Breakfast Before School

Task

On school days, Janelle sometimes eats breakfast and sometimes does not. After studying probability for a few days, Janelle says, “The events ‘I eat breakfast’ and ‘I am late for school’ are independent.” Explain what this means in terms of the relationship between Janelle eating breakfast and her probability of being late for school in language that someone who hasn’t taken statistics would understand.

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Commentary
The purpose of this task is to assess a student's ability to explain the meaning of independence in a simple context.

You might consider expanding this task by asking students to also explain what it would mean to say that the two events are not independent. You might also provide some probability values (such as "on days when Janelle eats breakfast, she is late to school about 20% of the time and on days when she does not eat breakfast, she is late to school about 10% of the time." Then ask if this indicates that the two events "eats breakfast" and "late to school" are independent or not independent.

Solution
If the events “I eat breakfast” and “I am late for school” are independent, that means that the probability that one of the events happens is not influenced by whether or not the other event has happened (or is happening). In this case, what Janelle is saying is that the probability that she is late for school is the same whether or not she eats breakfast.

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