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|  | * Materials: 1) 60 surveys for the parents to fill out 2) 60 surveys for the teachers to fill out 3) 60 2-day food logs to be filled out by the parents 4) 60 children to gives the surveys to * Procedure Day One 1) Randomly choose classrooms at Fairlands Elementary School. 2) Pass out teacher surveys for each child in the class. 3) Pass to teacher parent surveys for children to take home. Day Two 1) Collect teacher surveys for the class and pass parent surveys to all children who were absent. 2) Make sure children gave suveys to parents. Day 10 1) Collect all surveys from parents. 2) Analyze data provided. Day 11 1) Separate surveys into behavioral based groups: mild, intermediate, and extreme. * Data Data Analysis  To best analyze our data we divided the surveys into three groups: 1) children who are generally well behaved 2) children who are well behaved, but tend to be disruptive or hyperactive sometimes 3) children who were frequently hyperactive and disruptive.  To best set up the groups we established a rubric to determine whether the child would be in the mild group, the intermediate group, or the extreme group. Both the teachers and the parents rated several of the child�s behaviors on a scale of 1-3, one being the child rarely exhibits the disruptive behavior, 2 being the child sometimes exhibits the behavrior, and 3 being the child often exhibits the behavior. The child would be placed in the mild category if they had three or less 2�s and absolutley no 3�s. The child would be placed in the intermediate category if they had 4-5 2�s and/or one 3. If the child was rated with more than six 2�s and/or more than 2 3�s they would be placed in the extreme group. In all we had 8 children in the mild group, 8 in the intermediate group, and only 4 in the extreme group. After separating the surveys we focused on three major behaviors, that specifically related to out hypothesis: temper outbursts, excitability, and frustration. We then performed chi-squared tests, and proportion tests, to see if there were a significant amount of children who ate high-additive diets and corresponded to these behavior.  **Mild Behaviors**  |  |  |  |  | | --- | --- | --- | --- | |  | * high additive diet | * low additive diet | * total | | * temper outbursts | * 0 | * 0 | * 0 | | * no temper outbursts | * 3 | * 5 | * 8 | | * total | * 3 | * 5 | * 8 |  * Because row 1�s total is equal to 0, we were unable to perform a chi-squared test. Instead we did a two-proportion z test. Ho: P1 = P2 Ha: P1 < P2 Assumptions: sample ten times the population : yes simple random sample : yes n(p) > 5 : 8(.375) = 3 8(.625) = 5 n(1-p) > 5 8(1-.375) = 5 8(1-.625) = 3 Z-score= -1 P-value= .159   After calculating the equation, we came up with this conclusion. With a p-value of .159 and a significance level of .05, we fail to reject the null hypothesis. There is no significant evidence that in mild behaviored children, additives would play a part in their temper outbursts. View results with caution because the n(p) assumption test failed.  |  |  |  |  | | --- | --- | --- | --- | |  | * high additive diet | * low additive diet | * total | | * excitable | * 1(.75) | * 1(1.25) | * 2 | | * not excitable | * 2(2.25) | * 4(3.75) | * 6 | | * total | * 3 | * 5 | * 8 |  * For this set of data we were able to perform a chi squared test. Ho: there is no difference between the children who eat additives and the children who don't eat additives Ha: there is a difference between the children who eat additives and the children who don't eat additives Assumptions: expeced values greater than 5 : no simple random sample : yes population ten times greater : yes  |  |  |  |  |  | | --- | --- | --- | --- | --- | | * Observed | * Expected | * Obs - Exp | * Obs - Exp2 | * Obs - Exp2/ Exp | | * 1 | * .75 | * .25 | * .0625 | * .083 | | * 1 | * 1.25 | * -.25 | * .0625 | * .05 | | * 2 | * 2.25 | * -.25 | * .0625 | * .027 | | * 4 | * 3.75 | * .25 | * .0625 | * .016 |  * X2 = .177 P-Value = .67 Degrees of Freedom = 1 With a p-value of .67 and a significance level of .05, we fail to reject the null hypothesis. There isn't a significant difference in the children who ate additives and those who did not. View with caution because our expected value assumption failed.  |  |  |  |  | | --- | --- | --- | --- | |  | * high additive diet | * low additive diet | * total | | * easily frustrated | * 1(.75) | * 1(1.25) | * 2 | | * not easily frustrated | * 2(2.25) | * 4(3.75) | * 6 | | * total | * 3 | * 5 | * 8 |  * For this data we used a Chi-Squared test. Ho: there is no difference between the children who eat additives and the children that don't eat additives Ha: there is a difference between the children who eat additives and the children that don't eat additives Assumptions: expected value > 5 : no population ten times greater : yes simple random sample : yes  |  |  |  |  |  | | --- | --- | --- | --- | --- | | * Observed | * Expected | * Obs - Exp | * Obs - Exp2 | * Obs - Exp2/Exp | | * 1 | * .75 | * .25 | * .0625 | * .083 | | * 1 | * 1.25 | * -.25 | * .0625 | * .05 | | * 2 | * 2.25 | * -.25 | * .0625 | * .027 | | * 4 | * 3.75 | * .25 | * .0625 | * .016 |  * X2= .178 P-Value = .67 Degrees of Freedom = 1 With a p-value of .67 and a significance level of .05, we fail to reject the null hypothesis. There is no significant difference between the children who did eat additives and the children who didn't eat additives. View with caution because our expeced value assumption test failed. **Intermediate Behavior**  |  |  |  |  | | --- | --- | --- | --- | |  | * high additive diet | * low additive diet | * total | | * temper outbursts | * 4(3.5) | * 0(.5) | * 4 | | * no temper outbursts | * 3(3.5) | * 1(.5) | * 4 | | * total | * 7 | * 1 | * 8 |  * For this data we performed a Chi-Squared test. Ho: there is no difference between the children who eat additives and the children than don't eat additives Ha: there is a difference between the children who eat additives and the children who don't eat additives Assumptions: expected values > 5 : no simple random sample : yes population ten times greater : yes  |  |  |  |  |  | | --- | --- | --- | --- | --- | | * Observed | * Expected | * Obs - Exp | * Obs - Exp2 | * Obs - Exp2/Exp | | * 4 | * 3.5 | * .5 | * .25 | * .071 | | * 0 | * .5 | * -.5 | * .25 | * .5 | | * 3 | * 3.5 | * -.5 | * .25 | * .071 | | * 1 | * .5 | * .5 | * .25 | * .5 |  * X2 = 1.14 P-Value = .285 Degrees of Freedom = 1 With a p-value of .285 and a significance level of .05, we fail to reject the null hypothesis. There is not a significant difference in the children who eat additives and the children that don't eat additives. View with caution because our expected value assumption check failed.  |  |  |  |  | | --- | --- | --- | --- | |  | * high additive diet | * low additive diet | * total | | * excitable | * 6(5.14) | * 1(.86) | * 7 | | * not excitable | * 1(.86) | * 0(.14) | * 1 | | * total | * 7 | * 1 | * 8 |  * We used a Chi-Squared test for this data Ho: there is no difference between the children who eat additives and the children who don't eat additives Ha: there is a difference between the children who eat additives and the children who don't eat additives Assumptions: simple random sample : yes expected value > 5 : no population ten times greater : yes  |  |  |  |  |  | | --- | --- | --- | --- | --- | | * Observed | * Expected | * Obs - Exp | * Obs - Exp2 | * Obs - Exp2/Exp | | * 6 | * 5.14 | * .86 | * .7396 | * .143 | | * 1 | * .86 | * .14 | * .0196 | * .022 | | * 1 | * .86 | * .14 | * .0196 | * .022 | | * 0 | * .14 | * -.14 | * .0196 | * .14 |  * X2 = .1632 P-value = .6861 Degrees of Freedom = 1 With a p-value of .6861 and a significance level of .05, we fail to reject the null hypothesis. There is not a significant difference between the children who eat additives and the children who don't eat additives. View with caution because our expected value assumption check failed.  |  |  |  |  | | --- | --- | --- | --- | |  | * high additive diet | * low additive diet | * total | | * easily frustrated | * 3(2.63) | * 0(.38) | * 3 | | * not easily frustrated | * 4(4.38) | * 1(.63) | * 5 | | * totals | * 7 | * 1 | * 8 |  * Ho: there is no difference between the children who eat additives and the children who don't eat additives Ha: there is a difference between the children who eat additives and the children who don't eat additives Assumptions: population ten times greater : yes expected value > 5 : no simple random sample : yes  |  |  |  |  |  | | --- | --- | --- | --- | --- | | * Observed | * Expected | * Obs - Exp | * Obs - Exp2 | * Obs - Exp2/Exp | | * 3 | * 2.63 | * .37 | * .1369 | * .052 | | * 0 | * .38 | * -.38 | * .144 | * .38 | | * 4 | * 4.38 | * -.38 | * .144 | * .032 | | * 1 | * .63 | * .37 | * .1369 | * .217 |  * X2 = .6857 P-value = .4076 Degrees of Freedom = 1 With a p-value of .4076 and a significance level of .05, we fail to reject the null hypothesis. There is not a significant difference between the children who eat additives and the children who don't eat additives. View with caution because our expected value assumption check failed. **Extreme Behavior**  |  |  |  |  | | --- | --- | --- | --- | |  | * high