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Are Academics Messy? Testing the Broken Windows Theory with a Field Experiment in the Work Environment

Working Paper No. 2009 – 21

Are Academics Messy?
Testing the Broken Windows Theory with a Field Experiment in the Work Environment

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Abstract

We study the broken windows theory with a field experiment in a shared area of a workplace in academia (department common room). We explore academics' and postgraduate students' behaviour under an order condition (clean environment) and a disorder condition (messy environment). We find strong support that signs of disorderly behaviour triggers littering. In the disorder treatment 59% of the subjects litter compared to 18% in the order condition. The results remain robust when controlling compared to previous studies for a large set of factors in a multivariate analysis. When academic staff members and postgraduate students observe that others violated the social norm of keeping the common room clean the probability of littering increases ceteris paribus by around 40 percent.

JEL classification: Z130; C930; K420
Keywords: broken windows theory; field experiment; littering

I. INTRODUCTION

Understanding what triggers antisocial and petty criminal behaviour is important to developing better communities. The broken windows theory (BWT) states that "signs of inappropriate behaviour like graffiti or broken windows lead to other inappropriate behaviour (e.g. litter or stealing)" (Keizer et al. 2008, p.1685). The BWT appeared in an essay written by Wilson and Kelling (1982) in the *Atlantic Monthly* stressing that if a broken window in a building is left unrepaired, the rest of the windows will soon be broken, not only in rundown neighbourhoods, but also in nice ones. They argue that this is because an unrepaired broken window signals that no one cares and so that breaking more windows is costless.

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The theory has strongly influenced law enforcement strategies in several US cities such as New York, Chicago, Baltimore, Boston and Los Angeles aiming at maintaining order by dealing more aggressively with minor offenses (Harcourt and Ludwig 2006). Similarly, European countries have been influenced by the broken windows theory (Funk and Kugler 2003). However, Harcourt and Ludwig (2006) criticise that despite the widespread policy influence "remarkably little is known about the effects of broken windows" (p. 272). Some recent contributions contend that the enthusiasm for the broken-windows strategy is problematic (Taylor 2000; Harcourt 2001). Further studies also support such a picture. Moderate effects that were not robust were found by Sampson and Raudenbush (1999). Using data from a social experiment where low-income families living in communities with high rates of social disorder were randomly assigned housing vouchers to move to less disadvantaged and disorderly communities, Harcourt and Ludwig (2006) provide no support for the BWT. On the other hand, using a dynamic approach with quarterly time series data from Switzerland, Funk and Kugler (2003) find support that an increase in minor theft triggers a substantial increase in subsequent, more severe crimes such as burglary or robbery (but not the other way round). Moreover, in a recent field experiment Keizer et al. (2008) provides evidence supporting the theory. They find in six different controlled field experiments in common public spaces in the town of Groningen in The Netherlands that as a certain norm-violating behaviour becomes more common, it will negatively influence conformity to other norms and rules.

Thus, currently we observe not only a limited amount of empirical studies but also mixed results. Additionally, to date research into BWT has been criticised for being largely correlational and failing to provide concrete causal evidence (Keizer et al. 2008, p.1681). This suggests the usefulness of working with an experimental approach. Moreover, one should note that BWT has previously been applied in shared public settings or neighbourhoods where people live, but not in a smaller more enclosed environment such as the workplace.

In this paper we are therefore interested in testing in a controlled field experiment whether the BWT can be applied to quasi-private enclosed settings in the work environment using a homogenous group of individuals, namely academics. In particular, we explore whether this concept can be applied to the average office lunchroom. This setting is enclosed simply because it is indoors, quasi-private in that it is not a conventional public place; however it is not fully private either because it is shared by various staff of the particular organisation which can induces collective-action problems.

