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Strategy Workshop:

Psychology on the MCAT

Psychological, Social, and Biological Foundations of Behavior Passage 1 (Questions 1-5)

Researchers sought to connect maternal stress to low birthweight by examining a population of 130 low socioeconomic-status women from the Los Angeles metro area. Scientists hypothesized that maternal stress was linked to low birthweight due to hormonal and other physiological changes associated with stress, such as elevated catecholamine levels, decreased visceral blood flow, and elevated cortisol levels.

The study participants were all women seeking prenatal care at free clinics. Participants were enrolled only if they were over the age 18 and under 40, presented for their first appointment within the first two months of pregnancy, and continued prenatal visits throughout pregnancy. Women were interviewed at each prenatal appointment, at least five times each, and on average seven times throughout pregnancy. Researchers noted that at these free clinics there were no Spanish-speaking doctors, despite over half of study participants only speaking Spanish. Doctors also spent very little time with each patient and seemed too rushed to discuss health concerns fully with each patient.

An index of the latent variable stress was created through assessments of three different factors: environmental (event) stress, perceptions of stress, and affective responses to stress. The first was measured by asking the women to report on adverse life events that happened to friends and family (everything from mundane stressors like moving, to larger stressors like losing a job, to potential trauma like being a victim of a crime were included). Perceptions of stress were assessed through surveys about how the adverse life events were perceived, ranging from "not at all stressful" to "extremely stressful". Finally, affective response was measured through anxiety inventories.

Finally, patients were also extensively interviewed about their medical background, especially with respect to medical conditions that present serious risk during and after pregnancy and labor to generate a "medical risk" score. Birthweight was measured in grams as a continuous variable, rather than classifying the newborns in broad categories. This more specific data allowed the correlations developed below to be analyzed with a high degree of statistical significance.

Figure 1 Correlation matrix of study results

	Stress	**Event distress**	**Perceived Stress**	**Anxiety**	**Medical Risk**	**Birthweight**
Stress	1	0.44	0.84	0.80	0	-0.31
Event Distress		1	N/A	N/A	0	-0.18
Perceived Stress			1	N/A	0	-0.28
Anxiety				1	0	-0.29
Medical Risk					1	-0.15
Birthweight						1

1. The research described in the passage, which takes into account numerical measures of birthweight, survey reports of anxiety, and reports of life events related to friends and family best fits under what model of public health analysis?

A) Medical model
B) Biopsychosocial model
C) Psychosocial model
D) Cohort study

2. Which of the following identifies a potential methodological flaw in the study?

A) The study's sample size was far too small to allow for correlations with any statistical significance to be drawn.
B) By only assessing maternal and not paternal stress, researchers missed out on key data that would be essential to assessing the effect of parental stress on fetal health.
C) It is already well known that low birth weight correlates with preterm labor so the research findings are redundant.
D) By only working with women who had already chosen to come in for prenatal care very early in their pregnancies and to receive very frequent prenatal checkups, the researchers were working with a sample that may be unrepresentative.

3. According to the study results, which of the following women would be most likely to give birth to a low birthweight baby?

A) A first-time mother who was many years younger than the average age in the study
B) An unmarried woman with several medical risk factors but almost no event distress
C) A woman who reports a high level of anxiety and perceived stress but a low medical risk
D) A Latina woman with strong social networks and a large amount of event distress but low anxiety

4. Assessing a latent variable like stress through a series of surveys that create numerical results is an example of:

A) operationalization.
B) ethnocentrism.
C) medical bias.
D) external validity.

5. The study found that medical risk was not correlated with stress, despite the natural assumption that a woman who has many risk factors would be expected to experience stress about those factors. This lack of correlation may best be explained by:

A) the unusually robust health of study participants.
B) the fact that the women in the study were too focused on their high level of distressing life events to worry about their own medical risk factors.
C) the mothers' unawareness of their risk factors.
D) cultural differences between the doctors and patients.

