# Response to Multiple Choice Question

The answer is (C) Kerry, because there is more variability in the proportion of browns among smaller samples.

## Explanation:

This question is testing understanding of sampling variability and how sample size affects the distribution of sample proportions.

Let me analyze this systematically:

If the manufacturer's claim is true, then each candy has a 50% probability of being brown (p = 0.5), and we can model the number of brown candies in a bag as a binomial random variable.

For a sample proportion (p̂), we know that:

- E(p̂) = p = 0.5 (the expected proportion equals the population proportion)

- Var(p̂) = p(1-p)/n = 0.25/n (the variance of the sample proportion)

The key insight is that the variance of the sample proportion is inversely proportional to the sample size. This means that smaller samples (Kerry's fun size bag) will exhibit greater variability in the proportion of brown candies than larger samples (Sam's family size bag).

When we ask which bag is more likely to have more than 70% brown candies, we're asking which sample is more likely to deviate from the expected value (50%) by at least 20 percentage points. Due to the greater variability in smaller samples, Kerry's bag has a higher probability of showing such extreme deviations.

This is a manifestation of the Central Limit Theorem - as sample size increases, the sampling distribution becomes more concentrated around the true parameter value.

Therefore, Kerry's smaller bag has a higher probability of containing more than 70% brown candies.