It is not only useful to analyse the question in a field experimental setting, but also to focus on a homogenous group such as academics as it has been criticised that the differences across neighbourhoods are driven by unobservable individual characteristics related to the residents of the neighbourhood and the problems of self-selection of individuals in such neighbourhoods (Harcourt and Ludwig 2006). In other words it is difficult to isolate the impact of crime change in cities such as New York. Demographic factors, changes in drugs markets, organizational reforms within the police department and an increased incarceration or a reduction of unemployment could also have contributed to the crime drop (Harcourt 2001). Moreover, one should also note that as researchers we have a natural interest to not only explore the overall population, but also how academics behave. Interestingly, there is not a lot of evidence about social norm compliance among academics. In particular, exploring compliance behaviour among academic economists is interesting as it allows us to test as Coupé (2004, p. 210) stresses whether available theories can be applied to economists.

II. METHOD

To test these ideas we conducted a small field experiment at the School of Economics and Finance at the Queensland University of Technology in Brisbane, Queensland, Australia. Being members of the School provided us with the opportunity to control and test for the impact of several variables that previous studies have neglected due to lack of observability. Being part of the environment also allowed us to be sure that subjects were not aware of being involved in such a field experiment. The setting was the common room. This room is shared by almost all members of the School. Subjects were all people utilising the common room between the hours of 12 pm and 1 pm, i.e. during lunch time. The experiment was conducted in May 2009. The strength of such a field experiment is that subjects are acting in the natural environment instead of an artificial laboratory environment (natural incentives to behave). It has been shown that experiments performed in an environment where the test subjects are keenly aware that their behaviour is being monitored are prone to change their normal behaviour such that it is difficult to generalize the results (Levitt and List 2009).

Following in a similar fashion to Keizer, Lindenberg and Steg (2008), we distinguished between a contextual norm and a target norm and manipulated the indications that the contextual norm was violated. We can define the *contextual norm* which the participant *witnessed* having been violated and the *target norm* which the participant *violates*

themselves. Our dependent variable was whether a user of the common room violated the target norm, which in our situation would have been a minor inconvenience to the subject. We define a disorder condition as one where the contextual norm is violated and the order condition as one where it is not. We predicted participants would violate the target norm more frequently in the presence of a contextual norm violation. We treated the status quo as the order condition (our control group). The common room is cleaned every morning and so is generally maintained clean and orderly leading up to lunchtime (see *Figure 1*). Clean cutlery, crockery, and drinking glasses are stored in the common room cabinets and it is expected that any used wares are placed in the School's dishwasher (in the same room) for later washing. This behaviour, we assert, can be regarded as the injunctive norm or the most appropriate behaviour in this situation. Hence, any participant not placing used common room utensils, plates, etc. in the dishwasher was considered to have 'littered'.

For our disorder condition, we manipulated the indications that the contextual norm was being violated (placing used cutlery, crockery, and drinking glasses in the common room sink). To further reinforce the disorder condition, we made the common room generally untidy by spreading newspapers, magazines etc. around the room, and leaving sugar packets around the common room, and placing litter on floor near the rubbish bin (see *Figure 2*) hence making it immediately noticeable that the room was messier than usual. This established evidence of a cross-norm inhibition effect where not placing cutlery in the dishwasher fosters the violation of norms regarding the tidiness of the room.

Figure 1 about here
Figure 2 about here

III. RESULTS

In both treatments, the order treatment (ORDER, tidy common room) and the disorder condition (DISORDER, untidy common room) we obtained 49 observations. Of the participants in the order condition, 18% 'littered' compared with 59% of the subjects in the disorder condition (see Figure 3). A two-sample Wilcoxon rank-sum (Mann-Whitney) test indicates that the difference between order and disorder condition is highly statistically significant at the 1% level ($z = -4.125$).