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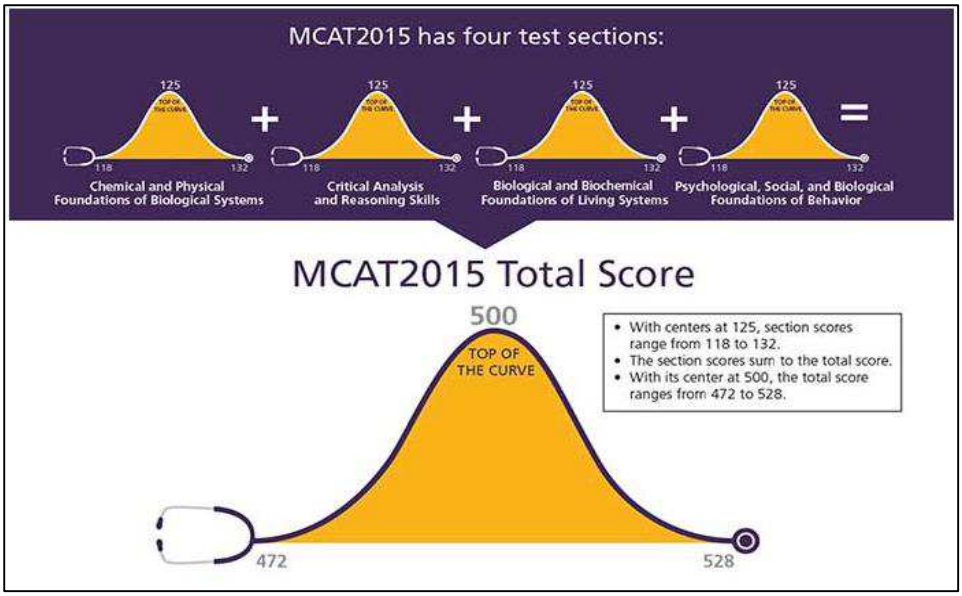

MCAT 2015 Pre-Reqs Next Step Suggests:

Biology: 2 to 3 semesters
Chemistry: 2 semesters
O-Chem: 1 to 2 semesters
Physics: 2 semesters
Biochemistry: 1 semester
Psychology: 1 semester
Sociology: 1 semester
Statistics: 1 semester
Humanities: 1-3 semesters

Answers and Explanations

Psychological, Social, and Biological Foundations of Behavior Passage 1 (Questions 1-5)

Researchers sought to connect maternal stress to low birthweight by examining a population of 130 low socioeconomic-status women from the Los Angeles metro area. Scientists hypothesized that maternal stress was linked to low birthweight due to hormonal and other physiological changes associated with stress, such as elevated catecholamine levels, decreased visceral blood flow, and elevated cortisol levels.

Cause and effect: stress causes changes to blood flow and hormone levels
Opinion: researchers hypothesized that maternal stress leads to physiological changes that lead to low birthweight

The study participants were all women seeking prenatal care at free clinics. Participants were enrolled only if they were over the age 18 and under 40, presented for their first appointment within the first two months of pregnancy, and continued prenatal visits throughout pregnancy. Women were interviewed at each prenatal appointment, at least five times each, and on average seven times throughout pregnancy. Researchers noted that at these free clinics there were no Spanish-speaking doctors, despite over half of study participants only speaking Spanish. Doctors also spent very little time with each patient and seemed too rushed to discuss health concerns fully with each patient.

Key terms: various factors limiting study participants
Opinion: researchers noted the seemingly substandard care the women were getting

An index of the latent variable stress was created through assessments of three different factors: environmental (event) stress, perceptions of stress, and affective responses to stress. The first was measured by asking the women to report on adverse life events that happened to friends and family (everything from mundane stressors like moving, to larger stressors like losing a job, to potential trauma like being a victim of a crime were included). Perceptions of stress were assessed through surveys about how the adverse life events were perceived, ranging from "not at all stressful" to "extremely stressful". Finally, affective response was measured through anxiety inventories.

Cause and effect: stress measured through three different factors

Finally, patients were also extensively interviewed about their medical background, especially with respect to medical conditions that present serious risk during and after pregnancy and labor to generate a "medical risk" score. Birthweight was measured in grams as a continuous variable, rather than classifying the newborns in broad categories. This more specific data allowed the correlations developed below to be analyzed with a high degree of statistical significance.

Key terms: medical risk score
Cause and effect: the birthweight measurements generated results with a high degree of significance

Figure 1 Correlation matrix of study results

Figure 1 shows us the results of the study. We see that perceived stress and anxiety were very strongly correlated with overall stress assessment, and that stress had a strong negative correlation with birthweight, thus confirming part of the researchers' hypothesis – that maternal stress is correlated with lower birthweight.

