

Vanity project or serious research?

Derek M. Jones

<derek@knosof.co.uk>

Researcher's view of their work



Figure 1. My amazing ideas

Industry view of academic researchers



Figure 2. Who let him in?

Is this guy serious?

Believable evidence provided?

Worthwhile improvement demonstrated?

Name and shame

Serious research

- based on experimental evidence
- replicated

Vanity project

Example experiment

The Empirical Investigation of Perspective-Based Reading,
Basili et al

My own experiments

<http://www.knosof.co.uk/dev-experiment.html>

Structure of experiment

	Group 1	Group 2
Day 1	NASA A ATM	NASA B PG
Day 2	Perspective-based reading training	
	PG NASA B	ATM NASA A

Variables measured

Independent variables:

SUBJ	subject identifier
RUN	experimental run (1994, 1995)
RTECH	reading technique (USUAL, PBR)
ORDER	First/Second day
PRSP	perspective (NONE, DES, USER, TEST)
YEXP	years experience in the assigned perspective
DKIND	document read NASA/generic (ATM, PG)

Dependent variables:

TDPC	percentage of true defects found
TDNO	number of true defects found
TIME	time to finish (in minutes)
FPNO	number of false positives
FPPC	percentage of false positives (derived)
TDPH	number of true defects found per hour (derived)

Data analysis

Mixed-effects regression model

Empirical Software Engineering using R

<http://www.knosof.co.uk/ESEUR/>

Commonly seen result

```
Generalized linear mixed model fit by
maximum likelihood (Laplace
  Approximation) [glmerMod]
Family: binomial ( logit )
Formula: cbind(TDNO, DNOTFOUND) ~ ORDER +
DKIND + (1 | SUBJ)
Data: complete_95
```

```
          AIC          BIC    logLik deviance
df.resid
  279.9      287.7    -136.0    271.9
48
```

Random effects:

```
Groups Name          Variance Std.Dev.
SUBJ (Intercept) 0.3448    0.5872
Number of obs: 52, groups: SUBJ, 13
```

Fixed effects:

```
          Estimate Std. Error z value
Pr(>|z|)
(Intercept) -0.8576      0.1948  -4.403
1.07e-05 ***
ORDER        -0.2972      0.1327  -2.240
0.0251 *
DKINDNASA    0.9718      0.1366   7.115
1.12e-12 ***
```

```
Signif. codes:  0 '***' 0.001 '**' 0.01 '*?'
0.05 '?.' 0.1 '?' 1
```

Correlation of Fixed Effects:

(Intr) ORDER

ORDER -0.319

DKINDNASA -0.273 -0.030

Worthwhile improvement

X% faster ... Y% cheaper

Allows lower cost people to do the job

Basic research

Models of how people read

<http://www.knosof.co.uk/cbook/>

Eye Movements in Programming

<http://emipws.org/>

Data availability

420 emails: "I have been reading your interesting paper"

Table 1. Responses to email request for data.

Response	Count	Percent
Received data	136	32%
No reply	132	32%
Pending (received a positive reply)	49	12%
Confidential	42	10%
No longer have the data	20	5%
Best known address bounces	11	3%