Figure 3 about here

However, the descriptive analysis only gives us information about the raw effects and not the partial effects. Thus, we test whether the difference remains statistically significant using a multivariate analysis. We use a probit model due to the non-linear and binary nature of the dependant variable. The dependant variable in this analysis is a variable used to indicate whether individuals were littering (value 1) or not (value 0). As a linear regression model is unbounded, the model can produce predicted probabilities that are negative or exceed unity which are of course unrealistic. It is also not possible to arbitrarily constrain the point predictions outside the unit interval to either 0 or 1 as the error term would not satisfy the assumption of homoskedasticity (Baum 2006). A probit model allows us to solve these problems by implementing a non-linear function that takes on values strictly between zero and one. As the estimated probit coefficients are based on a non-linear estimation technique, we cannot interpret the coefficients readily in terms of the quantitative sizes of the effects. We therefore calculate the marginal effects at the multivariate point of means to find the quantitative effect of an independent variable.

Table 1 presents the results. In specification (1) we only use DISORDER as an independent variable. In a next step we add socio-demographic factors such as gender and age and job characteristics, namely whether the person has an economic (ECONOMIST=1) or finance background or is a staff (ACADEMIC STAFF=1) or postdoctoral student. Next, in specification (3) we add a variable PEOPLE PRESENT that measures whether the litter behaviour changes when more individuals are in the room. As a further robustness check we present in specification (4), (5) and (6) a further group of specifications where standard errors by subjects are clustered, since clustering picks up unobserved individual-specific characteristics. In specification (5) we also control with two dummy variables whether there is a “Monday” or “Friday” effect as the field experiment was conducted over a period of six days. Finally, in specification (6) we control for the POSITION (RANK) of the subjects (1=Postgraduate student; 2=Postdoctoral Fellow, Lecturer, Senior Lecturer; 3=Associate Professor, Professor).

The results show a robust picture that is consistent with previous results. The coefficient of our variable DISORDER is always statistically significant (mostly at the 1% level). The marginal effects are also quite large. Being in a disorder situation increases ceteris paribus the probability of littering between 26 and 45%. The results also show that individuals AGE 50 AND MORE are more likely to litter than our reference group (AGE BELOW 30) reporting also large marginal effects (around 60%). We also observe the

tendency that a large amount of individuals in the room discourage littering. However, the coefficient is not always statistically significant is specification (4) and (6). There is also the tendency of a Monday effect. It seems to help spending the weekend at home where one may have difficulties littering. Finally, more senior staff members are more likely to litter, although one should note that the coefficient is only statistically significant at the 10% level.

IV. CONCLUSIONS

The novelty of this study is to use a small *controlled field experiment* in a *shared area* of a *workplace* in *academia* (common room) to explore whether the broken windows theory helps to explain littering behaviour. The evidence strongly suggests that a broken-windows effect is visible. The presence of signs of disorder in the common room led to a substantial increase in the probability of subjects violating the contextual norm ('littering'). The descriptive analysis shows that in the disorder treatment 59% of the subjects litter compared to 18% in the order condition. The strength of this study is also to be able to control, compared to previous studies, for a set of independent factors in a multivariate analysis. The statistically significant difference between control and treatment group remains in such a multivariate analysis. When academics observe that others violated the social norm of keeping the common room clean the probability of littering increases ceteris paribus by around 40 percent. The results therefore suggest that preventing signs of disorders is an effective method of maintaining the workplace common room in a satisfactory state.

