

Curriculum for Math Models to Assess Black Family Functioning - A Rational

Created by Roland Lucas
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The measure of a family's stability is its resourcefulness, its ability to adapt to environmental realities and challenges in ways that help the family unit meet its needs. Black families utilize specific strengths in attempting to meet the needs of its members (kinship bonds, strong work orientation, strong achievement orientation, adaptability of family roles, and a strong religious orientation).

The importance of Black family math models is in its utility for examining family dynamics.

The task of building African-American family strengths requires a plan or model that will serve to guide African-American reconstruction while protecting its integrity as uniquely African and American. As such, the reconstruction model should help to: (1) clarify the real world position and purpose of African-American families in the context of a fundamentally hostile, non-supportive and racist/oppressive environment; (2) reveal the specific and varying conditions which affect and influence African-American family life development; and (3) prescribe and excite solutions or remedies to the downward spiral of the African-American family's material and spiritual condition. In effect, the model should serve as an instrument of family praxis (processes that help reach self defined family goals for its members)." ~ seeking the Sakhu, by Wade Nobles

To properly assess the health of African families in the American context, it is necessary to first define the purpose of African families from an African centered perspective. In so doing we will then be in a position to ask, "how are African families fairing in terms of fulfilling its self defined purpose"? The organizational purpose of the African family according to Nobles,

"The family's reason for being should be considered child-centered. By this is meant that the purpose of the African-American family focused on, if not required, the presence of children. The family unite exists for the growth and development of children, rather than for the self-actualization of the adult members of the unit. Relative to the centrality of children in African-American family life, it should be pointed out that childrearing or socialization is the most important aspect of Africa-American reality."

Recognizing that there are internal and external factors impacting the integrity of African families in the American context, assessments of the health of African families will necessarily involve constructing models that reveal how the purpose of African families is being fulfilled by internal cultural factors and by external societal factors. It is understood that the forces within the wider American societal context that the African family functions in can modify internal cultural factors these families negatively or positively. Referring to such internal factors, Nobles points out "The task of building African-American strengths represent the reclamation of parenting techniques, which reflect and respect the mentioned purpose of families. The indigenous cultural system of African and African-American communities can serve as a natural inoculation against inappropriate and dysfunctional family life by parenting through Afrocentric principles.

- Unconditional love – desire to pure love
- Reciprocity – action to perfect sacrifice
- Restraint – action to perfect sacrifice
- Responsibility – desire to perfect love
- Adaptability – thought to clear understanding
- Inclusivity – desire to perfect love
- Respect – action to perfect sacrifice

A model that assess the healthy functioning or dysfunction of an African family in the American context should consider the affective attitudes and actions by members of African-American families with regards to the above parenting techniques. This would then be an important gauge in answering, "How are African families fairing in terms of fulfilling its self defined purpose?"

A math student would develop a model that would give quantitative values to how these principles are being enacted in a family, thus giving an overall assessment of Black family life.

Cultural identity

Another broad area that fits under the category of internal factors impacting the over all health of Black families is cultural identity. According to Nobles:

It is important to note the connection between a people's cultural traditions and their psychological self-worth and self-esteem. In regards to the psychology of a people, the principle of "Identity" reveals and determines the form in which a people's human energy is structured. Identity is recognized as the component or aspect of oneself that best approximates who and how you are. By providing the symbolism of one's conceptual universe and the dynamic affirmations of one's operational process, culture clearly influences the form in which a people's human energy is structured. Accordingly, for any particular group of people, when their cultural symbols lose their

legitimacy, and, thereby their power to compel thought and action, they lose at the same time the power to determine how their human energy is structured. Then psychological disruption will occur in that people.

One of the purposes or functions of culture is to give people the capacity to act and to re-act in relation to their material/spiritual condition and their own self-vested interest as defined by the conceptual universe (their ontology). In this regard Fanan. Sarason as well as others have made the point that the destruction of a people's indigenous culture is the necessary requisite to effective colonization and political domination of the people. Hence, to dominate or oppress a people requires the on usurp a people's cultural integrity and the best way to usurp a people's culture is to have their tool of development and transformation, i.e. the family to be cultureless or acculturated to an alien cultural form.

External factors

Some essential questions:

How are social forces and public policies impacting the Black family's ability to provide the needs of its members?

