

Some information and reflection about the value of attendance (with illustrative statistics)

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Take home message

You are 10x more likely to fail the 3rd year stats course if you regularly skip class, compared to those who attend. If you don't fail your mark is lower by 1-2 grades, on average. Even strong students show a boost from attendance. **Think twice before skipping class eh! Make a habit of regular attendance.**

Summary

In 2005 there was a 38% fail rate (average mark: 56) among people who were chronically absent from the stats lectures. In 2006 chronic absentees had a 44% failure rate (average mark: 43). This compares to a 3% failure rate among students who chronically attended stats lectures in 2005 (average mark: 72) and 4% in 2006 (average mark: 69).

Regular attendance boosts your final mark. This is true even when previous grades in stats and stats anxiety are controlled and even when extremely detailed lecture notes are posted online for you.

Why and what I did.

When I first taught 3010 in S2 2005 I made a point of posting detailed lecture notes on the web. First, I believe in students' ability and responsibility to make their own decisions about attendance, particularly for an evening course and one that attracts a lot of working mature students. In addition, I prefer to teach students who are interested and motivated, and I think trying to force students to attend by posting skeletal notes may lead to a resentful, cranky audience (and lecturer!). Finally, I genuinely didn't know how important it is to have face to face contact for a course like stats – I suspected for some students that it is quite possible to learn independently, if the materials were provided, and I wanted to facilitate that.

Accordingly, I posted detailed powerpoint slides for each lecture on the web. At four points through the semester, I monitored attendance (which dropped as low as 25-33%) and then looked at the relationship to grades. I did the same thing in 2006.

Chronic absenteeism: Low marks, high failure rate

In 2005, I divided the class into chronic absentees, chronic attenders, and the occasional defaulters. I used this as a three-level attendance IV, in a one-way ANOVA with marks as the DV. It turned out that attendance was strongly related to grades, $F(2,97)=9.83$, $p<.001$, $\eta^2p=.17$. Follow-up contrasts suggested that chronic absentees achieved lower final marks than occasional defaulters ($M=56.12$ vs. 64.76 , $p=.017$) and these together were outperformed by chronic attenders ($M=71.57$, $p=.001$). Focusing in on the failure rate (which has been about 20% overall in 3010 for the last few semesters, including in S2 2005): only 3% of chronic attenders failed, compared to 12% of occasional defaulters, and a startling 38% of chronic absentees.

The following year I repeated the analysis. The results were identical in outcome and pattern, $F(2,115)=13.546$, $p<.001$, $\eta^2p=.191$. Again, chronic absentees achieved lower final marks than occasional defaulters ($M=43.39$ vs. 60.63 , $p<.001$) and these together were outperformed by chronic attenders ($M=67.60$, $p<.001$). Overall the failure rate in S2 2006

was 22.7%, with another 7.8% who dropped out (I didn't keep track of drop-outs in S2 2005). Only 4% of chronic attenders failed, compared to 15% of occasional defaulters, and a truly appalling 43.9% of chronic absentees. Similarly, none of the chronic attendees dropped out, compared to 2.5% of occasional defaulters and 15.8% of chronic absentees.

It's not about weak students skipping class

One possible confound is if strong students are more likely to attend, and weak students to skip. When I checked however, students' previous grade in second year stats (which I take as a crude measure of how strong a stats student they are) was not correlated with attendance in my third year class in 2005 ($r=.18, p = .108$) or 2006 ($r=.07, p=.560$), despite a strong link with their final mark in 3rd year stats in both years (2005 $r=.67, p<.001$; 2006 $r = .53, p<.001$). So that can't explain away the results.

Can strong students afford to skip class?

It is also interesting to consider the possibility that attendance might impact differently on grades for strong and weak students. For example, I hypothesized that attendance would be more important in bolstering the grades of weak students, whereas high achievers might be more easily able to study independently.

With the 2005 marks, after centering 2010 grades, and using mean substitution to replace missing values, I conducted a hierarchical multiple regression in which students' 3010 final mark was predicted by their 2010 grades and attendance, in Block 1, and the interaction in Block 2. In Block 1, a significant amount of variance in grades was accounted for, $F(2,131)=32.65, p<.001, R^2 \text{ ch.} = .33$. Inspection of the coefficients revealed that 2010 grade was strongly linked to grades this year ($\beta=.46, p<.001$) but independent of previous mark, attendance boosted students' 3010 mark ($\beta=.29, p<.001$). When the interaction was entered in Block 2, no increase in variance accounted for was observed, $F(1,130)=0.04, p=.844, R^2 \text{ ch.} = .00$. Contrary to expectations, there was no moderating effect such that it was less important for strong students to attend class ($\beta= -.01, p=.844$). Although strong students get higher marks overall, the present data show that strong students who attended regularly boosted their mark as much as weak students did.