	Stress	Event distress	Perceived Stress	Anxiety	Medical Risk	Birthweight
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Event Distress		1	N/A	N/A	0	-0.18
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Birthweight						1

1. The research described in the passage, which takes into account numerical measures of birthweight, survey reports of anxiety, and reports of life events related to friends and family best fits under what model of public health analysis?

A) Medical model
B) Biopsychosocial model
C) Psychosocial model
D) Cohort study

B is correct. In the passage, researchers assess psychological factors through assessments of stress and anxiety. They are collecting sociological data by asking about adverse life events that have happened to friends and family, and finally they are making standard medical measurements through birthweight. The combination of these various factors best fits under the biopsychosocial model.

A: A medical model would not use assessments related to psychological and sociological factors as were used in the passage.

C: A psychosocial model doesn't fit the discussion about the effects of hormones and the numerical assessments of birthweight.

D: The study was a longitudinal one that followed women throughout their pregnancies, not a cohort study.

2. Which of the following identifies a potential methodological flaw in the study?

A) The study's sample size was far too small to allow for correlations with any statistical significance to be drawn.
B) By only assessing maternal and not paternal stress, researchers missed out on key data that would be essential to assessing the effect of parental stress on fetal health.
C) It is already well known that low birth weight correlates with preterm labor so the research findings are redundant.
D) By only working with women who had already chosen to come in for prenatal care very early in their pregnancies and to receive very frequent prenatal checkups, the researchers were working with a sample that may be unrepresentative.

D is correct. In the passage, we're told that all women in the study were interviewed at least 5 times, and on average 7 times throughout their pregnancy, with the first interview occurring no later than the second month of pregnancy. A woman who is willing and able to seek early and frequent prenatal care may not represent the larger population.

A: The study included 130 women. While this number would be considered small for a large epidemiological study, for a study seeking to link two major factors: stress and low birth weight, the sample size is large enough to develop statistics that have significance. In fact, the passage tells us that the correlations were significant.

B: The study was explicitly designed to study the effect of maternal stress on birthweight. There's no reason the researchers had to collect data on paternal stress.

C: The results indicated that stress was correlated with low birth weight irrespective of the term of labor.

3. According to the study results, which of the following women would be most likely to give birth to a low birthweight baby?

A) A first-time mother who was many years younger than the average age in the study
B) An unmarried woman with several medical risk factors but almost no event distress
C) A woman who reports a high level of anxiety and perceived stress but a low medical risk
D) A latina woman with strong social networks and a large amount of event distress but low anxiety

C is correct. The correlation information in the passage shows us that lower birthweight is most strongly linked to anxiety and perceived stress.

4. Assessing a latent variable like stress through a series of surveys that create numerical results is an example of:

A) operationalization.
B) ethnocentrism.
C) medical bias.
D) external validity.

A is correct. Operationalization is the process of taking a phenomenon to be studied and creating a framework by which one can measure it, even though the phenomenon itself is not directly measurable. Thus one can measure various indicators of stress but not stress itself.

B: Ethnocentrism is judging another culture by the values of one's own culture.

C: A bias is holding on to a particular perspective, often unreasonably so. There's no reason to assume these surveys had a "medical" bias. If anything, they were notably psychosocial rather than medical.

D: External validity is when a study is able to create general causal inferences that apply outside the study itself. These surveys in and of themselves are unrelated to external validity, as they only provide correlational information that doesn't directly lend itself to causal conclusions.

5. The study found that medical risk was not correlated with stress, despite the natural assumption that a woman who has many risk factors would be expected to experience stress about those factors. This lack of correlation may best be explained by:

A) the unusually robust health of study participants.
B) the fact that the women in the study were too focused on their high level of distressing life events to worry about their own medical risk factors.
C) the mothers' unawareness of their risk factors.
D) cultural differences between the doctors and patients.

C is correct. The passage mentions that these surveys were done at several free clinics, none of which had Spanish-speaking physicians despite over half of study participants only speaking Spanish. In addition, the doctors were often rushed and did not "communicate fully" with their patients, both English- and Spanish-speaking. This suggests that some of the women many not have been fully educated about their own risk factors.

A, B: Nothing in the passage suggests that either of these is true about the women discussed.

D: While somewhat plausible, this does not explain why there was no correlation even though many English-speaking women were included in the study, including Black and White women.