Interpreting b coefficients and making predictions – Practice

For each of the scenarios, answer the following questions.

1. Identify the independent and dependent variables.
2. Interpret the strength, direction and variance explained for the correlation coefficient.
3. Interpret the a value.
4. Interpret the b coefficient.
5. Make predictions for the particular clients associated with each scenario.
6. Interpret the prediction in narrative form.
7. How might this prediction be useful in social work practice?

1 – Witnessing violence and peer conflict

You work with youth who have experienced violence and notice that there appears to be a relationship between the amount of interpersonal violence a child has witnessed and the number of conflicts a child will have with his or her peers. You take a sample of children who are served by your agency and run a regression analysis. You get the following results:

r = .67
a = 4
b = 2

Make predictions for a child who has witnessed violence the following number of times: 1, 5 and 10.

2 – Month spent in residential treatment and amount of truancy

You are a social worker who works at an alternative school who enrolls many students who are coming out of residential treatment for substance abuse. It appears that the longer a student resides in residential treatment, the fewer days of school they miss. You take a sample of adolescents in your school who have spent time in residential treatment and run a regression analysis. You get the following results:

r = -.80
a = 5.3
b = - .73

Make predictions for an adolescent who has spent 1, 3 and 5.5 months in residential treatment.

Answers:

1 – Witnessing violence and peer conflict

1. IV = # times witnessed interpersonal violence, DV = peer conflict
2. This is positive and moderate relationship. 44.89% ($.67^2$) of the variation in peer conflict is explained by number of violent episodes witnessed.
3. When a child has witnessed 0 incidences of violence, that child is predicted to have 4 peer conflicts.
4. For each additional incidence of interpersonal violence that a child witnesses, the number of peer conflicts is predicted to increase by 2.
5. and 6. $Y' = a + bx$
    a. 1 witness - $Y' = 4 + 2(1) = 4 + 2 = 6$; A child who has witnessed one incidence of interpersonal violence is predicted to have 6 peer conflicts.
    b. 5 witness - $Y' = 4 + 2(5) = 4 + 10 = 14$; A child who has witnessed five incidences of interpersonal violence is predicted to have 14 peer conflicts.
    c. 10 witness - $Y' = 4 + 2(10) = 4 + 20 = 24$; A child who has witnessed five incidences of interpersonal violence is predicted to have 24 peer conflicts.

2 – Months spent in residential treatment and amount of truancy

1. IV = months in residential treatment; DV = amount of truancy
2. It is a strong and negative relationship. 64% ($-.80^2$) of the variation in truancy is explained by months in residential treatment.
3. When a child has spent 0 months in treatment, s/he is predicted to be truant for 5.3 days.
4. For each additional month spent in treatment, the number of days a child is predicted to be truant decreases by .73.
5. and 6.
    a. 1 month – $Y' = 5.3 - .73(1) = 4.57$; A child who spent 1 month in treatment is predicted to be truant on 4.57 days.
    b. 3 month – $Y' = 5.3 - .73(3) = 5.3\text{-}2.19 = 3.11$; A child who spent 3 months in treatment is predicted to be truant on 3.11 days.
    c. 5.5 months – $Y' = 5.3 - .73(5.5) = 5.3 - 4.02 = 1.28$; A child who spent 5.5 months in treatment is predicted to be truant on 1.28 days.