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Figure 1: Order condition

Figure 2: Disorder Condition

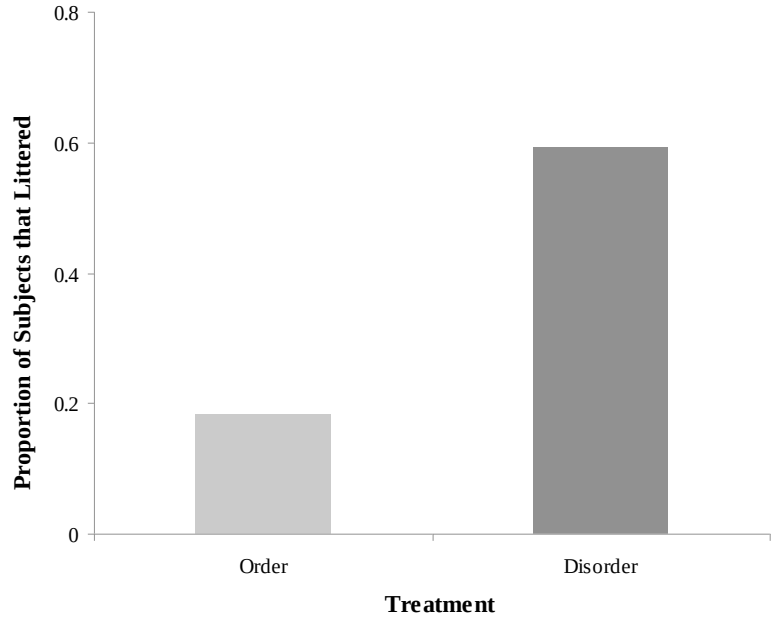

Figure 3: Proportion of subjects which littered under the order treatment and the disorder treatment

Table 1: The Impact of Disorder on Littering

PROBIT MODEL DEP. VARIABLE: LITTERING	(1)	(2)	(3)	(4) Clustering over individuals	(5) Clustering over individuals	(6) Clustering over individuals
INDEPENDENT FACTORS						
DISORDER	1.134*** (4.11) *0.408*	1.280*** (4.01) *0.453*	1.067*** (3.14) *0.381*	1.067*** (3.93) *0.381*	0.737** (2.50) *0.259*	0.809*** (2.95) *0.284*
MALE		-0.277 (-0.73) *-0.105*	-0.284 (-0.73) *-0.107*	-0.284 (-0.69) *-0.107*	-0.228 (-0.48) *-0.083*	-0.251 (-0.52) *-0.092*
ECONOMIST		-0.272 (-0.75) *-0.104*	-0.319 (-0.86) *-0.121*	-0.319 (-0.73) *-0.121*	-0.289 (-0.60) *-0.106*	-0.186 (-0.37) *-0.068*
ACADEMIC STAFF		0.425 (1.20) *0.160*	0.611 (1.63) *0.228*	0.611 (1.62) *0.228*	0.563 (1.33) *0.203*	
AGE 30-39		0.164 (0.44) *0.062*	0.089 (0.23) *0.033*	0.089 (0.18) *0.033*	-0.108 (-0.21) *-0.038*	-0.206 (-0.39) *-0.072*
AGE 40-49		-0.589 (-1.12) *-0.199*	-0.654 (-1.21) *-0.215*	-0.654 (-1.35) *-0.215*	-0.861* (-1.71) *-0.253*	-0.911* (-1.77) *-0.264*
AGE 50 AND MORE		1.599*** (3.28) *0.571*	1.719*** (3.41) *0.604*	1.719*** (3.41) *0.604*	1.758*** (3.38) *0.619*	1.692*** (3.35) *0.601*
PEOPLE PRESENT			-0.155* (-1.89) *-0.057*	-0.155 (-1.58) *-0.057*	-0.177* (-1.72) *-0.063*	-0.164 (-1.64) *-0.059*
MONDAY					-1.223* (-1.96) *-0.342*	-1.195** (-1.99) *-0.337*
FRIDAY					0.391 (1.43) *0.145*	0.345 (1.44) *0.128*
POSITION (RANK)						0.532* (1.67) *0.191*
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.137	0.286	0.315	0.315	0.373	0.380
# of observations	98	98	98	98	98	98

Notes: z- values in parentheses, marginal effects in italics. The symbols *, **, *** represent statistical significance at the 5%, 1%, and 0.1% levels, respectively. In the reference group: ORDER TREATMENT, FEMALE, FINACE, POSTGRADUATE STUDENTS, AGE BELOW 30, TUESDAY-THURSDAY.