Let's analyze each potential interpretation based on the information provided about the 95% confidence interval for the average number of chocolate chips in cookies (18.6 to 21.3). Remember that a 95% confidence interval means that if we were to repeat the sampling process many times, approximately 95% of the calculated confidence intervals would contain the true population mean.

\*\*Item 28: "We are 95% confident that the true average number of chocolate chips per cookie in the population is between 18.6 and 21.3."\*\*

- \*\*Answer: (A) Valid.\*\* This is a correct interpretation of a confidence interval. It states that there is a 95% confidence that the interval we calculated from our sample data contains the true population mean.

\*\*Item 29: "There is a 95% probability that the true average number of chocolate chips per cookie is between 18.6 and 21.3."\*\*

- \*\*Answer: (B) Invalid.\*\* This statement is misleading because once the interval is calculated, the true population mean is either within this interval or it isn't; it's not a matter of probability. The correct interpretation is about the process of constructing intervals, not the probability of the true mean being in this specific interval after it's been calculated.

\*\*Item 30: "95% of all cookies have between 18.6 and 21.3 chocolate chips."\*\*

- \*\*Answer: (B) Invalid.\*\* This interpretation confuses the concept of the average number of chips per cookie with the distribution of chips in individual cookies. The confidence interval pertains to the mean number of chips, not the range of chips in individual cookies.

\*\*Item 31: "If we took another sample of the same size from the same population, there is a 95% chance that the sample mean would fall between 18.6 and 21.3."\*\*

- \*\*Answer: (B) Invalid.\*\* This statement is incorrect because the confidence interval is about the population mean, not about where future sample means would fall. The 95% confidence interval tells us about the reliability of our interval estimate for the population mean, not about the distribution of future sample means.

In summary:

- Item 28: (A) Valid

- Item 29: (B) Invalid

- Item 30: (B) Invalid

- Item 31: (B) Invalid