additive diet | * low additive diet | * total | | * temper | * 2(2.25) | * 1(.75) | * 3 | | * no temper | * 1(.75) | * 0(.25) | * 1 | | * total | * 3 | * 1 | * 4 |  * Ho: there is no difference between children who eat additives and children who don't eat additives Ha: there is a difference between the children who eat additives and the children who don't eat additives Assumptions: population ten times the sample : yes expected values > 5 : no simple random sample : yes  |  |  |  |  |  | | --- | --- | --- | --- | --- | | * Observed | * Expected | * Obs - Exp | * Obs - Exp2 | * Obs - Exp2/Exp | | * 2 | * 2.25 | * -.25 | * .0625 | * .02778 | | * 1 | * .75 | * .25 | * .0625 | * .083 | | * 1 | * .75 | * .25 | * .0625 | * .083 | | * 0 | * .25 | * -.25 | * .0625 | * .25 |  * X2=.44 P-value= .50 Degrees of Freedom=1 With a p-value of .50 and an alpha level of .05 we fail to reject our null hypothesis. There is no significant evidence that children who eat additives and those who do not will have a difference in whether or not they will have temper outbursts. View with caution because our expected value assumption failed.  |  |  |  |  | | --- | --- | --- | --- | |  | * high additive diet | * low additive diet | * total | | * excitable | * 3 | * 1 | * 4 | | * not excitable | * 0 | * 0 | * 0 | | * total | * 3 | * 1 | * 4 |  * We could not use a chi-squared test on this one because the total for row 2 was equal to 0. Instead we decided to perform a two proportion z-test. Ho: p1=p2 Ha: p1>p2 Assumptions: simple random sample: yes Population ten times greater: yes n(p) > 5 : 4(.75) = 3 4(.25) = 1 n(1-p) > 5 : 4(1-.75) = 1 4(1-.25) = 3  Z = 1.41 P-value = .0786 After calculating the equation, we came up with this conclusion. With a p-value of .0786 and a significance level of .05, we fail to reject the null hypothesis. There is no significant difference between the children who do eat additives and the children who don't eat additives. View the results with caution because our data failed the n(p) > 5 and the n(1-p) > 5 assumption check.  |  |  |  |  | | --- | --- | --- | --- | |  | * high additive diet | * low additive diet | * total | | * easily frustrated | * 2(2.25) | * 1(.75) | * 3 | | * not easily frustrated | * 1(.75) | * 0(.25) | * 1 | | * total | * 3 | * 1 | * 4 |  * Ho: there is no difference between the children who eat additives and the children who don't eat additives Ha: there is a difference between the children who eat additives and the children who don't eat additives Assumptions: expected values > 5 : no population ten times greater : yes simple random sample : yes  |  |  |  |  |  | | --- | --- | --- | --- | --- | | * Observed | * Expected | * Obs - Exp | * Obs - Exp2 | * Obs - Exp2/Exp | | * 2 | * 2.25 | * -.25 | * .0625 | * .027 | | * 1 | * .75 | * .25 | * .0625 | * .083 | | * 1 | * .75 | * .25 | * .0625 | * .083 | | * 0 | * .25 | * -.25 | * .0625 | * .25 |  * X2 = .44 P-value = .5 Degrees of Freedom = 1 With a p-value of .5 and a significance level of .05, we fail to reject the null hypothesis. There is no significant difference between the children who eat additives and the children who don't eat additives. View results with caution because the expected value assumption check failed. **Summary**  |  |  |  |  | | --- | --- | --- | --- | |  | * high additive diet | * low additive diet | * total | | * extreme behavior | * 3(2.6) | * 1(1.4) | * 4 | | * intermediate behavior | * 7(5.2) | * 1(2.8) | * 8 | | * mild behavior | * 3(5.2) | * 5(2.8) | * 8 | | * total | * 13 | * 7 | * 20 |  * Ho: there is no difference between the children who eat additives the the children who don't eat additives Ha: there is a difference between the children who eat additives and the children who don't eat additives Assumptions: expected value > 5 : no population ten times greater : yes simple random sample : yes  |  |  |  |  |  | | --- | --- | --- | --- | --- | | * Observed | * Expected | * Obs - Exp | * Obs - Exp2 | * Obs - Exp2/Exp | | * 3 | * 2.6 | * .4 | * .16 | * .061 | | * 1 | * 1.4 | * -.4 | * .16 | * .114 | | * 7 | * 5.2 | * 1.8 | * 3.24 | * .623 | | * 1 | * 2.8 | * -1.8 | * 3.24 | * 1.157 | | * 3 | * 5.2 | * -2.2 | * 4.84 | * .93 | | * 5 | * 2.8 | * 2.2 | * 4.84 | * 1.728 |  * X2 = 4.62 P-value = .1 Degrees of Freedom = 2 With a p-value of .1 and a significance level of .05, we fail to reject the null hypothesis. There is not a significant difference between the children who eat additives and the children who don't eat additives. View results with caution because our data failed the expected value assumption check. | |
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