- What are the minimal resources needed to survive in the American context?
- What are materials needs and social policy imperatives of Black families from African centered perspectives that go beyond mere survival?
- What are the common goals, cultural values, norms, and roles that give rise to these needs?

External factors that negatively or positively impact or reveal the health of African families include:

- Unemployment / poverty
- Low numbers of Black businesses to anchor the economic health of Black communities/families
- Security and safety / violence
- Social isolation of the elderly
- Environmental pollutants
- Poor health care
- Poor nutrition
- Poor housing
- Low level of educational attainment / high dropout rate
- Lack of African centered schooling
- Teen pregnancy

- Increase in single parent households
- Over reliance on welfare
- High stress levels and diseases
- Increase in drug use
- Low participation with Black religious bodies

A math student would develop trend models that account simultaneously for all these areas, and thus give an overall assessment of Black family life. The areas would be given weighted values by the social analyst, for whom the model is constructed, determining the relative importance of any one area to the overall integrity of the Black family.

Model for Analysis of an Individual Family

- Score and report on External health factors
 - Weigh components for external factors – the weights should be acquired from both the individual family member from a survey and also from experienced judgment of the social scientist.
 - Obtain percentage of ideal health in each component from survey questions
 - Obtain a weighted score across all components
- Score and report on Internal health factors
 - Weigh components for internal factors - the weights should be acquired from both the individual family member from a survey and also from experienced judgment of the social scientist.
 - Obtain percentage of ideal health in each component from survey questions
 - Obtain a weighted score across all components
- Score and report on cultural identity health factors
 - Weigh components for cultural identity factors – the weights should be acquired from both the individual family member from a survey and also from experienced judgment of the social scientist.
 - Obtain percentage of ideal health in each component from survey questions
 - Obtain a weighted score across all components
- Score weighted average between Internal, External, and Cultural identity factors to give overall family health score. The social analyst gives weight of the 3 overall factors. An even 1/3 split is the default.

Individual family health models scaled up to larger aggregates of city, state, and national levels.

- Trend data on any component area impacting individual families can be obtained from reporting agencies on local, state and national levels.
 - Elementary statistical analysis
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- Trend results on any component area impacting individual families can be “rolled up” into community trends, city trends, state trends, and national trends.
 - Elementary statistical analysis
- Component areas impacting individual families are assigned weights in the model by social scientist.
 - Midlevel statistical analysis
- Combining some or all trend data from weighted component areas creates comprehensive trend models.
 - Midlevel statistical analysis
- Facility is given to comparing like trend data from multiple demographic groups.
 - Functional analysis is performed on trend lines - Midlevel statistical analysis
 - Maximum, Minimum, and other critical points
 - Rates of change functions can be generated over trend lines
- Raw data contained in Excel spread sheets.
- Statistical results ported to spread sheets for further processing.
- Perform factor analysis to see what components will trend in direct relationship with others, and possibly arrive at conclusions of causations and remedies. – Upper-level statistical analysis

All trend data in component areas must be converted into a percentage of optimal health over time as defined by the African centered social scientist. The component area is weighted. With this conversion and weight assignment, we have the means of modeling the overall health of African families, as a percentage of optimal functioning as defined by the social scientist and/or individual families. The user of the model can adjust weights for component areas dynamically.

A model of collective external factors will include the following component areas:

- Unemployment / poverty
- Low numbers of Black businesses to anchor the economic health of Black communities/families
- Security and safety / violence

- Social isolation of the elderly
- Environmental pollutants
- Poor health care
- Poor nutrition
- Poor housing
- Low level of educational attainment / high dropout rate
- Lack of African centered schooling
- Teen pregnancy
- Increase in single parent households
- Over reliance on welfare
- High stress levels and diseases
- Increase in drug use
- Low participation with Black religious bodies

Key math skills involved:

- Weighted averages
- Calculating percent
- Scattered plots and creating trend lines
 - Understanding and using functions
- Predicting future outcomes based on trend lines
- Performing function transformations
- Performing function analysis
 - Increasing / decreasing; Maximum / minimum, average rates of change; Finding zeros of polynomial functions
- Using technology
 - Excel spreadsheets
 - Desmos.com - graphing tool

Grades for Component Areas that Measure Family Health

How do the listed external factors, that negatively or positively impact or reveal the health of African families, translate into functionality in a single family?

