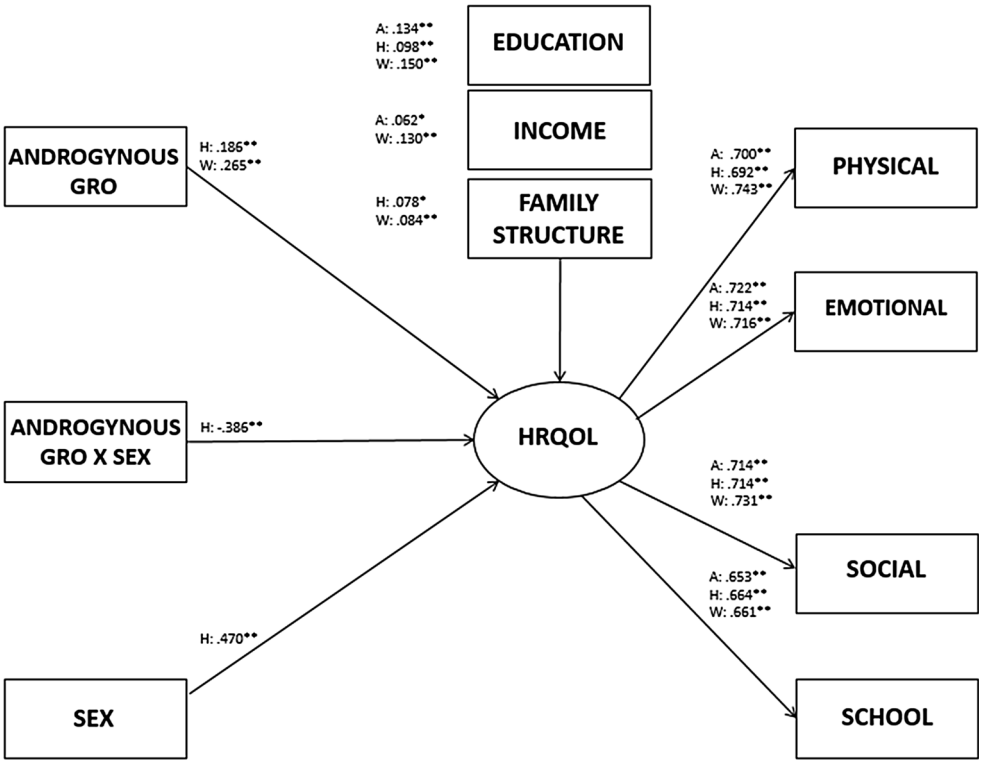

Fig. 2 Androgynous gender role orientation model. All of the estimated path weights are standardized to enable group comparisons. Path coefficients are indicated by *A* African-American, *H* Hispanic, *W* White. *HRQOL* health-related quality of life, *GRO* gender role orientation
$^{**}p < .01$; $^{*}p < .05$

SE = 0.065, respectively). Interactions between sex and both female and male GROs were associated with HRQOL among Hispanic ($\beta = -0.545$, SE = 0.195; $\beta = 0.504$, SE = 0.225, respectively) and White ($\beta = -0.594$, SE = 0.198; $\beta = 0.681$, SE = 0.236, respectively) youth. More specifically, female GRO was associated with better HRQOL among Hispanic and White females, lower HRQOL among Hispanic males, and not at all among White males. Male GRO was associated with better HRQOL for both sexes, but more strongly for males.

Androgynous gender role orientation

Figure 2 depicts results from the second multigroup SEM analysis of association between androgynous GRO and HRQOL, controlling for parental education, household income, and family structure. The model fit the data well: CFI = 0.944, TLI = 0.929, SRMR = 0.052, RMSEA = 0.047, 90 % CI on RMSEA = 0.041–0.052, $\chi^2_{(72)} = 300.331$, $p < .001$. Androgynous GRO was associated with better HRQOL across racial/ethnic groups ($\beta = 0.095$, SE = 0.052; $\beta = 0.186$, SE = 0.054; $\beta = 0.265$ SE = 0.055 for African-American, Hispanic, and White, respectively). Interactions between sex and gender roles were significantly associated with HRQOL for Hispanic and White youth ($\beta = -0.386$, SE = 0.154; $\beta = -0.339$, SE = 0.198, respectively), where androgyny was associated with better HRQOL among females but not males.

Discussion

The results indicated that GRO generally is associated with HRQOL in 10- to 11-year-old youth, beyond sociodemographic variables. Male GRO was positively associated with HRQOL for all racial/ethnic groups, whereas female GRO was associated with better HRQOL for Hispanic and White females, with poorer HRQOL for Hispanic males, and not at all for African-American youth of either sex. Androgynous GRO was associated with better HRQOL among females, but not males in Hispanic and White groups, and not at all in African-American youth.