I got the same pattern in 2006: again, past grades ($\beta=.33, p<.001$) and attendance ($\beta=.18, p=.037$) each predicted independently in Block 1, $F(2,125)=10.58, R^2 \text{ ch.}=.145, p<.001$, and the interaction did not increase variance in Block 2, $F(1,124)=0.09, R^2 \text{ ch.}<.01, p=.771$. The interaction is depicted in Figure 1.

In 2006 I also looked at stats anxiety as a potential mediator or moderator of the benefits of attendance, and I found no significant results.

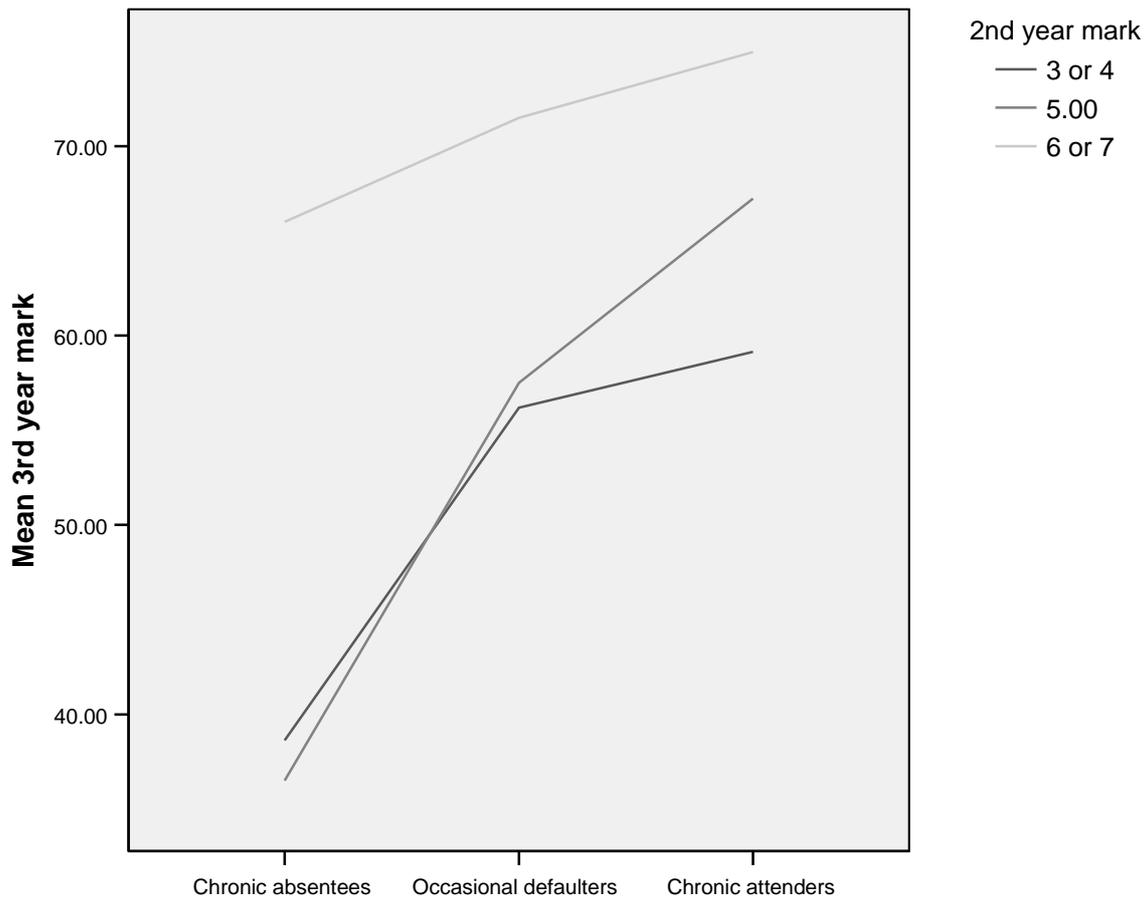


Figure 1 illustrates the 2006 data using attendance and previous grades in 2nd year stats in association with 3rd year grades. Attendance is equally important overall, but as you can see it's especially important in avoiding failure for struggling students, and in getting high marks for moderate and strong students.

In terms of why attendance is not interacting significantly with grades, I reason that there may be other factors which are both reducing attendance and adversely impacting on grades for strong and weak students alike. These could include heavy employment/family demands or personal stressors, which could undermine performance regardless of previous learning / ability.

Also, I think it is likely that regular attendance is benefiting top and bottom students alike by helping them disperse their learning over time. Whereas people who skip class end up trying to "cram" learning at the last minute (not impossible overall, but quite hard in this course), people who attend class regularly can assimilate the complex material one block at a time. I'm not sure how to measure this but I reckon it's probably the key driver of the effect.

Future directions

This year, I will repeat the study and try to figure out what I am doing that is helping strong students excel, as well as what I am doing to help weaker students bolster their marks and how this can be improved.

Obviously, I will also try to encourage students to attend class, for example by distributing this material at the start of semester.

I plan to keep on posting detailed lecture notes this year (2007) but I may have to review this policy next year if I can't get the rate of failure for the course to fall below 20%.