- Unemployment / poverty → Low income levels in low ratio to # of dependents adding to stress
- Low numbers of Black businesses to anchor the economic health of Black communities/families → Income from self owned business ventures, as a component of overall income.
- Security and safety / violence → Experienced adding to stress
- Social isolation of the elderly → Experienced adding to stress
- Environmental pollutants → Experienced adding to stress
- Poor health care → Experienced adding to stress
- Poor nutrition → Experienced adding to stress / Lethargy

- Poor housing
- Low level of educational attainment / high dropout rate
- Lack of African centered schooling
- Teen pregnancy
- Increase in single parent households
- Over reliance on welfare
- Diseases
- Increase in drug use
- Low participation with Black religious bodies

These component areas need to be placed under a factor (correlation) analysis to how they each relate to high mortality rates among children, loss of children to foster care or to non-biological parents, suicide rates, and disowning of family members. This in it's self is a longitudinal study. In the mean time the model will allow the social scientist to assign values to each component area as to how it impacts the overall health of the individual family. The answer to the weighted analysis is "What percent of good health is the family functioning at?"

Project – Individual Family Model

- Find a free teacher grade book tool on the Internet or as an Excel template. (<http://www.vertex42.com/ExcelTemplates/gradebook.html>) The grade book will be used to model the health of families.
- The created classes will correspond to individual families
- The students in the classes will correspond to family members
- The assignments will correspond to the component areas that measure family health. Each family member has her own assignment. If a component is not applicable the score may be left blank.
- The weights will be assigned to how important the "social scientist" or family member thinks each component area is to the overall health of the family. The grade book should handle these weight assignments.
- Grades in each component area will be a percentage of 100% functionality.
- The "family specialist" based on survey responses received by the family will assign the grade for a component.

Project – Model of Families in a Region for a Specified Year

- The created classes will correspond to a particular demographic area
- The students in the classes will correspond to individual families in the same area. This data can be accumulated from the Individual family model or entered directly.
- The assignments will correspond to the component areas that measure family health.

- The weights will be assigned to how important the “family specialist” or family members think each component area is to the overall health of the family. The grade book should handle these weight assignments.
- Grades in each component area will be a fraction of 100% functionality.
- The grade for a component will be assigned by the “social scientist” based on survey responses received by the family.

Project – Aggregates of Family Health Measures Across All Families by Region and Year

- The created classes will correspond to a particular cluster of Component Areas (Combine employment, education, mortality rates) in a demographic region (i.e. city or state) for a given year.
- The students in the classes will correspond regional area (i.e. state).
- The assignments will correspond to the component areas that measure family health.
- The weights will be assigned to how important the “family specialist” or family members think each component area is to the overall health of the family. The grade book should handle these weight assignments.
- Grades in each component area will be a fraction of 100% functionality.

Project – Yearly Trends of Family Health Measures Across by Region

- The created classes will correspond to a particular cluster of Component Areas (Combine employment, education, mortality rates) in a demographic region (i.e. city or state) for a given year.
- The students in the classes will correspond regional area (i.e. state).
- The assignments will correspond to the Aggregate Health Measure for families in the region.
- The weights for assignments will be the same across years.
- Overall grade averages will be that of family health over the years of acquired data per state.

What questions can these models help answer?

- How has the overall health of Black families changed over time?
- What is the average rate of change of Black family overall health between two given years?
- Is the current rate of change of Black family overall health increasing or decreasing?
- When what Black family overall health the lowest/highest according to the data?
- What components of Black family overall health change together and how strongly?
- What states have the highest/lowest levels of Black family overall health?

- What states are improving in Black family overall health?
- What is the projected family overall health for a given state in 5 years?
- What year can we anticipate a given state to pass another state in family health
- In the sample data from submitted surveys, how are families ranking the importance of the components of family health? Is this ranking in line with what the social scientist has learned about what are the more important contributing factors in Black family healthy functioning?
- How does Black family health compare with the health of other racial groups, across selected component measures? Is the gap widening or narrowing?
- Which how are the components measures of family health changing with respect to each other over time? (i.e. is the increase in single parent homes significantly related to decrease in overall health of the family?)
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