

## Case Study 9: Cheating

for April 13, 2012

Charges were brought against a student in a professional school for cheating. The charges alleged that Candidate X exhibited irregular behavior indicative of copying answers from another examinee during a standardized examination. According to the exam proctor, X had engaged in unusual and suspicious behavior during the examination. On multiple occasions during the exam, X would lift his/her examination booklet in front of his/her face and was observed to be looking at another student's test paper.

The school and the student have taken this matter to court, and each of your groups has been hired by a different party in this dispute to provide statistical expertise to help that group prepare for the trial. The first group is hired by the court itself, the second group by the school, and the third group by the student. The school's goal is to show that X cheated and the student's goal is to defend himself or herself from this allegation. The court's goal is to decide the case fairly.

The exam is multiple choice and it is known how X answered all questions, how all other candidates both at this school and elsewhere answered the questions, and what the correct answers are. The testing company has used this information to perform an "agreement analysis." You each receive the analysis performed by the testing company (found online), with the following cover letter.

Dear Dr. Y:

To investigate possible cheating by student X, an "agreement analysis" has been performed as described in the enclosed document on one pair of examinees who took the exam at your school on the date in question. Agreement analysis is a statistical tool that can provide helpful supporting information for the investigation of observed behaviors that may compromise the validity of examinees' test scores. The agreement analysis compares the degree of agreement that is observed between the wrong answers of two examinees with the degree of agreement that would be expected to occur between two randomly chosen examinees taking the same test independently. Agreement analysis uses only those test items that both examinees in the pair answered incorrectly.

Caution is advised when interpreting the results of these analyses, since there is always some probability that the observed agreement did occur by chance. You should not use the results of the statistical analyses alone for making a decision about suspected irregularity, but should also consider as a major factor in any decision the observations made by the proctor(s) and/or any other relevant, non-statistical information.

**Questions for consideration:** Is the analysis done by the testing company appropriate? What evidence does it provide for or against the student? Are there issues or problems with this analysis? Are there other analyses that might provide additional statistical evidence for or against X having cheated on these exams, or other issues should your client bring up or be ready to respond to?

**Groups:** Here are the groups that will work together on this case. The first student on each list will present the group's findings and should also organize group meetings. The groups should get together in the coming week and consider the case.

Group 1, Presentation:		Group 2, Presentation:		Group 3, Report:		Group 4, Report:	
Name	Email	Name	Email	Name	Email	Name	Email
Alain	vando026	Jenny	dokke040	Lindsey	diet0146	Wen	fanxx102
Jie	renxx034	Xiaoyi	zhuxx212	Emily	pech0081	Chris H	hulme005
Greg	schae029	Sarah	jaco0654	Felipe	acosta	Xin	zhan0648
Matt	stear067	Yu-Feng	chang648	Rachel	vonb0035	Qi	yanxx195
Zhou	fang0157	Bryan	mcca0828	Garrett	lepa0050	Joel	bear0201
						Chris D	desja004

*Presentation groups:* The presenter will have 12 minutes of class time to say what the team thought about the problem. To ease switching between groups, we will use my computer for all presenters, so if you choose to make a digital presentation, please email the slides to me by 2pm, or bring them on a thumb drive and arrive five minutes early. PDF format is preferred.

*Report groups:* Please email your report to me (PDF format preferred) by 2pm so I can make copies for the class. Your report should be at least one page long, but no more than two pages.