These results are consistent with previous studies suggesting that male GRO is linked with better mental health and lower engagement in risk behaviors [1, 5, 27, 33, 38, 40, 42]. The lack of positive associations of androgynous and female GROs with HRQOL among males may stem from the increasing importance of gender conformity during early adolescence. Because the sample consists of young adolescents, adherence to female gender roles possibly results in peer rejection [8, 48]. Moreover, the prevalence of machismo among Hispanics may explain why female GRO is associated with poorer HRQOL, consistent with reports of its association with anxiety [5, 9].

It may be speculated that androgynous gender roles are associated with better HRQOL among African-American girls because demonstrating leadership and autonomy can be helpful when confronted with challenges more common

in their experience, such being raised by a single parent where supervision and support may be less available [32]. White girls, both nationally and within this sample, are more likely to come from higher SES households in which having orientations toward caring and empathy may be more normative and do not generally result in pressures to neglect their own health [25]. This may partly explain why female and androgynous GROs are associated with higher HRQOL in those groups.

Given the positive associations between male and androgynous GROs with HRQOL, it may be fruitful to examine the circumstances in which these gender roles are helpful, but also whether masculinity becomes detrimental to health later in adolescent development. Iwamoto and Smiler [20] concluded that in addition to being male, masculine norms endorsed by both boys and girls predicted engagement in risky behaviors, which in turn have been associated with reduced life satisfaction [37]. Furthermore, outcomes contributing to the gender gap in mortality, such as unintentional death due to risky behaviors, which are most common among adolescent males, may be linked to male GRO but be independent from self-reported HRQOL [46]. This indicates possible developmental differences in the relationship between male GRO and health, as well as being dependent on what aspect of health is considered. That is, gains in perceived well-being during adolescence and adulthood might become offset by increased physical health risks related to risk behaviors. It will be interesting to pinpoint this convergence over the course of development during adolescence into young adulthood.

Among limitations in this exploratory research is employing a cross-sectional design, making attributions of causality impossible. Because this study was conducted in three metropolitan areas in the USA, findings may not generalize to the overall population of similarly aged youth. Moreover, the reliability of our measure of GRO is marginally adequate ($\alpha = 0.61$ and $\alpha = 0.58$ for female and male scales, respectively), likely due to it being abbreviated from in each case 20 to six and five items, respectively, in this large-scale epidemiological survey study. This scale is also unidimensional, which may make comparisons with studies based on multidimensional measures of GRO [26] difficult. The PedsQL School subscale likewise produced relatively low internal consistency reliability. Additionally, other factors such as pubertal status and social support may moderate or mediate these findings, which should be examined in the future research. Finally, potential biases of self-report data must be acknowledged.

Nonetheless, to our knowledge, this is the first study to examine the association between GRO and broadly construed health and well-being in young people, especially in diverse groups. Recognizing that the present findings need to be replicated first, potential implications include that racial/ethnic minority youth in particular may benefit from becoming aware of socially constructed gender roles including their potential flexibility and impact on emotional expression, tendencies to engage in risky behaviors, and perceptions within and external to their own culture. Goals for any interventions to these ends could include encouraging leadership and competitiveness coexisting with empathy and kindness. Moreover, contrary to previous research suggesting that Hispanic youth exhibit especially strong adherence to traditional gender roles [41], Hispanic youth exhibited lower levels of all three GROs despite their positive associations with HRQOL, although absolute differences were small. Taking our findings at face value could suggest it may be preferable for general health and well-being to encourage male GRO among African-American, Hispanic, and White youth and androgynous GRO among Hispanic and White female youth.

Understanding attitudes and behaviors tied to health are particularly relevant among African-American and Hispanic youth, because racial/ethnic minorities are more likely to be underprivileged in our society and have restricted access to resources and services, making them more vulnerable to health problems [24]. Additionally, adults adhering to traditional masculine norms report fewer health promotion behaviors (e.g., exercising, seeking social support) and more health risk behaviors (e.g., substance abuse) [7, 31]. Therefore, as GROs solidify across adolescence and health behaviors assert an influence on health status over time, encouraging healthy gender role beliefs in childhood will be important. Future research will have to investigate whether changes in gender role beliefs can be accomplished through education and parenting practices. Alternatively, social-contextual influences on gender roles may have to change for children to have options in developing on the continuum from masculine to feminine oriented behavioral styles that will project healthy outcomes.

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